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A SUPPLY CHAIN APPROACH TO STUDY EFFICIENCY AND SUSTAINABILITY IN THE NEPALESE TEA INDUSTRY



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Globalization and market liberalization has opened attractive opportunities for the emerging economies to internationalize their agricultural products in the global market. The economy of many developing countries, especially in South Asia, highly depends on agriculture. In context of Nepal, huge population living in southeastern and other rural areas of the country directly or indirectly depends on tea farming for their livelihood. Tea is one of the potential export commodity of Nepal, which is highly demanded in the international markets. With the opportunities on internationalizing agricultural products in developed markets, emerging countries usually face challenges and difficulties in meeting international quality standard requirements. Thus, implementation of sustainable supply chain management in agriculture sector has become an essential factor to maintain efficiency and create effective value adding activities throughout the upstream and downstream supply chain.

The purpose of this thesis report is to analyze the current supply chain practices of the commodity tea in Nepal and identify the key players along the supply chain, presenting all the general value chain activities involved in the industry. The study aims to categorize the bottlenecks of the economic leakage in final tea market, seek for the possible ways of strengthening efficiency and suggest on implementing sustainable supply chain management approaches to achieve competitive advantages in the international markets.

After the review of relevant literature on value chain and supply chain, the thesis adopted supply chain management theories as a framework for analyzing the value creating process, and activities involved in agro-supply chain processes. In relation to the various aspects of global supply chain theories the research intends to highlight the common global sustainable agro-supply chain barriers, determine the major factors that constraints against tea supply in Nepal and suggest the best possible ways of executing viable agro-supply chain practices.

The study adopted a qualitative research design in which document analysis and interviews were used as data collection methods. The interviews conducted with stakeholders involved in the Nepalese tea industry revealed several interesting facts and exposed different aspects of tea supply chain practices in the country.

Analysis of data collected reveal number of issues such as, poor government policy and support, and absence of other basic facilities, as major constraints to the growth of the industry. The study concludes that, with an improvement in the accessibility to basic infrastructural facilities, maintenance of healthy relation with different stakeholders throughout the supply chain, and the implementation of sustainable agricultural production policies, the Nepalese tea supply-chain would be efficient enough to launch the country's tea industry as major player in the global tea market.

KEYWORDS: Supply Chain, Management, Sustainability, Tea Industry, Orthodox tea, Nepal

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Bimesh Shrestha
Turku, Finland

List of Abbreviations (OR) Symbols

COC	Code of Conduct
CRM	Consumer Relationship Management
CSR	Corporate Social Responsibility
CTC	Cut, Tear and Curl
ECR	Efficient Consumer Response
FINEST	Finland Nepal Sustainable Tea
GDP	Gross Domestic Production
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GON	Government of Nepal
Ha	Hectare
HACCP	Hazard Analysis and Critical Control Points
HOTPA	Himalayan Orthodox Tea Producers Association
HIMCOOP	Himalayan Tea Producers Association
NCLR	Nepal Child Labor Report
NTCDB	National Tea and Coffee Development Board
NTDC	Nepal Tea Development Corporation
NTPA	Nepal Tea Planters Association
NPR	Nepalese Rupees
NGOs	Non-Governmental Organizations
RA	Rainforest Alliance
SAFTA	South Asian Free Trade Area
SC	Supply Chain
SSCM	Sustainable Supply Chain Management
TUAS	Turku University of Applied Sciences
VCA	Value Chain Analysis
WCED	World Commission on Environment and Development

1 INTRODUCTION

1.1 Study motivation

My motivation to conduct this research study started after being involved in a project, Finland-Nepal Sustainable Tea Project (FINEST, 2013), which is a collaboration between Turku University of Applied Sciences (TUAS), Turku, Finland and Novia University of Applied Sciences (Novia UAS), Vaasa, Finland. FINEST is a development project, with the objectives of importing tea from the country of Himalayas, Nepal to Finland and exporting the wind technology from Vaasa, Finland to Nepal, for the production of wind energy and the utilization of natural energy into tea processing.

Primary research during other extents of the project exposed inspiring realities about the supply chain processes involved in the Nepalese tea industry. During the field visit, study conducted by FINEST project members of certain tea farms' operations in Ilam district of Nepal discovered various constraints in the tea industry. For instance, one major problem is an involvement of intermediaries within the supply chain of tea. The mediators are taking advantage of the gap between the smallholder farmers and the customers, which results in less financial shares for the farmers despite their hard labor. Thus, with the objective of eliminating such constraints, the inspiration on researching evidences about the other supply chain issues and aspects of the Nepalese tea industry developed for making the value chain more efficient. Moreover, encouragement from the project members and my own interest in learning and finding out more about the Nepalese tea industry provided incentive for further research.

1.2 Objective and research questions

The principal objective of this research is to analyze the functioning and dynamics of the value chain and the supply chain practices of the commodity tea in the Nepalese tea industry. This thesis report focuses on supply chain analysis as a main research approach to explore the circulation of tea in the different links as

a primary agricultural product, as well as the impact the enterprises and global trade will have upon the tea growers and workers, who are at the bottom level of the supply chain. Moreover, this approach can also clearly reveal the influence that different actors and the stakeholders have upon the supply chain. The study aims in collecting data and information for analysis, in order to determine the relationship between various variables identified during the course of the research with the global agro-supply chain theories. It emphasizes on identifying the weak links that needs improvement to enhance the competitiveness of the sector in the international markets, increasing its efficiency and economic development. Based on the results, the paper intends to propose strategic solutions to eliminate major constraints, and strengthen the supply chain processes to increase efficiency. Furthermore, the research aims to find out the importance of maintaining quality standard tea products and the need of implementing sustainable agriculture-supply chain management in order to participate in the international market. The thesis answers the following research questions:

RQ 1. How is the supply chain of commodity tea organized in Nepal?

RQ 2. What are the major issues faced by stakeholders during tea supply chain in Nepal?

RQ 3. A. What are the major drivers and barriers towards sustainable supply chain management in Nepalese tea sector?

RQ. 3. B. What could be the best approach to engage in SSCM in the Nepalese tea sector?

1.3 Study design

The study design briefly outlines the chapters included in the paper and its contents.

Nepalese Tea Industry

The section 2.0 covers the detail history of Nepalese tea industry, present market scenario of the tea industry, latest data of plantation and production, and the types of tea produced.

Literature review

The section 3.0 covers the literatures review proposed by various authors and scholars to categorize the gaps between theories and practices of supply chain and value chain, in order to develop a theoretical framework of sustainable supply chain management for agriculture industry.

Research Methodology

The section 4.0 covers the methodology part that elaborates how the research is conducted for the study including method of data collection and its analysis.

Tea Supply Chain in Nepal

The section 5.0 covers the detail analysis of the current supply chain and value chain practises in Nepalese tea industry. It also outlines the major actors and stakeholders involved in the chain of Nepalese tea industry.

Sustainable Issues in Nepalese Tea industry

Section 6.0 covers the detail analysis of bottlenecks that effects on sustainable supply chain practise in Nepalese tea industry. The bottlenecks are categorised under Triple bottom-line (3BL) issues that are social, environmental and economic aspects. Moreover, this section outlines the drivers and barriers for the sustainable supply chain management in the tea industry.

Ways to overcome barriers and create sustainability in tea supply chain

Section 7.0 proposes the possible initiatives for eliminating the barriers that affect the engagement in sustainable supply chain management in the Nepalese tea sector.

Conclusion

The section 8.0 elaborate the findings and understanding of the research. Additionally, it shows direction for future research as well.

This thesis addresses the following areas:

- I. It introduces the reader about the Nepalese Tea Industry.
- II. It gives an overview of current supply chain activities in the tea sector.
- III. Identify the critical issues and bottlenecks regarding the final tea market. Provides suggestions on how to eliminate the weak links and create effective tea supply chain.
- IV. Classify the importance of sustainable agriculture practices in Nepalese tea industry in order to achieve competitive advantages in the international markets.

1.4 Limitation of the Study

The following conditions define the limitation of the study:

- I. Data was collected for this study from Finland through online sources; therefore, mostly secondary data's were analysed which might not give the precise results regarding the current issues of the tea sector.
- II. The data used in this study may be old; no updated data in a timely manner by the Government bureaus and other officials of tea industry.
- III. Due to limited time for conducting the research, the study lacks covering all the tea production areas in Nepal. Thus, it is narrowed to orthodox tea production in Ilam district, Nepal.
- IV. It was difficult to acquire information from processors and exporters due to trade secrets and the lack of their knowledge about the industry as a whole.

2 NEPALESE TEA INDUSTRY

2.1 Background of the Tea Industry

Tea plantation in Nepal started since early 19th century under British colonial period. Nepalese tea industry owes its roots to the colonization of India by the East India Company. The British promoted numerous tea plantations around the hill station of Darjeeling. Hybrid tea bushes in several districts of Nepal were introduced, for instance, Ilam, Taplejung, Panchthar and Dhankuta within a few years after their introduction in Darjeeling. The first tea state established in Ilam was on 1863, with the establishment of the Ilam Tea Estate in the hills and later in the mid hills of Suktim. The first tea plantation in the private sector was Budhakaran Tea Estate, established in 1959 in the plains of the Terai region.¹

After almost a century without any government support for the sector, the Government of Nepal established the Nepal Tea Development Corporation (NTDC) in 1966. In 1982, the Government of Nepal realized the potential of tea as a viable crop and export commodity, thus declared five eastern districts as 'Tea Zone': Ilam, Jhapa, Panchthar, Tehrathum and Dhankuta. Since then, the government has provided support to the tea growers and processors by a number of measures.²

In the early 1990's, larger tea plantation run by the government mainly dominated the tea sector. The growth and development of the tea sector increased after the economic liberalization process initiated in 1991, and the private sectors and smallholder farmers participated actively towards commercial tea cultivation. In 1992, Nepal government introduced Nepal Tea and Coffee Development Act and the legislation paved the way for provisions on the establishment of the National Tea and Coffee Development Board (NTCDB) in 1993. Through reforms in 1993, the state owned National Tea Development Corporation (NTDC), was privatize and its regulatory functions handled by the NTCDB under the Agricultural Ministry

¹ <http://www.besplatniseminarskiradovi.com/EN-History/History-of-Tea-in-Nepal.htm>

² <http://nepaltrade.org/sites/default/files/reports/Value-Chain-Market-Analysis-of-the-Orthodox-Tea-Sub-Sector-in-Nepal.pdf>

of Nepal. The role of NTCDB then was to organize tea and coffee farming, produce high quality products, and facilitate policy development towards market management, export, import and substitution. To promote the industry further the government leased its NTDC holdings to a private firm and introduced the National Tea Policy at the end of the year 2000. The policy provided easy access to credit facilities and cultivating land for tea producers, as well as built human capacity and established better opportunities for export promotion. A clear priority was also set for which type of tea processing should be promoted. Furthermore, NTCDB developed a Tea Sector Development Strategic Plan for 2010-2014.²

2.2 Current Situation of Nepalese Tea Industry

The tea sector experienced significant growth following its liberalization over a decade ago. According to latest data from the NTCDB, the total area under tea plantation as estimated on 2012/2013 is 19,036 hectares with the production volume of nearly 20.6 million kilograms of tea production (NTCDB, 2014).

Conferring the data, the tea industry has been expanding in recent years along with an expansion of its plantation areas approximately from 12,000 hectares in 2001 to 19,000 hectares in 2013 and is increasing on a yearly basis (See appendix 2). Majority of smallholder farmers are active in production and they dominate the present plantation scenario. The current socio-economic impact in terms of employment or job creation is very high in this sector, with significant potential to contribute to national income growth and providing direct employment to more than hundred thousand people.³

2.3 Types of Tea produced

Alike most of the other tea producing countries, Nepal has dual tea manufacturing base. Nepal produces both lowland CTC (Cut-Tear-Curl)/ black tea, which is

³http://www.cuts-citee.org/tdp/pdf/Case_Study-Tea_Industry_in_Nepal_and_its_Impact_on_Poverty.pdf

primarily for domestic consumption, and highland orthodox tea/ green (leaf), mainly for export and is available only in limited quantities. CTC method is a high volume process in which the withered leaves suffer more severe cutting to strong liquors, then fermented and dried. On the other hand, orthodox is a traditional method in which green leaves are withered at first, and then gradually twisted by the slow rolling process, followed by fermentation and drying processes.³

SN	Particulars	Orthodox		C.T.C		Total	
		Area	Production	Area	Production	Area	Production
1	Garden	3383	986696	6569	11133570	9952	12120266
2	Farmers	5403	2050998	3681	6416881	9084	8467879
3	Total	8786	3037694	10250	17550451	19036	20588145

Table 1: Orthodox and CTC tea plantation area and production as of 2012/2013 (NTCDB, 2014)

Table 1, represented above is the latest data available regarding the area of plantation and production done by the smallholder farmers and private tea gardens of Orthodox and CTC tea respectively. According to the statistics, the total areas of 8786 ha were under plantation with the output of 3.03 million kilograms of Orthodox tea, on the other hand 10,250 ha with production of 17.55 million Kilograms of CTC tea for the year 2012/13 (NTCDB,2014).

The data reveals that the smallholder farmers are attracted to orthodox tea production than the CTC tea: whereas, tea estates or tea gardens are producing more CTC tea. The ratio of CTC tea production is quite higher than that of orthodox tea in total production from both the farmers and the tea estates. The Nepalese tea industry is experiencing tremendous growth on orthodox tea production since the demand from the international markets are quite high, which leads to high export potential and it provides higher returns to the low income farmers.² To see major Orthodox tea production area (see appendix 1).

