

VAN HALL LARENSTEIN
University of Applied Science

Forumgebouw, gebouwnr
Droevendaalsesteeg 2
6708 PB Wageningen

Tel +31(0)317 486230
Fax +31(0)317 486280
www.vanhall-larenstein.nl

Alternative measures towards green tea supply chain integration

----- A case of Enshi Rainbow International Rich-Selenium Tea Co. Ltd China



A Research Project Submitted to Larenstein University of Applied Sciences in Partial Fulfillment of the Requirements for the Degree of Masters in Agricultural (Horticulture) Production Chain Management.

By

Xi. Zeng

September 2009



Wageningen

The Netherlands

© Copyright. Xi. Zeng. 2009. All Rights Reserved

PERMISSION TO USE

In presenting this research project in partial fulfilment of the requirements for a postgraduate degree, I agree that the library of this University may make it freely available for inspection. I further agree that permission for copying of this research project in any manner, in whole or in part, for scholarly purposes may be granted by the Larenstein Director of Research. Any copying, publication or use of this research project or parts thereof for financial gain shall not be allowed without my written permission. Due recognition shall be given to me and to the University in any scholarly use which may be made of any material in my research project.

Requests for permission to copy or to make other use of material in this research project in whole or part should be addressed to:

Director of Research
Larenstein University of Applied Sciences
P.O. Box 9001
6880 GB Velp
The Netherlands
Fax: 31 26 3615287

ACKNOWLEDGEMENT

This thesis could not have been done without the enthusiasm, commitment and support of a large number of people in my country. I appreciate all interviewees who provide useful information for me to understand the tea supply chain and the subsector. Without their knowledge, experience and support, nothing that is described here could have been accomplished.

I am especially grateful to the management of Enshi Rainbow International Rich-Selenium Tea Co. Ltd for offering the chance to carry out the research within the organization and providing me with constant help during the research.

Finally yet importantly, I realized that there was constant need to carry out consultation and obtain knowledge from the Van Hall Larenstein staffs who were involved in the course, particularly many thanks to Mr. Bernard, Gildemacher, who has been a very good supervisor. His sustained interest, constructive advice and insightful criticism guided me throughout the research.

TABLE OF CONTENT

PERMISSION TO USE.....	ii
ACKNOWLEDGEMENT.....	iii
TABLE OF CONTENT	iv
LIST OF TABLES	vii
LIST OF FIGURES.....	viii
LIST OF ABBREVIATIONS	ix
ABSTRACT.....	x
CHAPTER1. INTRODUCTION AND RESEARCH BACKGROUND.....	1
1.1 Company information of ‘Rainbow’.....	1
1.2 Problem statement.....	2
1.3 Research objective.....	2
1.4 Research questions	2
1.5 Research methodology	3
1.5.1 Research framework and data collection.....	3
1.5.2 General items for interviews	4
1.5.3 Limitation of the research	5
1.6 Significance of the study	5
1.7 Outline of the study	5
1.8 Definition of terminologies.....	6
CHAPTER2. COMPANY DESCRIPTION / ANALYSIS.....	7
2.1 Geographic and climatic condition	7
2.2 Mission and future perspectives.....	7
2.3 Organization structure	8
2.4 Cultivation factors.....	9
2.4.1 Tea variety.....	9
2.4.2 Soil conditions	9
2.4.3 Planting space	9
2.4.4 Fertilization applications	9
2.4.5 Quality certification	10
2.4.6 Plant protection.....	11
2.4.7 Control of chemical products	11
2.3.8 Other issues	11
2.5 Harvesting.....	12
2.6 Quality check, processing and refining.....	12
CHAPTER3. LITERATURE REVIEW.....	13
3.1 Tea industry in China	13
3.1.1 Tea plant information and tea products	13
3.1.2 Tea production and locations in China	14
3.1.3 Tea consumption in domestic market.....	15
3.1.4 Factors influencing domestic tea consumption.....	15

3.2 Development of green tea subsector and supply	17
3.2.1 Subsector mapping.....	17
3.2.2 Producing models in (green) tea subsector	18
3.2.3 Development of organic tea.....	18
3.2.4 Bottlenecks and constrains in the green tea subsector	20
3.2.5 New trends in green tea market.....	21
3.2.6 New trends in green tea supply chain.....	21
3.3 Chain integration	23
3.4 Out-grower scheme.....	24
CHAPTER4. RESULTS.....	26
4.1 Tea supply/value chain mapping.....	26
4.2 Role and functions of stakeholders	28
4.3 Situation analysis	29
4.3.1 Input supply	29
4.3.2 Tea growers.....	30
4.3.3 Problems for leaf collection	31
4.3.4 Quality control and processing in Rainbow.....	32
4.3.5 Distribution channels	34
4.3.6 Retailers	35
4.3.7 Consumers	35
4.4 Chain supporters.....	37
4.5 Chain influencer	38
4.6 Value share in the chain.....	39
CHAPTER5. BUSINESS ENVIRONMENT ANALYSIS.....	40
5.1 Porter five forces analysis	40
5.1.1Barriers to entry	40
5.1.2 Bargaining power of suppliers	41
5.1.3 Bargaining power of buyers.....	41
5.1.4 Threat of substitutes	41
5.1.5 Degree of rivalry in domestic tea market	42
5.2 SWOT analysis	43
CHAPTER6.DISCUSSION	45
6.1 Conflicts and contrasting interests with suppliers in the chain	45
6.2 Limitation in market development.....	46
CHAPTER7. ALTERNATIVE MEASURES TOWARDS CHAIN INTEGRATION.....	47
7.1 Applying vertical (backward) integration in Rainbow case	47
7.1.2 Applying out-grower scheme	48
7.1.3 Monitoring performance (quality and yield).....	50
7.1.4 Government support.....	50
7.2 Applying vertical (forward) integration in Rainbow case.....	50
7.2.1 Potential new markets	51
7.2.2 Market entry strategies	51

7.2.3 Functions/activities of the sales agency/branch office and other related issues	53
CHAPTER8. CONCLUSION AND RECOMMENDATION.....	54
8.1 Conclusion	54
8.2 Recommendation	55
REFERENCE	57
APPENDIX	60
Annex1. Tea green leafhopper.....	60
Annex2. Tealeaf (brown) blight	63
Annex3. Functions/activities of the sales agency/branch office and other related issues.....	65
Annex4. Brief notes for case study 1.....	68
4.1 Interview with general manager in Rainbow	68
4.2 Interview with sales manager in Rainbow.....	70
4.3 interview with production manager of Rainbow	71
4.4 Interview with growers	73
4.5 Interview with officer in Enshi agriculture Bureau	75
4.6 Interview with secretary of Hubei Tea association.....	76
Annex5. Interview notes for case study 2.....	77
5.1 interview with the general manger of Hua Longchun Company	77
5.2 Interview with general manger of Enshi Qing Jing Tea Company	79
5.3 Interview with the deputy manager of Wuhan Wuzi Green Company.....	80

LIST OF TABLES

Table1. Sales figure of Rainbow Company from 2005-2008	2
Table2. The fertilization of topdressing and the density of the fertilizer	10
Table3. Difference between Organic tea VS A grade Greenfood tea	10
Table4. Domestic per-capital tea consumption in different locations in 2007	16
Table5. Total growing areas of organic tea in different provinces	19
Table6. Average production per ha in major green tea producing provinces in China and other countries	20
Table7. Chain stakeholders and functions.....	28
Table8. Different consumer groups and green tea consumption in domestic market	35
Table9. Value share of actor in the green tea value chain.....	39
Table10. Comparing the market share between readymade tea beverages and carbonated beverages from 2001-2005	42
Table11. SWOT analysis of Rainbow's case	43
Table12. Estimated initial cost for branch office in Dalian	67

LIST OF FIGURES

Figure1. The organization chart of Rainbow.....	8
Figure2. The general processing procedures of different tea products	13
Figure3. Tea production regions in China.....	14
Figure4. Average per-capita tea consumption in China.....	15
Figure5. Tea consumption in rural and urban areas in China from 1985-2004..	16
Figure6. Green tea subsector map	17
Figure7. Market consumption of different tea products in1980 and 2006.....	21
Figure8. New trend of tea supply chain in Domestic market.....	22
Figure9. Green tea supply chain of Rainbow case	27
Figure10. Steaming time and different tea characteristics.....	33
Figure11. Tea refining workshop	33
Figure12. Marketing channels of green tea at retailing level	35
Figure13. Consumption of green tea at different price level in domestic market	36
Figure14. The centralized model of out-grower scheme.....	49
Figure15. Ansoff Matrix	52
Figure16. Right: Tea green leafhopper adult; Left: Nymph (immature stage)....	60
Figure17. Symptoms of tealeaf (brown) blight	63

LIST OF ABBREVIATIONS

ARI	Hubei Agriculture Research Institute
CCOF	California Certified Organic Farmers
CEEC	Center for Environmental Education and Communication
CESDRRC	China Environment and Sustainable Development Reference and Research Center
CGFDC	China Green Food Development Center
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Statistics
GDP	Gross Domestic Product
GFDC	Green Food Development Center
HA	Hectare
HTA	Hubei Tea Association
ISO	International Organization for Standardization
KIT	Royal Tropical Institute
MOA	Ministry of Agriculture
NGO's	Non Governmental Organizations
NPK	Nitrogen, Phosphorus and Potassium fertilizer
OA	Organic Agriculture
OTRDC	Organic Tea Research and Development Centre
USDA	United States Department of Agriculture
VCA	Value Chain Analysis

ABSTRACT

This dissertation is a case base study for Enshi Rainbow International Rich-Selenium Tea Co. Ltd. The company is facing the problem of declining of sales figure. To find the right business strategies is a priority for the company. In this research, the major research approach is two case studies. Additional information was collected from literature and interviews.

The first step is to analyze the current situation of Rainbow's supply chain and the business environment in the tea sector. The value chain was mapped to include all the chain actors, supporters and influencers. Information gathered through interviewing actors in the supply chain of Rainbow and used to identify the various stakeholders and investigate their roles, function, behaviour and relation. The business environment is analyzed by Porter five forces theory. Then the SWOT analysis for Rainbow is conducted.

Through the field research in Enshi County, the researcher indentified two major constrains in the supply chain of Rainbow. One is that purchasing raw materials from small-scale growers with a simple buying agreement causes conflicts and contrasting interests with suppliers in the chain. Another limitation for the company is that high dependency on a few wholesalers or intermediary leads to weak bargaining power and limited access in the main domestic markets. Based on the result, the author compared Rainbows' chain with other businesses in the tea sector and recommended two alternative measures (out-grower scheme and setting branch office in Dalian) by using the theory of chain integration. These recommendations aimed to contribute on strengthening the role of Rainbow Company in the green tea supply chain to enhance the competitiveness and access in domestic market.

Keywords

Rainbow Company, green tea, tea industry in China, supply chain management, chain integration, out-grower scheme, market access

CHAPTER1. INTRODUCTION AND RESEARCH BACKGROUND

Tea is a very popular beverage all over the world. Tea grows in tropical and subtropical countries, and several developing countries are highly dependent on tea for their export earnings. Production and consumption are steadily increasing. China is the world's top grower, with production of 1.094 million ton in 2007. India took second place, with 944,912 ton of tea. Kenya is next, taking the bronze medal with 369,606 ton and thus overtaking Sri Lanka in 2007 – Sri Lanka produced just under 304,613 t of tea, thus taking 4th position among the tea growing countries.

The cultivation and trading of tea originated in China and has a history of more than one thousand years. Tea has been one of the daily necessities China since ancient time. In the past dynasties, people not only formed a special way of tea drinking, but also developed an art form called tea drinking. Recent days, tea drinking in China is rather a tradition and culture than personal habit. As an import part in the agricultural sector, many private enterprises and government organizations are involved in the tea subsector.

This chapter introduces the backgrounds of the research problem. It also describes the research objectives, main/sub research questions and the methodology.

1.1 Company information of 'Rainbow'

The Enshi Rainbow International Rich-Selenium Tea Co. Ltd established in 2004 located in the Economic & Technological Development Zone of Enshi County by taking over a state-owned tea company. Now it is a private enterprise integrating development of tea products, cultivation, processing, trading and R&D of tea products. The organization focuses on producing and processing of premium quality tea as its core primary operations. The company is specialized in green tea with a brand name "EnShiYuLu". The most distinct feature of this product is that it has a high content of selenium (the details are in chapter 2.1 and 4.2.2). It is also one of the advantages making the products highly appraised by many clients and consumers.

It is about 43% of fresh tea leaves used as a raw material are collected from about 428 Ha of its own tea plantation. The other 57% of supply is directly purchasing fresh leaves from small holders. With 48 technicians and 86 workers, company has set up its own processing and refining production line. Its annual processing capacity reaches 900-1000 tons (the actual average annual production is around 700-750 ton which only reaches 70-75 percent the capacity). In last few years, about 40% products are sold within the Hubei province through several wholesale markets located in major cities in the province. Most the products are sold through a few wholesalers or intermediary and one big exporter (Hua Longchun Tea (Group) Co Ltd which is the leading tea company in Enshi district owns the import and export license) and distributed to other parts of China (45%) and the foreign market (15%).

The company has been certified with ISO9000 quality control system, QS (Quality Safety, the Chinese standard of product quality inspection) and 'A grade Greenfood'. All produces are made according to these standards. Due to the fact that quality of tea products from Rainbow is guaranteed by these quality management certificates, therefore this research will not focus much on the quality management of tea cultivation and processing in the field and processing workshop.

1.2 Problem statement

The Rainbow Company was reformed in 2004. With the increase of processing capacity, the supply from its own tea plantation was no longer fulfilling the demand. Therefore, the company had to purchase fresh leaves directly from local growers with a simply buying agreement, which is not legally valid and leads to other uncertainties. Basically, the company mainly plays the role as a processor in the tea supply chain. Most of the company's sales are highly depends on the few wholesalers and exporters. With the increasing intensity of competitions in the tea market, some buyers stops buying from Rainbow and choose other suppliers with low prices. The company is actually threatened by its declining sales figures (*table1*). It also makes the management group aware of that there is a need to change. Therefore, it is very important for Rainbow to analyze at the current supply chain and the business environment, and then find out the right strategies to be strength the role in the chain and remain competitive in the market.

Table1. Sales figure of Rainbow Company from 2005-2008

Year	2005	2006	2007	2008
Sales of products (ton)	736	751	735	713

(Source: Rainbow's sale department, 2009)

1.3 Research objective

As a mater student majoring horticulture chain management, the Rainbow Company expects the researcher to have a critical view at the current green tea supply chain objectively and find out the major constrains in the chain. Then by analyzing the green tea subsector, as well as other successful businesses in the subsector, the researcher could design the feasible strategies for the company.

Therefore, the objective of this research is to recommend on strengthening the role of Rainbow Company in the green tea supply chain to enhance the competitiveness and access in domestic market.

1.4 Research questions

How to optimize Rainbow's tea supply chain by applying vertical (forward and backward) integration?

- 1 What are the roles/ functions of the different stakeholders (chain actors, influencers and supporters) in the tea supply chain?
2. How do the quality control and logistics management applied in the chain?
3. How is the cost and value share in the supply chain for each actor?
4. How is the business environment in tea industry?
5. What are the constraints in supply chain?
6. How to form cooperative partnership with small-scale tea growers to insure a stable supply in the chain?

7. Is it feasible to establish its own sales agency or branch office in other part of domestic market?

1.5 Research methodology

To be able to answer the main question and sub-questions, it is necessary to investigate on Rainbow's green tea supply chain and the business environment, as well as the situation and new trends in the green tea subsector.

The comparative analysis involved use of the value chain analysis (VCA) tools. The first step of value chain analysis is to map the subsector. Then value chains were mapped to include all the chain actors, supporters and influencers. The information was then used to identify the various stakeholders and investigate their roles, function, behavior and relation.

One of the most import method used in the research is 'benchmarking'. The information are gathered from literature study and a case study on few successful companies in the tea sector and other supply chains. The author can compare them with the Rainbow's position and roles in the current chain and find the discrepancies. Then recommend alternative measures based on other successful experiences.

Analytic tools of Porter fives forces and SWOT are used to analyze the business environment for Rainbow and the green tea subsector. By analyzing the major constrains in the chain, the author gives his recommendation on sound alternative strategies for the development of the chain by applying vertical integration. Other marketing tools like market entry strategies and market segmentation are also used in the research.

1.5.1 Research framework and data collection

The field work was conducted within Hubei province from 20 July 2009 until 7th August 2009. The research focused on the company's function and position in the supply chain and relations with other actors in the chain. The study involved both qualitative and quantitative approaches based on empirical data, literature review and documents. In order to analyze Rainbow's current tea supply chain and recommend on the alterative business strategies, besides desk study, case studies are also carried out.

a. Desk study

In this research, the most important method used for collecting data, consisted in exploiting all documents related to tea industry, the green tea sub-sector in China in particular. The analysis of secondary data turned out to be extremely helpful in order not to duplicate efforts of information collection. Secondary data was collected by going through relevant documents to get more information by using journals, scientific books, PhD thesis, and proceeding from seminars, symposia, conferences that discussed about tea plants, tea products, tea production and trading, Chinese market consumptions. Moreover, to fulfill the research objective, the author paid extra attention to the recent market development and sector trends chain integration and other relevant information about tea industry in China.

Other documents included different reports documents produced by concerned government departments, social-economic profile at national and regional level, national statistics and agriculture policies, company annual reports etc. This has contributed to get understanding

about all those stakeholders with potential influencing role on the dynamics in green tea supply chain as well as the green tea subsector in general. Exploring those documents provided a clear understanding of threat and opportunities for green tea business.

b. Case study 1

1. Interviews with the general manger (Mr. Wenqi, Zhang) and the sales manager (Mr. Zixiang, Jiang) in Rainbow Company (*Annex 4.1 and 4.2*).
2. 1. Interview with 3 small-scale growers (Mr. Zhiguo, Tan; Mr. Hua, Liu; Mr. Kai, Xiang) and the production manager of Rainbow (Mr. Guodong, Zhang) (*Annex 4.3 and 4.4*).
3. 1 or 2 day observations in the company and crosscheck collected information with different informants.
4. Interview with the (Mr. Liming, Chen) secretary of Hubei Tea association (*Annex 4.5*).
5. Interview with (Ms. Shihang, Liu) an officer in Enshi agriculture Bureau (*Annex 4.6*).

Interviews tackled issues related to the company information (products, structure, operations, sales, quality control, logistics and tea processing technology), the role and behaviors of the different stakeholders in the green tea supply chain, relation between each other, constraints within the chain, key performance indication to evaluate the chain performance, government policies, and other tea sector related information.

c. Case study 2

1. Interview with general manager of Enshi Hua Longchun tea (Group) Co Ltd. (Mr. Huajie, Long) (*Annex 5.1*).
2. Interview with (Mr. Ming, Xu) general manager of Enshi Qing Jing Tea Company (*Annex 5.2*).
3. Interview with the (Mr. Tian, Ye) deputy manager of Wuhan Wuzi Green Tea Trading Co Ltd (*Annex 5.3*).

Interviews focus on the general information about the company, positions in the supply chain, relation between company and growers or other actors in the chain, marketing channels, and opinions on market development. Results from this case study 2 are used for 'benchmarking' (compare with Rainbow's supply chain).

1.5.2 General items for interviews

1. Before the interview, make a time plan. The plan can also be used as a check list.
2. Interviews were conducted using a self-administered questionnaire.
3. The questions were guided by the research objective and had to provide answers to the sub questions of the main research questions in the proposal.
4. Curried out during the exploration time, the pre-test was of great importance as it helped to get familiar with the subject and to ensure that the all questions are clear and adapted to the interviewees.
5. Be very clear at the introduction of the interview and try to note down all key words during the interview.
6. Make short summary after the interview.
7. Send back the summary to the informant to ask for additional feedback.

1.5.3 Limitation of the research

One of the limitations for the research is that author could not conduct a large survey in person with limited resources, such as large market surveys with hundred of retailers and consumers. Concerning the market research, a survey with 30 informants does not provide accurate information for decision making. Therefore, many secondary data are used to analysis the market.

Another limitation in the research that are sources for bias (overweighting some findings due to focusing on a particular and large set of data). During the research, large amount of data about the green tea subsector and the supply chain through literatures/interviews are found and the researcher did not spend much time with primary growers in the field (tea garden). Therefore, this thesis does not contain much information concerning the cultivation practices of tea, but more analysis of the chain and the subsector.

Last but most important, the level of information is limited during the research. In Chinese culture, it is very impolite for a junior researcher to question seniors in a critical way, especially for the weaknesses. Although the researcher tried to obtain and crosscheck information between different informants, there could be a risk that this report may not have an insight understanding for certain issues or some points are missed.

1.6 Significance of the study

This case study thesis focuses on the Rainbow case to recommend the alternative measures by applying chain integration (out-grower scheme and setting own sales agency) to strength the company's role tea supply chain to enhance its competitive and access to the market. The research plays a role in how to analysis and clarify problems in the supply chain and makes recommendations for the organization to become a chain leader.

This report reveals the existing problems and constrains within the tea supply chain in China. This report further analyses business environment in tea industry. The Enshi Rainbow International Rich-Selenium Tea Co. Ltd hopes that information derived from the study will aid the organization in improving the supply chain.

It also provides valuable information for other tea producing companies that interested in similar issues to benefit from this report. Particular for other companies or organization located in Enshi district and neighbourhood regions.

1.7 Outline of the study

This study is organized into five main chapters. Chapter 1 provides the general information of the company. It further describes the research objective and links the research problem with the main research question and 7 sub-questions. It also presents the methodology elaborating research methods, tools used and the data analysis procedure.

Chapter 2 gives more detail of the company including analysis of organization structure, cultivation and harvesting practices.

In Chapter 3 describes general information in tea products, an overview of tea industry in China, recent development and trends on green tea subsector as sector literature data. The chapter ends by explaining theories of chain integration and out-grower scheme as theory literature.

