

Though income from the orthodox tea sub-sector contributes more among the non-certified orthodox tea growers, there was a large variation in income among the non-certified growers than the certified growers as presented in Figure 2.

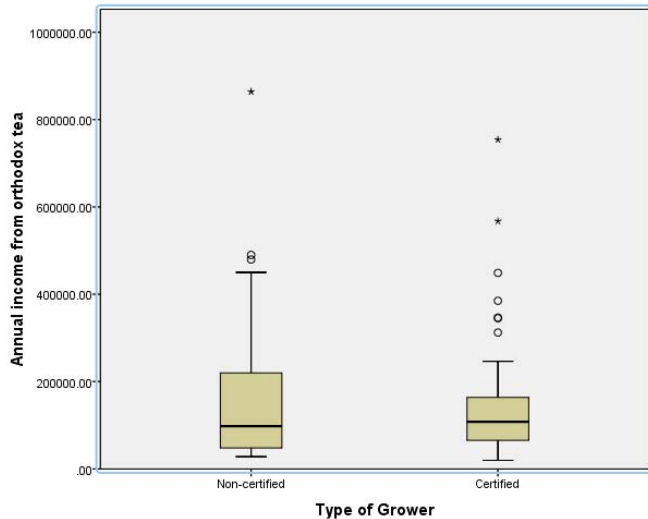


Figure 2: Annual income of HHs from the orthodox tea in the study area

3.2 Economics of orthodox tea production

The average annual productivity of the orthodox tea was found 5637.50 kg/ha. The average productivity of non-certified tea was 7791.38 kg/ha whereas it was 3483.41kg/ha for certified orthodox tea. The average cost of production of certified green tea leaves was found NRs. 50.78/kg while it was only NRs. 32.51/kg for noncertified green tea leaves production. Similarly, the finding showed the average return per kg of green tea leaves among the certified growers was NRs. 70.74 whereas it was only NRs. 41.87 for the non-certified growers, which was statistically significant. The study revealed that the benefit-cost ratio (B/C ratio) of certified orthodox tea was 1.46 while it was 1.58 for non-certified orthodox tea, which was statistically non-significant. Dhakal and Dahal also concluded that conventional tea productivity is higher than organic tea productivity but had no significant differences in profits (Dhakal and Dahal, 2016).

According to a study, the production cost of certified and non-certified green tea leaves was NRs. 35.79/ kg and NRs. 25.79/kg, respectively (Adhikari et al., 2017). The premium price of green tea leaves was higher in certified tea (NRs. 60/kg) than non- certified tea leaves (NRs. 40/kg). The marketing margin was higher in certified tea leaf (NRs. 24.21/ kg) than non- certified (NRs. 14.21/ kg). The detailed economics of production of certified and non-certified orthodox tea has been shown in Table 3.

Table 3: Economics of production of orthodox tea in the study area					
Variables	Total Average (n=160)	Certified orthodox tea(n=80)	Non-certified orthodox tea (n=80)	Mean Difference	t value
Average productivity(kg/ha)	5637.50	3483.41	7791.78	-	4308.37***
Cost of production per kg	41.64	50.78	32.51	18.26***	9.71
Return per kg	56.30	70.74	41.87	28.87***	11.64
B/C ratio	1.52	1.46	1.58	-0.12	-
Gross margin (per kg)		3827.74	5935.95		

Note: *** indicates significant at 1% level

As the study was conducted in different municipalities, the productivity and the B/C ratio of certified orthodox tea was found different for different study area. The average productivity of certified orthodox tea in the Ilam municipality was found 4630.72 kg/ha while it was only 2392 kg/ha in Phakphokthum Rural Municipality.

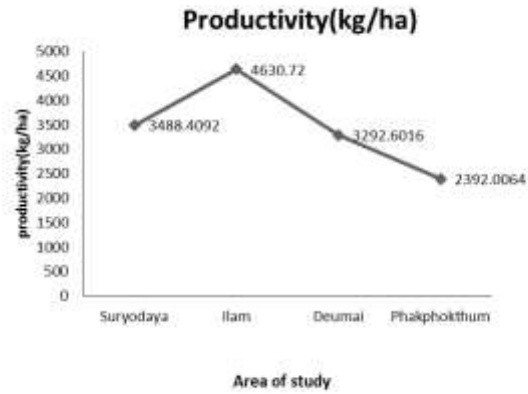


Figure 3: Productivity of certified orthodox tea in different study area

Similarly, the B/C ratio of certified orthodox tea in the Ilam Municipality was 1.8 while it was only 0.91 in Phakphokthum Rural Municipality. This wider gap is resulting in a low B/C ratio overall.

