ISSN: 2716-6678 (Online)
CODEN: FAMOCP

Food & Agribusiness Management (FABM)

DOI: <http://doi.org/10.26480/fabm.02.2020.63.67>

RESEARCH ARTICLE

ORTHODOX TEA: VALUE CHAIN ANALYSIS FROM THE PERSPECTIVE OF CERTIFICATION IN ILAM DISTRICT OF NEPAL

Pabitra Mishra*, Rishi Ram Kattel, Shiva Chandra Dhakal, Padam Lal Bhandari

Agriculture and Forestry University, Rampur, Chitwan, Nepal

*Corresponding Author Email: pabmis007@gmail.com

This is an open access article distributed under the Creative Commons Attribution License CC BY 4.0, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ARTICLE DETAILS

Article History:

Received 12 April 2020
Accepted 13 May 2020
Available online 22 May 2020

ABSTRACT

This study was conducted in the Ilam district of Nepal to identify the value chain actors of certified orthodox tea and estimating the share value of respective actors along the chain. 160 households (80 certified and 80 non-certified tea growers) from Ilam, Suryodaya, Dewmai Municipalities, and Phakphokthum Rural Municipality were selected by using simple random technique. Primary data were collected from the pre-tested semi-structural interview schedule by using KoBoToolbox, direct observation, focus group discussions, key informant interviews, and rapid market appraisal whereas secondary data were collected from journals, articles, bulletins, and reports from different organizations. This study revealed that the certified tea growers were small farmers with the total tea cultivation area 0.64 ha. The share of orthodox tea on the total annual income of HHs was 31.98%. Certified orthodox tea growers can sell their products to contracted tea processing factories with a guaranteed market. The return from certified green tea leaves was higher (NRs.70.74/kg) as compared to the non-certified green tea leaves (NRs. 41.87/kg). But yields were found relatively low among the certified orthodox growers due to which high price premium obtained for the certified orthodox tea 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 a limited number of private tea processing factories. The findings of this study indicate restructuring as well as 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, and strengthening of national brand can enhance return to actors.

KEYWORDS

Value chain, Orthodox tea, certification, export, Income

1. INTRODUCTION

Tea (*Camellia sinensis*) is a popular beverage all over the world (Ferruzzi, 2010). Being a cornerstone in the export economy of the country, is a source of foreign currency, and helpful eradicating the existing poverty, and thus for uplifting the living standard of the Nepalese farmers (Adhikari et al., 2017). Based on processing, there are two types of tea: *Camellia assamica* for crush, tear and curl (CTC), and *Camellia sinensis* for orthodox tea (Poudel, 2010). Orthodox tea is grown in high altitudes, whereas the CTC tea is grown in low altitudes or plain areas. Generally, CTC tea accounts for more than 95% of total domestic consumption whereas 90 % of orthodox tea is generally exported to international markets (NTCDB, 2019).

Orthodox tea also known as 'hill tea' or 'leaf tea' is produced by a special process in which only the top two leaves and bud from each branch ('*duee pat ek suero*') are picked and produced by hand-processing or by rolling it in the machines which mimics the hand rolling technique (Rana, 2007). In Nepal farmers used conventional and certified methods for the cultivation of orthodox tea. Orthodox tea production areas by small farmers were 9238 ha with a production of 3.18 million kg whereas tea garden production areas were 7560 ha with 2.67 million kg production (NTCDB,

2018). Mainly orthodox tea was produced in hill districts such as Ilam, Panchthar, Dhankuta, Terathum, Solokhumbhu, Udayapur, Sankhuwasava, and Bhojpur in the eastern part of the country; and Sindhupalchowk, Kavre, Makwanpur, Lalitpur, Ramechhap, and Kaski districts in the central part (ITC, 2017). Ilam alone occupies 77% of total orthodox tea production. Most of the specialty tea, like green tea, oolong tea, white tea, golden tea, silver tea, and hand-rolled tea come under the category of orthodox tea (NEAT, 2011). There are mainly four grades of orthodox tea: Leaf Grade, Broken, Fanning, and Dust.

Globalization and market liberalization has creating the huge opportunities to internationalize the agricultural products in the global market. The demand for the special hill orthodox tea has always been high in the overseas market due to its distinct naturally occurring aroma, tippy appearance, bright liquor, slightly fruity flavor, and exquisite bouquet (Yami and Khanal, 2002). But the global market demands not only the quality of the product but also environmental and social responsibility. Improper use of chemical fertilizer and pesticides by conventional growers is creating environmental issues, soil degradation, and non-tariff barriers like SPS and TBT in pursuance of the global trade regimes.