Chapter 4 and 5 consist of the findings of the research (the situation in the chain and the business environment). Chapter 6 covers the discussion of these findings. Chapter 7 answers the main question of the research. The report ends with Chapter 8 that formulates the conclusion and recommendations of the study.

1.8 Definition of terminologies

- I. **Small-scale Farmer:** Adopted from Rainbow Company, a small-scale tea farmer is one with a total acreage holding of not more than 0.5 Ha.
- II. **'Greenfood' organic certification:** It is an innovative project of China, initiated and coordinated nationwide by the Ministry of Agriculture of the People's Republic of China since 1992. Its fundamental concept and objectives are to enhance food quality and safety, to promote consumer's health, and to protect agricultural bio-environment for sustainable development. (The 'Greenfood' certification standard is not the same as other organic certifications in EU or USDA. Details in chapter 3.2.3).
- III. **Organic tea production:** tea is grown without the use of chemical pesticides or fertilizers. The soil is enriched with natural compost and a layer of mulch retains the moisture while providing extra nutrients as it breaks down. Other well-established organic agricultural practices, such as crop rotation, are also followed.

CHAPTER2. COMPANY DESCRIPTION / ANALYSIS

2.1 Geographic and climatic condition

The Rainbow company is situated in Enshi county (part of the Enshi Tujia Miao Autonomous Prefecture) which is located in southwest of Hubei province. It lies between Wuling mountains and Dabai mountains in the Yunnan-Guizhou plateau. It has agriculture, mining and tourism based economy. It is the only region in the province to enjoy the National Policy of Western Development. Particularly, the agriculture sector receives many financial and policy supports from the central government (*Source from Ms. Liu in Enshi Agriculture Bureau*).

The county bears a subtropical mountain climate distinctly influenced by monsoon. The weather is humid and moderate all year round. The annual average temperature of the region is between 14.7°C. It is seldom bothered by extreme heat in midsummer and chilliness in midwinter. It is usually foggy and rainy. With complex landform and an average altitude around 1,000 meters temperature varies greatly as the height and terrain change.



Another distinct characteristic in this region is that it owns the only independent selenium deposit with high-content selenium (in Asia. This region is called “the city of selenium”. The selenium content is high in corn, wheat, paddy rice, pharmaceutical herbs, tea and tobacco. It forms the particular biological resource.

The favourable geographic location and rich of nature resources makes the region one the main green tea producing areas in China for centenaries (Enshi Commerce Bureau, 2008). There are about 6500 ha tea gardens with an annual production close to 4000 ton. The favourable geographic location and climate provides the company a great opportunity for tea production.

2.2 Mission and future perspectives

The Company's mission statement:

To promote the development of tea industry in Enshi County

In line with the mission, the company also wants to make sufficient profits to maintain and develop the company. Therefore, the management of the company sets long-term plans and specific objectives each year. During the interview with the general manger Mr. Zhang, he mentioned two future perspectives: 1. The Company plans to enlarge the production (cultivation) scale to meet the full processing capacity (900-1000 ton annually); 2. Extend the company's sales network and gain more market share in the domestic market. Besides these, with the increase of consumer awareness on food safety and health status, the company is considering to introduce 100% organic cultivation and to apply the “AA Greenfood” certification within 5 year.

2.3 Organization structure

The primary activity for Rainbow is tea producing. The company is specialised in green tea product 'EnShiYuLu'. The main activities include cultivation, processing and refinery. As mentioned in the introduction, the company also collect fresh tealeaves from local small-scale growers.

Rainbow has adopted an organizational structure to aid in the coordination, control, and department integration. The organization has a Mintzberg structure of a machine bureaucracy. This organizational structure focuses on standardization of work and coordination between horizontally decentralized departments. The organization is divided into different function groups (*figure 1*). As a private company, the general manager (Mr. Wenqi, Zhang) is the leader of the company. He is directly in charge of the human resource and financial department. There are also two deputy managers in charge of production department, processing department and R&D department by working together with Hubei agriculture research institute. Another one is in charge of administration office, sales/marketing department and 5 branch office within the Hubei province. These two deputy managers also have responsibility to report to general manager for all important issues within their domain.

This structure encourages efficiency and requires coordination between departments leading to a hierarchy of control and authority (*Rollinson, 2008*). This is important with the majority of the employees within this company, particularly for cultivation and processing department, have specialized jobs and skills. It also enables the company to mass produce green tea in a standardized and systematic way. Therefore, the well-organized company structure is one of the internal strength for Rainbow.

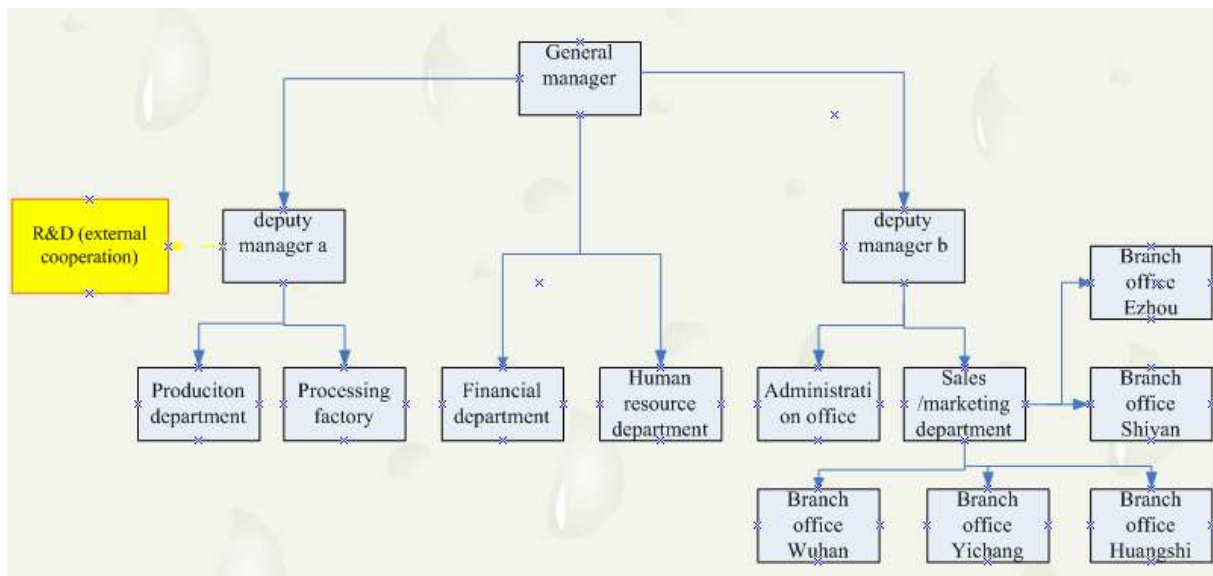


Figure1. The organization chart of Rainbow
(Source from: Interview with the general manager of Rainbow)

2.4 Cultivation factors

2.4.1 Tea variety

Tea refers to the agricultural products of the leaves, leaf buds, and internodes of the plant (*camellia sinensis*). Most of the tea trees planted from the middle of 1990's by transplanting of 'Improved Clonal Tea Variety'.

This improved variety is called 'Entai #1'. This variety first introduced by Hubei Agriculture Research Institute in 1992 and it is particularly suitable for green tea production in the region. The advantages of using of this variety are early sprouts, uniform in growth, good yield, and cold resistance. The disadvantage is that the variety is not strong in drought resistance. It is difficult for tealeaves to keep fresh and soft under dry conditions. The general performance (quality and yield) of this variety in the plantation is rather good. The average production from the plantation is about 765kg/ha. The spring tea sprouts (1 bud and 2 leaves) contains 44.8% watery leach property, 6.3% amino acid, 12.5% tea polyphenols, 5.2%total catechins, 3.4 coffee alkaline (*Source from: the production manager of Rainbow*).

2.4.2 Soil conditions

In order to have good quality and yield, the tea plants require certain soil conditions including high nature fertility, a deep soil layer and a loose soil body. The nutritive elements should be rich and balance. During this research, the detailed figure of soil composition is not found. The manager mentioned that the trace elements are not deficient, the company applies NPK at a moderate rate of N 60-80, P 10 and K 20 kg/ha to maintain soil fertility. The PH value is known 5.0-5.5 in the tea garden that is suitable for tea growing.

2.4.3 Planting space

Planting is a very delicate operation and needs adequate planning and proper supervision. Correctly planted tea plants establish in the field quickly, grow vigorously and come into full bearing earlier. On the other hand, a slight error during planting can cause high percentage of mortality or permanent setback to the plants. In the Rainbow's plantation, all tea trees are planted in two lines. The row spacing is 150cm * 40cm * 30cm. The density of tea plants per ha is more than 7000 plants.

2.4.4 Fertilization applications

High-value crops like tea require proper use of fertilizers. The use of organic fertilizer makes yield more stable, and improve the quality of produce. Application of organic fertiliser also helps control soil-born diseases improve soil properties and conserve soil moisture.

Tea trees need to absorb many mineral element including nitrogen, phosphorus, potassium, calcium, magnesium, sulphur etc. Particularly, large amount of nitrogen is needed.

There are two ways of fertilization:

a. Basic fertilizer: It is used at the end of picking season. In order to increase the resistance of the plant and accumulate the nutrient, giving the proper fertilizer to the tea tree will provide good basis for the next year. The basic fertilizer is always the organic fertiliser like oil cake, barnyard manure, compost and manure from animal or human. All these are used together with phosphate fertilizer.

b. Topdressing: It is used for the growing season. Topdressing always uses nitrogen fertiliser together with phosphate fertiliser. It is important to control the nutrient contents and time of application (table 2).

Table2. The fertilization of topdressing and the density of the fertilizer

Name	Nutrient content of solution (%)	Times of application
Urea	1.0	4-6
KH ₂ PO ₄	0.2-0.3	4
K ₂ SO ₄	0.2-0.3	4
Borax	0.2-0.3	4
“Wuyuan” 21	0.3-0.5	3
Plant ash leaching solution	1.0-2.0	4-6

(Source from: Rainbow company, 2009)

When tea plants are young, they need 75-100 kg oil cake as the basic fertilizer and ammonium sulphate 1.5-1.7 kg/ha, phosphate fertilizer 1.7-2.0 kg/ha and potassium fertilizer as the topdressing fertilizer. But plants which are more mature need 2-5 kg/ha ammonium sulphate, 2-3.3 kg/ha phosphate fertilizer and 1.2 kg/ha K₂SO₄.

The production department makes central planning for fertilizations based on the situation in the field. All Records are kept for all fertilizer applications, including amount of fertilizer, geographical area, the name or reference of the field, date, and name of the employee in charge.

2.4.5 Quality certification

According to the ‘A Green food’ certification requirement, the company only allowed to use very limited amount of chemicals. The difference between ‘A Green food’ tea and organic tea are in table 3.

Table3. Difference between Organic tea VS A grade Greenfood tea

Organic tea	A grade Green food tea
No harmful chemicals or pesticides have been applied for at least two years	Chemicals and pesticides can be used in a limited amount to improve soil quality and prevent pests
Farms and processing plants are inspected annually in order to get their certificate extended	Farms and processing plants are inspected every three years in order to have their certificate extended
Certification of land and practices	Certification of products.
Produced mainly by individual farmers	Produced mainly in state farms and large

and self-organized organic farmers associations	scale plantations
---	-------------------

(Source from: Lian , 2007)

2.4.6 Plant protection

Disease and pest are important factors, which affect the quality and output of the tea. The perennial habit and monoculture habitat of tea plant provide a stable environment to many pathogens. During the interviews with the production manager in Rainbow and three growers, they mentioned that main diseases/pests in this region are tea green leafhopper (茶小绿叶蝉) and tealeaf blight (茶云纹叶枯病). Besides, there was another pest called the Tea tussock moth, Semiochemicals of Euproctis pseudoconspersa(茶毛虫). Now it is controlled by using synthetic sex pheromone traps and the optimum dosage of synthetic sex pheromone was 1.5 mg/septum in a trap.

The detailed description of tea green leafhopper and tealeaf blight is in Annex1 and Annex2 respectively, as well as the controlling methods.

2.4.7 Control of chemical products

There are items concerning the use of chemical in Rainbow production department (Source from the production manager of Rainbow).

1. Any crop protection products, which are banned from 'Greenfood' certification, should not be used.
2. All chemical products should be stored and locked in a separate space, never mix with other cultivation equipment.
3. Clear instructions and documented records should be in place. Persons involved in crop protection products usage are well informed for not using fertilizers or crop protection products within 10 meters of any permanent stream.
4. All the crop protection products applications should be recorded including the re-entry time of people into the sprayed area.

2.3.8 Other issues

1. Any animals or livestock are not allowed in the growing/harvesting areas, and packaging or equipment storage areas.
2. Infants or Toddler-aged Children are not allowed in growing/harvesting, packing and equipment storage areas.
3. It is not allowed for any external visitor without permission by the manager.

2.5 Harvesting

For harvesting, the company decided to use hand-plucking methods in order to insure the leaf quality and minimise the damage of bush health. The peak season usually starts from middle of March and ends at April. Each year, the peak plucking time is different. Therefore, it is important for management to make a proper planning based on the weather forecasting and the conditions of tea plants. By working with Hubei Agriculture Research Institute, the company could always get advices on harvesting and other issues from ARI. It is only one of the strength for Rainbow Company.

Any employee has to follow the instructions learnt from the training program. Employees usually work in a group of 5 persons including a team leader. The team leader is working on checking and monitoring hygienic requirements before and during working, keeping record and report to the manager.

Only the tenderest young leaves are plucked: the top two leaves and a bud are plucked to ensure the most flavourful and highest quality of products. Whenever there are infected leaves, the worker should not touch them and report to the team leader. The standard picking technique of the workers is to face the hands upwards, hold the stem between the index and middle fingers, and then break the stem gently using the thumb.

Hand plucking does not need any machines. Workers are trained how to carefully pluck leaves by hands and put them into the baskets. The standard bamboo basket should not be filled with more than 5 kg leaves and carried not more than 2 hour in order to prevent crushing of green leaves and overload of work.

2.6 Quality check, processing and refining

Once harvesting is done, the leaves are transported to the closest temporary storage rooms. It is less than 1 km from the harvesting field. It also has enough indoor holding space for good ventilation. The storage room also has a good protection again direct sun, rain, and avoids contamination.

At the storage place, the quality check, weighing and recording takes place and then the tea is transferred to the processing factory for processing and refining.

The details are mentioned in chapter 4.3.4

CHAPTER3. LITERATURE REVIEW

3.1 Tea industry in China

This chapter provides the reader general information in tea products, an overview of tea industry in China, recent development and trends on green tea subsector as sector literature data. This chapter also explains the theories of chain integration and out-grower scheme.

3.1.1 Tea plant information and tea products

Tea refers to the agricultural products of the leaves, leaf buds, and internodes of the 'Camellia Sinensis' plant (originated in Southeast Asia), prepared and cured by various methods. It also refers to the aromatic beverage prepared from the cured leaves by combination with hot or boiling water. It is an evergreen plant, which grows mainly in tropical and sub-tropical climates. Nevertheless, some varieties can also tolerate marine climates and are cultivated as far north as Cornwall on the UK mainland and Seattle in the United States.

In addition to warm climate, tea plants require at least 1200 mm of annual rainfall and prefer acidic soils. Many high-quality tea plants are cultivated at elevations of up to 1500 meters. At these heights, the plants grow more slowly and acquire a better flavour. It is a highly perishable commodity both before and after processing. The fresh green leaf cannot be stored more than 8 hour without negatively affecting its quality. Processed tea has a shelf life of about 12-18 months before serious loss of quality.

There are hundreds of different varieties of tea made from the tea bush, but almost all of them fall into three main categories: green tea, Wulong tea, black tea and others. Green tea is a type of tea made solely with the leaves of, which has undergone minimal oxidation during processing. Black tea is a variety of tea that is more oxidized than the oolong, green, and other varieties. It is generally stronger in flavour and contains more caffeine than the less oxidized teas. It is also called crimson tea. The Oolongs, which are somewhere in the middle and combine the best qualities of both. Figure 2 shows the general processing procedure for different tea products.

Tea (Cameillia Sinensis) Processing Chart

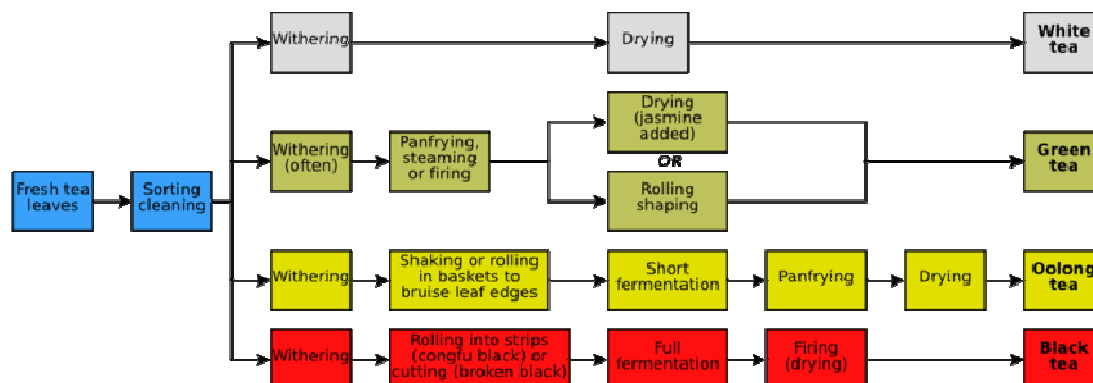


Figure2. The general processing procedures of different tea products
(Source from: Wikipedia, 2009).

3.1.2 Tea production and locations in China

In 2006, China's tea plantation covered an area of about 1.45 million hectares with a total tea output of 940,000 tons. In domestic market, the tea sales volume was about 660,000 tons. In international market, Chinese tea's export volume also reached to about 280,000 tons. In general, there are five major products: Green tea, Wulong tea, Scented tea - Jasmine tea, Black tea and Compressed tea. Green tea occupies the biggest share in domestic market. It is approximately 73.3% of the total sales volume, and it accounted for 488,000 tons. (Source: China Agriculture Yearbook, 2006)



Figure3. Tea production regions in China

(Blue represents the Southwest area; green represents the Lingnan area, yellow represents the Jiangnan area; red represents the Jiangbei area)
(Source from: www.china-tea.org)

Tea is produced in vast areas of China from Hainan Island down in the extreme south to Shandong Province in the north, from Tibet in the southwest to Taiwan across the Straits, totalling more than 20 provinces. Based on different geographic and climatic conditions, there are four major tea-growing areas (figure 3) in China: 1. The Jiangnan area. It lies south of the middle and lower reaches of the Changjiang (Yangtze) River, and is the most prolific of China's tea-growing areas. Most of its output is the green variety; some black tea is also produced; 2. The Jiangbei area. This refers to a large area north of the same river, where the average temperature is 2-3 degree Centigrade lower than in the Jiangnan area. Green tea is the principal variety turned out there, but Shaanxi and Gansu provinces, which are also parts of this area, produce compressed tea for supply to the minority areas in the Northwest; 3. The Southwest area. This embraces Sichuan, Yunnan, Guizhou and Tibet, producing black, green as well as compressed teas. Pu'er tea of Yunnan Province enjoys a good sale in China and abroad; 4. The Lingnan area. This area is consisting of the southern provinces of Guangdong, Guangxi, Fujian and Taiwan, produces Wulong tea, which is renowned both at home and abroad.

3.1.3 Tea consumption in domestic market

As one of the biggest traditional tea consumption and producing countries, tea plays a very important role in people's daily life. Following up the fast development of economy and standard of living, the total amount of tea consumption also increased. According to national statistic in 2007, the domestic tea consumption amount rose from about 186,000 metric tons in 1980 to 660,000 tons in 2006. Particularly, the average annual consumption growth rate between 2002 and 2006 was around 19.3 percent. Considering the population, the per-capita consumption moved up from 0.2 Kg in 1980 to about 0.53 Kg in 2006 (*figure 4*).

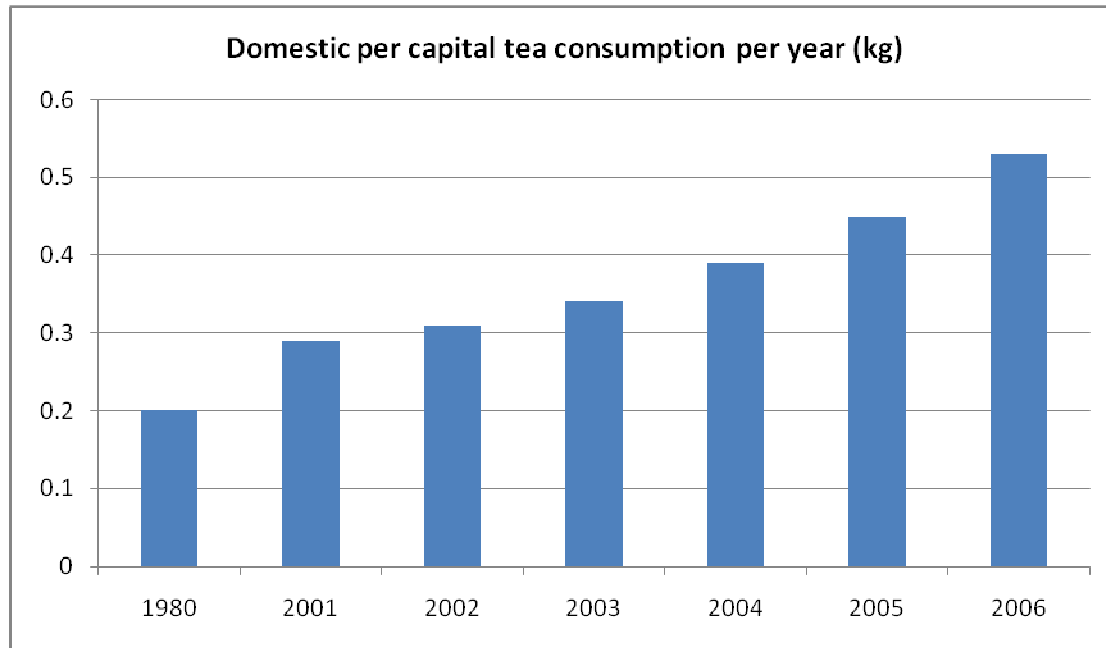


Figure4. Average per-capita tea consumption in China
(Source from: FAO, 2006)

It is clear that the tea consumption in domestic market is going up. However, comparing to other main tea consumption countries such as Russian and The UK, the per-capita tea consumption is still rather low. In 2006, average tea consumptions in these two countries are 1.26 kg and 2.21 kg respectively (FAO, 2006).