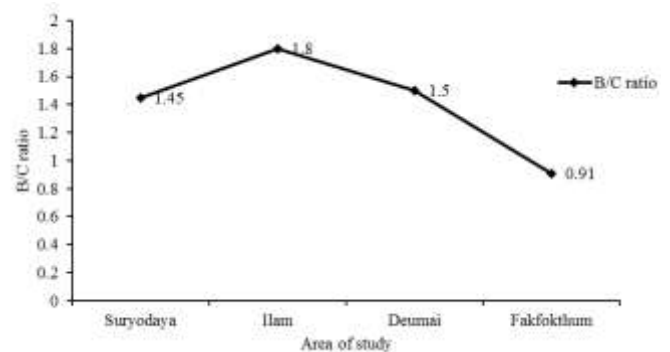


Figure 4: B/C ratio of certified orthodox tea in the study area

3.3 Value chain mapping

Value chain mapping of orthodox tea has been developed through the focus group discussions (FGD) and key informant interviews (KII). The market mapping of orthodox tea in Ilam district is presented in Figure 5.

3.3.1 Input Suppliers

Most of the farmers and tea gardens produced saplings through cutting method of propagation. Agro-vets supply the necessary inputs like fertilizers and pesticides. Certified growers used farmyard manure of their farm as a fertilizers and some of the farmers purchased fertilizers from the border of India.

3.3.2 Producers

About 10,209 small farmers and 6,943 tea gardens involved in the production of orthodox tea in Nepal. In Ilam, 6995 numbers of small farmers and 2945 tea gardens produced the tea in 2945 ha area with 2213.19 MT of green tea leaves. In total, 59% of producers followed the conventional method of production, 30% of producers were conversion producer, and rests were certified producers (NTCDB, 2017). A farmer who wanted to get certified, but did not yet belongs to cooperative, entered a cooperative as in Nepal most of the certification done by tea factories in a group through the cooperatives To obtain organic certification, farmers must decline the use of chemical pesticides or fertilizers and completely stop to use within the three years. During the first three years without agrochemical use, they are considered as in conversion and their produce is treated separately from conventional and certified produce (Mohan, 2014). In the first year, they reduce 25% of the total used of chemical fertilizer and pesticides, in the second year 75% and total abstain in last year and afterward.

3.3.3 Collectors

Majorly processors hired the local collector for the collection of green leaves from farmers with the deal of some percent of commission. Cooperatives were also involved in collection. Local brokers and cooperatives supply the collected leaves to processors.

3.3.4 Processors

There are large and medium-sized factories as well as small scale processors in Nepal. Approximately 54 tea factories involved in the processing process, out of which 19 were specialized in orthodox tea, and 35 were in CTC tea. There were 97 cooperatives with 6,200 members and some of these cooperatives have their processing units. Small tea producers and small farmers altogether had 65 processing units. These factories produced orthodox black tea, oolong tea, green tea, white tea, silver needles/tips needles, and other specialty tea. Ilam Tea Producers Pvt. Ltd. is the biggest processor of orthodox tea. Gorkha Tea Estate, Himalayan Shangrila tea producers, and Kanchanjunga Tea Estate produced and processed certified orthodox tea in the Ilam district. Only these three processing factories collect green tea leaves from certified growers with premium price. They process, and export in international markets because of which the processors had created a monopoly and offered the low price of green tea leaves. Only these factories were found supporting tea growers by providing technical and financial support for organic certification in groups.

3.3.5 Exporters

Most of the processing factories export themselves, and some firms purchased processed tea from factories/small processors and export. About 90% of the orthodox tea produced in the country was exported (Investment Board Nepal, 2017). The majority of the exported product goes to India and rest goes to countries including Germany, USA, UK, Czech Republic, the Russian Federation, China, France, Japan Canada, and Ukraine (ITC, 2017). Almost all exporters have marketing offices in Kathmandu. Some exporters also have marketing offices in Kolkata. Himalayan Tea Producers Cooperative (HIMCOOP) was majorly responsible organization to support the export.