3 LITERATURE REVIEW

As a theoretical framework, I have used several theories proposed by different authors that will comfort readers in understanding the dynamic nature of supply chain and supply chain management. Different theories and definitions of global supply chain management within the manufacturing sector outlines the concept of supply network in relation to the agriculture industry. The fundamental theories of agriculture supply network and the factors influencing the global agro-supply chain are outlined. Furthermore, it implies the strong impact of sustainable supply chain management in the agro-industry for obtaining competitive advantages in the global markets.

3.1 Supply chain

Supply Chain (SC), is a widely used phrase in today's global business world, where the movement of materials are commonly practised. The term SC is defined by the American Production and Inventory Control Society (APICS) Certified Supply Chain Professional (CSCP), the Educational Society for Resource Management, as either the "process from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies," or as the "function within and outside a company that enable the value chain to make products and provide services to the customer."⁴

A supply chain consists series of activities and organisations that materials move through on their journey from initial suppliers to the final customers (Waters, 2003). In general, supply chain is a combined manufacturing process where various business entities such as supplier manufacturers, distributors and retailers work together in converting raw materials into final products and then deliver to the customers (Beamon, 1998). A typical supply chain begins with the delivery of raw materials from the suppliers to the manufacturers, which processes the raw materials to a fine product, then transport to the wholesalers

⁴ Lawrence D.F. & Ed Hill, Basics of Supply Chain Management, 2001

or distributors, to the retailers and eventually delivers to the customer along a network, which is called distribution channel (Beamon, 1998). Customer is regarded as an essential part of the overall supply chain, therefore, the key principle of any supply chain is to satisfy customer needs, with an objective of generating profit out of the service (Lawrence & Hill, 2001).

A supply chain is dynamic and involves the constant flow of information, product flow and associated flow of money and property rights between different organisational stages (Van der Vorst, 2000). Chopra, Sunil and Peter (2004), argued that supply chain cannot be limited only between the manufacturers and suppliers, but should comprise of all the actors that are involved, directly or indirectly, in fulfilling customers' demand; for instance, transporters, warehouses, retailers, service organisations and customers themselves.⁵

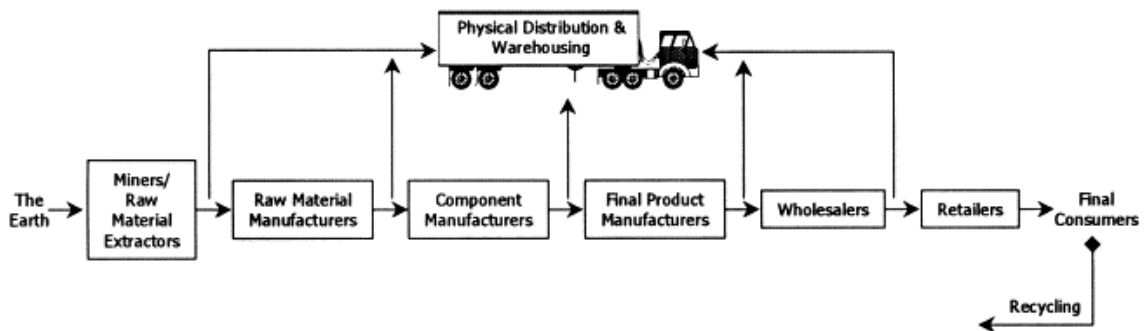


Figure 1: Activities and firms in a supply chain (New & Payne, 1995).

Figure 1, shows the activities and firms involved in a supply chain as portrayed by New and Payne (1995). It begins with the extraction of raw materials or minerals from the earth, moving through the different manufacturing processes, wholesalers, retailers, and ends with consumptions.

⁵ Chopra, Sunil and Peter Meindl. Supply Chain Management. 2 edition. Upper Saddle River: Pearson Prentice Hall, 2004. (http://www.sbaer.uca.edu/publications/supply_chain_management/pdf/01.pdf), P.1-2, 2014

3.1.1 Value Chain

A value chain (VC) is the collection of activities that a firm operating in a specific industry performs to design, create, build and deliver a valuable product or service for the market (Porter, 1985). Basically, the concept of value chain is the whole series of activities in a particular organisation that includes the process of input, transformation of it, and produces an output which involves consumption of resources (i.e. time, money, labour, material, equipment, land, buildings, administration and management etc.). Therefore, the total value delivered by the firm at the end is the total sum of the value built up all throughout the firm, and the end customer pays the total price for the final product including certain amount of profit (Lawrence & Hill, 2001).

APICS defined 'Value Chain' as "The Functions within a company that add value to the products or services that the organisation sells to customers and for which it receives payment" (Lawrence & Hill, 2001).

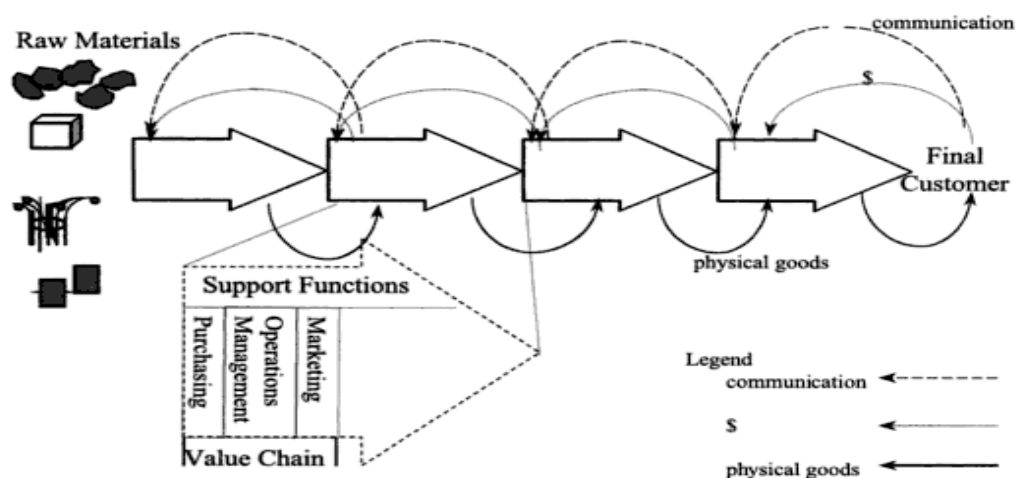


Figure 2: Supply Chain and Value Chain

Source: Adapted from Lawrence D. Fredendall, Ed Hill, "Basics of Supply chain Management," 2001.

In Figure 2, the difference between supply chain and value chain are illustrated. The diagram exemplifies supply chain as sequences of arrows moving from the

raw materials phase to the final customer, passing through various stages which represent different individual organizations in a network. Each phase represents an individual firm that adds value by performing own value chain activities. However, in the figure 2, value chain of only one firm is shown to demonstrate the core function of the firm that adds value in the overall supply chain. In this example, purchasing, operational management, and marketing are shown as a part of firms' inner value chain. Likewise, each firm under a supply chain network has their own internal functions that add value to the product or service until the end of the supply chain (Lawrence & Hill, 2001).

3.1.2 Supply Chain Management

Van der Vorst (2000) defined supply chain management (SCM) as “the integrated planning, coordination and control of all business processes and activities in the supply chain to deliver superior consumer value at least cost, while satisfying the variable requirements of other stakeholders in the supply chain network”.

According to the members of the Global Supply Chain Forum (GSCF); “Supply Chain Management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders” (Lambert et al, 1998, p.1)⁶

In brief, SCM is the management of relationships among the network of organisations, from original suppliers to end customers using key cross-functional business processes to create a value added service focusing on reducing the total cost for customers and all the stakeholders (Lambert, 2014). Basically, it is a process-oriented management approach and relationships internally within an organisation, with immediate suppliers, with the focus on sourcing, production and delivery of goods and services to the end customer (Harland, 1996).

⁶ This definition of SCM was developed by members of The International Center for Competitive Excellence, University of North Florida, Douglas M. Lambert, Co-coordinator, 1994. Later in 1996, the group moved to the Ohio state University and transformed to The Global Supply Chain Forum (GSCF). Lambert Douglas is currently the Director of the forum.

Implementing an effective supply chain management approach is now essential to achieve competitive advantage in the global market economy (Lambert 2008). Historically, the importance of SCM was only limited on annual cost reduction, revenue growth and performance of the individual organisation (Chandra & Kumar, 2000). Ultimately, the goal of optimizing supply chain management in a firm has become to achieve competitive advantages by adding value to create efficiencies and effectiveness of material and information flow, thereby increasing customer satisfaction, thus benefitting on returns on investment and assets (Stock & Boyer, 2009). Consequently, with the increasing customer awareness and necessity of achieving customer satisfaction, the focal point of SCM trend moved towards the Customer Relationship Management (CRM) and Supplier Relationship Management (SRM). CRM and SRM creates an important link with the external companies within the network and attempts to develop and maintain relationship with the major customers by increasing the value offered to both customers and suppliers respectively (Lambert, 2008). However, the current trend of SCM is more inspired by the sustainability of operations management (Kleindorfer et al., 2005).

3.1.2.1 Agro-Supply chain management

Agriculture or agri-business plays a vital role in economic development of many developing countries, especially in South-Asia, where large proportion of population in rural areas depends on agriculture industry directly or indirectly for their living. Agricultural sector covers huge part of the nations' GDP and the employment ratio in most of the developing nations (Stamm, Jost, Kreiss, Meier, Pfister, Schukat, & Speck, 2006).

Agro-supply chain can be defined as a value creation process, which includes other activities such as research & development, logistics activities from farm to the consumer (Jauaratne, P., Styger, L. & Perera, N., 2011). To support the fact Figure 3 shows the standard agro-supply chain at the organisation level within the context of a complete supply chain network. Each firm positioned in a network layer belongs to at least one supply chain where multiple supplier and customers are participating at the same time. The other actors involved in the supply chain

network have direct or indirect influence on the performance of the chain. As a result, organisation involved at different stages of chain should cooperate and establish healthy relationship or partnership for the efficient supply chain output. Thus, this complex directed network of food chain among the participating actors, who cooperate to bring a product to customer can be referred as 'net chain' or Food Supply Chain Network (FSCN) (Lazzarini et al., 2001).

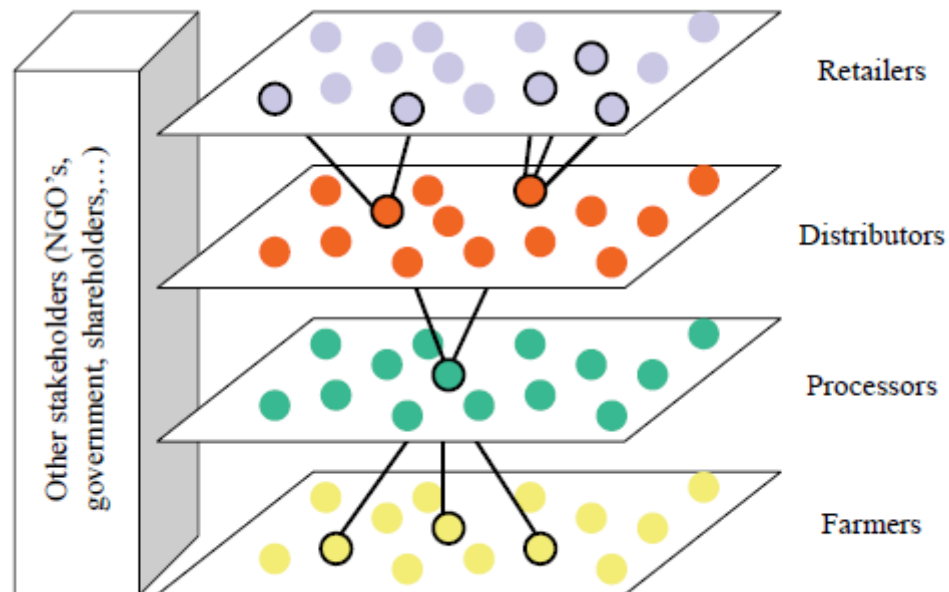


Figure 3: Schematic diagram of agri- food supply chain from the perspective of the processor within the total Food Supply Chain Network (Adopted from Van der Vorst, Beulens & Van Beek, 2000).

3.2 Sustainability

The concept of sustainability have been noticed since late 80's, when report "Our Common Future", was published by the World Commission on Environment and Development (WCED) in 1987, also known as the Brundtland Commission (Geir B. Asheim, 1994). The Brundtland report (1987) defined sustainability as, "the development activities that meets the needs of present without compromising the ability of future generations to meet their own needs".

The limited definition of ‘sustainable development’ from the Brundtland report was later enhanced and defined ‘Sustainability’ as, “a requirement of our generation to manage the resource base such that average quality of life that we ensure ourselves can potentially be shared by all future generations” (Geir, 1994). Sustainability as a condition of existence has been defined in many ways, all of which connotes the ability of the current generation of humans and other species to experience social wellbeing, enjoy the dividend of a vibrant economy, and maintain a healthy environment, without hurting the chances of future generations (Dauncey, 2010). The modern definition of sustainability compiles the implications of triple bottom lines (3BL): economic, social and environmental equities. With the emphasis given on social, economic and environmental aspects for assuring average quality of life, it has been identified as the key pillars of sustainable development (Kalchschmidt & Syahrudin, 2011). As shown in the figure 4, sustainability can be achieved when all three; environmental, social and economic performances could be placed together for achieving long-term development and benefits (Carter & Rogers, 2008). The figure 4 below shows the intersection of 3BL aspects in sustainable performances in the supply chain.