3.1.4 Factors influencing domestic tea consumption

The Agriculture University of China has done several researches and surveys. The results shows that the tea consumption are differ in products, way of drinking, population groups and locations.

The average tea consumption in Tibet ranks the first. From table4, the average tea consumption in Tibet it was about 3.75 kg in 2007, which is much more than the national average. Most of residents in Tibet are minority groups. They usually take meat and dairy as daily food. This sort of food has a high content of fat. Therefore, these people prefer to drink tea for digestive reason. Taiwan and Guangdong province rank the second and third. Most people in Guangdong and Chaozhou area prefer Wulong tea to make Gongfu tea. This

special way of drinking consumes more tea products. Besides, the tea consumption is also high in many big cities like Beijing, Shanghai and Guangzhou.

The results also found that different age group, gender, education level and occupation among the population have different tea consumption habit.

Table4. Domestic per-capital tea consumption in different locations in 2007

Location	Per capital consumption (KG)	Location	Per capital consumption (KG)
Tibet	3.75	Guangzhou	1.66
Beijing	0.70	Shanghai	0.59
Taiwan	2.00	Chaozhou	1.60
Guangdong	0.61	Hongkong	1.28

(Source from: FAO report “Demand analysis for tea in China”, 2007)

One of the most important factors is the different income in rural and urban areas. Specific figures about per capital income are not found during the research. The average income gaps between rural and urban areas are considerable and they differ in locations. For instance, in Author’s hometown 2007, Wuhan city, the per capital net income of urban residents is 1120 euro and 435 euro for rural resident. Figure 5 is quoted from FAO source shows difference tea consumption between rural and urban areas in domestic market.

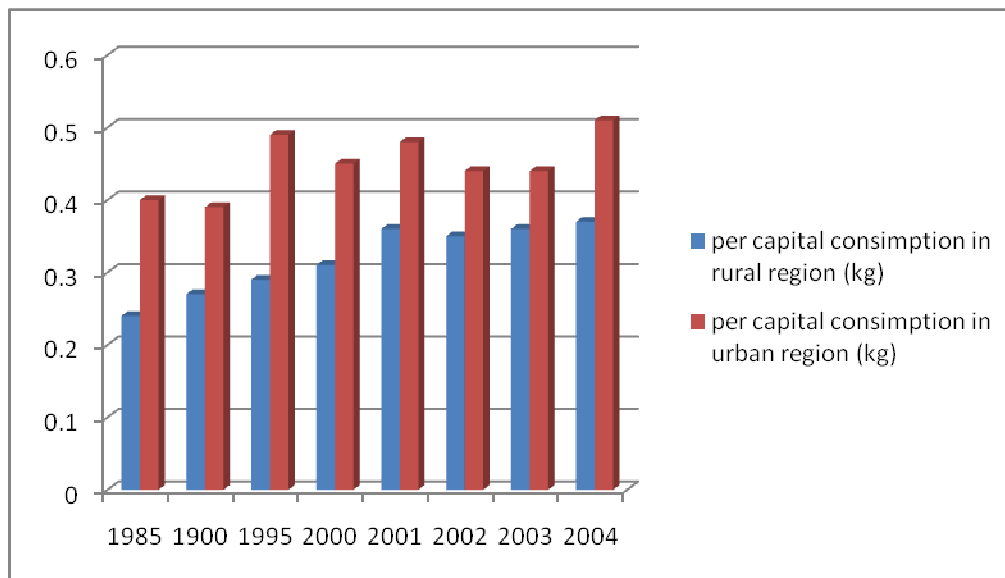


Figure5. Tea consumption in rural and urban areas in China from 1985-2004
(Source from: FAO, 2007)

The personal income between rural and urban areas shows great difference in tea consumption. Therefore, with the further development economy in China, there is still a great market potential in many developing areas and non-tea-producing regions.

3.2 Development of green tea subsector and supply

3.2.1 Subsector mapping

A good subsector map is a range of activities required to bring a products or service to the final consumer, as well as a supply/value chain. It includes both vertical and horizontal linkages. The tea subsector chain consists of input suppliers, primary producers, collectors, processors, wholesalers, retailers, and consumers. Except all operators within the value chain, there are also chain supporters and chain influencers to form a general tea subsector map as illustrated in figure 6.

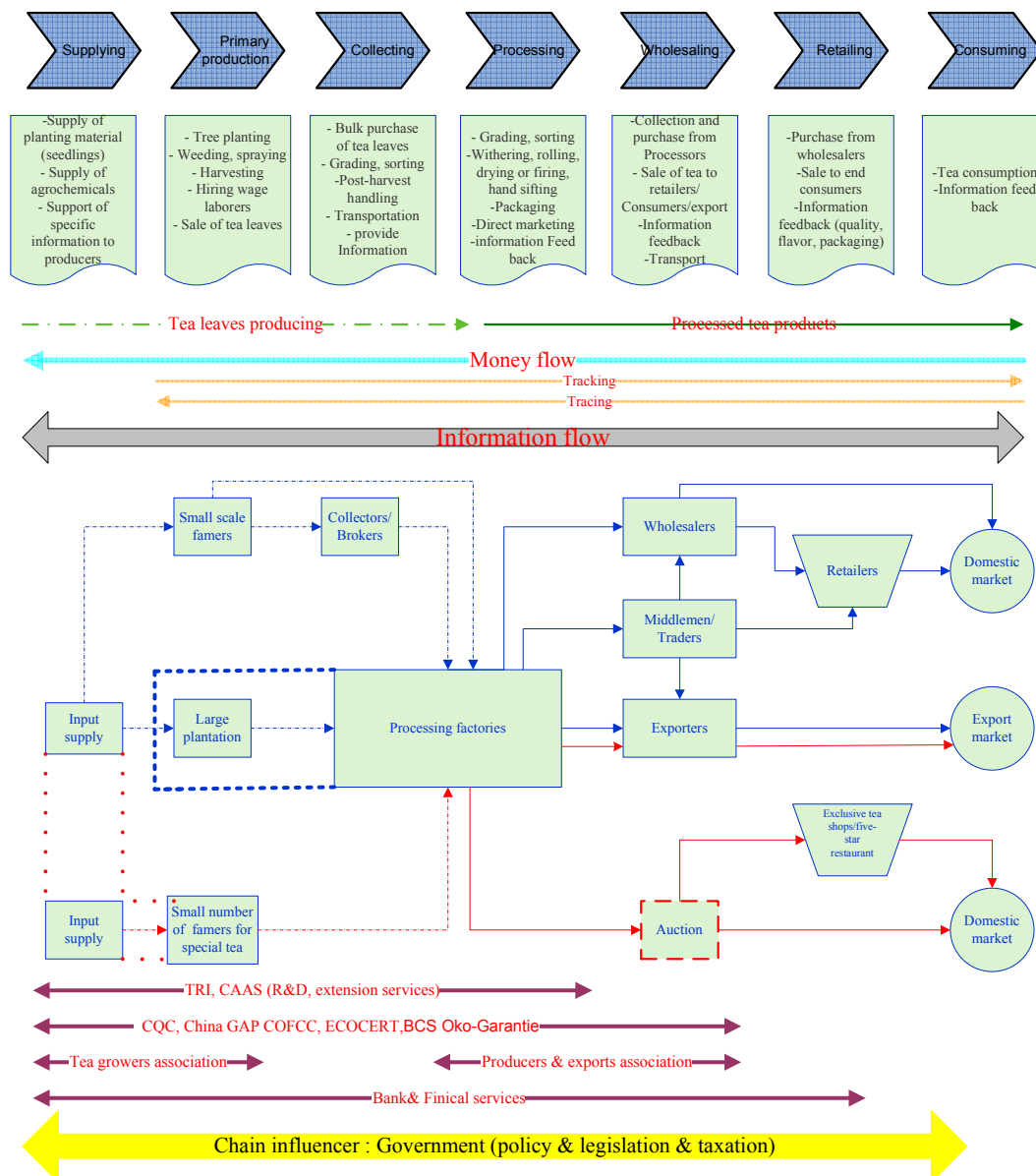


Figure6. Green tea subsector map

3.2.2 Producing models in (green) tea subsector

The Chinese government changed the policy in agriculture in the 1970s and early 1980s. Previously, all plantations were state owned, and farmers worked together on farming communes. The government purchased all of the harvest from the state farms at set prices. During the transformation of the national economy, the farming communes broke down and individual households and farmers could grow their own crops on their own land and many state owned large plantation become private commercial enterprises. There are three producing models in the tea subsector. There are company model, cooperative model (company associated with tea growers), and smallholder group model (*Xin and Shangwen, 2007*).

- The company model is easy to manage. The companies directly handle the plantation, processing and selling systems as well as product brands and other standards. The quality of tea is stable (particularly for organic production and export), and its profits are usually the highest among these three models under proper management.
- In the second model, which is relatively new, trading corporations are the main part of the association, who associate with many small tea growers to form a certain plantation area. In this model, companies have limited abilities in improving production scale and varieties.
- Recently a new model of tea-grower group emerges along with the industrial progress. In this model, smallholders form into a production group, and they build up their own plantation for tea growing. The production and processing process is regulated by rules set up by the group. The products of the group use the same brand, and the farmers can also apply for certification for their products.

3.2.3 Development of organic tea

Organic farming is an option in sustainable agricultural production that enables smallholders to attain household food security and modest income while regenerating the land, regaining biodiversity, and supplying quality food to local communities. Such benefits of organic agriculture (OA) have been demonstrated by diversified and integrated organic farm systems that are economically viable, environmentally sound, and enhancing to people's culture (*Angelina, 2000*).

China's strategy for a niche in organic trade is a reflection of its experience in introducing "green food" to the market as part of its campaign for environmental regeneration. Green food is a product of ecological agriculture (follows ecological principles with notable reduction in the use of synthetic pesticides). To lay down a foundation for green food development (fresh and processed), China established the Green Food Development Center (GFDC) in 1992 for R&D and certification of green food products. There is a registered logo for green food. However, the quality standard of Greenfood is not equivalent to many international organic certifications such as USDA organic and CCOF organic. There are three different levels of Greenfood certification: The 'Greenfood' (It means that none of the forbidden chemicals are used during the production); 'A Greenfood' (It means that limited amount of certain chemicals applied during the production); AA Greenfood (it indicate that 100% free of chemicals). Among all these three level, only the AA Greenfood tea is accepted in the international market as organic produced. Therefore, Greenfood' and 'A Greenfood' teas are generally sold in domestic market and considered as a sort of organic tea (*Guoli and Xiang, 2005*).

The government of China also started in 1994 with the creation of the Organic Food Development Centre. Only few years later, organic products from foreign trade brought in approximately 6 to 8 million Euros in 1997. In the last two years, this increased to about 10 to 12 million Euros (*Li 2002*). In 1996, China established an organic tea certification program in the Organic Tea Research and Development Centre (OTRDC). The OTRDC had three sections: Certification Management, Quality Testing and Inspection, and Technical Support. This brief account demonstrates how China used its OTRDC in capacity building to enter the organic trade for not only the foreign market, but also domestic market as well.

Since the first export of organic tea to Holland from China was in 1990, the organic tea has developed rapidly in China. Because the price was higher than conventional tea, some companies made good profit in export business. By the end of 2003, there were 17 organic tea producing provinces and municipalities in the country. Production technology research has been carried out in 11 provinces and municipalities and some have gained success.

In 2008, the official figure of annual output of qualified organic tea is more than 16,500 tons, 1.5% of total tea output (In 2006, the total up put was around 10,000 ton, 1.1 of the total tea output). The accounted organic tea plantation areas are more than 20,000 ha, mainly concentrated in Zhejiang and Fujian province (*table 5*).

Table5. Total growing areas of organic tea in different provinces

Province	Area (ha)	Output (ton)	Average production (ton/ha)
Fujian	6800	6000	0.88
Zhejiang	4500	3645	0.81
Hubei	3300	1815	0.55
Hunan	3000	Unknown	unknown
Yunnan	1500	Unknown	unknown

(Source from: *Di, 2006*)

Following up the entry of WTO, the amount of organic tea export is continually increasing. However there were many complains in the international market concerning the chemical residue about Chinese organic products. The fact is that the domestic organic certifications do not meet the international standard. Therefore, China introduced the new China National Organic Product Standard (GB/ T19603.1-4-2005) and The Rule on Implementation of Organic Products Certification in 2005. The updated Chinese organic regulation covers production certification and imports of organic food products. All products sold in China as organic are required to comply with the new National Standard.

Nowadays, organic teas are gaining in popularity as the public becomes more aware of the benefits of organically grown foods in both domestic and international market. Organic teas are sold all over the country, as well as exported mainly to EU, the U.S and Japan, etc. Many consumers believe that organically grown tea is significantly better than non-organically grown tea. In general, the quality is better and the resulting tea is better for human body. Unlike other foods such as fruits and vegetables, one is able to wash the food free of any

chemicals or potential harmful substances before ingesting it. With tea, this is impossible. Therefore with organically grown tea, it is assured that no chemicals or chemical fertilizer.

3.2.4 Bottlenecks and constrains in the green tea subsector

The Chinese green tea industry is facing a number of problem limiting effective coordination of the production-marketing system. These include production, marketing risks, inadequate information flow, high transaction, logistic, and marketing costs (*Goutam, 2004*).

One of the biggest problem in the raw material supply is that the spread of production over a large geographical area creating the involvement of a large number of small producers which makes it difficult and costly to exchange production and marketing information. The physical characteristic of tea plants also leads to high unit cost moving through the distribution channels for both growers and processors. In many mountainous areas, large quantity of green tea leaves perish due to lack of adequate transportation. The general short shelf life of processed tea (outside the vacuum packaging) restrains producer's bargaining capacity.

Table6. Average production per ha in major green tea producing provinces in China and other countries

Country or region	production (Kg/ha)
Fujian	1320
Zhejiang	1080
Yunnan	705
Hubei	820
Average in China	870
India	1725
Sri Lanka	1620
Kenya	1935

(Source: *Shuhua and Guimou, 2005*)

Concerning the average per ha production (*table 6*), per unit production in China is much lower than other main tea producing countries. Individual household farms are not efficient for tea growth and causes a low production. Large farms in India, Sri Lanka, and Indonesia allow for a more efficient use of resources and scientific management techniques. The problem of allocating tea production to small individual farmers is aggravated when one considers that tea is seen mostly as a 'spare time crop'. Because of in the time of labour shortage, priority will be given on food crops. Tea is often grown on the side, not as the farm's major crop.

Another issue in the supply chain is that the contract problem between small-scale tea growers and tea processing companies is also suppress development of the industry. The terms in contracts are often far shorter than the ideal time for cultivating a tea plant and provide tea growers no incentive to extend their production scale and improve the quality of produce.

Particularly for organic tea, many producers and processors lack the special knowledge on organic production technologies. In order to develop the tea industry further, these problems have to be solved urgently.

3.2.5 New trends in green tea market

Since 1980, with the increase of total tea consumption, the consumer choices of different tea products are also changed in domestic market (*figure 7*).

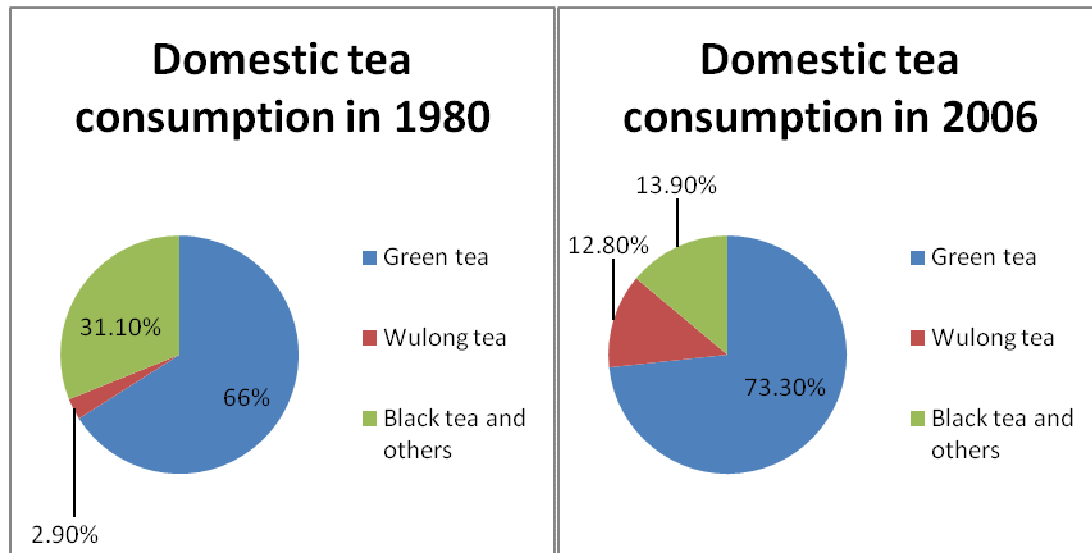


Figure7. Market consumption of different tea products in1980 and 2006
(Source: Hangzhou tea Association, 2007)

By comparing consumption of different tea products in 1980 and 2006 in figure 7, green tea still occupies the largest market share and it will increase its percentage continually. The total consumption of Wulong tea was 5 times more in 2006 than in 1980. On the contrary, although the consumption of black tea and other tea products still occupied second position, they were not as popular in the market as they used to be.

3.2.6 New trends in green tea supply chain

The intensive competition in the market could have a positive side that it can be driving force for innovative changes. With development of the sector, there are many changes taking place.

With the fast development of Supermarket chain, the total amount of tea products directly from factories to the supermarket increased significantly. Simplifying the supply chain by kicking out the intermediary and wholesalers leads to a reduced final price in favour of consumers. It also reduces the transaction time, so the shelf life of tea products could increase (*Linwen, Wei and Qian, 2007*).

The production model of Company associate with growers is getting its popularity in the sector. The model can be described as “company + growers + processors”, which is encouraged by the government. Normally, the company offers help to contracted producers, such as in put supply or extension services to improve the quality of yields. These contracted growers usually receive a better price than other individual growers do. The company mainly focuses on the marketing and sales.

During the research, the author had an interview with the deputy manager Mr. Ye in Wuhan Wuzi Green Tea Trading Co Ltd. This company has “two side contracts” with growers, which means that these tea growers are the exclusive tea supplier for the Company. The company offers training and credit for inputs. The company has been certified with ‘ORGANIC FOOD’ by China Green Food Certification Center. For organic production, the tea growers get training on cultivation and harvesting handling. They also agreed never to use any chemical or pesticide for tea cultivation and supply all green leaves to Wuzi Company at a negotiated price. This sort of model such as out-grower scheme is also widely used in tea and other agro-subsector in many countries.

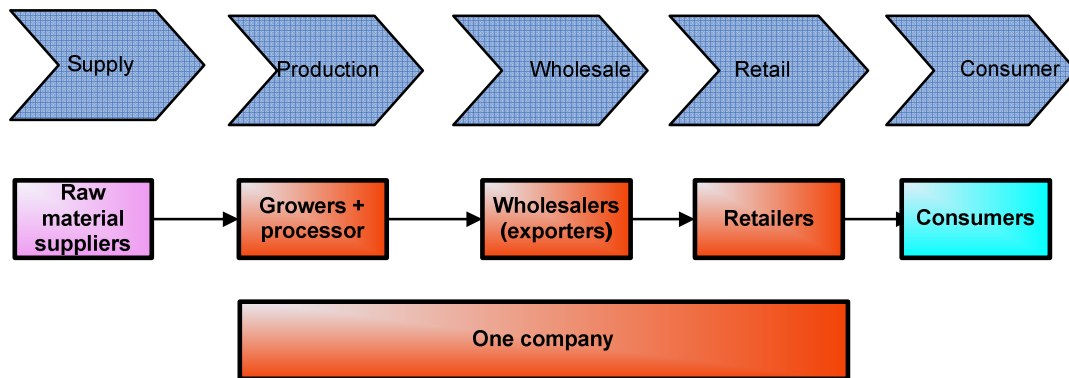


Figure8. New trend of tea supply chain in Domestic market
(Source: Xi, 2009))

Figure 8 represents a new trend in green tea industry. The Blue blocks are the functions of the tea supply chain. Pink, red and cyan blocks are actors in the chain. In this chain, one company plays the role of growers, processors, wholesalers, exporters and retailers. The multifunction of the company makes it in control all of these components in the chain, from raw materials to final delivery. This is defined as ‘balanced vertical integration’.

A real example of success by chain integration was found during the research and it can be used for ‘benchmarking’ with Rainbow company. In this case, benchmarking is the comparing supply chain management to another that is widely considered to be an industry standard or best practice. Essentially, benchmarking provides a snapshot of the performance of the business and identifies gaps to a particular standard. The result is often a business case for making changes in order to make improvements.

By interview with the Mr. Long, the general manager of Hua Longchun Tea (Group) Co Ltd, the author knows that it is the leading tea company in Enshi Tujia Miao Autonomous Prefecture. The foundation of the company resulted from a merge of nine middle sizes tea processing factories and companies among the region in 2000. It has more than 1700 ha organic tea farm cultivated by out-growers, research labs and 19 production lines for three different tea products (black tea, green tea and flower tea). Because it is the only one in the region has the import & export license, many products can be directly exported to the international market (more than 1000 ton per year). For the domestic market, it also has 15 sales branches and 48 franchise shops all over the country. The products from Hua Longchun Company can be found in many (chain) supermarkets.