3.3.6 Wholesalers and retailers

Several wholesalers and retailers in major cities of Nepal like Kathmandu, Pokhara, Ilam, and Jhappawere involved in chain for the marketing of tea. The wholesalers get the supply from factories as well as from small processors. About 40 tea shops were in Kathmandu and Pokhara, and departmental stores, groceries have also placed the orthodox tea both of domestic and foreign origins (SNV, 2010).

3.3.7 End consumers

Domestic consumption of orthodox tea is less but the trend is increasing and the most are exported and consumed in the international market.

3.3.8 Enablers

Different government organizations like Ministries and National Planning Commission (NPC), National Tea and Coffee Development Board (NTCDB) that mainly formulate plans and policies for the development of tea and coffee at the national level. The Government of Nepal established a "Trade and Export Promotion Centre" which is responsible for the overall development of the tea sector. The Central Tea Cooperative Federation (CTCF established at 2010) supports the producer and Himalayan Orthodox Tea Producers Association HOTPA (1998) and Himalayan Tea Producers Cooperative HIMCOOP (2003) majorly supports the processor and marketing activities. Tea Development Alliance (TDA) enhances the orthodox tea value chain by helping link efforts of various supporters and actors. Agriculture Knowledge Centre (AKC) and many I/NGO like UNNATI, United States Agency for International Development/Nepal (USAID/Nepal), Winrock International, GIZ, Japan International Cooperation Agency, Nepal (JICA), International Development Enterprises (IDE), Netherlands Development Organization in Nepal (SNV/Nepal), Tea

Sector Service (TEASEC) support the value chain development activities and the value chain, actors.