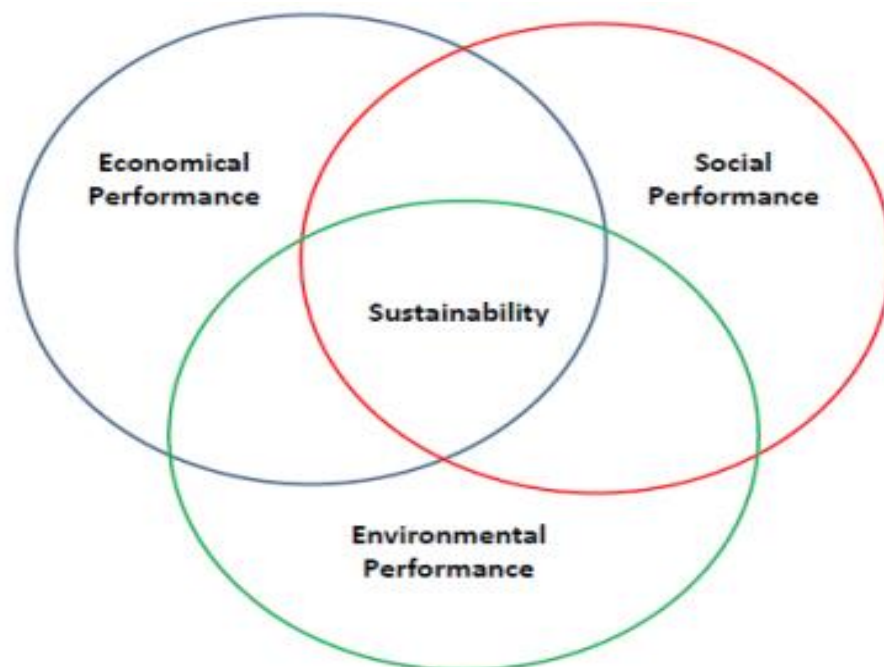


Figure 4: Sustainability as intersection of 3BL performance (Kalchschmidt & Syahrudin, 2011).

3.2.1 Sustainable Supply Chain Management (SSCM)

Carter and Rogers (2008), defined Sustainable Supply Chain Management (SSCM) as “the strategic, transparent integration and achievement of an organisation’s social, environmental and economic goals in the systematic coordination of key inter-organizational business process for improving the long term economic performance of the individual company and its supply chain”. Furthermore, Kalchschmidt et al. (2011), mentioned Seuring and Muller (2008) defining SSCM as the management of material, information and capital flows, along with the cooperation between companies in supply chain network, considering all three dimensions of sustainable development i.e. economic, environmental and social, derived from customer and stakeholder requirements. These definitions highlights the importance of integrating specific sustainable supply chain management strategies in the supply network, without which sustainability cannot be achieved.

Recently, relationship between sustainability and supply chain management is gaining more attention in the global supply chain market. Traditional concept of focusing on price, profit margin, Efficient Consumer Response (ECR) and Consumer Relationship Management (CRM) practises has become outdated and regarded as rather conservative aspect of supply chain strategy (Beamon, 2008). The modern concept supports sustainability as an essential factor in any business operation and supply chain management, due to increased globalization and its effect towards the social and environmental aspects. The social and environmental aspects are associated with acquisition of raw materials, resources, production process and the product itself (J. Van der Vorst, Beulens, & van Beek, 2007). Increased consumer awareness on higher safety and security demands, environmental protection, lack of scare resources, social and ethical issues have raised the pressure towards the modern supply chain managers to implement additional strategies and policies to meet sustainability challenges in their business operation (Cetinkaya, et al.,2011). Hence, to achieve competitive advantage in today’s globalized market, modern supply chain managers requires

effective supply chain management strategies, integrating sustainability approaches for attaining long term sustainability.

3.2.1.1 Sustainable Agro-Supply Chain Management

Traditionally, the agribusiness may have been only confined on 'growing and harvesting' and limited only to the local and regional supply. However, in recent years, the way of production, processing and delivery of the agriculture product have become an international process (Van Der Vorst et al., 2007). Apparently, the fundamental changes in the globalizing business economy; establishment of open worldwide market and adoption of new technologies offers opportunities to the developing nation for internationalizing agricultural products (Roekel et al., 2002). Moreover, with this trend of agro-industrialization and the increase dependency of agri-products in international markets, not only create opportunities but also construct risks and challenging factors (M.Slingerland et al., 2006). Due to raising consumer awareness, requirements in maintaining quality of product and price level, safety standards, implementing international trade regulations, Corporate Social Responsibility (CSR), and competing in international market have become a challenging factor for the upstream supply chain members of the developing countries and emerging economies (Roekel et al., 2002). Unavailability of adequate infrastructure facilities, institutions and constant support is one of the major obstacles for producers of developing nations in having better control and quality management on production, trade and distribution of the agri-products, in order to compete in complex global market. Thus, as a consequence of globalization, the implication of better SCM concept in agriculture industry has become essential (Vorst et al., 2007). Moreover, impact on global environment; global warming, depletion of natural resources, environmental changes and damages caused by the agriculture production practises are more of concern by the end consumers, which have put on pressure on agribusinesses for implication of CSR and sustainable production practise throughout the supply chain (Kalchschmidt & Syahrudin, 2011).

3.3 Drivers and barriers for Sustainable Supply Chain Management

As defined by Brundtland (1987), sustainable development as a general concept encompasses three fundamental approaches: economic, environmental, and social developments, and as Cetinkaya (2011) said, in order to balance the objectives of the three dimensions it is necessary to understand the conflicting and complementary relationship that exist between them. The organisational movement towards the triple bottom line (3BL); guaranteeing economic, social and environmental aspects, implementing Corporate Social Responsibility (CSR) strategies, meeting the challenges and relationship between the three P's: (a) profit- strengthening the viability and competitiveness of the sector, (b) people- the social challenge to improve the living condition and economic opportunities, (c) planet- the ecological challenge of promoting good environmental practises, are the key element of sustainable supply chain management to achieve long term economic performance and benefits (Kleindorfer, Singhal & Wassenhove, 2005). Therefore, considering these three aspects of sustainability is essential to any supply chain approach for its effective performance, thus, being an important driver for sustainable development.

To gain competitive advantage in the market, an effective supply chain strategy is inevitable. Most supply chain strategies in their bid to take care of the supply and demand nexus of the system tend to downplay external factors, such as social, technological, environmental, and political conditions (Cetinkaya, 2011). In the competitive global environment, performance of an organization can no longer solely be by the decisions and actions that occur within a firm; rather it will depend on the execution of decisions and actions taken in its entire supply chain (Naslund & Williamson, 2010). As Cetinkaya (2011) suggest, "individual practices must be assembled to integrate meaningful long-term sustainability principles, along the end-to-end supply chain". The key to successful supply chain management is coordination within an organization and between its suppliers and customers. This is why the integration of business activities and collaboration with upstream and downstream partners is now considered to be an integral part of doing business (Gupta, Abidi, Bandyopadhyay, 2013).

The reason of engaging to Sustainable Supply chain management may be based on internal or external factors, therefore drivers and barriers can be found within and outside an organization. There have been different attempts at creating a framework for designing and evaluating the sustainability of supply chains. For instance, Walker, H., Lucio, D. Sisto, and Darian, M., (2008) created such framework from the summary of key-points identified from extensive literature analysis. According to them, the main **internal drivers** of sustainable supply chain are factors that are intrinsic to the way the Organization operates as an independent firm; this they called 'Organizational related factors', while **external drivers** are, 1) Regulators, 2) Customers, 3) Competition, 4) Society, 5) Suppliers.

Internal barriers include 1) Costs, 2) Lack of legitimacy, and **external barriers** are, 1) Regulations, 2) Poor supplier commitment and low levels of trust, 3) Industry-specific barriers and legislation.

Similarly to (Walker et al. 2008), reviewing several prior literature (Tay, Rahman, Aziz, & Sidek, 2015) identified the following categories concerning **internal drivers and barriers** that may have impact on engaging in sustainable supply chain management.

1. People Issues. This issues pertain to top management commitment, employee involvement including middle management, and Culture.
2. Strategic issues. This involves alignment of company strategy with purchasing/supply strategy, company sustainable SCM strategy, competitive advantage/firm competitiveness, risk management, performance management and organizational size, financial, technical, managerial and organizational issues.
3. Functional issues. This has to do with Purchasing and supply function and corporate structure and practices. They include capabilities within purchasing and supply function, and other internal CSR practices influencing SCM.

Regarding to their study the possible arising **external drivers and barriers** to implement SCCM are listed below.

1. Government: This issue is about government control that can drive or hold back sustainable supply chain management.
2. Competitors: It deals with the pressures and opportunities in a competitive environment.
3. Customers: This factor is rising up issues that come along with the tension that is caused by the consumer's desire for lower prices and by the poor commitment from suppliers. Moreover, it also deals with the opportunities for growth by sharing information with customers.
4. Suppliers: This involves the threats and opportunities of enhancing competitive advantage by the collaboration with suppliers.
5. Media: This point is about the effects of Green wash by the media.
6. Investors: This has to do with the pressures from investors that can drive towards sustainability.
7. Sectorial: This is about the restraining force of less regulated industries.
8. NGOs: This factor is in regards of driving force by the influence of NGOs.
9. Organization: This barrier element is to get a handle on Policy and Market issues.
10. Technology: It is dealing with the issues, such as lack of ICT facilities, which weaken the feasibility of SSCM.

As it can be seen from the above categories, in the process of engaging in SSCM there are several stakeholders involved with considerable potential action that can enhance or undermine SSCM.

4 RESEARCH METHODOLOGY

Qualitative research method was implemented using analytical research strategy for data collection and analysis to answer the research questions and meet the objective of this thesis.

4.1 Qualitative research method

Qualitative research refers to research method of collecting descriptive data (non-numerical) which are concerned more with the qualitative phenomenon involving quality more than the quantity or the amount (Rajasekar, S., Philominathan, P. & Chinnathambi, V., 2013). Qualitative research shares the characteristic of being non-numerical, expressive, factual, providing deep understanding of the issues of interest and helps in developing the solution for the problem (Kothari, 2004).

Inaccurate data collection can affect the result of the study and ultimately lead to invalid results.⁷ Qualitative research method is more subjective that provides first-hand information and helps in a truthful reporting. The method used in collecting data and information are targeted mainly on selected individuals, small number of people or focus groups, and interviewed in-depth. The use of qualitative research generates details and valid data, acquiring effective information that contribute in depth understanding of the context and produce more complete data analysis (Anderson, 2006). Moreover, qualitative research is especially effective in identifying intangible factors, such as individual opinions, behaviors, social norms and values, socioeconomic status, gender roles, ethnicity or social context of particular population.⁸ This method can also be collaborated with other methods, for instance, quantitative research that can help to interpret better understanding and create better conclusions. Hence, the qualitative research method implemented in this thesis report made the research process smooth and

⁷<http://people.uwec.edu/piercech/researchmethods/data%20collection%20methods/data%20collection%20methods.htm>

⁸ Qualitative Research Methods: A data collector's field guide.
<http://www.ccs.neu.edu/course/is4800sp12/resources/qualmethods.pdf>

helped in obtaining qualitative information and data for the efficient analysis and proposing better conclusion.

4.2 Research Design

According to Kothari (2004), 'Research design' or 'Research strategy' is the conceptual structure within which the research is conducted that set up the design for collection, measurement and analysis of data. As such, the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. Thus, research design is the preparation of a plan or a proposal to conduct a research, involving intersection of philosophy, structure and strategies of inquiry, in order to find the answers for the research questions and meet the objectives.⁹

Research strategy depends on the nature of the research and type of the research questions and objectives. This study highly depended on archival research strategy. An archival research strategy uses already existing administrative records and data archives available from past to recent documents for analytical study (Kothari, 2004). The data from various sources were extracted for this research study; for instance, administrative documents published by Governmental and Non-governmental organizations such as Ministry of Agriculture, NTCDB, SAWTEE, USAID/Nepal, SNV/Nepal etc. as the secondary source of data. The data collected from these sources were mostly statistical data and information, which were both qualitative and quantitative. This research also used several reports and researches on tea supply chain of other tea producing countries like Srilanka, Bangladesh, India, China, and Kenya in order to compare the supply chain practices.

Another method applied in this research study is 'Contact strategy', thus information was collected also by email, telephone, personal interviews and through social media such as Skype and Facebook.

⁹ C.R. Kothari, "Research Methodology Methods & Techniques", Second Edition, New Delhi: New Age International publisher, 2004, P. 31.

4.3 Collection of data

The methods of collecting data completely depend upon the sources of data collection including primary and secondary sources of data. Emphasis on both set of data collection method have provided valuable information and created better understanding analyzing in this research.