Since 2006, the company is involved in the tea tourism sector and hotel business. Now the company is the biggest company in Hubei province. The key success factors of Hua Longchun case are the integration (both vertical and horizontal) of different resources and networks, a strong position in the supply chain and government support. In China, without government it is almost impossible to be a good player.

3.3 Chain integration

In the dynamic changing business environment, rapid advances in communication technology and increasing regulatory freedom have changed the rules and nature of competition. Enterprises are now competing globally and traditional barriers between industries are breaking down.

To cope with these changes and achieve superior performance, business leaders are moving towards new business paradigms that allow their companies to work more closely with their traditional and new business partners to adapt to the rapidly changing marketplace. This improved integration is the very essence of supply chain management. Supply chain leaders are reconsidering the linkages, not only between functions within their own company, but with organizations up and down the supply chain (*Marjolein, 2003*). Integration of the supply chain and optimizing over the barriers of the individual companies require the partnership thinking.

All companies function as links in chains of entities that produce and distribute goods. In traditional view of supply chain management, each organization looks at their participation in the chain from an independent perspective, and aims to maximize its own profit. While in the model of chain integration, each organization aims to maximize total supply chain success. In the model of chain integration, those organizations will overcome its external boundaries.

In the model of chain integration, there are four views:

1. Business and operational planning are coordinated

In the successful supply chain, all members collaborate in both strategic and operational business planning. The goal is not only products development and production planning, but also common or coordinated administration and operational procedures

2. Information is widely shared and problem are solved jointly

As a member of a system, participant in a boundaryless supply chain share information more freely than before. A production problem is one part of the chain is everyone's concern, and the best resources throughout the system applied.

3. Resource are shared

A system view of supply chain allows companies to manage resources and expertise more efficiently throughout the chain.

4. Accounting, measurement and reward systems are consistent

A key requirement for a boundaryless supplier-customer relationship is a common incentive system so that everyone in the supply chain works of the same numbers, speaks the same language, and aims toward the same set of goals. Successful supply chains have jointly accepted methods to determine cost, margin and investment. Agreed-upon performance goals for each organization unit are derived from those methods. A matching reward system motivates employees to achieve the objectives (*Spekman, 1998*).

There are two types of chain integration, vertical integration and horizontal integration. Vertical integration means one of the actors in the chain, taking part of other activities and functions in the chain. There are three kind of vertical integration: backward (upstream) vertical integration, forward (downstream) vertical integration, and balanced (both upstream and downstream) vertical integration. A company exhibits backward vertical integration when it integrated with other actors that produce (some of) the inputs used in the production of its

products. A company tends toward forward vertical integration when it controls distribution centres and retailers where its products are sold (*Le Nguyen, 2007*).

There are alternatives to vertical integration that may provide some of the same benefits with fewer drawbacks. The following are a few of these alternatives for relationships between vertically-related organizations:

- long-term explicit contracts
- franchise agreements
- joint ventures
- co-location of facilities
- implicit contracts (relying on firms' reputation)

Nineteenth century steel tycoon Andrew Carnegie introduced the idea of vertical integration (*Machosky, 2006*). In microeconomics and management, the term vertical integration describes a style of management control. Vertically integrated companies are united through a hierarchy with a common owner. Usually each member of the hierarchy produces a different product or (market-specific) service, and the products combine to satisfy a common need. It is contrasted with horizontal integration. Vertical integration is one method of avoiding the hold-up problem.

3.4 Out-grower scheme

An out-grower scheme is defined as a contractual partnership between growers or landholders and a company for the production of commercial products (*FAO, 2001*). Out-grower schemes or partnerships vary considerably in the extent to which inputs, costs, risks and benefits are shared between growers/landholders and companies. Partnerships may be short or long-term (up to years), and may offer growers only financial benefits or a wider range of benefits. Growers may also act individually or as a group in partnership with a company, and use private or communal land. Out-grower schemes are usually prescribed in formal contracts. Any informal contract should not be used for Outgrower scheme.

Within this definition, out-grower scheme may include joint ventures and contract farming. Differences between these arrangements are largely in responsibility for cultivation, resource ownership and control, and the financial remuneration to growers. In conventional out-grower scheme, the landholder is contractually responsible for the cultivation and the supply of the product to the company at harvest. Under the contract, the company may provide inputs or technical support to the grower, and guarantees a market for the product.

In Australia and New Zealand, out-grower partnerships are usually referred to as joint ventures, with there being three broad types of arrangements - 'lease' joint ventures, 'crop-share' joint ventures, and 'market' joint ventures (*Curtis and Race 1998*). In New Zealand, joint ventures that share the financial returns following harvest are more common than the 'lease' joint ventures common in Australia. 'Lease' joint ventures account for about 70% of current plantation expansion of 50-60,000 hectares per year in Australia (*Race 2000*). Not all industry investors are 'end-product' processing companies - some industry investors 'on-sell' or simply trade in raw or unprocessed forest products such as woodchips (*Curtis and Race 1998*).

A prominent positive result of commercialization in small-scale agriculture is the engagement of agro-industrial firms as partners in production and marketing. Out-grower systems have been in existence for many years as a means of organizing the commercial production of

both large-scale and small-scale farmers. The interest in out-grower systems continues to expand, particularly in countries that previously followed a central planning policy and in those countries that have liberalized marketing through the closing down of marketing boards (*Edwin and Haike 2006*). Concerning the worldwide tea and tobacco cultivation, the growers or landholders receive a range of potential benefits through out-grower partnerships:

- Secure land tenure
- Gain access to financial support or sources of income
- Receive higher net returns than from traditional land uses;
- Secure markets for products
- Cash flow is reliable through a regular income or assured sales
- Offer cost-sharing option particularly suitable for long-term investment like tea.
- Means of negotiation and participation with the partner is clear

Out-grower systems should be seen as a partnership between an agro-industrial firm and farmers. To be successful it requires a long-term commitment from both parties. Exploitative arrangements by a company are likely to have only a limited duration and can jeopardize agribusiness investments. Similarly, farmers need to consider that contractual arrangements are likely to be to their long-term benefit. It must be stressed that the decision to use the out-grower system modality must be commercial. Out-grower systems that are primarily motivated by political and social concerns rather than economic and technical realities will inevitably fail (*Eaton and Shepherd, 2000*). There are several key issues influencing the success of out-grower scheme: a. competing land use; b. production model; c. access to financial loans; d. competitive market; e. negotiating arrangement; f. scope of arrangement; g. other external issues such as unpredictable direction of natural resource management policies, conflict with environmental organizations and unstable local economies for business.

CHAPTER4. RESULTS

4.1 Tea supply/value chain mapping

The term supply chain refers to the distribution channel of a product, from its sourcing to its delivery to the end consumer. The supply chain covers the full range of activities required to bring a product from its conception to its end use and beyond, covering research and development, raw material supply, activities of production, marketing and sales to national or international buyers, disposal and recycling.

Comparable to the supply chain, but a step further, is the value chain. Value chains are primarily concerned with the overall efficiency and the cost of performing the key activities of the supply chain. In a value chain, the actors actively seek to support each other so they can increase their efficiency and competitiveness. They invest time, effort and money, and build relationships with other actors to reach a common goal of satisfying consumer needs. So they can increase their profits (SOMO, 2006).

By value chain analysis, the author can understand the linkage between different actors and other stakeholders to identify constraints in the chain. This section indicates the specific value chain for Rainbow. It includes stakeholder (chain actors, supporters and influencer) analysis, calculation of value/margin share, logistic /quality control and problems in the chain also discussed through each sections.

This chapter describes and analyzes Rainbow's supply chain as the answer to sub-question 1, 2 and 3. As mentioned in chapter 1.1, the company collects fresh leaves from its own plantations and small holders. The company is responsible for all processing and refinery. All tea products are distributed through intermediary, wholesalers and exporter to retailers, and then products are sold to the end consumers. Besides, the company also directly supplying to some consumers (institutional buyers like government and large organizations). Figure 9 in next page shows the chain map.

Supply chain map of Rainbow case

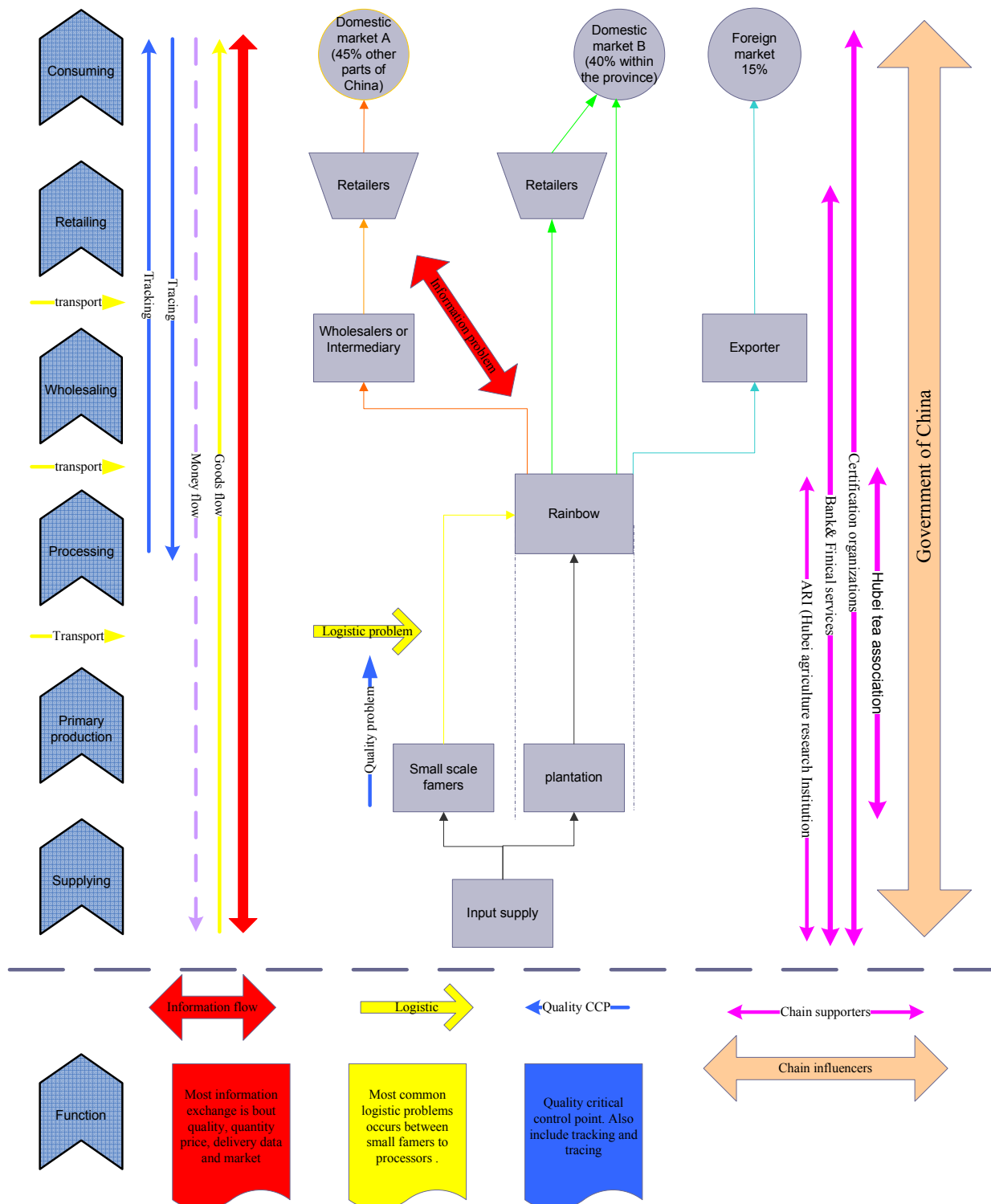


Figure9. Green tea supply chain of Rainbow case

(Source from: Xi 2009).

4.2 Role and functions of stakeholders

The tea supply chain in Rainbow's case, the main actors are: input suppliers, primary growers, Rainbow, wholesalers, intermediary, export companies, different sort of retailers and final consumers. There are no other chain supporters and influencer involved in the chain (table 7).

Table 7. Chain stakeholders and functions

Stakeholder	Role	Major Functions
Input Suppliers	Actor	- Supplies farm inputs e.g. organic fertilizers, herbicide, etc - Machineries/ tools and production equipments - Other facilities plucking container, cleaning chemicals, fuels, packaging materials, etc.
Small scale growers (a simply buying agreement with Rainbow)	Actor	- Cultivation and harvesting in their farm with family labours - Unscheduled field inspection and crop maintenance - Crop protection are done based on personal experience from the past - Manual harvesting with the standard agreed with the company - Manual transportation of the harvest to closest collection point or direct to the company - Quality control during the transportation and at the weighing points
Rainbow + Branch offices	Actor	- Cultivation and harvesting in own plantation by hired labours - Regular monitoring of pest/disease and crop maintenance in the field - Extension service - Leaf quality control through maintaining good plucking standards based centralized planning and management. - Leaf quality control quality inspector at collection points or in plantation - Payment for collected leaf from farmers and transportation of leaf from the collection points to the factory - Second check of collected leaf and grading - Primary processing and refining - Packaging and labelling of final product - Storage - Sales and marketing activities - R & D on cultivation and processing technology
Intermediary and exporter	Actor	- Coordinates between processors and retailers or importer - Implements shipment and transportation of tea to different market - Quality monitoring - Information feed back

Whole Sellers	Actor	▪ Purchases tea products from different processors or intermediary ▪ Implements transportation of tea ▪ Storage ▪ Quality control and monitoring ▪ Information feed back
Retailers	Actor	▪ Purchases tea products from wholesaler or intermediary ▪ Marketing and advertisements of the products ▪ Quality control and monitoring ▪ Information feed back
Consumers	Actor	▪ Purchases tea from the retailers ▪ Taste and preferences dictates market trends ▪ Information feed back
ARI (Hubei agriculture research Institute)	Supporter	▪ R&D of high yielding, drought resistant tea varieties and other framing practices ▪ Collection of updated information in the agriculture sector for the ministry of agriculture ▪ Working with private companies on research projects
Hubei tea association	Supporter	▪ Providing members with business opportunities ▪ Information exchange
Bank of China and Agricultural Development Bank	Supporter	▪ Provide short/long term loans ▪ Other financial services
Certification Organization (Greenfood and QS)	Supporter	▪ Provide certification services ▪ Yearly based quality monitoring
Government of China	Influencer	▪ Construction of physical infrastructure and maintenance ▪ Formulation of agriculture sector policies ▪ Legislation and taxation

(Source from: Rainbow Company, 2009)

4.3 Situation analysis

This sub chapter analyzes the current situation of the chain and explains the linkage between different actors. The quality control and logistic flow are also mentioned through each section.

4.3.1 Input supply

The Chinese Government has liberalized the trade in farm inputs for a long while and the same applies to the input suppliers into the tea subsector. The main input suppliers to tea growers are the Enshi agriculture research institute and several other private companies. They provide producers with specific production inputs such as planting materials, (organic) fertilizers, pesticides, herbicides and other cultivation tools needed for tea production. They also offer information on the use of chemicals or other cultivation equipments to growers. Therefore, all tea growers have access to the input supply such as organic fertilizers.

However, the many large set of processing equipments still imported from other countries and the price is rather high (*interview with Mr. Zhang*).

4.3.2 Tea growers

Concerning the supply of fresh tealeaves, the company has its own plantation of 428 ha. The rest of the supply is from local small-scale growers by a simple buying agreement.

Because of High density of population, the average acreage owned by a tea grower is only around 0.4 ha. Some of them even have less than 0.2ha (*Source from Ms. Liu in Enshi Agriculture Bureau and several informants in the company, 2009*). Economy of scale is a valuable concept for analyzing the competitive strength of producers to compete in the market and make superior profit (*Syed and Mahmud, 2005*). Compare to the company, generally because of the large operation, Rainbow's plantation can spread its fixed cost across greater number of units as more are produced thus reduces the unit cost of each product. However, limited arable land for tea farming is one of the reasons that the company cannot extend its own plantation, but to buy from local tea growers.

During the interview with the production manager Mr. Zhang in Rainbow, he mentioned that because of the limitation of chemical use required by the "A Greenfood", the production is usually lower than in conventional tea production. The average production in its own plantation is more than 765 kg/ha. On the contrary, the average production from small-scale tea growers is less than 600kg/ha. It means that there is still a potential for small-scale growers to increase the production under proper cultivation management.

Mr. Zhang also mentioned that the company has permanent workers to manage the own plantation and also hires temporary workers during the peak season (harvesting) based on its centralized planning and cultivation management system as mentioned in chapter 2.3. The company has hired employees for crop protection and regular maintenance of the plantation. Under the proper planning, the harvesting is also done by well-trained employees working in groups. In other words, the quality of tea from plantation is well managed. The major cost in tea cultivation and harvesting is the labour costs. The company has a simply buying agreement with local growers, but it does not involve into cultivation and harvesting of local growers. Besides, the growers are not trained for cultivation with the "Greenfood" standard. Although the growers agreed not to use much chemicals, there is still a concern of how green do these growers cultivate? Therefore, it is necessary for the company to have a control on the chemical applications. The best way of control for the company is to offer all chemicals that are allowed to use for "A Greenfood" standard to growers.

The cultivation management of small growers is decentralized. They usually use family labours like children to help them to work in the farm, practically during the harvesting seasons (from middle of March to middle of May). Most of small-scale famers do not have a regular schedule to work in the tea field. Besides tea farming, they also have other corps to manage or other part time jobs. In the time of labour shortage, the priority is given to food crops. According to one of the grower, his family also grows other vegetables and raise pigs and chicken. Therefore, he does not set a fixed working hours for his tea garden. He also mentioned that he spends not more than 150 hours for a year. The other interviewed growers did not mention specific hours, they said that besides harvesting, they go to and work in the garden when they are not busy. Sometime, they just left the garden for several days. When disease, pest and weeds appear, he cannot treat them in time that will have serious consequence on the quality and yield. That is one major reason for low yield.

As mentioned in chapter 2.3, there are three main pest/disease (green leafhopper, tealeaf blight and tea tussock moth) in the company's plantation, as well as in small-scale grower's tea garden. Growers used to deal with them based on their own cultivation experiences such as using chemicals. With limited use of chemicals, they do not have enough knowledge to treat pest/disease effectively. Besides, one grower said that he does not know how to apply organic fertilizer properly.

Sometime driven by the problem of lack of money, growers pluck too many leaves causing low production in next growing season. All these could be reasons for low production of small-scale tea farms.

Since the price of tea is higher than other food crops, many growers want to extend their tea garden. However, they cannot afford to grow new tea plants and wait 4-5 years to start pluck leaves. Growers also are not happy with the price offered by the company. One grower mentioned that he wants to extend his tea garden, but his family could not provide enough labour. With the current price, it is not profitable to hire labours to work for him.

The production manager also mentioned that some growers think that the quality standard in Rainbow is too strict and many leaves are rejected. Therefore, they choose to sell their produce to another company.

4.3.3 Problems for leaf collection

The objective of logistic management is to reduce integral cost and increase clients' satisfaction. The logistics structure can be also found in the value chain map (yellow arrows). Following the logistic flow, the operational responsibility or legal possession is transferred to the next link in the Chain. There are four important logistic steps in the chain: farmers - collection points; Collection points - processing unit; processor – wholesalers or intermediary and exporters; wholesalers, intermediary and exporters - retailers. Quality problems usually occur between small farmers to collection points caused by inadequate logistic management.

The process of transferring green tea leaves from the growers to the company consists of a number of stages that can differ quite significantly depending on the distance between the farm and the processing unit. For fresh tea leaves, the grower has to deliver to the company within 8 hours. For growers who are close to the company, they could deliver fresh green leaves directly to the company. For those who are far away to the company, the grower has to carry leaves from the field to closest weighing point. One grower mentioned that there is only a limited number of leaves weighing points. The nearest weighing point is some 12 km from his field. He has to carry his leaves over such distances. During the transportation, leaves can quickly lose freshness and weight within a few hours if kept under inhospitable conditions. These leaves will not be accepted and paid.

Before the tractor comes to collect tea at collection points, the grower needs to remove leaves from whatever container would have been used and spreads it on the ground to allow free circulation of air. It is very important that the leaf is constantly turned to make sure that it does not burn itself out while the grower waits for the tractor to arrive. Under sunny conditions, the leaf has to be kept under shade so that it does not get sun burnt. Meanwhile, the grower also removes old hard leaves that have been plucked accidentally. It is very difficult to pluck tea that is free of these old leaves as plucking is usually done at quick speed. Some collection points also do not provide temporary storage facilities. Therefore, during the cultivation transferring between growers to the collection points, many problems may arise that influences the quality and quantities of the tea leaves. Moreover, it will directly

affect the final payment that the grower receives and causes troubles between growers and the company.

4.3.4 Quality control and processing in Rainbow

The Rainbow Company is responsible for collecting leaves, all the processing and refining activities from fresh tealeaves to refined and packed tea products.

1. The quality control start at the collection points, the fresh and green tea quality assessment is carried out by a field inspector who looks at a number of criteria before he/she decides whether to accept or reject the leaf. The criteria include leaf freshness, length of branches (only the two youngest leaves and a bud called “2½”), presence of old hard and broken leaves. When he/she is satisfied that the quality meets the minimum requirements, leaves are weighed and loaded on the light truck or tractor. The inspector also records weight for each grower’s tea. After entering weighting figures into a book, the growers also looks at the scale to make sure that the figures that the inspector writes down are the correct ones as reflected on the scale. The production manager Mr. Zhang mentioned that it is about 6-8 percent of leaves from growers rejected at the weighing points.

2. At the processing unit, all leaf will be weighed at the weighbridge and compared with the total recorded weight at the collection points. The quality of leaf is checked again and the grading takes places. If it is below standard, the leaf will be rejected. However, the rejection at this stage hardly happens. .