Despite of the high demand of Nepali certified orthodox tea in the

Quick Response Code

Access this article online

Website:
www.fabm.org.my

DOI:
[10.26480/fabm.02.2020.63.67](http://doi.org/10.26480/fabm.02.2020.63.67)

international market, producers failed to trap expected benefit from the orthodox tea production. Though the certification of organic products was introduced in 1996, it has not been gaining momentum in Nepal. At the national level, the norms and standards required for production, inspection, and certification of organic products have not yet been implemented except some initiatives taken by some private traders and NGOs. Some internationally recognized certifying agencies such as National Association of Sustainable Agriculture Australia (NASAA), the Institute for Market Ecology (IMO, Switzerland), the Ethical and Environmental Certification Institute (ICEA, Italy), Ecocert France, One Cert America, Organic Certification, HACCP, ISO, USDA-NOP, JAS, Organic or Fair Trade show their local presence to work on organic product certification (NEAT, 2011).

The majority of tea growers follow the conventional method of tea production (59%), while 30% of farmers were in conversion, and the rest 11% were certified growers (NTCDB, 2017). The total 15685 MT tea was exported from Nepal which was about 90% of total production (NTCDB, 2018). But out of this, 80% sold to India, and only 10% exported in other international countries and again India rebrands it after certification and sells it as their product. The Ministry of Agricultural Development (MoAD) has recently endorsed the Nepal Orthodox Tea Certification Trademark "Nepal Tea, Quality from the Himalayas" that will increase the credibility of Nepali tea in the global market and assure the competitive quality of the product (ITC, 2017). Agriculture Development Strategy (2015–2035): a long-term vision that guides the agriculture sector of Nepal has also prioritized tea subsectors for value chain development (ADS, 2014). However, there is a gap between the actors involved in certified orthodox tea production and the concerned organization. An in-depth study is necessary to identify profitability, problems, prospects, export potentiality, of certified orthodox tea. The identification of the actors involved in production and marketing, might help in identifying intervention areas for further strengthening the present condition and strengthening the certification mechanism. Hence, this study was carried out with the objectives of assessing an in-depth value chain analysis of orthodox tea from a certification perspective in the eastern Himalayan corridor of Ilam district.

2. MATERIALS AND METHODS

The major tea producing districts in Nepal are Jhapa, Ilam, Panchthar, Tehrathum, and Dhankuta which are also known as Nepal's "Tea Zone". Ilam, the largest orthodox tea producing district was purposively selected for this study. The certification based orthodox tea production was only located in Ilam, Suryodaya, and, Deumai Municipalities, and Phakphokthum Rural Municipality of Ilam district. Based on these considerations the site was selected for the study. Data were collected from a total of 160 households (80 HHs from certified growers and 80 HHs from non-certified growers). Both primary and secondary data were collected for the study. Primary data were collected through the household's interview schedule. For this purpose, a semi-structured questionnaire was prepared in KoBoToolbox (<https://ee.kobotoolbox.org/x/#YsZV>).

In addition to the household survey, Focus Group Discussion (FGD) and Key Informant Interview (KII) were conducted to poll information regarding orthodox tea production, certification, and marketing. Secondary data and other relevant necessary data were collected from the different bulletins, journals, books, reports. Analysis was done by using statistical Package for Social Science (SPSS, version 20.0) and STATA (version 12.0 software). Descriptive, and inferential statistical tools was used for the data analysis. The mapping of the value chain was done based on the marketing channels followed and analysis of the price spread at each step was evaluated. Problem ranking was done based on spread frequencies, weighted indexes were calculated for the analysis of farmer's perception of the extent of production and marketing problems of tea production. The index of importance was computed by using the formula:

$$I_{imp} = \sum \left(\frac{S_i f_i}{N} \right)$$

Where:

I_{imp} = index of importance

$\sum$ = summation

S_i = i^{th} scale value ($i=0, 1$)

F_i = frequency of i^{th} importance given by the respondents

N = total number of respondents

3. RESULTS AND DISCUSSION

3.1 Economic characteristics of households

3.1.1 Land availability and average area of tea plantation

The average cultivated land of respondents was 1.05 ha among which certified farmers reported 1.18 ha of land whereas among non-certified growers it was 0.92 ha. Total cultivated land was found statistically significant among certified and non-certified orthodox tea growers. The total tea production area was found 0.64 ha among the certified growers and 0.62 ha among the non-certified growers. The land features in the study area are presented in Table 1.