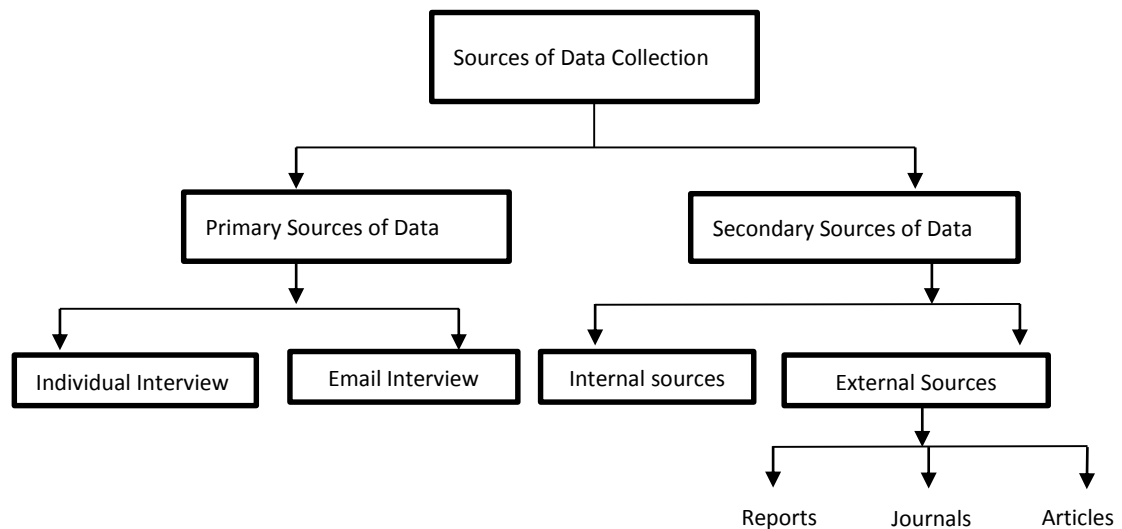


Figure 5: Data Collection Framework

4.3.1 Primary sources of data

Primary data are information, collected specifically for the purpose of the research.¹⁰ The source of the primary data, usually collected by interacting with different individuals from the targeted population, are very efficient on discovering real information. The primary data and information collected for this research were from different individual representing various organization who are directly or indirectly involved with the tea industry of Nepal and has knowledge about tea supply chain activities practiced in the country. Major actors and key stakeholders of Nepalese tea industry, for instance, tea cooperatives, factory owners, and

¹⁰<http://education-portal.com/academy/lesson/what-is-primary-data-in-marketing-research-definition-sources-collection.html#lesson>

exporters are contacted to find know how about the supply chain activities and problems experienced in the industry. The research used interview method for collecting primary data.

4.3.1.1 Interview

Interview is one of the widely used method in data collection as it is efficient in finding qualitative information from wide range of sample population. It is a very effective way of collecting data and information since it gives an opportunity to the interviewer to have deeper view into the participants' thoughts about the research topic.¹¹

Standardized open-ended interview questions (i: 10) were prepared. The questions were seeking answers to support the major objectives of the research. The questions focused on answering the general supply chain activities, major issues faced by the stakeholders, sustainable agriculture practice applied on tea production in Nepal and its importance on obtaining competitive advantage in global market.

Five response arrived to the emails (n: 12) that were sent out with the interview questions (Factory owners); two of the respondents provided the answers, and the other three rejected to answer the questions through email due to their lack of knowledge on the topic. In order to collect as much valid information as possible, guided-interviews, without pre-determined questions were conducted with two additional key informants through telephone interviews.

Three of the interviewees (further: Interviewee A, Interviewee B and Interviewee C) required confidentiality regarding their own and their organization's identity. This does not apply to Udaya Kumar Chapagain, agro-entrepreneur, who has agreed to publish his identity. Chapagain has taken Nepali tea to the global markets when he was associated to the industry as a founder president of HIMCOOP (Himalayan Tea Producers Co-operative) between 2003 and 2010. HIMCOOP is a major actor in improving lives of farmers. Presently, Chapagain is

¹¹ <http://readingcraze.com/index.php/types-of-primary-data/>

acting as President of HOTPA (Himalayan Orthodox Tea Producers Association) and a successful proprietor of Gorkha Tea Estate in Fikkal, Ilam. His passion, dedication and contribution towards the industry for the long run has made him a knowledgeable industrialist of this sector and has developed a socially responsible value chain for harvesting tea in Nepal. Interview with Chapagain (2014) revealed several interesting facts about the tea industry of Nepal and helped in analysing data and information to lead to a better conclusion.

4.3.2 Secondary source of data

Secondary data is information that has already been collected for some other research purposes but has some relevance and utility for the conducting research. The secondary data collected for this thesis were from the available internal and external sources.¹²

4.3.2.1 *Internal sources*

Internal sources includes data that exists already and is collected by the organisation as a part of the research. The thesis used internal data, referencing interviews and meeting minutes conducted by the member of FINEST project, Ajaya Joshi and Alberto Gonzalez, during late July, 2013 on their field visit to Ilam district, Nepal. The study was conducted with some smallholder farmers, selected household level tea processors, traders, and exporters, to gather information on their opinion about the tea manufacturing processes and the major obstacles faced by them during tea production in Ilam district, Nepal.

4.3.2.2 *External sources*

The research used external sources by reviewing relevant documents available on internet, provided by various agencies, like government bureau, national and international organizations, NGOs involved in the tea sector development of Nepal. The sources includes progress reports, annual reports, press releases, research papers, newspaper articles, documentary videos, interviews and other

¹²<http://education-portal.com/academy/lesson/secondary-data-in-marketing-research-definition-sources-collection.html#lesson>

published documents related to the tea sector. The data revealed information regarding value chain, supply chain practices, responsible actors, and problems faced by the stakeholders throughout the supply network. The primary data and secondary data supported in analyzing the current situation of the Nepalese tea industry and helped in drawing conclusion.

5 TEA SUPPLY CHAIN IN NEPAL

In relation with the various global supply chain theories discussed in section 3, literature review, supply chain of orthodox tea production in Nepalese tea industry are discussed below.

5.1 Orthodox Tea supply chain

Tea supply chain is a vast process that go through various production processes, material flows between many different stakeholders involved in a network. Initiation of tea production starts with the workers and the smallholder farmers working in the tea fields, creating general value adding activities during different stages of tea plantation and production processes, transforming tealeaves into a final tea product and delivering a valuable processed tea at the end of network to the consumers. This section provides an overview to the upstream and downstream supply chain activities of orthodox tea in Nepal, as in domestic and international market.

5.1.1 Production Process

The initiation of tea farming starts with the management of raw materials, land and other inputs associated with it. The cultivation of tea begins with seed management of tea in nurseries. Nursery is a place, operated by estates, farmers and by regional offices of NTCDB¹³, “where young plants and trees are grown for sale or for planting elsewhere” (Oxford Dictionary). Before planting, the area intended for planting are cleared of wild growth and the surface areas of land are leveled which is known as weeding process. Planting lines are traced, pits of convenient size are dug, and the plantation of tea is done.¹³ With concrete process of production, followed by planting, growing, plucking, collecting and ends at the factory for further manufacturing processes. The figure 6, below

¹³ http://s3.amazonaws.com/zanran_storage/www.intracen.org/ContentPages/17882660.pdf

outlines the general tea production process and movement of raw tea product from one stage to another.



Figure 6: Cultivation process

5.1.2 Smallholders farmers

Smallholder farmers as producers of green leaves are at the bottom level of the tea production chain. They are one of the key essential factors who plays an important role for the production of Orthodox tea in Nepal. In context of Nepal, farmers who cultivate tea plants in their own tea gardens, relatively in small plantation area, cultivating tea plants on land up to 20 to 25 ropanis (1-Hectare \approx 19.65 Ropanis of land) are consider as smallholder farmers (FINEST, 2013). However, there are smallholders who employ workers in their gardens for larger production.

According to Nepal Tea and Coffee Development Board (NTCDB), the total plantation area of smallholder farmers producing Orthodox tea was 5,403 hectares (ha.) with the production volume of 2.05 million kilograms for the fiscal year 2012/2013 (NTCDB, 2014). In the last few decades, there has been remarkable growth in the smallholders sector in terms of area of plantation and production. According to the data collected by FINEST project (2013), Ilam district solely covers more than 200 hectares of Orthodox tea plantation. The agriculture of orthodox tea is attractive to smallholder farmers, since it provides higher market value than the CTC tea.¹

5.1.3 Tea Estates/ Larger producers

Larger producers, also known as tea estates, are one of the major players in the Nepalese tea industry. In general, tea estates have larger plantation area and often employs workers for maintaining and harvesting tea bushes for massive tea production.¹⁴ In particular, there are several orthodox tea estates owned by factories in Nepal. The total area of tea estates in Orthodox tea production as presented by NTCDB is 3,383 hectares, with production volume of nearly 1.0 million kilogram for the fiscal year 2012/2013 (NTCDB, 2014).

Most of the tea estates have their own factory, where tea leaves are further processed. There are also tea estates who buys Orthodox tea directly from the smallholder farmers and further handles primary tea processing in the factories (Chapagain, 2014).

5.1.4 Collection center or Cooperatives

Collection centers, usually maintained by the local brokers, is the place where tealeaves are collected all together after the plucking. Moreover, green leaves are also collected by cooperatives formed by the members, usually combination of farmers.¹⁴ Some factories also organize collection centers where interested smallholders farmers can sell their tealeaves. After the tealeaves are collected in collection centers, the leaves are supplied to the factory for further processing. The ownership of the tea leaves transfer to the factory after the transaction between collection center and the factory, and the factory will be fully responsible for the tealeaves (FINEST, 2013).

5.1.5 Processors or Factories

In Nepal, factory or processors usually purchase tealeaves directly from collection centres or from cooperatives formed by farmers (FINEST, 2013; Chapagain, 2014). According to the interview (Chapagain, 2014), more than 95% of the factories are buying green leaves directly from the farmers through collection

¹⁴ Value chain/Market analysis of the orthodox tea sub sector in Nepal, USAID| Nepal Report

center or cooperatives. In factory processing, tealeaves go under various value adding phases: withering, rolling, drying, tasting, grading, bulk packaging (see appendix 3).

Generally, the packaging of processed tea is completed by the factories. The factories usually does bulk packaging for the wholesales in the domestic market and international exports as well. There are also factories who has their own processing factory and packaging centers and prepares consumer packaging such as tea bags, aluminum foil, tea chests, etc. and sell them as their own brand in the domestic markets.¹⁴

5.1.6 Blenders and Packagers

In practice, after the tea is bulk packed the factory owner forward invoice samples to the interested buyers, usually tea packaging companies or international buyers, and negotiate the deal (Chapagain, 2014). Tea packaging companies purchase processed tea directly from the factories, completes the blending and packaging process, puts up their own brand label and sells it to wholesalers or retailers in the market.

There are also involvement of buying agent (intermediaries), who act as a mediator between factories and international buyers and gain certain amount of profit share from the sales (FINEST, 2013).

5.1.7 Wholesalers and Retailers

There are several distribution centers and retailers of the different individual tea companies, who outlets the final tea product for consumption in different brand names. The distribution channels are mainly based in the cities, especially in Kathmandu valley, Pokhara and other major cities and markets the product in the domestic market. There are also tea companies, who has their own distribution channels and supply tea to the distributors, wholesalers and retailers in the domestic market on their own brand name. (USAID, 2011)

5.1.8 End Consumers

Tea is one of the most consumed beverage in Nepal. A normal day starts with a warm cup of tea as a breakfast for most of the Nepalese people. The downstream supply chain of the orthodox tea ends with the consumption of tea by the consumers in the domestic market. However, export of tea to international market states another chapter of downstream supply chain activity.

5.1.9 Other stakeholders in organizational level

There are many domestic and international organizations, non-governmental organizations, government ministers and departments, tea boards, and other service specific organizations providing service and facilities at different levels of value chain phase (production, processing, and marketing) for the development of the orthodox tea sector in Nepal. Some of the major actors identified by USAID Nepal (2011) are summarized below.

5.1.9.1 Domestic development organization

At production level, Central Tea Cooperative Federation (CTCF) is involved in providing services to the producers. In the processing and marketing levels, Himalayan Orthodox Tea Producers Association (HOTPA) is actively involved in providing training to the farmers, international marketing, Code of Conduct (COC) implementation, policy advocacy and much more in partnership with various donor agencies. Himalayan Tea Producers Cooperative (HIMCOOP) has established several international market linkages, promoted the Nepal Tea brand through participation in numerous trade fairs, tea events, and has been involved in providing necessary assistances such as sending samples, inquiring buyers, disseminating product information, quality controls, policy advocacy and others.¹⁴

5.1.9.2 Government organization

Government organizations such as Ministry of Agriculture (MOA), National Tea and Coffee Development Board (NTCDB), Nepal Tea Planters Association (NTPA), Nepal Tea Association (NTA), Trade and Export Promotion Centre (TEPC)...etc. are directly and indirectly responsible facilitators, providing services for the development of the tea sector.¹⁴

5.1.9.3 International donor projects and NGOs

Several international donor agencies such as Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), The United States Agency for International Development/Nepal (USAID/Nepal), Netherlands Development Organization in Nepal (SNV/Nepal), and Winrock International (WI) have supported HOTPA and HIMCOOP through various activities with collaboration and partnership for the development of the orthodox tea sector.¹⁴