3. Then primary processing begins. Although green tea does not require oxidation, it also has to go through several stages

Withering (optional): Fresh leaves are thinly (15-20cm in thickness) spread to dry during this process by heated air forced over the withering racks. The objective of goal process is to reduce the water content. It also increases the concentration of polyphenols (catechins). The appropriate withering time ranges from 16—20 hours. By the end of this process, the leaves become soft and pliable. Quality required: no smell of green grass; no burnt smell and no water smell. This stage in tea manufacture is the very expensive in terms of time taken and space used (this process is not used in Rainbow anymore).

Steaming: All leaved are putted into a large steamer and heated at the temperature of 180 □). This also softens the leave for rolling and keeps ‘juices’. During this process, the oxidizing enzymes contained in the fresh leaves are killed by the steam-heat. The steaming process has a significant effect on the colour and quality (*figure 10*). The longer the steaming time, the more easily the tea leave' cellular membrane breaks down during later processing. This in turn leads to cloudiness in the tea's colour. However, longer-steamed leaves have a brighter luster while astringency and fragrance is reduced.

Method	Light steaming	Moderate steaming (Normal steaming)	Deep steaming	Special steaming	Extra deep steaming
Steaming time	20-30 seconds	30-40 seconds	40-60 seconds	90-120 seconds	140-160 seconds (two step steaming)
	Short time ← Long time				
Flavor	Clear taste	Slightly rich taste	Rich taste	Full-bodied rich taste	Low astringency. Strong taste and color
	Clean finish (astringency) ← Deep, full-bodied taste (smoothness)				
Aroma	Strong ← Fresh aroma → Weak				Light aroma
Leaf shape	   				Suitable for coarse tea leaves
	Long, narrow, uniform shape ← Broken shape, fine				
Tea color	   				Deep green color
	Clear, light green color ← Darkish green color				

Figure10. Steaming time and different tea characteristics
(Source from: <http://www.itoen.co.jp>)

If the steamed tealeaves are left at high temperature, they will lose their bright colour and their flavour and aroma will be spoiled. For these reasons, to preserve the tea's luster and colour as well as flavour and aroma, air is blown over the steamed leaves to rapidly cool them to normal room temperature.

Rolling: This process is done through rolling machine. For some expensive teas, the rolling process is usually done manually with skilful employees. Leaves are twisted and rolled to break up the leaf cell and to release juices gives the tea its distinctive aroma. After rolling, the leaves will be shaped up and damage of leaf cell is about 45-50%. It is required after rolling 85% of leaves should be ready. When putting leaves into the machinery, the amount of leaves should be proper. If too much, they are easily formed as blocks. If not enough, they cannot be formed as strips.

Drying: In this stage the leaves are dried evenly and thoroughly without burning the leaves. Requirements: The moisture content of leaf is reduced to 5% with hot-air drying. This allows long-term storage and further draws out their distinctive aroma.



Figure11. Tea refining workshop
(Source from: Rainbow, 2009)

4. After drying, tea still needs to be refined in order to have nice shape and excellent taste. The company has a separate refinery and workshop. It is always maintained cleanly. Its floor is made of wood traditionally. There are tea refining machines, optical tea stalk separator, tea cutter, tea blender and tea packing machine. Tea refining machine is composed of the various sieves in size. Crude tea is firstly classified according to size by this machine in the refined tea workshop (*figure 11*). Optical tea stalk separator is the device that separates stalks and the branches in a crude tea. Perceiving a difference of colour of leaves, and stalks and branches by the light sensor, only stalks and branches were blow off by the compressed air. It is about 300 kg as to processing volume per hour.

5. After refining, tea are packed with labels and put into storage rooms.

All these processes are done within the processing unit of Rainbow. During the whole process, the main costs are including energy cost, mechanical maintenance and repair of processing machineries, package and labelling material and wages for labour.

For quality control, the company designed its own system with the help of Hubei agriculture research Institute. All processing equipments are imported from Japan. All worker involved in the processed were well trained with a license. During the whole process, the strict quality inspection is taking place at each stage. All data during the process are recorded with computer. Therefore, the quality of green tea from Rainbow is highly praised by its clients.

4.3.5 Distribution channels

During the interview with the sales manager Mr. Jiang, he pointed out that there are three distribution channels for Rainbow as show the in the chain mapping (*figure 9*).

a. The blue line is to foreign market. The rainbow sells 15% of its products to the big exporter (Hua Longchun Tea (Group) Co Ltd). It is the leading tea company in Enshi district and the only one owns the import and export license. The fact is that Rainbow only supply with primary processed tea without value adding activities such as refining and packaging. Therefore the profit is low. Because Rainbow does not have its own import and export license, it is not allowed to export by itself. Therefore, it is not possible to make changes in this situation yet, but the company will try to apply for an import and export licence within a few years.

b. The green line is to the market within Hubei province (40%). Most of products are sold through several wholesale markets located in major cities in the province to retailers. The company also supplies directly to some institutional buyers. In this channel, the company has direct linkage with retailers and consumers and the transaction costs are minimized. Most of expenditure on marketing and promotions are spend within the province. The brand name of 'EnShiYuLu' won the prize of 'Number one tea' in Hubei province. The problem in this channel is that the market of green tea is saturated in Hubei province. It is difficult to increase the sales volume and profit.

c. The orange line is to the market outside the Hubei province. All products are sold through several wholesalers or intermediary and usually long distance transportation is involved. In this channel, the company has no access to market and consumer information. Mr. Jiang also mentioned the lack of products brand image is another problem. Many consumers in other provinces do not know the name of 'EnShiYuLu' and the characteristic of the products. In general, the market power of Rainbow is weak and the company has no control in this channel. There is also a danger of being replaced by competitors with a low price.

However, those non tea-producing regions such as west and north of China have a large market potential for green tea, the company need to find the right strategies to directly enter the market and built its own network.

4.3.6 Retailers

As mentioned in chapter, the market share of green tea is continuously increasing, the distribution channel are also changing. In domestic market, the main players are food retailer stores, supermarkets, tea specialised shops, tea franchise stores, hotels and tea bars. The percentages are illustrated in figure 12.

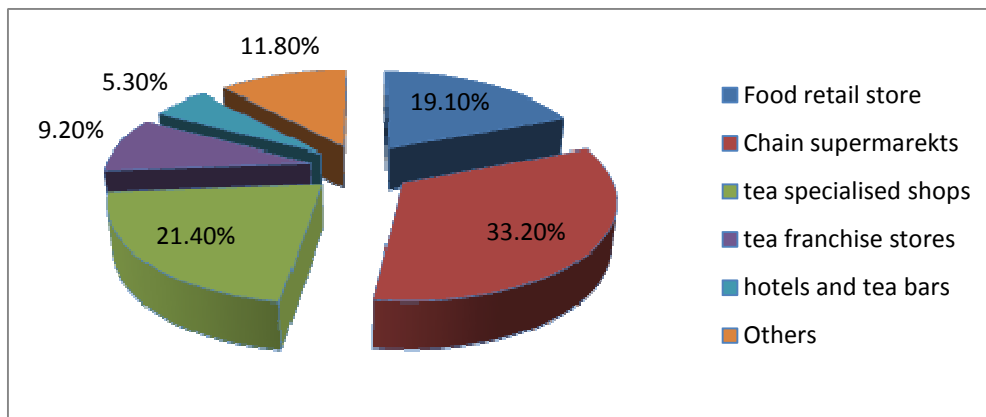


Figure12. Marketing channels of green tea at retailing level
(Source from: Qian, 2006)

Based on these figures, the chain supermarkets have almost 1/3 of the share. The tea specialised shops and food retail store rank the second and third. Although tea franchise stores only occupy 9.2%, it has a better coverage and market power like chain supermarkets. Therefore, chain supermarkets and tea franchise stores are the preferred targets for Rainbow to promote the products in the new market.

4.3.7 Consumers

As mentioned in chapter 3.1.4, the tea consumption differs greatly in rural and urban areas. There are also other factor such as gender, age and personal income level. During the research, a survey among 1000 consumers carried out by Hua Longchun Company was found (table 8). It indicates how these factors affect the consumption of green tea in China.

Table8. Different consumer groups and green tea consumption in domestic market

	Consumer group	0-100 gram per year	100-300 gram	300-600 gram	More than 600 gram
Gender	Male	29.64%	35.39%	15.57%	19.40%
	Female	31.31%	37.71%	17.51%	13.47%
Age group	Below 25	42.65%	41.23%	9.48%	6.64%
	25-40	18.92%	37.30%	24.32%	19.46%
	40-50	11.76%	22.35%	21.18%	44.71%

	Above 50	11.25%	21.25%	27.50%	40.00%
Income	Below 200	39.10%	40.10%	11.28%	9.52%
(euro/month)	200-250	22.82%	34.90%	23.49%	18.79%
	300-400	17.82%	28.71%	24.75%	28.71%
	400-500	11.11%	27.78%	25.00%	36.11
	Above 500	8.10%	15.70%	16.20%	60.00%

(Source from: Hua Longchun Company, 2008)

Base on figures in this table, the result is clear. It shows:

a. There is no significant difference on green tea consumption between male and female.

b. There is significant difference on green tea consumption among different age groups. About 85% of consumers below age of 25 do not drink more than 300 gram of green tea per year. Consumers at the age of more than 40 usually consumes more than 600 gram of green tea per year. Therefore, it indicates that younger people drink less tea. They prefer other soft drinks that are more convenient to drink, such as carbonated beverages.

c. The income also plays a very important role in green tea consumption. There is tendency that consumer with higher income consumes larger amount of tea.

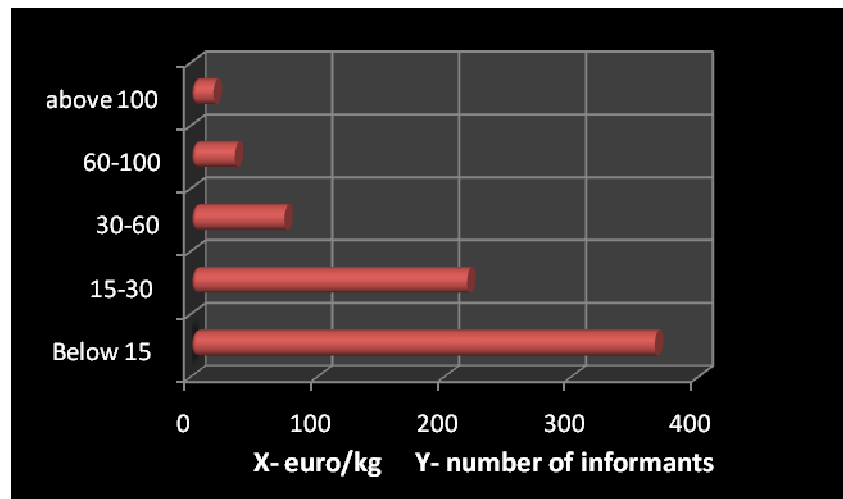


Figure13. Consumption of green tea at different price level in domestic market

(Source from: Hubei Tea Association, 2008)

During the interview in Hubei tea association, Mr. Chen provided the author with a survey (800 consumers) which shows that the consumption of tea is influenced by the price of green tea (figure 13). Moreover, it gives the tea company an indication of consumer's acceptance of tea price. The higher tea price leads to less consumption. About 80-90% of consumers expect green tea price below 30 euro per kg.

With the improvement of living standards, more and more customers are willing to pay more attention to food safety and their health status. These customers are the particular group that always purchases organic tea. Undoubtedly, with the high awareness of food quality and safety, more and more customers will take organic tea as their first choice

To conclude, consumer with highest green tea consumptions are usually more than 40 years old with a relatively high income. The green tea with a price below 30 euro/kg is most popular in the market. In additional, as mentioned in chapter 3.2.3, the increase awareness of food safety and health status also creates market demand for green tea with organic labels and other quality certificates.

4.4 Chain supporters

All firms are connected with non-firm organizations, e.g. employer's associations, trade unions, NGOs, universities and government agencies (*Altenburg 2007*). Many of these relationships do not directly influence the process of value addition and should therefore be distinguished from vertical value chain links. These organizations can be defined as chain supports and influencers. This sub chapter describes and analyzes these organizations, as well as their relations with chain actors.

1. ARI (Hubei Agriculture Research Institute)

It is a premier national institute (part of ministry of agriculture) bringing together research programmer in food crops, horticultural and industrial crops, livestock and range management, farming technologies, land and water management, and socio-economics. It promotes sound agricultural research, technology generation and dissemination to ensure food security through improved productivity and environmental conservation. This organization usually works with farm groups and helps local government in extension services. It collects information in the agriculture sector in Hubei province and report to the ministry of agriculture. For tea subsector, ARI is working on R&D of high yielding, drought resistant tea varieties and other cultivation technologies. It also handles research projects or application applied by private enterprises. Rainbow works together with ARI and has a lab, as the company's R&D department.

2. Hubei Tea Association

It is an organization of economical cooperation, which consists of the voluntary enterprises and the growers of Hubei who engaged in the production, processing, marketing, research, and transportation of tea products as well as relevant facilities manufacturers in Hubei. It provides members with business opportunities and exchange of market information. It also carries out business projects for it members, such as marketing surveys. However, it is not possible for individual groups to join and the membership fee is expensive (*interview with Mr. Chen*). Rainbow is a member of the association.

3. Bank of China and Agricultural Development Bank

These two banks offer financial support and banking services to actors in the chain, such as providing a short-term loan to tea producers to purchase farming input. They give credits to larger processing company and provide other financial services. These banks sometimes also directly invest in large agriculture development programs. In fact, it is difficult for individual famers to get a loan from banks, but for large-scale grower groups (cooperatives). As one of the leading tea companies with good profits in the county, Rainbow has a close relationship with the director in Enshi Agricultural Development Bank and the credit grade in the bank is AA (*source from Mr. Wenqi, Zhang*).

4. China Green Food Development Centre (CGFDC)

It was founded in 1992, is a specialized agency responsible for national development and management of Green Food in supervision of the Ministry of Agriculture (MOA). It has merged with the Green Food Management Office of MOA. Rainbow has the certification of "A Greenfood" (different levels of standard are mention in chapter 3.2.3).

The major functions of China Green Food Development Centre include, under consignment of MOA:

- 1) Generation of policy, regulation, and strategic plan,
- 2) Creation and implementation of standard and authentication based on the standards.
- 4) Quality control of Green Food based on "Law of Agro-Product Quality and Safety",

- 5) Management of logo and trademark based on “Trademark Law of The People’s Republic of China”,
- 6) Organizing various activities related to Green Food, such as research, demonstration, technical extension, training, education and international exchange and cooperation etc,
- 7) Providing guidance to the provincial and municipal branches, and coordinating the operation of quality inspection stations and environmental monitoring branches.

4.5 Chain influencer

In general, government is an influencer for the whole chain. The objective of the Government is to encourage and promote the development of the tea industry. The Government of China through the Division of Ministry of Agriculture and the Ministry of Finance, Economic Planning and Development influences operations of the tea sector within Enshi County. This is achieved mainly through policy formulation on agriculture, trade, taxation and legislation. General observations are made on roles of the government and their local agencies for green tea subsector.

The enabling and regulatory role

- Suitable laws of contract and other laws are required as well as an efficient legal system.
- Government needs to be aware of the possible unintended consequences of regulations, and should avoid the tendency to over-regulate.
- Government should provide services such as research and extension.

The development role

- Government can take steps to bring together agribusiness and farmers.
- The government needs to develop the infrastructure within the out-grower area. This includes the structuring of good roads for easy transactions of both the producers and agro-industrial firms.

To be specific to agriculture sector, the government issued several beneficial policies to stimulate the development of tea Industry. During the interview with officer (*Ms. Liu*) of Enshi agriculture Bureau, she mentioned that as one of the leading agriculture company in the region, Rainbow enjoys the policy of reduction of 15-20% of import tax for agriculture equipments and other tax refunding policies.

At the large scale, the issue of tax exemption provides incentives for farming. For growers, who have paid taxes for centuries based on the size of their families and the acreage of cropland they farm. They are no longer need to carry this burden. In Hubei Province, the tax exemption released the farmers' tax burden by 410 million euro last year, an average 150 euro for each farmer. Besides the tax exemption, the Chinese Government has also worked out a series of agriculture-friendly policies to boost the rural economy and increase farmers' income, including direct subsidies for growers and more subsidies for farmers to buy improved crop strains, agricultural machinery and tools (*source from: www.agri.gov.cn, 2009*)

4.6 Value share in the chain

This chapter describes the value adding process through physical flow of the chain (from small-scale grower to company and wholesaler till retailer). The unit in the table is euro/kg of standard of green tea product.

Table9. Value share of actor in the green tea value chain

Chain Actor	Variable cost	Revenue (selling price)	Gross income (revenue-cost)	Added value (revenue-previous actor's revenue)	Gross margin (gross income *100/ revenue)	Value share (added value* 100/ retail price)
Grower	3.4	4.5	1.1	4.5	24%	22%
Company	8.6	11.0	2.4	6.5	22%	33%
Wholesaler	12.1	14.0	1.9	3.0	14%	15%
Retailer	15.5	20.0	4.5	6.0	23%	30%

(Source from: Rainbow Company, 2008)

From table 9, the selling price at retail level for 1 kg of Rainbow's green tea is around 20 euro. Tea grower contributes 22% of the value share with a gross income of 1.1 euro per kg. Although the gross margin is 24% which is high, the low yield (600kg/ha) and limited land (average 0.4 ha) do not provide growers a good income.

CHAPTER5. BUSINESS ENVIRONMENT ANALYSIS

The Business environmental analysis is the study of the organizational environment to pinpoint environmental factors that can significantly influence organizational operations. This chapter analyzes the business environment through Porter five forces model and SWOT.

5.1 Porter five forces analysis

The tea market is subjected to a web of underlying forces generated by its characteristic system of production, sale, value adding, wholesaling and retail distribution. There are five major forces influence the industry dynamics. In general, the collective strength of these force indicate the intensity and the profit potentials in the industry (*Hong 2008*).

For those businesses that want to develop an edge over rival firms can use this model to better understand the industry context in which the firm operates. In the case study of Rainbow, five forces model would be a great help to fulfill the analysis of business environment so as to understand the relationship among these factors and consequences. It also can help the author to understand the intensity of the competition in order to design the most feasible strategies for Rainbow.

5.1.1Barriers to entry

New entrants to an industry create additional capacity and come with an urge to gain market share and consumer franchise. In the process, prices are pushed down and margins reduced, resulting in reduced industry profitability in the long run (*Goutam, 2004*).

In tea industry, there are three main barriers. The first barrier is economies of scale, through which major competitors in the industry create low per unit cost for themselves not only in production but also in research and development, marketing and general administration. It is not easy for small sized tea company and cooperatives to start organic production on a large scale. The requirements of 'Greenfood' or 'Organic certified' certifications are getting more strict in line with other international organic certification.

The second major barrier is product differentiation through which individual producers of tea can create a perceived uniqueness for their products in the minds of buyers. In the segment of organic green tea in domestic market, there is not much product innovation.

The third entry barrier is created by the government policies that protect the local market and provide generous subsidies to local producers. However, the effectiveness of this barrier is reduced if the same polices are adopted. By visiting the website of China organic tea produces association, the author found that in the current organic green tea market, the main players are the big companies in the main tea producing area (Zhejiang, Fujian and Hubei province). These companies are the leading private and state owned companies in their province with large-scale production and strong technical and financial support from local government.

5.1.2 Bargaining power of suppliers

If the suppliers of a commodity have enough leverage over the distribution system they can control prices and profitability. This usually happens when the suppliers are large, relatively few in numbers, or are in some kind of agreement to limit supply to the market or the products are highly demand or involve high switching cost. A good example is the suppliers of crude oil that fulfilled all these condition and has strong bargaining power. The tea industry, on the other hand, has been at a disadvantage in all this aspect. Most of the supply of fresh leaves still largely depends on the small-scale growers- all trying to increase output with expectation of enhancing revenue regardless of the effect of imbalance between supply and demand causing price reductions. In most tea producing regions, substantial investments have already been made in the sector to expand the production scale. It is therefore easy to understand why the price in the market is low. Also, tea is not a product with high switching costs, so consumers can easily switch to alternative beverages.

Through successive family generations and the resulting fragmentation of land, small farmers in China are poor, undernourished, poverty stricken, depending on monsoons and they often practice subsistence agriculture. As their risk-taking abilities are low, productivity declines. Small farmers also have difficulties to negotiate with company. Poor market orientation and low value addition capacity, gives them low margins leading to low risk-taking abilities. Thus, small farmers enter a vicious circle and find it difficult to break (*Yan and Yanbing, 2005*). The perishable characteristic also make the weak bargaining power of both growers and supplier. Some of small holders even use part of the produce as organic fertilizers, simply because they cannot sell it or the price is too low.

5.1.3 Bargaining power of buyers

The ultimate aim of buyers in commodity market is to lower the price as far as will go, to transfer profit from the producers to themselves to the maximum extent possible. By interview with Ms. Liu from Enshi agriculture Bureau, she points that in the domestic market, direct sales in wholesale market is still the dominating way for many tea companies. The overall unorganized market transaction system elevates the bargaining power of buyers. Only in Hubei province, there are 231 tea companies with more than 200 ton annual production. The number of suppliers is much more than the number of buyers. The high concentration of tea producing companies also enhances the bargaining power of buyers. To some extent, with the lack of distribution channel and access to the national market, the buyers actually set up the price. That is also the reason why the Rainbow Company wants change the situation of high dependency on a few buyers to search its own market channel.

5.1.4 Threat of substitutes

In Porter's model, substitute products refer to products in other industry. The threat of substitute exists when a product's demand is affected by the price change of a substitute product. A product's price elasticity is affected by substitute products - as more substitutes become available, the demand becomes more elastic since customers have more alternatives. A close substitute product constrains the ability of firms in an industry to raise prices. Except other tea products like Wulong and black tea, there are other major substitute products like soft drink, fruit juice, coffee and alcohol (beer).