Land (hacter)	Total average (n=160)	Certified growers (n=80)	Non-certified growers(n=80)	Mean difference	t value
Total owned land	1.89	2.07	1.70	0.36	1.58
Total cultivated land	1.05	1.18	0.92	0.26**	2.16
Total upland	0.88	1.02	0.74	0.27***	2.45
Total lowland	0.15	0.16	0.13	0.03*	1.72
Tea production area	12.63	0.64	0.62	0.028	0.383

Notes: Figures in parentheses indicate percent. ***, ** and * indicate significant at 1%, 5% and 10% levels, respectively

Though total average orthodox tea cultivated land among the certified orthodox tea growers were more than non-certified orthodox tea growers, the box plot revealed that variation of total tea cultivated land among certified orthodox tea growers were higher than non-certified orthodox tea growers as both the box and inner fences of certified growers were longer than in non-certified growers (Figure 1).

Figure 1: Total tea cultivated land by sampled households

3.1.2 Households income source

Tea sector was the major source of income (31.98%) for the farmers in the study area. Apart from this, the livestock sector and remittance played a major role in livelihood in the study area. Share of agricultural enterprise in total household income was found 11.91% in an average, whereas tea contributed 31.98% of the total income of the households in the study area. The contribution of the tea sector was seen more in non-certified grower's annual household income (35.49%) than in certified grower's annual household income (28.48%). Share of different enterprises to annual household income as presented in Table 2.

Annual HH income (%)	Total (n=160)	Certified growers(n=80)	Non-certified growers(n=80)	Mean difference	t value
Tea sub-sector	31.98	28.48	35.49	-7.00	-1.88
Agriculture (except tea)	11.91	13.87	9.95	3.92**	1.97
Livestock sector	20.42	23.55	17.29	6.26***	2.39
Wage	4.31	5.61	3.01	2.59	1.29
Government service	4.065	1.06	7.07	-6.00***	2.79
Remittance	18.43	21.32	15.53	5.78	1.29
Own business	8.46	5.56	11.35	-5.79	-1.89
Other	0.39	0.51	0.271	0.23	0.54

Note: *** and ** indicate significant at 1% and 5% level, respectively

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.

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***	-6.64
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	-0.306
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 Jhapa were 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.

REFERENCES

- Adhikari, K.B., Regmi, P.P., Gautam, D.M., Thapa, R.B., Joshi, G.R., 2017. Value chain analysis of orthodox tea: evidence from the Ilam district of Nepal. *Journal of Agriculture and Forestry University*, 1, Pp. 61.
- ADS. 2014. Agriculture development strategy (2015- 2035). Ministry of Agriculture Development.
- Dhakal, S.C., Dahal, K.R., 2016. The Relative Efficiency of Organic Farming in Nepal. *South Asian Network for Development and Environmental Economics (SANDEE)*.
- Ferruzzi, M.G., 2010. The Influence of Beverage Composition on Delivery of Phenolic Compounds from Tea and Tea. *Physiology & Behavior*, 100, Pp. 33-41.
- ITC. 2017. Nepal national sector export strategy tea (2017-2021). Government of Nepal.
- Mohan, S., 2014. 'Rethinking governance of complex commodity systems: Evidence from the Nepali tea value chain.' In *Scale Sensitive Governance of the Environment*, ed. F. Padt, P. Opdam, N. Polman, and C. Termeer (UK: Wiley Blackwell), Pp. 220-240.
- NEAT. 2011. Value Chain/Market Analysis of the Orthodox Tea Subsector in Nepal. USAID Nepal: Nepal Economic Agriculture and Trade Activity.
- NTCDB. 2017. Commercial tea survey report. Retrieved from <http://www.teacoffee.gov.np/>
- NTCDB. 2018. National tea and coffee development board: Government of Nepal. NTCDB. Retrieved from <http://www.teacoffee.gov.np/>
- NTCDB. 2019. National tea and coffee development board: Government of Nepal. NTCDB. Retrieved from <http://www.teacoffee.gov.np/>
- Poudel, K., 2010. Orthodox tea production and its contribution to Nepal. *The Third Pole: Journal of Geography Education*, 34-42.
- Rana, A., 2007. Orthodox tea in Nepal: Upgrading with Value Chain Approach. *Deutsche Gesellschaft for technische Zusammenarbeit (GTZ)*.
- SNV. 2010. Cost Benefit Analysis-Production of Green Tea Leaf for Orthodox Tea. Lalitpur: SNV Netherlands Development Organization Nepal.
- Yami, K. D., Khanal, I., 2002. Organic tea farming in Nepali mountains. In: F.P. Neupane and K.M. Bajracharya (eds.) *Proceedings of International Seminar*, 6- 8 March 2002. International Center for Integrated Mountain Development, Lalitpur, Nepal.