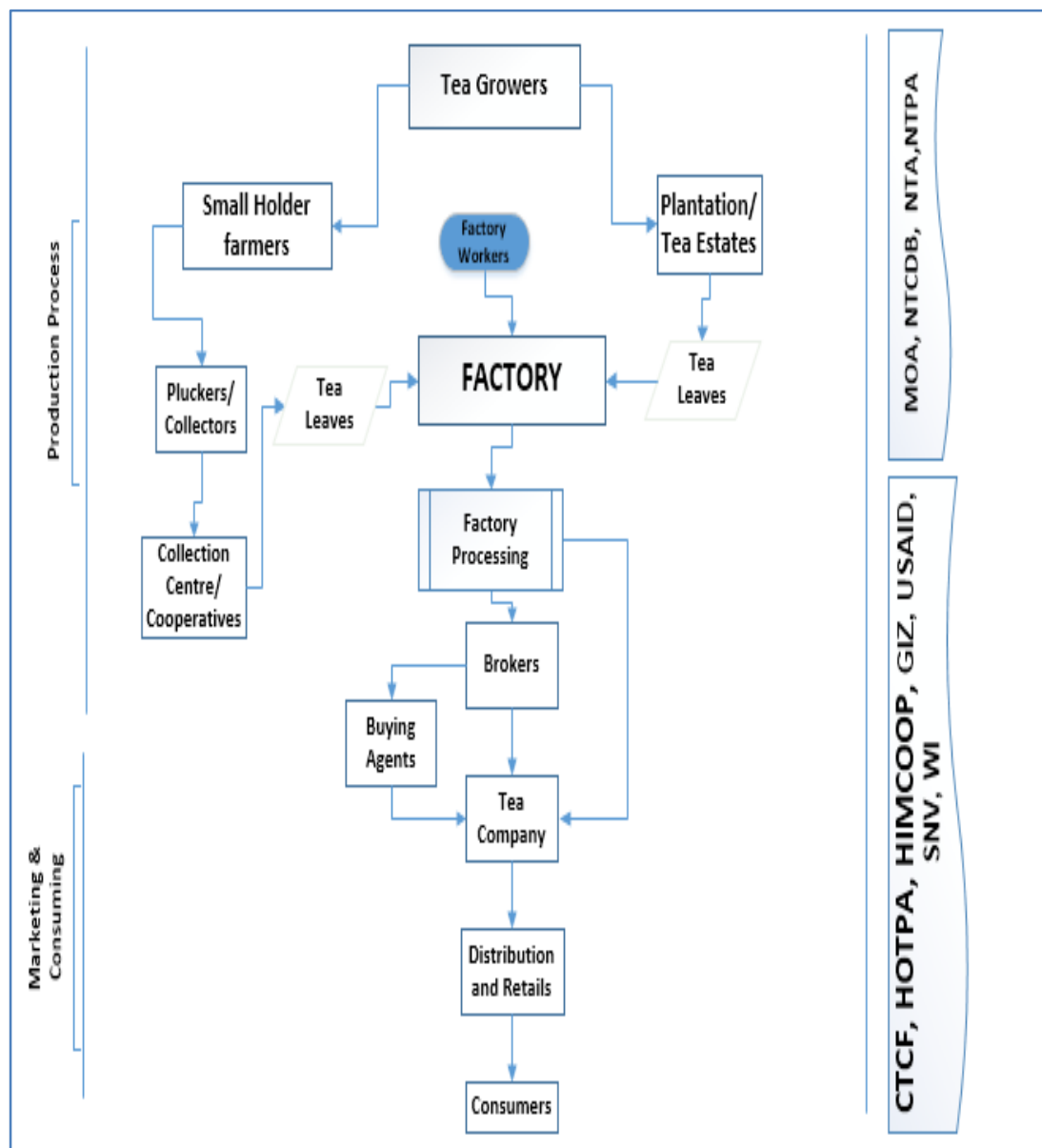


Figure 7: Domestic supply chain of orthodox tea

After analyzing the supply chain process of Orthodox tea in Nepalese tea industry, I was able to draw a supply chain map of Orthodox tea, as shown in the Figure 7 above, with entire upstream and downstream supply chain activities, with different stakeholders involved in the network.

5.2 Orthodox tea export supply chain

5.2.1 Indian Markets

India is the major end market for the Nepalese orthodox tea (USAID, 2011). There is a greater scope of Nepalese tea to explore the lucrative market of India, which in itself is vast and expanding. However, there is no any formal data available on how much tea has been exported to India. According to Chapagain (2014), it is estimated that nearly 80 to 90 percent of orthodox tea produced in Nepal are exported to the Indian market. The major destination markets for Nepalese orthodox tea in India are Kolkata and Siliguri. Most of the Nepalese exporters have marketing offices in Kolkata, India. There are auction markets in both market hubs of India. (USAID, 2011)

Indian market is huge and has a high capacity for tea exports. Every grade of tea (whole leaf, broken, fanning and dust) sells in the Indian market. Most of the orthodox tea goes to India without any value addition (blending, packaging...). Most of the value addition activities are completed in India, such as producing blend teas, flavor teas, and specialty teas. Moreover, some processors also use Nepali tea as fillers in other Indian tea brands.

5.2.2 Foreign Markets

There is high demand for organic and specialty orthodox tea in international markets. Mostly high-grade orthodox tealeaves produced in Nepal are export commodity to the overseas markets. Some of the overseas tea importing countries are Germany, France, Japan, USA, Russia, Poland and Canada.

Among these, Germany is a major importer of Nepalese tea. In the cooperative level, Himalayan Tea Producers Cooperative (HIMCOOP) is leading overseas marketing and sales representative of Nepal. HIMCOOP was form to engage in collective marketing and exporting. HIMCOOP members largely represent large and medium sized factories. The cooperative has been sending products of its members by consolidating orders; however, the percentage of export is relatively low. ¹⁴

According to the interview (Chapagain, 2014), the foreign direct export of Orthodox tea from Nepal accounts approximately for only 10 to 12 percent out of total production; others are exported through market channels from India and only few percentage of orthodox tea is consumed in domestic market. However, there is no any formal data on international exports because of individual exporters and importers dealing transactions on their own contacts. Most of the big factories export their products themselves and there are some exporting firms, who purchase made tea from factories or small processors and export to the international customers. The importers in their country carry out most of the value adding activities. (Chapagain, 2014)

The consumption of orthodox tea in domestic market is relatively low, thus most of the Nepalese orthodox tea are exported to the International markets. Export supply chain is not very different from the domestic supply chain, which can be outline from the figure 8 shown below.

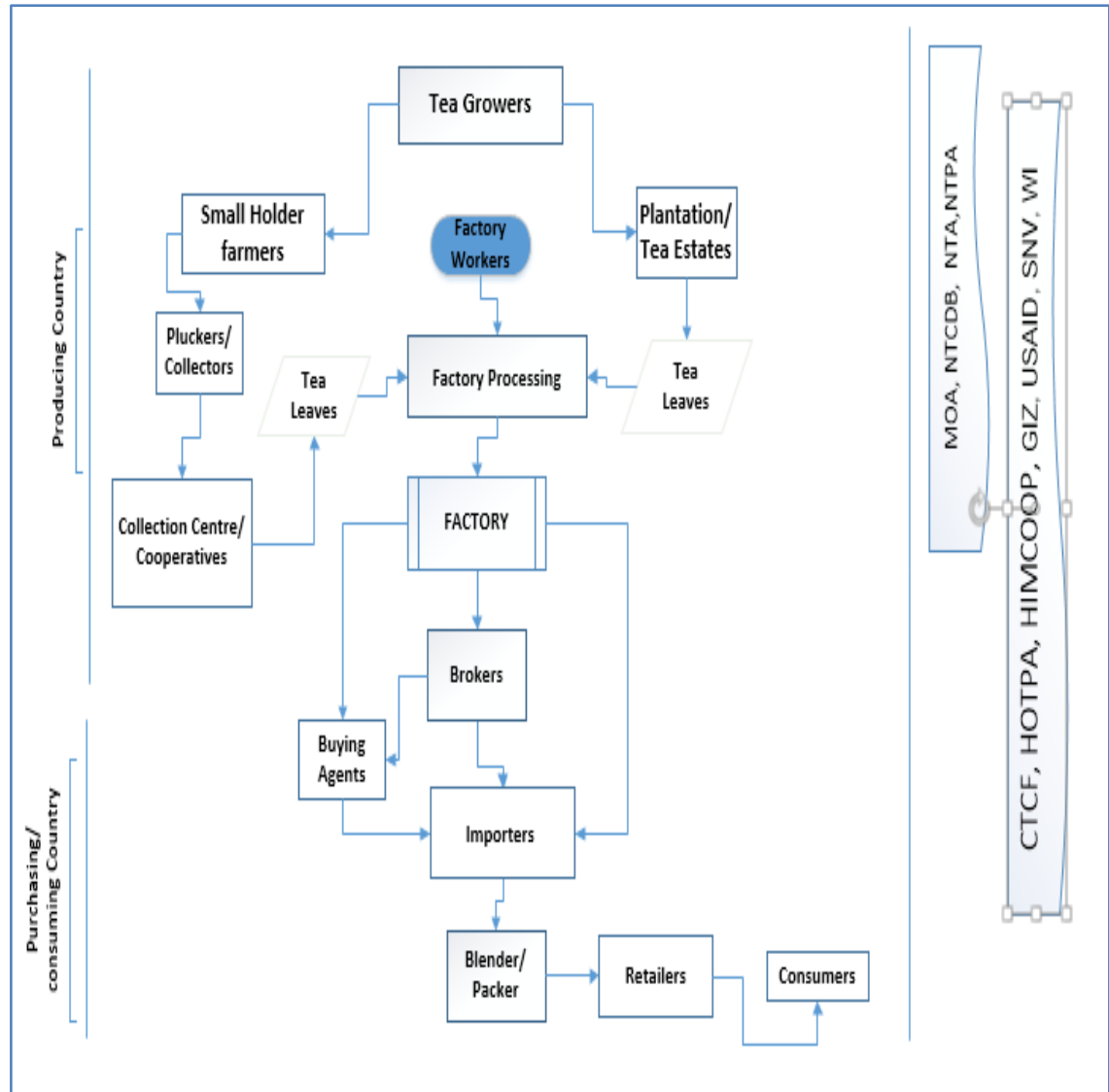


Figure 8: Orthodox tea Export Supply chain

The figure 8, above shows the Nepalese orthodox tea export chain in the international markets. The domestic production process are all same until the factory manufacturing phase, and after the processed tea are packed in the factory, the Nepalese traders export it to the international markets. The export process usually involves of intermediators or buying agents who makes business deals with the international importers. Some factories have their own contacts and dealers in foreign markets and some depends on agents for the exports. In recent years, there has been a trend that international buyers come to Nepal,

purchase tea from local farmers, collectors, factories, and does the value adding activities in the importing country and market the final product for the consumption. (FINEST, 2013) Relatively, large quantity of orthodox tea are sold to Indian traders, and only small quantities of orthodox tea is export to other international markets, mainly in European continentals in the brand name of 'Nepal Tea' (USAID, 2011).

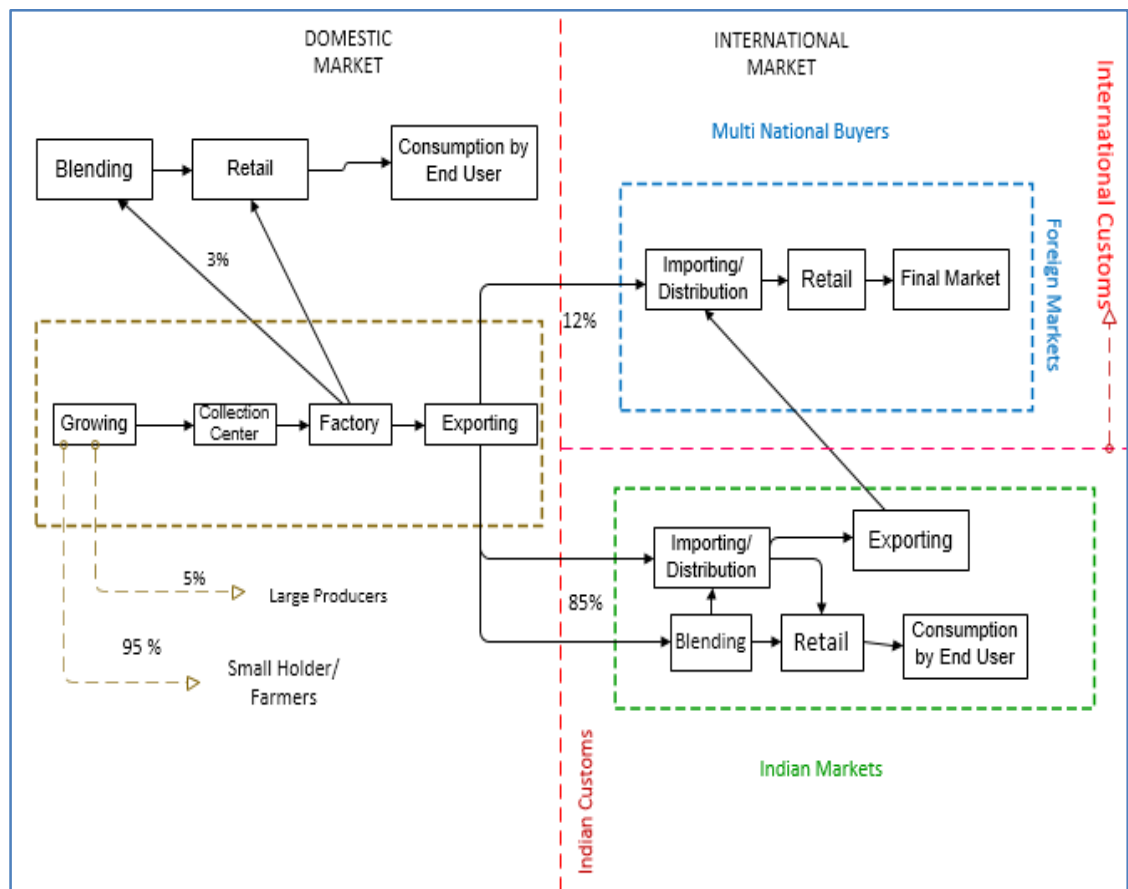


Figure 9: Upstream and Downstream supply chain of Orthodox tea

The figure 9, above shows the general supply chain map of orthodox tea in domestic market and international markets, focusing major exports of orthodox tea through different market channels in India and other foreign markets.

6 SUSTAINABLE ISSUES IN NEPALESE TEA INDUSTRY

In spite of gaining international reputation for the quality tea product, Nepalese tea sector is not being able to increase productivity, create efficiency and meet the international demands. In relation to the theories described in the literature review, section 3, the globally recognized effective aspects on sustainable agriculture production and sustainable supply chain management tries to relate and identify the sustainable drivers, barriers and issues of the Nepalese tea industry.