The fruit juice as a conventional drink is gaining a slow but steady increase. It is probably due to the growing health consciousness among all consumers. Since the entry of soft drinks, coffee and beer in the domestic market a few decades ago, the number of consumers interested in these drinks has increased significantly. Convenient packing and aggressive promotion have helped increase consumer preference for these types of drinks. According to national statistic, the consumption amount of alcohol drink and coffee are growing at an average annual rate of 3.7% and 2.9% respectively from 1995-2005 (Qian, 2006).

Concerning No1 competitor, soft drink products (particularly young people below 25 years old), readymade tea as a soft beverage is gaining more market share than other carbonated beverages. As most of conventional tea drinkers are at the age of more than 25, the increase of soft drinks could be a threat for Chinese green tea producers.

Table10. Comparing the market share between readymade tea beverages and carbonated beverages from 2001-2005

Year Type	2001	2002	2003	2004	2005
Readymade tea beverages	7%	13%	15%	17%	21%
Carbonated beverages	36%	27%	25%	22%	20%

(Source from: Yin, 2006)

The long history of tea drinking makes tea a daily necessity for most of Chinese residents. In the domestic market, the percentage of tea consumption will remain the leading position.

5.1.5 Degree of rivalry in domestic tea market

The intensity of competition among competitors is an extreme force affecting the tea industry, both positively and negatively, in a sizeable manner. On the positive side, it provides competitive pressures to rationalize costs and bring about products and process improvements. On the negative side, it has the potential of driving down price and hurting the entire industry. Some of the factors that create intense rivalry between competitors are industry maturity, excess capacity, high fixed costs, lack of differentiation and the absence of switching costs (Shuhua and Guimou 2005).

In the domestic market, the green tea is a classical example of a mature sector where little market expansion is taking place and the only way for competitors to gain market share is by taking it away from others. Also, the tea industry has had excess supply for a long time and the drive to dispose output has made producers to accept whatever prices they have been offered. Lack of differentiation makes tea products to the situation which buyers can easily shop around for the best price. Switching costs have also been low for tea in the beverage industry, because of its non-essential nature.

To summarize, the main reasons for the intense competition in the domestic tea market have been:

- Competitors are numerous and many of them are roughly equal in size and power.
- Fast expansion of production areas and increasing number of processors VS relatively slow market growth.

- c. Products have been essentially undifferentiated. In these days, many companies focus on making attractive packaging, but not much innovation on product itself.
- d. The cost of buyers switching form one supplier to another has been low, because of the high concentration of suppliers. Producers have not developed ways and means to tie their customers into long-term relationship.
- e. The perishability of the product has created the need to cut prices for clear stocks and financial flow in short term.
- f. Most producers remain in the market in spite of low profits because of large investments and the lack of other opportunities.

5.2 SWOT analysis

In this chapter, the situational analysis of Rainbow in domestic market is discussed using SWOT analysis (table 11). It is a strategic planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favourable and unfavourable to achieving that objective.

Table11. SWOT analysis of Rainbow's case

	Internal	External
Positive	Strength: - Company owns 428 of its own tea plantation, all of processing, refining and packing facilities (<i>Chapter 1.1</i>) - Well organized company structure (<i>Chapter 2.3</i>) - Advanced processing technologies with highly skilled employees and large processing capacity (<i>Chapter 4.3.4 and 1.1</i>) - 'A Greenfood' and 'QS' certified products (<i>Chapter1.1 and 2.4.5</i>) - Premium quality of products (high content of selenium) appraised by clients and consumers (<i>Chapter 2.1, 4.3.4 and 7.2.2</i>) - By working together with ARI, the company has its own R&D department and Lab providing technical supports (<i>Chapter</i>	Opportunities: - Increase market demand of green tea (<i>Chapter 3.2.5</i>) - Favourable geographic location and climate for tea cultivation (<i>Chapter 2.1</i>) - Increase consumer awareness on health issue leads increasing demand of "Greenfood" products (<i>Chapter 4.3.7</i>) - More R & D projects about cultivation practices carried on by ARI (<i>Chapter4.4</i>) - Government policy on reducing import tax for agricultural equipments (<i>Chapter 4.5</i>) - tax exemption and increased subsidies for farming (<i>Chapter 4.5</i>)

	2.5)	
Negative	Weaknesses: - Lack of market information and sales network in other provinces (<i>Chapter 4.3.5</i>) - Without the license of import & export (<i>Chapter 4.3.5</i>) - Weak in brand image (<i>Chapter 4.3.5</i>)	Threats: - Intense competition on the market (<i>Chapter 5.1.3</i>) - Highly depend on few wholesalers and intermediary (<i>Chapter 4.3.5</i>) - Increasing consumption of soft drinks (<i>Chapter 5.1.4</i>) - Supply problem with tea growers (<i>Chapter 4.3.2 and 4.4.3</i>)

CHAPTER 6. DISCUSSION

This chapter further discusses and analyzes the major problems in the tea supply chain as the answer to sub-question 5.

6.1 Conflicts and contrasting interests with suppliers in the chain

The production model of Rainbow can be positioned between the company model and cooperative model. However, the outsourcing from small holders is not easy to manage. As described in previous chapters, the company has a major problem with the suppliers (fresh leaf growers). It is also an issue of conflicts and contrasting interests with suppliers in the chain as a major hindering factor.

Problem analysis: More than half of the raw material are purchased from many individual small holders. However, it is very difficult to make good contract with local growers. The problems faced are:

- a. Rainbow agreed a price with the farmers – who suddenly claims that the market price increase and ask for higher price. It is simply because the low yield causing high cost per unit for small holders.
 - b. The long distance between growers and company with inadequate logistic arrangement also causing quality problem during the transferring of fresh leaves. During the transportation, leaves can quickly lose freshness within a few hours if kept under inhospitable conditions. Consequently, it will be rejected at the weighing points.
 - c. At some weighing points, there are structures, shades, under which the tea is stored before weighing takes place, but most of the weighing points do not have such facilities. They simply have two vertical poles and a third one across where scales are tied when weighing takes place. Commenting on the transport issue and speaking on behalf of growers in his area, one grower angrily complained: “The Company comes only once per day so that if they come in the afternoon, the tea will have lost a lot of weight due to exposure to the sun. And if it gets sun burnt, they no longer accept it”.
- At the company's point of view, it is not responsible for any damage before weighing and it has to reject tea leaves which are below the quality criteria.
- d. The quality check of the tea leave at weighing points always disputing argument, many growers think that the quality standard is too strict. The quality criteria include leaf freshness, length of branches (only the two youngest leaves and a bud called “2½”), presence of old hard and broken leaves. They are not trained by the company to apply the same crop protection harvesting methods.
 - e. Rainbow agreed to collect fresh leave at certain time, but farmers had already sold it to other companies. It is also an issue of money caused by high production cost V.S relatively low collecting price and it also because of lack of loyalty. It is also because of lack of transparency of value share between chain actors.

When suppliers break the agreement, the company cannot do anything about it. One of reason is that the buying agreement does not have legal validation. There are also too many smallholder suppliers, It is time-consuming. Besides, the company also wants to keep a good relationship with local famers. It is clear that without a stable supply the company could not assure a regular supply to customers.

6.2 Limitation in market development

Comparing the tea distribution channel in the many other countries, the price setting and trading are done through the auction system. In domestic market of China, most of the tea companies need to find its own way to market their products.

To compare Rainbow with the case of Hua Longchun (Group) Co Ltd in chapter 3.2.6, the gaps are found. Despite the export market, Hua Longchun gains sales its products through its 15 sales branches and 48 franchise shops over the country. These sales branches and franchise shops also collect market and clients information for the company at each level. For Rainbow, it has a strong position within the province, but the market power is weak at the national level (As mentioned in chapter4.3.5).

Under the intense competition, the saturated market in the province and the risk of high dependency on a few buyers are the driving forces for Rainbow to start search for the new market opportunities and to set up its own sales network.

CHAPTER7. ALTERNATIVE MEASURES TOWARDS CHAIN INTEGRATION

Strengthen the role in chain development allows organizations to become competitive and generate greater value added for their products through chain upgrading and chain promotion (Roep and Han 2006). One of the keys to chain upgrading is improvements in coordination between chain actors. Chain promotion is achieved through chain supporters providing assistance to chain actors. Chain supporters can also aid in chain development by upgrading the visions and strategies of actors within the chain which allows actors and supporters to pursue a commercial goal that will not only benefit them but also the chain as a whole. As a useful chain upgrading strategy, the vertical integration has been widely applied in many industries.

Almost every company is nowadays considering the integration of its supply chain entities to yield better business performance and benefit. In This chapter, the author explains his ideas on how to apply different vertical integration theories in practice to optimize the green tea supply chain for Rainbow Company to enhance the competitiveness and market access in domestic market. It is also the main objective for this research. This chapter also answers the sub-question 6, and 7.

7.1 Applying vertical (backward) integration in Rainbow case

In the case of supply problem, the company really needs to find a system solution to insure a stable supply and to strengthen its role in the supply chain. The concept of vertical (backward) integration (chapter 3.3) can be a useful strategy. As mentioned in chapter 3.2.6 and 3.4, the recommendation for change is to apply out-growers scheme instead of direct purchasing from smallholders by simply buying agreement.

7.1.1 Possible solutions for the supply problem

The idea of applying out-grower scheme is to form a long-term partnership with small scale growers. The management of the company needs to consider their interests/ welfare at their view and helping them to solve problems. Besides, the company should have all growers information registered and arrange regular information exchange to plan on cultivation and logistics in a centralized method.

1. During the interview in Enshi Qing Jing Tea Company and Enshi Hua Longchun Tea (Group) Co Ltd, the author found that these companies purchase large amount of farming inputs directly from producing factories and offer to their contracted farmers. This is used as an incentive to ensure the supply loyalty of the farmers in light of the fierce competition for green leaf by the factories especially during the drought period. In this case, the company not only reduces input costs of these farmers, but also has a monitoring on the use of chemicals during cultivation for quality control. This strategy could be used for any tea company associated with small-scale farmers, as well as for Rainbow in the future.

2. Setting centralized planning in logistic and information management. Concerning leaf collection, and arrange it based on geographic locations. With the formation of groups of farmers, it is more convenient for Rainbow to help in the provision of extension advice, delivery of inputs, training, buying, and crop collection. In each group, the company could also choose 1 or 2 contact persons. These contact persons are responsible for information exchange between the group and the company. From the company side, there should also be specific employees responsible for different grower groups.

The company can also negotiate with growers in different group on which place and what time is appropriate for weighing their leaf. If most of growers in the group agree with the specific location and time, there should not be many problems. When there is delay for collection, the company should inform the contact person of growers in advance. With the use mobile phone, it is not going to be difficult.

3. The structures of weighing points are also very important because that is where leaf is kept to prevent the sun from burning it. In addition, when it is rainy the shades keep the leaf, as well as the growers, from the rain while they wait for the arrival of the tractor. The company also needs to provide proper shading and storage facilities in all weighing points. In addition, the company also needs to provide out-growers with standard containers to carry leaves from farm to the weighing points in order to prevent quickly lose of freshness. These containers can be standard sacks made of thin plastic-like material which is very light, and have numerous holes that are some 3 cm in diameter which allow free circulation of air in the sack so that the leaf inside remains fresh. In this case, the post harvest loss from some small-scale growers should be reduced.

4. Because of the production gap between company plantation (765kg/ha and growers 600kg/ha), the company could offer technique support, extension service, training and financial credits to help individual growers to increase the production to attract these growers as exclusive out-growers. The increased production of individual will not only provides farmers with excess income, but also built trust between two chain actors. Besides, increased production could also insures a stable supply if the company has the plan to reach its processing capacity (900-1000) in the future.

7.1.2 Applying out-grower scheme

In order to apply the out-grower scheme successfully the centralized information and quality control are crucial. The centralized model (*figure 14*) is a vertically coordinated model where the agro-industrial firm purchases the crop from farmers and processes or packages and markets the product. Rainbow takes care of the organization structure in a centralized model; it also needs to provide management, administration, training, input and technical support etc. These efforts are invested into the scheme, plan, development, mission and task of the whole out-grower system. Rainbow also needs to set up a new department with a group of technical staffs specially working on the program.

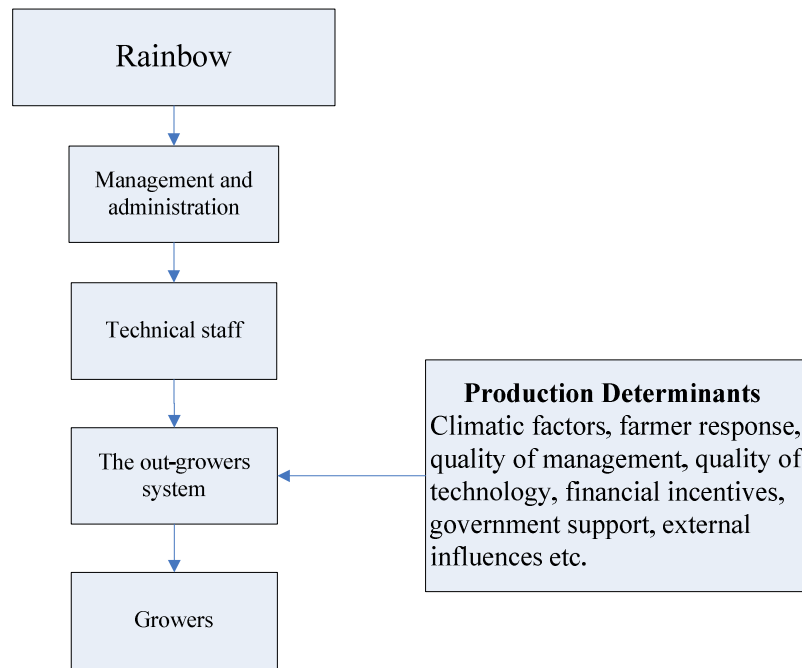


Figure14. The centralized model of out-grower scheme
(Source from: Edwin and Haike, 2006)

First, the company needs to rent more tea farms or land from the government or potential out-growers. The duration of the contract should be at least 5-10 year, because the long growing period of tea plants. So the out-growers are insured that they can have a stable income for a long time. Then a new program could be introduced. There are two phases:

1. Training of out-growers

The potential contract out-growers work 1-2 days a week at the company farm. This is also practical training in cultivation, farm management, fertilizing, etc. Therefore, they can earn a living. On top of this, there is one day of theoretical training about basic food safety knowledge, 'A Greenfood' quality requirements, cultivation planning, fertilization, harvesting skills, equipment/tools handling and maintenance, hygiene requirements, basic information of plants diseases/pest management, weed control, bookkeeping and marketing, etc. One important subject in the training is that the specific quality standard and criteria of acceptance of fresh leave should be clear informed and emphasized. Therefore, it will greatly reduce the amount of rejected products at the collection points (The percentage of rejected leaves from local growers at weighing points is about 6-8%).

2. Implementation of the outgrowing

After one year training, there will be exams for both theory and practical handling for all out-growers. When they have passed with a license, the out-growers can start growing tea with a piece of tea garden and other needed inputs and credits provided by the company. The out-growers must offer their total production to company. The company guarantees a price that covers all their costs and with a reasonable profit. After the contract, these out-growers free to do something else. If they want to work on their own farm, the company can market their products.

This kind of framework of change will be an adaptation. This approach minimizes the risk for company and providing growers reasonable profits by increasing of yield and qualified leaves at weighing points. By working together with the company, the out-growers also get to know the operation system in the company and the value share in the chain becomes transparent. Therefore, they become part of the company. The vertical integration as a useful chain

upgrading strategy not only improves supply chain relations, but also strengthens the role of the company in the chain development as a chain coordinator.

7.1.3 Monitoring performance (quality and yield)

Regular attention needs to be given to all activities of out-grower system ventures in order to take full account of changes (*Edwin and Haike 2006*). Quality problems can have far-reaching consequences for any firms while quantity shortfalls can reduce processing efficiency and jeopardize markets. The company needs to set a performance monitoring system to insure the yield and quality.

- a. Setting regular field quality inspection.
- b. Quality control should be carried out before, during and immediately after harvest and at collection points.
- c. Remedial measures may have to be implemented prior to harvest if the farmer fails to carry out recommended practices.
- d. Techniques for estimating yields are visual observations and statistical analysis. Estimates can then be used to prepare calculated yield indicators (expected yield from out-grower should reach 700kg/ha).

7.1.4 Government support

The government has to play an important role if contract farming is to be successful, especially in a communist country like China. The government role is to establish a legal framework that captures the conditions for the legal agreement in the out-grower system as the chain support and influencer. A relevant legal framework and an efficient legal system are preconditions to apply the out-grower program (*Eaton and Shepherd 2001*). The legal agreements, in turn, have to be backed up by appropriate laws and an efficient legal system. While it may not be considered a precondition, it is desirable that the government plays an arbitration or dispute resolution role.

Out-grower systems depend on either legal or informal agreements between the company and farmers. An informal agreement is not a reliable for out-grower system and should not be encouraged. That is also the reason why problems happening in Rainbow by having a simple buying agreement. For this reason, it is necessary for Rainbow to search for legal assistance. The signing and enforcement of the outgrowing contracts should be under the supervision of in local government agencies such as Enshi Agriculture Bureau.

7.2 Applying vertical (forward) integration in Rainbow case

Based on the theory of vertical (forward) integration ((*chapter 3.3*), a firm may consider forward integrating into distribution. In this case, Rainbow can build its own distribution channels and taking over the roles of those wholesaler and intermediary. By building a sale agency or branch office, Rainbow can operate as a wholesaler in the chain and have direct contact with potential buyers in the new market.

7.2.1 Potential new markets

China has a huge domestic market for green tea products, so it is very important for Rainbow to make the right choice on specific market location. As mentioned in chapter 3.2.5, green tea still occupies the largest market share and it will increase its percentage continually. Most green tea companies are focus on big cities like Beijing, Shanghai and Guangzhou. The advantages in these cities are high population and high income level. However, the high concentration of suppliers direct leads to competition and price reduction. The market in those big cities is also more or less saturated and occupied by numerous of competitors. Therefore, the author does not suggest Rainbow to enter these conventional markets.

During the research, the author also found that the green tea consumption in northeast part of China (Heilongjiang, Jilin and Liaoning province) has increased remarkably. The flower tea has been occupied the almost the northeast market for a long time. In recent years, the market share of flower tea declined from 80-90% to less than 60%. Green tea and Wulong tea are becoming more and more popular. Therefore, the northeast market has a great potential for consumption of green tea products. This fact indicates a good market opportunity for Rainbow.

Concerning the macro environmental factors and geographic locations among all cities in these three provinces, the author recommends that Rainbow may set the sale agency or branch office in Dalian city of Liaoning province. There are several advantages for Dalian city.

- a. Dalian is one of the most commercialized cities with a GDP of 385.8.2billion euro in 2008 (ranks the first in northeast part) and the GDP growth rate of 16.5% (ranks the second in China). The fast-grow economy in Dalian brings up a large number of high income residents
- b. Dalian also has great advantage in infrastructure and logistics. The position of Dalian is like the Netherlands in Europe as a trading hub covering the whole northeast of China.
- c. Dalian has the biggest tea wholesale market and hosts the trade fair of 'Dalian International Tea Expo' every year to promote trading and tea culture.
- d. The government in Dalian actively encourages the development of tea industry and provides favourable policies for both domestic and international investors
- e. Dalian has 18 universities and colleges that provide large amount of valuable human resources for new businesses.

All these items indicate a clear picture of the business environment in Dalian. They also back up the author's opinion that Rainbow choose Dalian as the entry point to start develop its own distribution channel in northeast market.

7.2.2 Market entry strategies

Products and market mix

By considering ways to grow via existing products and new products, and in existing markets and new markets, there are four possible product-market combinations.

	Existing Products	New Products
Existing Markets	Market Penetration	Product Development
New Markets	Market Development	Diversification

Figure15. Ansoff Matrix
(Source from: www.quickmba.com)

Considering the Rainbow case, the company should focus on its products “EnShiYuLu” with high content of selenium, which is new in the northeast market. It is not much to do with product innovation. By applying Ansoff Matrix, it can be defined as existing product in new market. Therefore, the strategy for the company should focus on market development. Market development options include the pursuit of additional market segments or geographical regions. The development of new markets for the product may be a good strategy if the firm's core competencies are related more to the specific product than to its experience with a specific market segment.

Targeted consumer group

The characteristics of the consumer mentioned in 4.3.7, consumers with highest green tea consumptions are usually more than 40 years old with a relatively high income (more than 300 euro/month). Consumers at this age group are usually more aware of health issues.

Price range

The green tea with a price below 30 euro/kg is consumed by most of consumers in domestic market. By taking over the role of wholesaler, it is possible for Rainbow to reduce its selling price 0.5-1 euro per kg to at the wholesale level. The current price at retail level is round 20 euro/kg. Therefore, the final selling price will also be not more 20 euro per kg in the new market. This price meets the expectation of mass consumers.

Competitive Advantages

A competitive advantage exists when the firm is able to deliver the same benefits as competitors but at a lower cost (cost advantage), or deliver benefits that exceed those of competing products (differentiation advantage). Thus, a competitive advantage enables the firm to create superior value for its customers and superior profits for itself (Porter, 2003).

As mentioned in chapter, all tea products from Rainbow have ‘A Greenfood’ certification and highest content of Selenium, which is unique in China. Selenium is a trace mineral that is essential to good health. It is incorporated into proteins to make selenoproteins, which are important antioxidant enzymes. The antioxidant property of selenoproteins helps prevent cellular damage from free radicals. Free radicals are natural by-products of oxygen metabolism that may contribute to the development of chronic diseases such as cancer and heart disease. There is evidence that selenium deficiency may contribute to development of a form of heart disease, hypothyroidism, and a weakened immune system. There is also evidence that selenium deficiency does not usually cause illness by itself. Rather, it can

make the body more susceptible to illnesses caused by other nutritional, biochemical or infectious stresses (*Source from: <http://www.hbenshi.gov.cn>, 2009*).