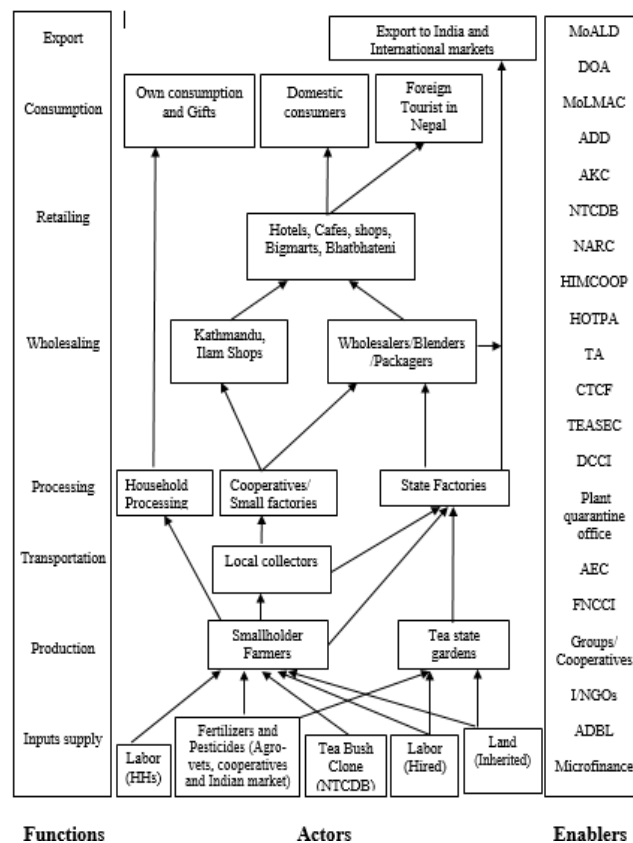


Figure 5: Value chains of orthodox tea sub-sectors in the study area

3.4 Value addition and market margins at different chain

The study revealed that the production cost of certified and non-certified orthodox green tea leaves was NRs. 50.78/kg and NRs. 32.51/kg respectively. The premium price of green tea leaves was higher in certified tea (NRs. 70.74/kg) than non-certified tea (NRs. 41.87/kg). The marketing margin was higher in certified tea leaves (NRs. 19.96/ kg) than non-certified tea leaves (NRs. 9.36/ kg). Factories purchased certified green tea leaves from farmers through cooperatives. By keeping the margin of NRs.5/kg, cooperatives sold green tea leaves to factories. At the end of the season, they also received the NRs. 3/kg bonus from factories and distributed NRs. 2/kg of green tea leaves to farmers and kept NRs. 1/kg to cooperatives itself for its development. The processing factories played an important role in the value chain of orthodox tea. To produce 1 kg of orthodox tea, it requires 4.5kg of green tea leaves. The production cost of orthodox tea at the factory level by calculating all the cost of raw material, assembling, transportation, management, customs, it was NRs. 825/kg. The profit margin to processor was NRs. 275/kg of certified orthodox tea when they sold tea at wholesale price and the wholesale price at processor level was NRs.1100/kg. In general, processing factories themselves export orthodox tea in the international market. The price of the orthodox tea differed with the country and on an average, marketing margin to exporters was started from NRs. 1350/kg. (Table 4).

Table 4: Gross margin in the chain of certified orthodox tea

Item	Producer (NRs./kg)	Cooperative (NRs./kg)	Processor (NRs./kg)	Wholesaler (NRs./kg)	Exporter (NRs./kg)
Production cost	50.78				
Purchasing cost		70.74		1100	1500
Processing cost			825		
Trading cost				50	150
Selling price	70.74	75.74		1500	3000
Selling price at the wholesale level			1100		
Margin	19.96	5	275	350	1350

3.5 Problems related to the production of orthodox tea

In the study, it was found that a shortage of labor was the major problem for both certified and noncertified growers. The major production

problems among the certified growers were low production followed by the difficulties in fulfillment of the certification requirement. Similarly, the production problems among non-certified growers were a shortage of labor, insect pest and disease, and lack of financial resources (Table 5).

Table 5: Production related problems in the study area

Problems	Certified growers (n=80)		Non-certified growers (n=80)	
	Index	Rank	Index	Rank
Shortage of labor	0.94	I	0.94	I
Low production	0.86	II	-	-
Difficult to fulfill the process of production	0.81	III	-	-
Insect, pest and disease	-	-	0.92	II
Lack of financial resources	-	-	0.70	III

Note: Problems were ranked from 1 to 0.2 in 5 point scale based on severity (1= very highly severe, 0.8= highly severe, 0.6= moderately severe, 0.4= less severe, 0.2= very less severe) identified on HHs survey

3.6 Marketing problems in the study area

The study found that major problems among certified growers were; bound to sell to specific and single returns followed by low bargaining power and the problem of local transportation. Similarly, low selling price, poor access on market information for product selling, and the problem of local transportation were major marketing-related problems among the non-certified growers.

Table 6: Market-related problems in study area

Problems	Certified growers (n=80)		Non-certified growers (n=80)	
	Index	Rank	Index	Rank
Bound to sell to specific and single factory	0.90	I	-	-
Low bargaining power	0.79	II	-	-
Problem of local transportation	0.7	III	0.73	III
Poor access to market information for products selling			0.75	II
Low selling price			0.96	I

Note: Problems were ranked from 1 to 0.2 in 5 point scale based on severity (1= very highly severe, 0.8= highly severe, 0.6= moderately severe, 0.4= less severe, 0.2= very less severe) identified on HHs survey

4. CONCLUSION

Certified orthodox tea growers were supported by cooperative and private tea processing factories. Certified orthodox tea growers can sell their products to contracted tea processing factories with a guaranteed market. But, yields were found relatively low among the certified orthodox growers due to which price premium obtained for the certified orthodox tea of almost double the non-certified tea price barely compensated for the yield difference.

In addition to production, processing and the value addition are the most profitable but this part of the value chain is done by only a limited number of green tea leaf processing factories. But these factories are facing different challenges- lack of domestic tea experts for processing of different specialty orthodox tea, lack of equipment of different capacity in factories, which results in high cost of production of processed tea even when the green leaf is in less quantity. Thus, restructuring and changing modes of production to increase the yield, capturing value-addition in the orthodox tea supply chain, and intervention to support processing

facilities and infrastructure can enhance return to actors.

ACKNOWLEDGMENTS

The authors would like to acknowledge Agriculture and Forestry University, Chitwan, and UNNATI for the financial support to accomplish this study.

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