6.1 Main drivers towards SSCM in Nepalese tea industry

This section outlines the need of implementing sustainable agriculture practice in tea industry and the drivers that are enforcing for its implementation. Internal drivers for sustainable development are organizational related factors, whereas external drivers are regulations, demand from customers, suppliers, society and competitive pressure (Walker et al. 2008). Hereby under, the internal drivers of Nepalese tea industry in implementing sustainability is directly or indirectly influenced by the external barriers, such as customer demands of international quality standards, Corporate Social Responsibility (CSR) regarding the society and the environment that causes change in organizational policy for its advancement.

6.1.1 International quality standards

Most of the developing countries has an issue of quality standards (Roekel et al., 2002) in agriculture production. Tea as an agro-food product needs to undergo certain quality and standard requirements imposed by the international trading partners and buyers, relatively as strict food safety regulations in the international markets. Since orthodox tea is an export commodity, during overseas export the international importers or the buyers usually require high quality standards of tea ensuring various factors that influence in tea production and manufacturing

process. Nepalese tea has to go through lab testing and present report regarding its quality.

For instance, as Chapagain (2014) said:

“...to export tea to Indian market, or any other countries lab report is a must. After the lab testing reports are ready only then the deal is materialized”.

On the other hand, while exporting to international market, customers' usually demand quality organic tea with international certification, such as Hazard analysis and critical control points (HACCP), International Organization for Standardization (ISO), Good Agriculture Practice (GAP), international labor law, Rainforest Alliance (RA), Fair Trade certified, and application of organic fertilizers. In addition, customers ask test samples for various quality parameters such as Maximum Residue level (MRL), labeling, and packaging standards. (USAID, 2011)

“...when exporting to international buyers we need certification to prove the quality standards of the tea... the ISO 22000 standards...”

(Interviewee B, 2014).

Moreover, international legal requirements, for instance, international quality standards and food safety regulation, examination of contamination level, nutrition and hygiene label etc. are equally essential for implementation on agriculture production. However, the level of requirements may depend on the requirements of importing country. (Chapagain, 2014) Therefore, it is necessary to implement basic international rule and regulation on the production process for the sustainable agro-supply chain practice. Thus, maintaining quality standard without affecting environment and society during tea production process has been one of the major concern for the stakeholders in Nepalese tea industry for the betterment of this sector.

6.1.2 Corporate Social Responsibility (CSR)

Rising issues of global warming, climate changes and environmental effects has brought huge attention all around the world (Kalchschmidt et al., 2011). Due to increasing consumer awareness and concern by international consumers regarding environmental depletion and damages created by several manufacturing activities and production process, the need of implementing corporate social responsibilities (CSR) strategy and sustainable agriculture practice in tea industry has become essential (Brundtland, 1987; Kalchschmidt et al., 2011). Showing concern about social, environmental and economic issues and thus implementing sustainable approach on supply chain activities gives an organization to gain competitive advantage among the competitors and create a brand reputation in front of the society and customers.

“...quality standard requirements imposed by international buyers and their concern about the environment has made us aware about our responsibility towards environment and society...”

(Interviewee A, 2014).

Moreover, pressure by international partners and customers on applying CSR strategies is also one of the external factor, which Nepalese tea industry have to adopt in practice to improve the industry's efficiency and create brand image in the society, nationally and internationally.

6.2 Triple bottom line issue (3BL)

This section focuses on identifying bottlenecks under social, economic and environmental aspects of sustainable development in Nepalese tea sector. The emphasis is given especially on the issues affecting the smallholder farmers and tea field workers, who are at the bottom level of the supply chain and are the most important actors in the sector. Lack of human work force, child labour, unfair price distribution, low wages, lack of financial investments and unavailability of basic agriculture supplies are the intercontinentally recognized factors affecting the

sustainable agriculture production in developing countries (Sanne van der Wal, 2008).

6.2.1 Social Issues

6.2.1.1 Gender and declining workforce

Nepal is experiencing huge migration rate because of the poor economic condition in the country.

“...finding reliable workers has been one of the major problem ...”
(Interviewee A, 2014)

“...sometimes it is very challenging to find the right people to work for us... lot of local men go abroad for work ...”
(Interviewee B, 2014)

Due to mass migrations of men to foreign countries for work, there is a shortage of skilled work force for cultivation and production in this sector. However, on the positive side, it has created job opportunities for the female population of the country. Due to lack of working men in the tea sector, majority of workers are trained local women. Women accounts more than 60% of the total work force in the industry, who participates during cultivation, harvesting, plucking and processing of tea plants.¹⁵

6.2.1.2 Child labour

“Child labour is a widespread phenomenon in Nepal, and one that has not declined despite the existence of laws that prohibit especially burdensome forms of child labour and the efforts of many governmental, non-governmental, international and private organizations to protect child rights” (Nepal Child Labour

¹⁵ http://consulat-nepal.org/IMG/pdf/NATIONAL_NEPALESE_TEA_POLICY_YEAR_2005_VISION_2020_.pdf

Report, 2012)¹⁶. The political uncertainty of Nepal has resulted in poor economic status, which led to high income-inequality, and declining workforce¹⁷ as mentioned in previous section. In order to develop the economy of the country every possible workforce is needed, regardless the age groups. Thus, significant number of children are also involved in economic activities, despite the existing laws that are aimed to protect children. The reason behind this is the improper monitoring of child labour. The highest number of child labour is found in the agricultural sector where in the same time they receive less payment compared to those employed in other sectors. (NCLR, 2012) Employing child labour in any stage of supply chain, including the tea supply chain could lead not only to legal consequences but also due to its unethical nature can have negative socio-economic impact on the overall supply chain.

6.2.1.3 Low wage rates

The wage rate for field workers are determined by various factors such as skills, ability and the type of work. The wage rate is fixed by the agreement between the representatives of employees (Labor Unions) and employers (tea estates).

“...every tea estates have their own wage rates for their workers...their salary will vary depending on the type of job they are doing...”

(Interviewee B, 2014)

For instance, the regular wage rate of Nepalese tea pickers in Ilam is NPR. 150 per day for picking an average of 20 kilograms of green leaves (FINEST, 2013). The minimum wage rates do not even provide a decent standard of living and is below the minimum wage rate set by the Government of Nepal. The Government of Nepal, Department of Labour, proposed the minimum wage rate to be around NPR. 200 per day; however, the tea processors have not accepted the rule for

¹⁶http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-kathmandu/documents/publication/wcms_182988.pdf

¹⁷ <http://www.thehimalayantimes.com/fullNews.php?headline=Global+recession+&NewsID=373741>

implementation.¹⁸ Thus, the tea workers often go for protest with the help of their labour unions.

The industry faces complication from the workers and their labour unions affiliated to different political parties, with higher demands on wage raise on a regular basis. If the demands by labor union are not made and implemented, the labors stops working which will directly affect to the industry by disturbing people depending on the earnings from the tea business and to the government revenue.¹⁹

6.2.2 Environmental issues

6.2.2.1 Energy use

Tea processing requires high energy-consumption during tea manufacturing processes, where the tealeaves go through various processes such as withering, drying, blending, packing etc. Hydroelectricity power is commonly used in operating the machines. However due to lack of electricity power supply, some factories uses petroleum oils (Diesel) to run the generator and operate the factory machines. (FINEST, 2013) One of the interviewee also raised this issue:

“...to run the factory machines we are using diesel fuels...”

(Interviewee C, 2014)

Some processors also use other source of energy, such as coal, and firewood for the drying the tealeaves (Interviewee B, 2014). The use of alternative sources of energy affect environment-causing pollution. Moreover, use of firewood from forest cause extensive deforestation and deplete the natural resources.

¹⁸ http://www.myrepublica.com/portal/index.php?action=news_details&news_id=65549

¹⁹ <http://nepalitimes.com/news.php?id=15185>

6.2.2.2 Chemical fertilizer

Different chemical fertilizers are applied throughout the cultivation of tea plantation for the growth of nutritious tealeaves and to protect tea bushes from variety of pesticides.²⁰ However, the nature of fertilizers used may depend on the farmers. In general, farmers' use chemicals like Nitrogen Urea; Nitrogen (N) Phosphorous (P) Potassium (K)- NPK fertilizer on the plants, which is rather expensive and ineffective (FINEST,2013). Farmers also use highly toxic pesticides, such as Ethion, Monocrotophos, Phorate and Quinalphos, which are banned pesticides in developed countries.¹⁹ However, there are farmers who are attracted in using organic fertilizers, such as compost fertilizer and Gadayaula fertilizer (made of earthworms) for better productivity and healthier tea products protecting the environment. Though, the numbers of organic producers are comparatively low and there is lack of knowhow on elaborating organic fertilizers.

According to the data collected by the FINEST project (2013), almost 99% of orthodox tea production in Ilam is inorganic, using conventional methods applying harmful chemical fertilizers. Improper application of such harmful pesticides results in various environmental problems like, high toxic residue in soil, water and air, affecting the whole eco-biological system. Moreover, constant use of toxic chemicals creates problems with soil fertility rate leading to low productivity and less quality tea. In addition, it causes problems like soil erosion that can lead to natural calamities.²¹

6.2.3 Economic issues

6.2.3.1 Investment and Credit facilities

Finding adequate financing and investment on agribusiness is an important part of upstream supply chain activity. Investments in agriculture usually requires huge amount of capital and assets, which would be needed to be invested for

²⁰ http://consulat-nepal.org/IMG/pdf/NATIONAL_NEPALESE_TEA_POLICY__YEAR_2005_VISION_2020_.pdf

²¹ http://somo.nl/html/paginas/pdf/Sustainability_Issues_in_the_Tea_Sector_EN.pdf

longer lead times.²² In developing countries like Nepal, huge investments in farm enterprises are far beyond the capacity of some small holder farmers and producers. Therefore, long term external finance or investments from external sources; for instance loans from financial institutions or banks, are the most favourable sources of financing.²³ However, providing huge amount of loans is very risky and it goes through the lengthy process of legal paper works, thus, there is less possibility for smallholder farmers and producers of getting huge investments from the financial institutions in emerging economies like Nepal.

The credit supply situation is unreliable and a bit disappointing as in context of Nepal. Most of the tea growers (individual farmers, tea estates or factory) use credit facilities provided by financial institutions in one way or other. The GON has been providing the interest subsidy through the financing institution- in particular; 'Agriculture Development Bank of Nepal', which provides loans with comparatively low interest charges; around 10% per annum.²⁴ Despite the credit facility, the tea producers and farmers are not convinced with the credit supply facilities. With the increasing number of farmers and tea entrepreneurs, the government bank is not being able to provide sufficient amount of loans. Thus, they are compelled to take loans from the private banks with heavy interest rates (Chapagain, 2014).

6.2.3.2 Unfair value distribution

As we have discussed in section 5.1.5, when buying the tealeaves from farmers' cooperatives, the factory decides the market value of the tea leaves depending on the quality of leaves provided by the farmers. The quality of leaves differs depending on the climatic variations and the time of the year. The price of the tealeaves are determined by the peak season and low season depending on the quality of tea leaves (FINEST, 2013). The first plucking season starts on April to

²² http://consulat-nepal.org/IMG/pdf/NATIONAL_NEPALESE_TEA_POLICY__YEAR_2005_VISION_2020_.pdf

²³ http://www.ruralfinance.org/fileadmin/templates/rflc/documents/6_financing_smallholder_web.pdf

²⁴ http://consulat-nepal.org/IMG/pdf/NATIONAL_NEPALESE_TEA_POLICY__YEAR_2005_VISION_2020_.pdf

June, known as 'First Flush', since the season has less rain the tea picked are of very good quality and farmers gets high prices for the tea, nearly around NRs. 70 per Kilogram. The second pick known as 'Second Flush' usually starts from July to mid-September, however, the tea produced from these leaves are of not that qualitative due to abundant rainfall in this season. The tealeaves from this season are relatively cheaper, i.e. around NRs. 30 per Kilogram. The 'Third Flush' starts from end of September until end of November, and the leaves plucked at this season are of good quality, which value around NRs. 55 in the markets. (FINEST, 2013) Thus, the buying power by the processors usually dominate the market value of the tealeaves and farmers gets lower and fluctuating prices for their tealeaves.

Many farmer complains about getting lower prices for their tealeaves, and delay on payments by the factories (FINEST, 2013). At the end, farmers end up getting low prices as a share of their value chain activity and the stakeholders on the latter part of supply chain receives the higher shares and the most profitable margin. Thus, many farmers are not encouraged on farming tea because of less profit margin and incapable of maintaining sustainability on tea production.

6.3 Factors with negative influence on Sustainable supply chain in Nepalese tea industry

This section outlines the internationally recognized barriers of sustainable supply chain management that tries to relate with sustainable issues in the Nepalese tea industry. The framework used in this thesis, provided by different authors mentioned in the literature review attempts on relating both the "internal and external barriers" (Walker et al., 2008; Tay et al., 2015), affecting the Nepalese tea industry for advancement on sustainable development.

6.3.1 External Barriers

In the following lines, we can see there are more external barriers than internal barriers that are influencing factors on sustainable development of the Nepalese tea sector. These external barriers have huge direct or indirect influence on

creating internal barriers. The general external barriers are government rules and regulations and industry specific obstacles as pointed out in the literature review.