These characteristics are the most competitive advantages for the company to differentiate with competitors in the new market and creating value.

7.2.3 Functions/activities of the sales agency/branch office and other related issues

Setting up the sales agency/branch is the first step of a long-term business plan to enter the northeast market. As an independent sales agency/branch office of Rainbow in a new place, all details should be taken into careful consideration.

Additional information can be found in Annex 3. It includes functions and activities of the brand office, legal registration, human resource management, office setting, inventory storage and estimated initial cost.

CHAPTER8. CONCLUSION AND RECOMMENDATION

8.1 Conclusion

The report investigates the current supply chain of Rainbow Company, as well as the green tea subsector in China. After the comparative analysis, a number of conclusions were drawn. As a conventional tea producing and consumption country, the continuous growing tea consumption in domestic provide a favorable business environment for the development of green tea subsector and there is a large market potential for ambitious tea company with clear objectives.

Considering the case of Rainbow, the company has well-organized structure and good relations with many chain supporters in its supply chain. However, it was noted that there are two major constrains in the current supply chain. One is that purchasing raw materials from small-scale growers with a simple buying agreement causes conflicts and contrasting interests with suppliers in the chain (Chapter 6.1). There are also several minor issues need to be taken into consideration:

- Since 45% of the raw materials are from small-scale producers, the company does not involve much into the implementation of “A Greenfood” standard cultivation in small-scale grower’s tea garden. The small-scale growers are lacking of specific knowledge/training to apply the “A Greenfood” standard in the cultivation as well. The lack of monitoring and communication may cause a risk for the company to fail the compliance of the “A Greenfood’ standards. Therefore, the company need to be aware of the issue of how ‘green’ do they cultivate.
- Unscheduled crop protection and field maintenance and post harvest loss during the transfer to the collection points lead to a comparatively low yield for small scale growers (600kg/ha for growers, 765kg/ha for the company’s plantation).
- Limited number of leaf collection points and simply structured temperate storage facilities at the collection points contribute to the 6-8% of rejection rate at the weighting points.
- The purchasing price and the quality are always the disputing issues between the company and local growers. Quality standard and market information are poorly communicated.
- The simply buying agreement does not have any legal validation. It does not guarantee a stable supply for the company and it also does not provide growers a good income to optimize the yield or extend their scale of production.

Another major constrain for the company is that high dependency on a few wholesalers or intermediary leads to weak bargaining power and limited access on market segments (Chapter 6.2). To be specific:

- The company does not own an import & export license which limits its access to the international market
- Weak brand image and lack of market access cause weak market power in the main domestic markets. Most of products are sold in the lower market. This in spite of the fact that high selenium tea is supported to be of higher quality and of relatively higher price.

- A saturated market within the province and a high dependency on a few wholesalers or intermediaries reduce the competitiveness of the company in the supply chain.

8.2 Recommendation

In order to overcome the problems in the chain and reach the company's objectives, the author recommends sound alternative measures towards chain integration to strengthen the role of the company in the chain.

Vertical backward integration

By comparing the chain of Rainbow with other supply chains in the green tea subsector, the practical application of vertical backward integration is that the company may design and introduce a centralized model of out-grower scheme to solve the supply problem and to ameliorate the relation with local growers. In this model, all producing activities are managed a centralized model. There is a need to set a new department with a group of technical staff to work in the program. The company provides out-growers with training, all farming inputs, credit, extension service and legal contract with duration of at least 10 year (Details are in Chapter 7.1).

This out-grower system should be seen as a partnership between the company and growers. To be successful it requires a long-term commitment from both parties. During the application of out-grower scheme, the company should set a monitoring system to control quality and yield regularly. Besides, it is also necessary for Rainbow to search for legal assistance. The signing and enforcement of the outgrowing contracts should be under the supervision of in local government agencies such as Enshi Agriculture Bureau.

This kind of framework of change will be an adaptation. The production problems for growers will be solved together with the company and resources and information are shared jointly. This approach minimizes the supply risk for company and providing growers reasonable profits by increasing of yield and qualified leaves at weighing points. The company also have a stable supply to reach its full processing capacity. By working together with the company, the out-growers also get to know the operation system in the company and the value share in the chain becomes transparent. Therefore, these out-growers become part of the company. It is also the foundation for Rainbow to enlarge the production scale and to introduce 100% organic cultivation in the coming future. This strategy not only improves supply chain relations, but also strengthens the role of the company in the chain development.

Vertical forward integration

In regards to second constrain, the practical approach of vertical forward integration for Rainbow could be establishing its own distribution channels and gradually taking over the roles of those wholesaler and intermediary in the chain. In this case, Rainbow could set a branch office in Dalian city as an entry point to northeast market that has the fastest growth rate of green tea consumption in domestic market (Chapter 7.2 and Annex 3).

By building the branch office, Rainbow has a new role of operating as a wholesaler in the chain and has direct contact with potential buyers/clients in the new market. Simplifying the supply chain by replacing the intermediary or wholesalers leads to a reduced final price in favour of consumers. It also reduces the transaction time, so the shelf life of green tea products could increase.

Financial feasibilities

For a business proposal, it should contain a project planning and other elements and there is still a need to make financial feasibility calculations for these two recommendations. It requires more contacts and exchange of information with company. This report stops at the stage of proposing recommendation to the company.

For applying out-grower scheme, the number of out-growers, availability of training staffs, costs for inputs ,expected outcomes from growers and financial benefits etc should be clearly considered, as well as the plan for setting branch office. In this research, the initial cost for setting the branch office is made (Annex 3). The estimated initial cost is 113361.15 euro. Other information and financial data are not collected. Further interactive discussion still need to be carried on between the researcher and the company.

REFERENCE

- ✚ Altenburg. T, 2007. Donor Approaches to Supporting Pro-Poor Value Chains. A Report prepared for the Donor Committee for Enterprise Development Working Group on Linkages and Value Chains. German Development Institute. Bonn. Germany.
- ✚ Barnes. M, 2004. Value Chain Guidebook: A Process for Value Chain Development, Ag and Food Council, Second Edition.
- ✚ Baumann. P, 2000. Equity and Efficiency in Contract Farming Schemes: The experience of Agricultural tree crops. Overseas Development Institute. London, UK.
- ✚ Jichai. T, 2004. Crop protection handbook of tea plants. Published by Hebei Agricultural University. China.
- ✚ Chengjian. X, 2008. Enshi (China) investment guide. Enshi Tujia Miao prefecture commerce Bureau. China.
- ✚ Derek. R, 2007. Organisational Behavior and Analysis: An Integrated Approach. 4th Edition. London: Prentice Hall.
- ✚ Di. B 2006. Quality control of organic tea in China. Student thesis Van Hall Larenstein. The Netherlands.
- ✚ Eaton. C and Shepherd. A.W, 2001. A guide, Contract farming-partnership for growth. FAO Agricultural Services Bulletin 145.
- ✚ Edwin N. A and Haike R 2006 Out-grower system through contract farming Grolink / Agro Eco Report nr: 2007-04 Zambia.
- ✚ FAO report, 2007. Demand analysis for tea in China.
- ✚ FAO report, 2008. Demand and supply analysis for tea in China.
- ✚ FAO report, 2001. Forestry out-grower schemes: A global overview. Report based on the work of D. Race and H. Desmond. Forest Plantation Thematic Papers, Working Paper 11. Forest Resources Development Service, Forest Resources Division. FAO, Rome (unpublished).
- ✚ Goutam. K.S, 2004. The world tea economy. Oxford University Press UK.
- ✚ Guoli. Z and Xiang. X, 2006. The green food cognition of customer and purchase behavior analysis. Modern Economy Discussion, Vol.5, No.3.
- ✚ Hong. L, 2008. The research and investment prospect of tea industry, Journal of Tea Science and Technology. China.
- ✚ Hua Longchun Company, 2008 Different consumer groups and green tea consumption in domestic market. (unpublished).
- ✚ Hubei Tea Association, 2008. The survey of consumption of green tea at different price level in domestic market. (unpublished)

- ✚ Le Nguyen. D, 2007. Vertical integration as an alternative governance structure of value chain quality management: The case of Pangasius industry in the Mekong River Delta, Vietnam.
- ✚ Royal Tropical Institute (KIT) 2006. Chain empowerment: Supporting African farmers to develop markets. Royal Tropical Institute, Amsterdam; Faida Market Link, Arusha; and International Institute of Rural Reconstruction, Nairobi.
- ✚ Liang. J, 2007. Organic food consumer guide. Published by Center for Environmental Education and Communication (CEEC) China.
- ✚ Liangyu. W, Jianglin. Y and Linwen. C, 2007. Development model of circular economy in tea industry. Journal of Fujian Agriculture and Forestry University. 2008 series 04. China.
- ✚ Lisa Keith¹, Wen-Hsiung K, and Dwight M Guide, 2006. Guidebook for Diseases of Tea (*Camellia sinensis*). United States Department of Agriculture, Agricultural Research Service, Pacific Basin Agricultural Research Center. US.
- ✚ Qian. Q, 2006. Hot drinks in China. Agriculture university of Hebei Province. China.
- ✚ Race. D, 2000. The social and economic implications of farm forestry development for regional Australia. Unpublished PhD thesis submitted to the Australian National University: Canberra, Australia.
- ✚ Race. D and Curtis. A, 1999. Farm forestry in Australia: Improving links between small-scale growers and industry. Journal of Sustainable Agriculture, 13 (4): 67-86.
- ✚ Roep. D and Han. W, 2006. Nourishing Networks: Fourteen lessons about creating sustainable food supply chains. Reed Business Information Wageningen The Netherlands.
- ✚ Rollinson. D, 2008. Organizational Behavior and Analysis: An Integrated Approach. Pearson Education Limited, England.
- ✚ Shuhua. C and Guimou, Z, 2005. The problems and solutions of China tea industry development, Agriculture Development Research, No.7, p34-38.
- ✚ SOMO report, 2006. The Dutch Tea Market and Corporate Social Responsibility. ProFound & India Committee of the Netherlands.
- ✚ Spekman et al, 1998. Alliance management: a view from the past and a look to the future. Journal of Management Studies. v35 i6. 747-771.
- ✚ Suh-Neu. H, 2001. Monograph on tea pests and diseases in Taiwan. Wen Shan Tea Plant Improvement Station, Taiwan.
- ✚ Angelina. M. B, 2000. Organic agriculture in Asia: Implications to development, environment and trade in developing countries. University of the Philippines. Laos.
- ✚ Xiaozhong. L and Xiaodi. Z, 2009. Analysis on China's Tea Trade Based on Comparative Advantage Enhancement through Standardization of Tea. Journal of issues in agricultural economy. 2009 series 03 China.
- ✚ Yang. W and Yanbin. Q, 2005. Application of agricultural trade chain management to tea industry. Journal of tea. 2005 series 03 China.

- ✚ Yin. L, 2006. Report of tea beverage in China. University of Hunan. China.
- ✚ Zhenwen. D, 2008. Thought on the Development of Xiangfan Tea. Journal of Xiangfan vocational and technical college. 2008 series 05

Internet website:

- ✚ Assess: Library.wur.nl – Search – Library catalogue – Basic search – Crop Protection Compendium
<http://www.cabicompendium.org/cpc/datasheet.asp?CCODE=AULASO&COUNTRY=0>
<http://www.cabicompendium.org/cpc/report.asp?CCODE=AULASO&criteria=T/E>
(Published by Crop Protection Compendium in Wageningen University)
Access date: 30-Aug-2009
- ✚ Assess: <http://www.agri.gov.cn>
(Published by Ministry of Agriculture of People's Republic of China)
Access date: 28-Aug-2009
- ✚ Access: <http://www.hbenshi.gov.cn/news/xzykf>
(Published by Enshi County Government)
Access date: 20-Aug-2009
- ✚ Access: <http://www.itoen.co.jp>
(Published by Japanese Tea association)
Access date: 13-Aug-2009
- ✚ Access: <http://www.quickmba.com>
(Published by Internet Center for Management and Business Administration, Inc)
Access date 15-Aug-2009

APPENDIX

Annex1. Tea green leafhopper

This section is used as a supplement in addition to chapter 2.4.6.

Scientific names: *Empoasca onukii*, *Empoasca vitis*, or *Jacobiasca formosana*

Tea green leafhopper is one of the biggest pest problems for tea growers in the many tea production areas, as well as in Rainbow Company.

Description and behaviours

Leafhoppers do not like direct sunlight and therefore prefer to stay on the underside of the leaves. When they walk, they move sideways. When the plant is disturbed, they jump very quickly to another place.

The adult leafhopper is 2 - 4 mm long and has the green color of rice seedlings. The wings are transparent and green. Leafhopper nymphs have no wings, but for the rest they look like the adults. A newly hatched nymph is a little bigger than a rice bran cell, with a transparent white colour (see figure16). The older nymphal stages (instars) get the green colour and each instar is a little bigger than the previous one. The last instar is about 2 mm long (*Crop Protection Compendium*, 2009).

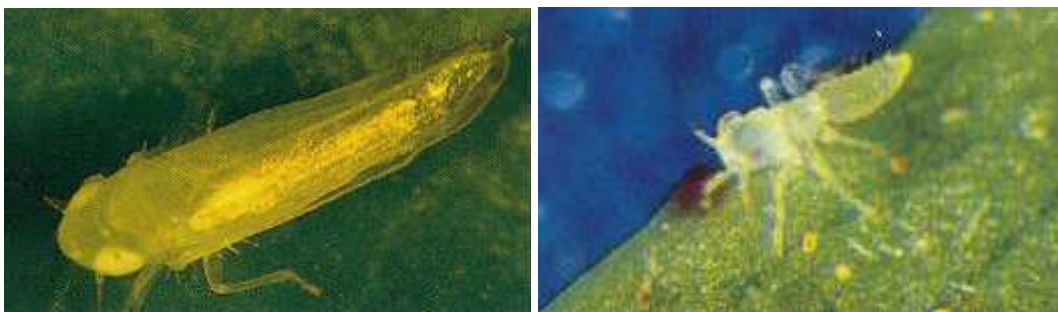


Figure16. Right: Tea green leafhopper adult; Left: Nymph (immature stage)
(Source from: *Suh-Neu*, 2001)

Life cycle

Eggs are laid inside the soft tissue of new tea buds, particularly in the internode. In one bud, from 1 - 7 eggs can be found. One female can produce up to 100 eggs during her lifetime. Depending on the temperature, the eggs will hatch after 5 - 10 days, producing nymphs. There are four instars during the nymph stage. In other words, the nymph sheds its skin 4 times as it grows into an adult. The total duration of the nymph stage is 7 - 16 days depending on the weather (faster in warm weather). Therefore, it takes from 12 - 30 days for leafhoppers to complete a generation (from when eggs are laid until the new adults are ready to lay eggs themselves). There can be as many as 10 generations in a year. The life span of the adults is 14 - 21 days; females in general live longer than males.

Plant damage and plant tolerance

Both nymphs and adult leafhoppers use their needle-like mouthparts to suck sap from the leaves. By feeding in this way, the hoppers make wounds in the leaves, causing the leaves to become covered with small yellow spots. With continued feeding, the leaves become stunted and, especially under dry conditions, the upper part can dry out (see picture). The less seriously affected leaves can have a purple color. The damage to the plant is caused by the removal of sap and by the actual injury to the plant tissues, which prevents the leaf from receiving nutrients from other plant parts (*Suh-Neu, 2001*).

For newly planted tea, especially when less than 4 - 5 months old, leafhoppers can cause the drying out of new shoots, with the plant becoming stunted and growing more slowly. If feeding is severe and prolonged, newly-planted tea plants could even die. Larger tea plants (branch formation stage and older) are much more able to tolerate leafhopper feeding. However, high populations of leafhoppers can considerably reduce the yield and quality of the tea bud.

Different kinds of spiders such as the white gray spider, the black spider, the long-legged spider and the small black spider, were found to be predators of leafhoppers. Carabid beetles, ladybeetles, and dragonflies also feed on leafhoppers. All these natural enemies prey on both young and adult hoppers, but they seem to prefer the nymphs.

Prevention methods

1. Grow a strong crop that can tolerate leafhoppers

The most important in controlling leafhoppers is to practice good cultivation techniques in order to have a strong tea crop. If pruning and plucking are not carried out well then the tea plants will grow weakly and many leafhopper eggs will hatch in the field. Good fertiliser management is also important, making sure that all necessary elements are given and not only nitrogen (urea).

2. Pluck frequently to remove leafhopper eggs

The frequency of plucking plays an important role in limiting leafhopper populations. When plucking is done at short intervals, based on when the buds meet the criteria and not just once a month or so, the availability of suitable sites for egg laying is reduced. Also, with the harvested buds many eggs will be brought out from the field before they have a chance to hatch.

3. Protect natural enemies by using less insecticide

Leafhopper is killed a lot by natural enemies, especially spiders. Preservation of natural enemies is therefore very important for better control of leafhoppers. To achieve this it is essential to limit as much as possible the use of pesticides. The leafhopper problem is often made worse because of the destruction of natural enemies by the use of broad-spectrum pesticides such as Monitor, Wofatox and Bi-58. Especially the regular use of Monitor to stimulate the development of new shoots can kill many natural enemies. It is believed that the increased use of these pesticides has caused the leafhopper to become a much bigger problem than in the past, making this insect one of the most difficult tea pests to control (*Suh-Neu, 2001*).

4. Plant shade trees

Growing tea underneath shade trees tends to reduce problems with leafhoppers. Mulching also helps to increase humidity and therefore reduce leafhopper populations.

Field monitoring and decision making

There are generally two periods when leafhopper populations become very high: March – May; September - December. Too much rain or too dry weather are not favourable for the development of the insect.

Sampling should be done every week since the development of the leafhopper can be very fast. Just searching in the leaves for leafhoppers can be difficult because the leafhopper is small and very active. To overcome this problem a sampling tray can be used. The recommended size of the tray is 20 x 20 x 5 cm and it is used by holding it at a angle of about 45 degree under the tea plant canopy and then vigorously tapping the plant three times. The number of leafhoppers in the tray can then be counted. Measurements should be made in at least 10 places in each field. In addition, there should be a thin layer of soapy water or grease in the tray in order to make the leafhoppers stay there.

Control methods

The grower makes decision based not only on how many leafhoppers found, but also:

- how old the tea is (young tea plants are more sensitive to leafhopper)
- how the number of leafhoppers has been changing for the past few weeks
- number of natural enemies you find
- weather forecast (rainy weather can help control leafhoppers)
- whether the control can be done without spraying (for example, by plucking more often).

When decided that spray is needed, avoid insecticides that will kill many natural enemies, such as broad-spectrum ones and pyrethroids. Instead, growers could try some botanical pesticides such as “Xuan” tree (scientific name *Melia Azadirachta*), or solutions of soap plus water. Any sprays should be directed at the bottoms of leaves, where leafhoppers are most abundant.

Annex2. Tealeaf (brown) blight

This section is used as a supplement in addition to chapter 2.3.6.

Pathogens: *Colletotrichum sp* or *Pestalotiopsis sp*

These fungi are considered weak pathogens and usually affect plants that have been weakened by improper care or adverse environmental conditions. The poor air circulation, high temperature, and high humidity or prolonged periods of leaf wetness favour the disease. When young twigs of susceptible cultivars are cut and used to root new plants, latent mycelium in the leaf tissue may start to invade nearby cells to form brown spots. This may lead to death of leaves and twigs (*Crop Protection Compendium, 2009*).

Symptoms

Small, oval, pale yellow-green spots first appear on young leaves. Often the spots are surrounded by a narrow, yellow zone (*figure 17*). As the spots grow and turn brown or gray, concentric rings with scattered, tiny black dots become visible and eventually the dried tissue falls, leading to defoliation. Leaves of any age can be affected.



Figure17. Symptoms of tealeaf (brown) blight
(Source from: Lisa, Wen-Hsiung and Dwight, 2006)

Life cycle

The spots on the lesions contain the fungal spores. Rain splash transports the spores from one plant or site of infection to another. If the spores land on a leaf, they germinate to start a new leaf spot or a latent infection

Culture control

- Avoid plant stress. Grow tea bushes with adequate spacing to permit air to circulate and reduce humidity and the duration of leaf wetness.
- Pruning of the severely affected sections.
- Thinning out of the dense shade
- Adoption of shorter pruning cycle in chronic and severely affected sections

Chemical control

Copper fungicides are the most widely used fungicide to control various tea diseases. A combination of copper oxychloride and nickel chloride has been proven useful (*Jichai, 2004*). For control of tealeaf blight, thoroughly drench of all the stems and decomposing pruning litters below the bush with copper oxychloride (COC) one week after the first spell of rainfall in February / March. Spray two blanket rounds of COC or Copper hydroxide or Hexaconazole at 15 days interval during May-June. Spot spraying of these two fungicides should continue until September if the disease incidence is severe. Application of two monthly rounds of COC or Carboxin during winter will inhibit sclerotia formation. However, the total amount of chemicals is checked and monitored carefully before using.

Annex3. Functions/activities of the sales agency/branch office and other related issues

This section is used as a supplement in addition to chapter 7.2.3.

Functions/activities of the sales agency/branch office

This sales agency in Dalian city could operate as an independent unit that is responsible for the whole northeast market in the future. The head office in Enshi County can only focus on production, the market within the province and existing buyers. It is the first step for Rainbow Company to enter the Northeast market. The major functions of sales agency are including logistics, inventory storage, market exploring, sales and customer service. Another important task is that it should also be the place to gather market/client information to build a new database for the Northern market. Concerning the increasing capacity of organic green tea consumption, the agency should also look for opportunities to set up its stores in other major cities in these three provinces. At that time, this sales agency will be the head office to manage them.

Among all these functions, the agency should pay more attention to sales and information collection. To be specific, the following activities should be included:

- a. Carrying out market research to targeted groups and look for new business opportunities. Attending trade fairs or by other means to promote 'EnShiYuLu'. Focus on the advantages of organic products and uniqueness of high content of selenium.
- b. Searching for potential clients such as key persons in major supermarkets, teashops and main institutional buyers (government organization, hospital, etc). Try to build a reliable personal and business relation.
- c. Investigate on main competitors in the Northern market.
- d. Collect and transfer market information to Rainbow
- e. Communicate with clients, sign contracts in the name of Rainbow, and transfer client orders to processing factory
- f. Arrange transportation to deliver to clients
- g. Collect customer's feedback and responsible for all customers' complaints and other requires
- h. Built client database and Vendor-rating system

All information founded in this chapter are based on interview with Mr. Long (Hua Longchun company has a sales office in Shenyang city which is close to Dalian) and through telephone-interview with Mr. Wenliang. Wang (an employee from Dalian Tea Wholesale Market).

Legal registration

In order to simplify the legal registration procedure, it is better to register in the local government as branch office of Rainbow Company. The application form should be filled by Rainbow's head office. It requires copy of all legal documents of Rainbow and the application procedure takes 5-6 weeks. In Dalian city, the minimum registration fee for a branch office is 20,000 euro (not include 2500 euro application cost).

Setting a branch office is the easiest, but it also has some limitation. Such as, all financial flow has to be done through head office of Rainbow. Another option is to set a subsidiary

sale agency which is more independent and flexible. In author's opinion, it is better to start with a branch office during the explore phase. When the sales network is built, it is time to register as a subsidiary sales agency to operate as the head office in the northern market.

Human recourses

Exploring a new market is one of the most difficult issues for a commercial company. Therefore, the employee in this sales agency really should be competent to carry out his/her duties. It would be the best that these employees have relative working experiences and familiar with the tea distribution channels.

In the first year, Rainbow should send an employee as the location manager to work in the sales office in Dalian and hiring 2-3 sales representatives as a small team to start the as a testing period. The first year the company should not expect much direct sales, but more information gathering and network building.

At the beginning of the next year, the manager needs to setting an overall sales objectives and each sales representatives should have their own minimum sales. Each of them is responsible for his/her clients. Besides, there is also a need for a regular employee working on logistic and information management. There are some basic requirements for those sales representatives: a. Speak the local language; b. University education majoring in business management or marketing; c. Good communication and interpersonal skills; d. 3-5 years working experience in sales. The basic salaries paid are according to local labour law and extra commissions or bonuses are accounted based on individual sales performance.

Requirement of office, Logistics, inventory storage and total initial costs

The ideal location for the branch office in Dalian is in the 'Dalian Tea Wholesale Market'. As the biggest tea wholesale market among the northeast china, it has the advantages of the best access to logistic and transportation facilities as well as exchange information with (potential) clients/consumer. The high concentration of tea companies and consumers also provides a good opportunity for Rainbow to promote its products effectively.

There are two options the company could either rent or buy one. At the first year, renting an office of 150 m² would be enough for daily operation and financially acceptable. One important issue is that there should be a showroom to display all kind of products and a room for meeting clients and presentations. The author contacted the employee Mr. Wenliang. Wang from Dalian Tea Wholesale Market. He mentioned that of duration of the renting contract should be for a minimum of 1 year. The rent cost (including service fee and two parking spaces in underground garage) is usually 12-15 euro/m² per month depending on specific location. Therefore, the renting cost should be around 21600-27000 euro.

In addition, there is also a need for other equipment such as furniture, computers and other office equipments. All these equipments together will cost about 10000 euro. The branch office also needs a car and a mini van. The purchasing and running cost will be around 24000 euro.

Although the control of logistics is done from the head office of Rainbow in Enshi County by outsourcing from a third party, the branch office also needs to rent a warehousing with a storage capacity of at least 30-50 ton of green tea products for emergent order. Because of the high rent, the warehouse is not necessary to be set within the 'Dalian Tea Wholesale Market'. The rent cost will be around 350-400 euro per month.

The following table is the estimated initial cost for the branch office in the first year. The estimated cost should be no more than 113.361 euro (*table 12*).

Table12. Estimated initial cost for branch office in Dalian

Expenses	Unit	# of units	Unit rate (euro)	Costs (euro)
1. Human Resources				
1.1 Manager	Per month	1	1000	12000
1.2 Sales representatives	Per month	3	500	18000
Subtotal Human Resources				30000
2. Travel				
2.1. Other provinces	Per flight	12	120	1440
2.2 Local transportation	Per month	5	20	2400
Subtotal Travel				3840
3. Equipments				
3.1 Purchase of vehicles	Per vehicle	2	10000	20000
3.2 Running cost	Per year	2	2000	4000
Subtotal Equipment and supplies				24000
4. Office				
4.1 Office rent	Per month	1	2250	27000
4.2 Furniture, computer equipment etc	One time	1	8000	8000
4.3 Consumables - office supplies	Per month	1	100	1200
4.4 Other services (tel/fax, electricity/heating, maintenance)	Per month	1	130	1560
Subtotal Local office				37760
5. Other costs, services				
5.1 Rents of inventory storage	Per month	1	400	4800
5.2 Financial services (bank guarantee costs etc.)	Per year	1	500	500
Subtotal Other costs, services				5300
6. Subtotal direct eligible costs of the Action (1-5)				100900
7. Provision for contingency reserve (maximum 5% of 6, subtotal of direct eligible costs)				5045
8. Total direct eligible costs of the Action (6+ 7)				105945
9. Administrative costs (maximum 7% of 8, total direct eligible costs)				7416.15
10. Total eligible costs (8+9)				113361.15

Annex4. Brief notes for case study 1

This annex presents the details of the interview in case study1.

4.1 Interview with general manager in Rainbow

Interviewee(s)	Mr. Wenqi, Zhang
Organization	Enshi Rainbow International Rich-Selenium Tea Co. Ltd
Position	General manager
Place	(Head office) No.473 Dongfeng Road No.473, Enshi, Hubei, China Post code: 445000 恩施市东风大道 473 号 邮 编 : 445000
Date	21-July-2009
Contact	0718-8221861
Main topics	business history, organization structure, financial capacity, products, tea production and processing capacity, logistic management, business network, competitors in the market, future perspectives, difficulties in the chain, relations with other chain actors, opinions about value chain management and chain integrations and support organizations, etc.
Major founding	1. Rainbow has a Mintzberg structure of a machine bureaucracy. focuses on standardization of work and coordination between horizontally decentralized departments. The general manager and two deputy managers controls different function groups. The responsibility is clear. 2. The company has a good relationship with local banks, especially the Agricultural Development Bank. The company has AA credit in this bank. 3. The company has its own plantation, processing and refining units. The company owns its R&D department together with Hubei Agriculture Research Institute. The company has been certified with ISO9000 in quality management. 4. The product is green tea with a brand name of “EnShiYuLu”. This product has a high content of selenium which is unique in the market. The product is certified with “A Greenfood” and “QS”. Mr. Zhang also mentioned that he wants to improve the current cultivation system to 100% organic cultivation and apply the ‘AA Greenfood’ certificate. 5. The company has a processing capacity of 900-1000ton green tea per year. Currently, only 70%-80% is used. Therefore, it is possible for the company to extend its production scale or purchasing more fresh leaves from growers. 6. The company has its plantation (482ha) which supplies 43% of the fresh leaves, others are from local growers. The company has a

	buying contract from local growers, but the contracts are not legally valid. And the company does not offer much help to growers in cultivation. The supply from local growers is a problem. Fresh leaves from own plantation has a stable quality. For small growers, many leaves are rejected at the collection points. Therefore, many growers complain that the quality criteria are too strict and ask for better price. Some of them break the agreement and sell produces to other tea companies. 7. For logistic part, the concern is about the leaf collection. The current situation is that growers are not concentrated in one location, it is not easy to manage the collection efficiently. 8. Another constrain for the company is that the company does not have its own import and export license. It is not possible to enter directly to the international market. Some of produces are sold to the exporter without refining and other value adding producers. Now the company is trying to apply its own license. 9. The main competitor within the province is Hua Longchun (Group) Co Ltd. Many green tea companies with low price from Yunnan province are competitors in the domestic market. 10. Mr. Zhang is worried about the company performance and He is also very interested in the theory of value chain management and chain integration. He also wants to find out the right strategies to improve the current situation.
--	---

4.2 Interview with sales manager in Rainbow

Interviewee(s)	Mr. Zixiang. Jiang
Organization	Enshi Rainbow International Rich-Selenium Tea Co. Ltd
Position	Sales manager
Place	(Head office) No.473 Dongfeng Road No.473, Enshi, Hubei, China Post code: 445000 恩施市东风大道 473 号 邮 编 : 445000
Date	22-Jul-2009
Contact	0718-8221881 jiangzixiang@runbcy.cn
Main topics	Sales figure, price of the products, distribution channels, clients requests, logistic support and cost, clients information management
Major founding	1. The sales of Rainbow decreases from 751 ton in 2006 till 713 in 2008, practically for clients outside the province. 2. The selling price at the company level is about 11 euro per kg and the final consumer price is about 20 euro per kg. 3. There are three distribution channels. The company can only control the distributions within the province. The products are well-known in the province. Except the main sales department, the sales manager also manages 5 branch offices located in the major cities within the province. These branch offices can direct contact with big clients such as super market and other tea specialized shops. These branches offices are also collecting market information and working for customer service. The brand name of “EnShiYuLu” is well known in the province, but not in other provinces. 4. For export and other part of domestic market, sales are depending on fewer wholesalers and an exporter. The market power for rainbow is weak, as well as the brand image. 5. Logistics are done through the third part in Enshi Logistic center usually by truck or train. Once the order is confirmed with clients, the company has to arrange the transportation. Some clients also arrange the transportation by themselves. In average, it costs about 0.1 euro to transport 1 kg green tea to clients.

4.3 interview with production manager of Rainbow

Interviewee(s)	Mr. Guodong, Zhang
Organization	Enshi Rainbow International Rich-Selenium Tea Co. Ltd
Position	Production manager
Place	(Head office) and (Plantation) Denglongba Village, Bajiao Town, Enshi, Hubei Post code: 445033 恩施市芭蕉镇灯笼坝下街
Date	23-July-2009
Contact	13671870382
Main topics	Production scale, yields, variety, soil condition, fertilization, crop protection (pest/disease), harvesting method, quality control,
Major founding	1. The quality control is based on "A Greenfood" certification. Therefore, the yield is lower comparing to conventional tea farming. The average production among 482 ha plantation is about 765 kg/ha which still is more than the average yield in the region, as well as in Hubei province. 2. The variety used is called "Improved Clonal Tea Variety" and named 'Entai #1'. It was introduced by Hubei Agriculture Research Institute in 1992. It has advantages in early sprouts, uniform in growth, good yield, and cold resistance. The disadvantage is that the variety is not strong in drought resistance. It is difficult for tealeaves to keep fresh and soft under dry conditions. Now this variety is been wildly used in the Enshi county. 3. The PH value of soil is about 5.0-5.5, the company applies NPK at a moderate rate of N 60-80, P 10 and K 20 kg/ha to maintain soil fertility. 4. The company has a centralized planning for all cultivation, harvesting and leaf collection. The company has permanent employees working in the field and also hires temperate workers during the peak season. There are mainly two fertilization methods: basic fertilizer and topdressing. 5. The main diseases/pests in the region are tea green leafhopper and tealeaf blight. Besides, there was another pest called the Tea tussock moth, Semiochemicals of Euproctis pseudoconsersa. 6. The harvesting is done manually with well-trained pluckers working in a group of 5 people. Each group has a leader who is responsible for checking and monitoring hygienic requirements before and during working, keeping record and report to the manager. Only the top two leaves and a bud are plucked. 7. The quality control start at the collection points, the fresh and green tea quality assessment is carried out by a field inspector who looks at a number of criteria before he/she decides whether to

	accept or reject the leaf. The criteria include leaf freshness, length of branches (only the two youngest leaves and a bud called —2½□), presence of old hard and broken leaves. It is about 6-8 percent of leaves from growers rejected at the weighing points. After weighing, the qualified leaves are transported to processing unit. Then second weighing takes place to be sure of the quality. The rejection is not usually the case. 8. Mr. Zhang also explains all processing and refining procedures in the Rainbow company.
--	--

4.4 Interview with growers

Interviewee(s)	Mr. Zhiguo, Tan; Mr. Hua, Liu; Mr. Kai, Xiang
Organization	
Position	Small-scale growers
Place	Close to Denglongba Village, Bajiao Town, Enshi, Hubei Post code: 445033 恩施市芭蕉镇灯笼坝下街附近
Date	24-July-2009
Contact	
Main topics	Education level, production scale, yields, variety, crop protection (pest/disease), field maintenance, harvesting method, quality control, relation with the company, difficulties in the cultivation , other farming business etc.
Major founding	1. All three interviewees received high school education, but none of them had specific training on tea cultivation. Extension service offered by the local agriculture research station, but not much about the tea. 2. All these grower have no more than 0.5 ha (0.2 ha, 0.4 ha and 0.4 ha) tea garden, but they also have other crops like vegetables and keep livestock such as pigs and chicken. Therefore, the tea cultivation is not the main source of family income. Mr. Xiang mentioned that some of his neighbors want extend their tea garden. However, they cannot afford to grow new tea plants and wait 4-5 years to start pluck leaves. Therefore, the growers need a stable long-term contract and financial support. 3. Most of growers are using the same variety 'Entai #1' as the company does, also the soil condition is similar to the company . 4. The cultivation management of small growers can be defined as decentralized. They manage their farms with family labor. At the time of shortage, the priority is given to other crops. Tea is considered as a spare time crop. Mr. Liu mentioned that he does not set a fixed working hours for his tea garden and he spends not more than 150 hours for a year. Other two informants have the similar answer. 5. Since they agree with company not to use many chemicals, growers do not have enough knowledge to treat pest/disease effectively. Besides, one grower said that he does not know how to apply organic fertilizer properly. 6. The harvesting is done by hand plucking. Growers have to start work very early in the morning and delivery leaves to the company weighing points with bicycle or on foot. Mr. Liu mentioned that there is only limited number of leaf weighing points. The nearest

	weighing point is 12 km from his field. He has to carry her leaf over such distances. During the transportation, leaves can quickly lose freshness and weight within a few hours. As a result, those leave will not be accepted and paid. Even the quality is ok, the weight of leaves will be less. 7. These grower also mentioned some of the weighing points do not provide proper storage facilities. When they wait for the company truck, some leave may not freshness and loss weight. 8. All these growers think that the quality control at weighting points is too strict, Mr. Tan said: “they only accept branches with two youngest leaves and a bud, any presence of old hard and broken leaves is not accepted. Therefore, many leaves are rejected at the weighing points. They (the company) have many requirements, but they do not offer much help. If other company offer a better price, I will supply to them” All growers expect a better price and receive more help from the company.
--	--

4.5 Interview with officer in Enshi agriculture Bureau

Interviewee(s)	Ms. Shihang, Liu
Organization	Enshi agriculture Bureau
Position	Officer
Place	Hangkong street 162 Enshi Post code: 445000 湖北省恩施市航空路 162 号邮 编：445000
Date	25-Jul-2009
Phone	0718-8224048
Main topics	Function of the organization, general information of the tea sector in Enshi county, government policies etc.
Major founding	1. As a division of Ministry of Agriculture, the organization also under the control of local government. The mission is to promote and regulate the development of the agriculture sector as the influencer for the tea supply chain. 2. Enshi county as the only region in the province to enjoy the National Policy of Western Development, the government issued many favorable policies to stimulate the development of the agriculture industry. 3. To be specific to agriculture sector, the government issued several beneficial policies to stimulate the development of tea Industry. As one of the leading agriculture companies in the region, Rainbow enjoys the policy of reduction of 15-20% of import tax for agriculture equipments and other tax refunding policies. 4. At the large scale, the issue of tax exemption provides incentives for farming. For growers, who have paid taxes for centuries based on the size of their families and the acreage of cropland they farm. They are no longer need to carry this burden. In Hubei Province, the tax exemption released the farmers' tax burden by 410 million euro last year, an average 150 euro for each farmer. 5. For the tea sector, one of the problems is limited production scale. In Enshi county, the average tea garden per grower is less than 0.4 ha. She also pointed out that there are 231 tea companies with more than 200 ton annual production in Hubei province. In the domestic market, a direct sale in wholesale market is still the dominating way for many tea companies. The overall unorganized market transaction system elevates the bargaining power of buyers.

4.6 Interview with secretary of Hubei Tea association

Interviewee(s)	Mr. Liming, Chen
Organization	Hubei Tea association
Position	Secretary
Place	Nanjing street No 5. Wuhan city Hubei Province Post code: 430071 中国湖北省武汉市汉口南京路 5 号 邮编 : 430071
Date	29-July-2009
Contact	027-82831500 cyxh@hbtea.com
Main topics	Main function of the organization, structure, members, market development etc
Major founding	1. It is an organization of economical cooperation, which consists of the voluntary enterprises and the growers of Hubei who engaged in the production, processing, marketing, research, and transportation of tea products as well as relevant facilities manufacturers in Hubei province. 2. It has 172 members. It provides members with business opportunities, exchange of market information, applying quality certification and business consulting service. It also carries out business projects for it members, such as marketing surveys. However, it is not possible for individual groups to join and the membership fee is expensive. Rainbow is a member of the association. 3. During the interview, Mr. Chen provided a market survey showing the price influence on the consumption of green tea in domestic market. The results indicate that the higher tea price leads to less consumption. About 80-90% of consumers expect green tea price below 30 euro per kg. 4. Mr. Chen also mentioned that the new trend in the tea sector is that more and more consumers are concerning the issue of food safety and health status. Therefore, the demand for green tea with organic labels and other quality certificates is increasing.

Annex5. Interview notes for case study 2

This annex presents the details of the interview in case study2.

5.1 interview with the general manger of Hua Longchun Company

Interviewee(s)	Mr. Huajie. Long
Organization	Hua Longchun Tea (Group) Co Ltd
Position	General manager
Place	Fenghuang street No 11 Enshi Post code: 445000 恩施市凤凰山 11 号 邮 编 : 445000
Date	2-Aug-2009
Contact:	0718-8236999
Main topics	History and structure of the company, production model, products, distribution channels, functions in the chain etc
Major founding	1. It is the No 1 leading tea company in Enshi Tujia Miao Autonomous Prefecture. The foundation of the company resulted from a merge of 9 middle sizes tea processing factories and companies among the region in 2000. 2. The company has more than 1700 ha organic tea farm cultivated by contracted out-growers (the company has ten year contract with growers and provides all cultivation inputs, such as improved tea variety, organic fertilizers etc and extension services). The company also has its own research labs and 19 production lines for three different tea products (black tea, green tea and flower tea). 3. The company is the only one in the region has the import & export license, many products can be directly exported to the international market (more than 1000 ton per year). Hua Longchun company also purchases primary processed green tea from Rainbow. 4. For the domestic market, it also has 15 sales branches and 48 franchise shops all over the country. The products from Hua Longchun Company can be found in many (chain) supermarkets. The main functions of these branch office are also discussed. 5. Since 2006, the company is involved in the tea tourism sector and hotel business. Now the company is the biggest company in Hubei province. Basically, the company plays the role of grower, processor, wholesaler, exporters and retailer in its supply chain.

	The multifunction of the company makes it in control all of these components in the chain, from raw materials to final delivery. The company is absolutely a chain leader. 6. Mr. Long emphasized that the key success factors of Hua Longchun case are the integration (both vertical and horizontal) of different resources and networks, a strong position in the supply chain and government support. 7. Mr. Long showed a survey of 'different consumer groups and green tea consumption in domestic market' which indicates that about 85% of consumers below age of 25 do not drink more than 300 gram of green tea per year. Consumers at the age of more than 40 usually consumes more than 600 gram of green tea per year. And consumer with higher income consumes more tea.
--	--

5.2 Interview with general manger of Enshi Qing Jing Tea Company

Interviewee(s)	Mr. Ming, Xu
Organization	Enshi Qing Jing Tea Company
Position	General manager
Place	Shizhou street No 64 Enshi Post code: 445000 恩施市施州大道 64 号 邮编 445000
Date	4- Aug-2009
Contact	0718-8414857
Main topics	History and structure of the company, production model, products, distribution channels, functions in the chain etc
Major founding	1. It is a state owned the company under the authority of Enshi agriculture research station. The director of the station is also the general manager of the company. 2. The company owns the processing factory and 30 ha of land for growing young plants. The production model in 'company + contracted growers'. The company has annual production of 90 ton organic green tea products with premium quality and high price.. 3. The Enshi agriculture research station is one of the input suppliers in the Region. Therefore, the company offers all input supply to out-growers as an incentive to ensure the supply loyalty of the farmers. 4. Enshi agriculture research station conducts training to all growers and also provides extensive services. 5. The packing and transportation are done through third parties depend on the clients' requirements. Most of the produce are sold directly to large institutional buyers. 6. The advantage for the Qing jing company is the support from the research station and good relations with other government organizations.

5.3 Interview with the deputy manager of Wuhan Wuzi Green Company

Interviewee(s)	Mr. Tian, Ye
Organization	Wuhan Wuzi Green Tea Trading Co Ltd
Position	Deputy manager
Place	Jianshe street No 20 Wuhan Postcode: 430071 武汉市建设大道 20 号 邮编：430073
Date	7-Aug-2009
Contact	027- 82669388
Main topics	History and structure of the company, production model, products, distribution channels, functions in the chain etc
Major founding	1. It is private enterprise established in 1998 and specialized in organic green tea products. All products use the brand name "Wuzi". 2. The production model is company + growers'. This company has "two side contracts" with growers, which means that these tea growers are the exclusive tea supplier for the Company. The company offers training and credit for inputs. 3. The company has been certified with 'ORGANIC FOOD' by China Green Food Certification Center. For organic production, the tea growers get training on cultivation and harvesting handling. They also agreed never to use any chemical or pesticide for tea cultivation and supply all green leaves to Wuzi Company at a negotiated price. 4. The annual product is around 500 ton. This company has its own import & export license and mainly targets on the export market. The company has a sales agency in the U.S.