6.3.1.1 Inadequate government support and policy

Government rules and regulations play a vital role in sustainable supply chain practises (Roekel, 2002). In developing countries and emerging economies like Nepal, lack of government support often hampers the supply chain development. Government of Nepal lacks in providing basic facilities such as communication, electricity and transportation infrastructure without no supply chain practises are possible. Absence of proper policy incentives, disruptive fiscal and monetary policies, political issues and interventions, and inactive participation from responsible governmental organisation like Ministry of Agriculture has been the challenging factor for the Nepalese tea industry. Moreover, tea industry of Nepal rather is frustrated by unnecessary price controls, export subsidies, tariffs and non-tariff barriers, quotas system and strict safety and quality regulation imposed by the importing countries that developing nations cannot adapt and compete in international market.²⁵

Stakeholders in tea sector stresses that there is quite less support from Government of Nepal and the National Tea Board than desired (Chapagain, 2014). Poor governance, lack of proper law and security, and political interventions in the tea industry are one of the major constraints. For instance, lack of proper trade law between Nepal and India always causes trouble for Nepali traders while exporting tea to India and other international markets. Moreover, there is lack of R&D investments; lack of implementation of proper policy, lack of training centers to educate farmers on tea farming and most importantly lack of investment on tea sector are the barriers for the industry as a whole for its development.

²⁵ http://s3.amazonaws.com/zanran_storage/www.intracen.org/ContentPages/17882660.pdf

6.3.1.2 *Political instability and Uncertainty*

Nepal has been experiencing political down run since the Nepalese Civil War leaded by the armed political party 'Maoists' since early 1996 until 2006. Even after the end of 10 years long civil war and abolishment of centuries old monarchy system in 2006, political conditions are still facing critical situation with the disagreement between seven leading political parties on new constitution, which is yet to confirm.²⁶

Due to political issues, constant practice of strikes, protests, complains objections, riots and chaos created in an in-disciplinary manner, leads to uncertainty in country's economy. It has an indirect impact on the private and industrial sectors, for instance, losing income opportunities, high production costs, raw material supplies hampered and not meeting sales targets etc. Therefore, many public and private investments are being delayed due to the political uncertainty. Likewise, Nepalese tea industry has also been a victim of the current political situation and facing it as an obstacle to improve the sector.

6.3.1.3 *Electricity Blackout*

Nepal largely depends on hydroelectricity as the only source of energy. During winter season, from October to May, the water level in the rivers falls. Thus, electricity production in the country falls in huge percentage and the demand of electricity gets much more than the production. According to the annual report from Nepal Electricity Authority (NEA, 2014), the current power demand is about 1200 megawatts, however, 791 megawatts of power has only been supplied and rest of the demand was restricted by electricity power cut of maximum 12 hours per day.²⁷ Hence, people are bound to live without electricity for 12 hours a day and it has caused negative impact on the economic condition of the country.

²⁶ <http://www.bbc.com/news/world-south-asia-12511455>

²⁷ http://www.nea.org.np/images/supportive_docs/Annual%20Report-2014.pdf

In particular, tea industry has been experiencing huge loss and high production cost due to less power supply and use of other external source of energy for production processes. According to the stakeholders from the interview, tealeaves get ruined if they could not be processed within 24 hours after harvesting. Thus, the processors are bound to use external energy sources for tea processing. For instance, one of the interviewee (FINEST, 2013) said that the factory uses petroleum product (i.e. Diesel) to run the power generator which serves operating factory machines. The generator consumes approximately 3 liters of diesel per hours, which makes $8 \times 3 = 24$ liters of diesel consumption in minimum per working day. Therefore, the use of diesel directly adds extra production cost making final production cost very high, which is comparatively more expensive than using hydro-electricity power. Moreover, the effect of using such external sources has negative impact on environment as well, which we have discussed in section 6.2.2 under environmental issues.

6.3.1.4 Transportation facilities

Interviewees (2014) described another issue faced by the Nepalese tea industry, which is the inadequate transportation system, regarding domestic and international logistics. Hilly roads, improper road facilities and lack of railways system makes the transportation of tea products very challenging and rather expensive.

Additionally, the geographic location of Nepal²⁸ is not either in favor for smooth transportation system. Geographically, being a land locked country, bordered by China and India, Nepal lacks harbor or ports for the international shipping practices. Thus, Nepal still has to depend on Indian ports for exporting to the international markets. Transporting to India from Nepal by roadways has been another challenge faced by the traders. In practice, Nepalese trucks or vehicles are only allowed to enter up to the nearest market towns and rail heads, and they also need to have entry permit for every trip with certain amount of fees, which

²⁸ <http://welcomenepal.com/promotional/know-nepal/geography/>

allows them to travel in Indian roads for the maximum period of three months. Due to this reason, Nepalese goods need to be transhipped to Indian trucks at the borders, which adds extra costs, likewise requires additional labor and time for loading and unloading the goods. (SAWTEE, 2013)

6.3.1.5 Lack of tea auction centres

Tea auction centre is a place where samples of different tea grades are exhibited for the inspection of interested buyers.²⁹ Majority of stakeholders' in Nepal stresses about the unavailability of the tea auction house, where the sellers could display the sample of different grade of tealeaves for the interested customers (Chapagain, 2014).

Since the auction system is not available in Nepal, and there is lack of market for orthodox tea in the country, traders export most of the orthodox tea to Indian markets. The nearest access to auction market is in Kolkata, India. However, Nepalese tea does not have formal authentication to participate in Indian auction houses, as it was also stated in an interview³⁰ that was published in a national newspaper of Nepal, The Himalayan Times (2012):

“...Nepali tea is not allowed to participate in the auction market in Kolkata. Therefore, they are compelled to sell their products at a lower rate and are losing the opportunity to establish their own brand in the Indian market...”

Dr. Pradyumna Raj Pandey, Sr Agri-Economist
Ministry of Agricultural Development
Government of Nepal

The consequence of this is that the exporters have to rely on their personal contacts to sell their quality tea products at a lower rate to the Indian buyers. This

²⁹ <http://encyclopedia2.thefreedictionary.com/auction+house>

³⁰

<http://www.thehimalayantimes.com/fullNews.php?headline=Tea%26sbquo%3B+lentils+facin++export+barriers&NewsID=328523>

leads to less shares of the final price for the tea growers and manufacturers, which we have discussed earlier above in the section 6.2, under unfair price distribution. Therefore, marketing linkage has been the main problem for the tea producers (FINEST, 2013). Unavailability of auction house has created gap between tea sellers and the international buyers. An example is a survey conducted by the German aid agency GIZ in Germany, which revealed that German buyers were not interested on buying tea from different tea farmers and tea gardens that could only provide less quantity of tea than required.³¹ Therefore, Nepalese tea is losing its opportunity to establish its own brand in the international market.

6.3.1.6 Lack of quarantine laboratory

Nepalese orthodox tea significantly struggle with certification (FINEST, 2013) in international market due to lack of well-equipped laboratories and mutual accreditation facilities in Nepal. Tea as an agro-food product needs to undergo certain quality and standard requirements imposed by the international trading partners and buyers, relatively as strict food safety regulations in the international markets. Due to this requirement, every batch of produced tea has to go through testing labs and certified before exporting to India or other international markets (Chapagain, 2014). Since Nepal does not have mutual accredited laboratory facilities, the tea traders face difficulties certifying their products.

In reference to the earlier mentioned interview²⁷ in The Himalayan Times (2012):

“...Nepal does not have the Pest Risk Analysis report and accreditation laboratories yet.India does not accept Nepal’s lab test report for tea exports. Therefore, exporters need to go to food labs in Kolkata, Sunauli or Lucknow periodically...”

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³¹ <http://www.besplatniseminarskiradovi.com/EN-History/History-of-Tea-in-Nepal.htm>

This issue has been one of the major export barriers for the tea industry since the Nepali traders are compelled to go to the Central Food Labs in India periodically that generates substantially burdensome costs.³²

6.3.2 Internal barriers

6.3.2.1 *Lack of modern agricultural facilities and ICT*

Nepalese farmers and producers are still depending on traditional methods of tea production and manufacturing processes. Lack of new tools and technologies are the biggest disadvantage for the evolving nations to compete in the complex global market (Stamm et al., 2006). Due to absence of modern machinery, tools and technologies, the productivity of tea is comparatively lower than the capacity of production (Chapagain, 2014). The lack of Information and Communication Technology (ICT) inhibits constant exchange of information and knowledge among the stakeholders in the chain. All these lead to a slowdown in the agriculture industry in an unsustainable manner (Kalchschmidt and Syahrudin, 2011; Cleaver and Schreiber, 1994).

6.3.2.2 *Limited cultivation practice*

Unavailability of infrastructure facilities and lack of modern agricultural facilities leads in high production cost for sustainable agriculture practice, thus majority of the farmers are more encouraged in conventional, more profitable, orthodox tea production process (not organic). Organic tea production is rather time consuming and expensive since organic fertilizers are difficult to find in the domestic market; the importation cost is comparatively high (FINEST, 2013). Focusing on cost reduction at expense of sustainable practices is somehow inevitable in the sector, especially in smallholder farming. However, few of the

³²

<http://www.thehimalayantimes.com/fullNews.php?headline=Tea%26sbquo%3B+lentils+facings++export+barriers&NewsID=328523>

producers acknowledge the benefits and advantage of organic tea production, and therefore apply sustainable agriculture practices (Chapagain, 2014).

6.3.2.3 Lack of awareness

Majority of bottom level farmers are unaware about sustainable agriculture practices and its benefits. The research, conducted by FINEST project (2013), shows that most of the farmers do not know about the organic farming process and ways to use organic fertilizers. Therefore, lack of social awareness of incorporating sustainable development, lack of training and management commitment regarding sustainability and sustainable agriculture production process are also major internal constraints that Nepalese tea industry is experiencing.

6.3.2.4 Isolation from developmental organizations

Supportive policies, rules and regulation on sustainable development of tea production is another issue in the Nepalese tea industry. For instance, according to Chapagain (2014), there is no powerful act on using proper ways of production neither on the restriction of using harmful pesticides or on the usage of organic fertilizer in tea farming. Nevertheless, Chapagain (2014) said, development organizations like HOTPA, HIMCOOP, in collaboration with international donor agencies, are trying to develop the tea sector by implementing sustainable agriculture practice, executing a Code of Conduct (CoC) on agriculture production. However, these organizations mainly focus on larger producers such as tea estates; thus, the large number of private smallholder farmers have no access to the contribution of development.

7 WAYS TO OVERCOME BARRIERS AND CREATE SUSTAINABILITY IN TEA SUPPLY CHAIN

After identifying the major barriers that affect the sustainability in Nepalese tea sector, the possible ways to overcome those issues are presented in this chapter.

7.1 Governmental support

7.1.1 Stable government and political condition

Nepal, as a developing country, in its current political situation, should urgently seek to form a stable government and implement well-established laws, policies, rules and regulation, and introduce new constitution in the country. This will have direct positive impact on the operating industries in the country, thus improving economy of the nation. Therefore, improving political condition of the country and forming a stable government should be the first priority for the Government of Nepal.

7.1.2 Laws and Policies

The Government of Nepal should adopt specific laws and policies in the agriculture sector. Specifically in tea sector, policies prioritizing the tea production according to the high social, environmental and economical standards should be implemented. Encouraging CSR and sustainable tea production at the national level by setting minimum quality standards, implementing strict labour laws, ensuring human rights, minimum wages rates and continuous assistance could bring bright change in the industry.

7.1.3 Easy access to agricultural inputs

Adequate support from the government and government representing organizations like NTCDB, providing incentives such as leasing land for agriculture, exemption of land revenue, providing capital grants and credit facilities to the farmers, subsidies and tax immunity on purchase of plants and

machineries for production, availability of input supplies could be an encouraging factor for the development of the sector.

Input supplies such as organic fertilizers, modern tools, machinery and technologies should be easily accessible for the growth of the production with its consequent rewards. With the availability of earlier support and resources, entrepreneurship could be encouraged in the society and would create employment opportunities in the country for those people who are intend to migrate to foreign countries for work purposes.

7.1.4 Investment in R&D and infrastructure

Special emphasis should be laid on identifying the possibilities and construction of alternative energy sources, including hydro-electricity, solar energy, bio-energy, wind energy. The current demand for energy could be met by operationalizing the existing hydropower at full capacity and more research on alternative sources of energy should be carried out. Strategic plan to improve the quality of roads, developing new routes and transportation system should be aimed. Investments on new technologies and tools, implementing ICT in manufacturing and marketing of tea product will help in constant exchange of information and communication between the stakeholders. Investigation on how to increase and maintain international quality standards by setting up well equipped laboratories for testing quality and accrediting mutual certification on the quality level of the tea product.

7.1.5 Auction system

Auction system is a process, where tea producers organizes a large scale of sampling with different grades of tea at one place and the buyers would offer/bid prices based on the quality of tea and negotiate the deal. Therefore, establishing an auction centre facility in Nepal is essential, which would create a scenario where buyers and sellers can be bring together at the same ground or market place. This would ensure transparency in marketing, quality product, costs and fair prices for the smallholder farmer and producer, by eliminating the involvement of intermediaries, thus removing the gap between consumers and producers.

This will consequently increase in the export ratio in a more formal way. Moreover, transparency between downstream farmers, producers and the international customers would provide an opportunity on establishing healthy relationship, further creating partnership, collaboration and cooperation for achieving competitive advantages.

7.2 Organizational support

7.2.1 Factories and processors

Tea factories and processors should encourage smallholder farmers on adopting organic farming, implementing CSR policies by improving social, environmental and economic aspects for the long-term sustainability. Moreover, they should inspire the smallholders by providing fair prices for the tealeaves, and giving commitment on buying tealeaves produced sustainably. Furthermore, providing financial assistance, marketing assistance for market access can increase the productivity and efficiency on quality organic tea production.

7.2.2 Adequate support from facilitators

Active participation and support from development organizations like HOTPA, HIMCOOP and other donor agencies would be the motivational factor for the improvement of the tea sector. These organizations should conduct wide-ranging outreach programs for smallholder farmers to train and provide technical assistance on sustainable agriculture practices. Conducting educational programs such as, creating awareness on critical sustainable issues in tea sector, importance of implementing social, environmental and economic aspects in tea supply chain, etc. could ensure sustainable development of the sector.

Moreover, monitoring the implementation of CSR policies and quality standards on plantation areas, implementing international labour law, setting minimum wage rate for workers, implementing strict Code of Conduct (CoC) on production process would construct positive impact on the industry.

7.2.3 International standards and certification

Maintaining quality standards in tea products is necessary as per the standard requirements imposed by the international customer and partners. Implementing organic farming procedure, Good Agriculture Practices (GAP), rainwater harvesting, and production process etc. should be strictly maintain for the quality of tea product. Getting international certification like 'Fair Trade', guarantees fair working conditions, guaranteed human rights at different stages of production, and fair share of margin to the smallholders provides competitive advantage to the larger producers and contributes to sustainable development. Other international certification such as ISO standards, Rainforest alliance, are necessary quality parameters that should be implemented in manufacturing and production process of tea to attain competitive advantages in global market.

7.2.4 Collaboration between government and donor agencies

Partnership, cooperation and collaboration between all the trading partners provides opportunity on gaining competitive advantages and in creating a win-win situation for all the stakeholders in the network. Good relation and collaboration between governmental organizations (MOA, NTCDB...), NGOs, international organizations and donor agencies like GIZ, USAID/Nepal, SNV/Nepal, Winrock International, and domestic organizations like HOTPA, HIMCOOP, and NTCDB etc. could create competitive advantages in tea industry. Chapagain (2014) also suggested that with the adequate support from the government; the development organizations like HOTPA, with the help from donor agencies could bring the positive change in the industry. Collaboration with such international agencies could come together at the same ground and implement necessary laws and policies for the sustainable agriculture practice. Working together for the development of the sector provides strength and positive attitude on implementing required changes for the sustainable development.

8 CONCLUSION

The present research study was aimed at finding out the production process and the overall supply chain practices of the orthodox tea in Ilam, Nepal. Additionally, the study also fulfills the objective of identifying the major bottlenecks of the sustainable supply chain and the need of implementing sustainability in Nepalese tea industry. The result of this research shows that Nepalese orthodox tea has the potential and competitive advantage of being an agricultural export product, which has already established its way to the international markets. Consequently, the demand of Nepalese orthodox tea in the international markets and the boost up increment in cultivation and production of this cash crop has given the progressive outlook for the development of this sector. Despite the fact that having such capability for high production and fulfill market demands, the industry is currently facing certain constraints on its path of establishing a successful industry.

The whole tea supply network goes through various production processes and material flow with many different stakeholders involved in a chain, and delivers a valuable product at the end of the network to the consumers (New and Payne, 1995; Beamon, 1998; Van der Vorst, 2000; Waters, 2003). In order to engage effectively in SSCM, issues that arise from the Social, Environmental and Economic dimensions must be resolved considering the fact that all of them have effect on each other on the long run (Carter & Rogers, 2008; Seuring and Muller 2008; Kalchschmidt et al., 2011). To overcome these issues, to establish and maintain SSCM, the abolishment of external and internal barriers (Walker et al., 2008; Tay et al., 2015), is indispensable.

These initiatives, that represent the key steps for a successful engagement in sustainable supply chain management, are mostly in the hand of the government in the context of Nepalese tea sector. However, domestic developing organizations, likewise international donor agencies and NGOs also have a vital role/potential in the progress of establishing and maintaining sustainability in the tea supply chain.

The study found that major factors, which drive to engage in sustainable supply chain management in Nepalese tea industry, are international quality standards and corporate sustainable responsibility demand by the consumers and the international trading partners. On the other hand, the major barriers to the growth of the industry are poor government policy and support, absence of infrastructure facilities, and other industry specific barriers. The study concludes that with an improvement in the accessibility to basic infrastructural facilities, maintenance of healthy relation with different stakeholders throughout the supply chain, and the implementation of sustainable agricultural production policies, the Nepalese tea supply-chain would be efficient enough to participate in global tea market.

8.1 Inadequacies of the research

This thesis report has delivered some very useful data and information about the Nepalese tea industry in an elaborate way; however, some parts of this study could have been enhanced in a better way.

The report highly relied on online data and information from secondary sources, which made the whole research work very challenging in collecting data from Nepal while writing in Finland. My own knowledge of the Nepalese economic and social background contributed a lot to my writing; however, it might not have been sufficient. Unavailability of reliable information sources and the distance between two countries, Nepal and Finland, made this study much challenging than expected. Part of the available sources were not up to date, and some were dysfunctional. Furthermore, the available information and data sources varied in numbers and figures depending on the organization and their understanding of the tea industry.

On the other hand, collecting data and information through company officials was very difficult. Senior management personnel from Nepalese government officials and other responsible bodies and major actors of the Nepalese tea industry were not cooperative in matters of providing information to the queries. Numbers of email inquiry to the representatives of respective organizations were unanswered

and some denied providing information. Nevertheless, some companies were interested in providing information only if it would lead to new business opportunity instantly. Thus, this thesis report depends on available secondary sources, with key individual informants and may lack consistent data and information about Nepalese tea industry as a whole.

8.2 Direction for future research

This thesis report has managed to provide useful information to the readers about the current situation and practices regarding the Nepalese tea sector, which could be a guide to the tea industry. Moreover, the report also delivers knowhow about the country's political condition, cultural and social aspects, history and backgrounds, and other interesting facts that could be used as a good reference for analyzing and internationalizing in other areas of businesses other than tea sector. Therefore, the report could come handy to those entrepreneurs willing to start business or internationalize in Nepal.

Considering the fact, that, not one size fits all and every time: business theories, supply chain practices and way of doing business is changing in a timely manner around the world. In addition, high flow of information because of the internet era, improvements in technology, and drastic changes in business strategies has made the market situation very competitive. Thus, these changes have to be taken into account during future research.

Moreover, relying on some outdated secondary data, second hand information and my limited knowledge about the industry for this study has decreased the reliability of the report. Hence, considering on recent and reliable data and information is highly recommended for future research to achieve findings that are more precise. Furthermore, case studies on international organizations, different NGO and Non-profit organizations like GIZ, Winrock etc. involved in the Nepalese tea industry is highly recommended in future research, which may provide the different horizon and understanding of the Nepalese tea industry, limited by this study report.

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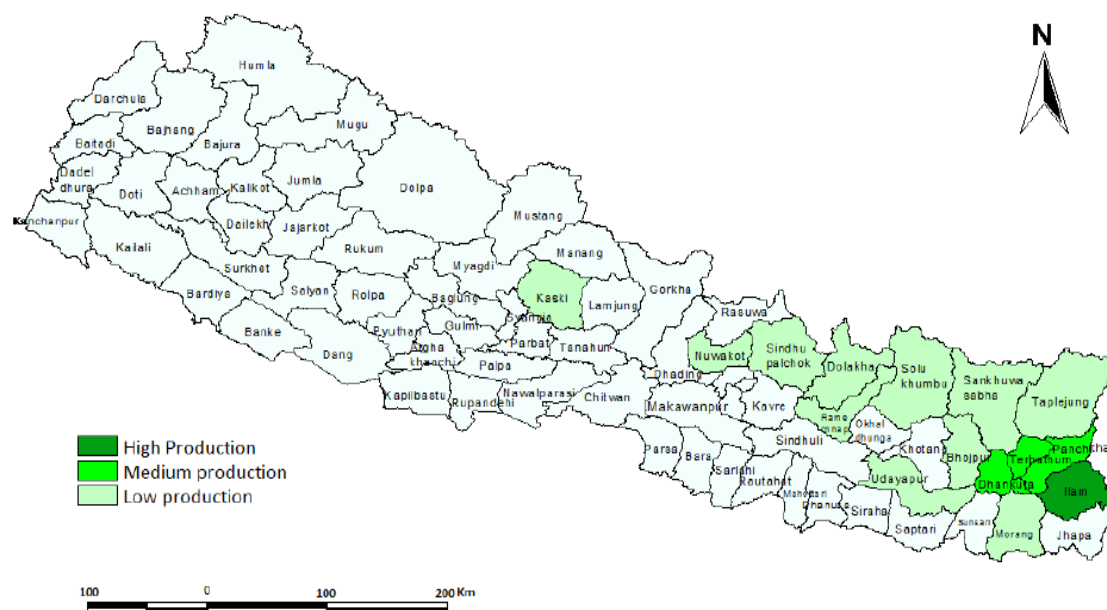
Telephone:

Interviewee B, Representative of a tea factory, Ilam, Nepal. Interview 07.06.2014.

Interviewee C, Representative of a tea factory, Ilam, Nepal. Interview 15.06.2014.

APPENDIX 1

Major Orthodox tea production areas



Picture: Map of Nepal with major orthodox tea producing areas

Above picture is the map of Nepal, outlining the 75 districts and major orthodox tea growing area. Orthodox tea Plantation is largely located in rural middle hills and backward areas of eastern and southeastern states on Mechi and Koshi zones of Nepal. Major tea growing areas of the country are concentrated particularly in the districts of Ilam, Jhapa, Panchthar, Dhankuta, Tehrathum and other emerging districts. Some emerging districts in orthodox tea production are Bhojpur, Sankhuwasabha, Taplejung, Sindhupalchowk, Nuwakot, Solukhumbu, Kaski, Dolakha, Morang, Ramechhap, and Udayapur. However, the production volumes in these districts are relatively small in comparison to major cultivating regions (USAID, 2011).

APPENDIX 2

Plantation and Production trend of tea from 2001-2013

Tea Plantation in Hectors					Tea Production in Kgs.		
F. Years in AD	Private	Small Holders		Total	Private	Small Holder	Total
		Farmers	Area				
2001/2002	8179	5575	4186	12346	5864720	1653855	7518575
2002/2003	8321	4314	12647	12643	6478000	1720000	8198000
2003/2004	8869	6252	6143	15012	7714669	3956535	11651204
2004/2005	8912	6854	6989	15900	7789893	4816188	12606081
2005/2006	8912	7154	7100	16012	8443907	5244330	13688237
2006/2007	9001	7593	7409	16420	9340754	5826989	15167743
2007/2008	9030	7791	7564	16594	9940311	6187179	16127490
2008/2009	9063	8184	7655	16718	999013	6218114	16208127
2009/2010	9159	8735	7968	17127	10237514	6370041	16607555
2010/2011	9331	9523	8120	17451	10749390	6688543	17437933
2011/2012	9798	9941	8351	18149	11416646	6893176	18309824
2012/2013	9953	11932	9084	19036	12120266	8467879	20588145

Source: NTCDB, 2014.

APPENDIX 3

Tea processing in factory ^[33,34]

After the green tea leaves are transported to the factory, the tealeaves undergo certain processes to form a final orthodox tea. Quality of orthodox tea is determined mainly by the manner in which it is processed. The tea processing methods outline as follows:

Weathering

As soon as the tealeaves are sent to the factory, leaves are arranged in long weathering columns before the tealeaves are ruined. Weathering is a process to remove moisture or excess amount of water from the tealeaves and stimulate a temperate enzymatic oxidation. The leaves are withered nearly about 14 hours by passing cool and warm air through the weathering columns and the withering percentage varies from 60% to 70% depending on the nature of the tealeaves. The tea leaves lose almost a quarter of its weight during this process that allows the breakdown of leaf proteins into amino acids and enhances the amount of caffeine, which is essential for the taste of the tea.

Rolling

After the leaves are withered, they are processed immediately to another step known as rolling. The leaves are rolled with the help of heavy rolling machines, for certain period of time depending on the quality of tealeaves and the type of tea being processed. The tea leaves are twisted and rolled to stimulate oxidation of the leaves and remove essential oils from the tea leaves which are essential for the oxidation process. This is another important process highly responsible for the taste of the tea.

³³ <http://www.antuvalleytea.com/teaprocessing.html>

³⁴ <https://www.youtube.com/watch?v=IUpa4xfwlr8>

Oxidation or Fermentation

After the tealeaves are twisted, leaves are transferred to a temperate controlled room. The leaves turn darker after losing their chlorophyll contents. The oxidation process could take almost 12 hours to be completely oxidize. This process is very essential for the optimum flavor, colour and the taste of the final tea.

Drying

When the leaves produce optimum flavor and colour, it is processed to another step to arrest the optimum flavor by drying the leaves, also known as firing or baking. The process is very essential for the final quality of the tea. Thus, the heat and temperature while drying should be carefully observed, as not to over bake the tealeaves.

Grading

Finally, the tea is sorted into different grades according to the quality and size of the leaves. Mainly, the orthodox tea are sorted into four different types of grades, i.e. leaf, broken, fanning and dust. The tea containing whole leaves are leaf tea, the tea containing broken leaves are broken tea, the tea which are little smaller are called fennings and the tea leaves which are broken into fine dust particles are graded as dust tea. The sorting machine usually does the grading process however not all the leaves could be sorted by the machine, and the trained workers separate those unwanted particles manually. The leaf grade orthodox teas are mainly exported to the international market, and other grades are usually exported to Kolkata, India or for domestic consumption.

Tasting

After all the processing, the tea is finally ready for tasting and is tasted by the tea specialist to ensure the quality of tea produced. Usually, tea is tasted after every batch of production to confirm the quality concerning its flavor, color, fragrance and other elements defining good grade of tea. After the tea is fully processed, it is ready for packaging.