DETERMINANTS OF ORGANIC TEA CULTIVATION AND SELECTION OF EFFICIENT MARKETING CHANNELS BY THE ORTHODOX TEA GROWERS IN NEPAL

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ABSTRACT

The trend of organic agriculture in developing countries has increased due to increasing health consciousness of consumers and high demand for organic products in developed countries. However, the rate of conversion to organic production is much slower than in other countries and the tea farmers who work hard all-around a year have not got proper market share due to several reasons. The study was conducted in Suryodaya municipality, Sakejung, Jasbire, Maipokhari, and Sandakpur area of the Ilam district by purposively and randomly selecting 160 tea farmers for questionnaire survey to determine the socio-economic and institutional factors that play a significant role in organic cultivation practice and selection of effective marketing channels. The data were collected from the interview with farmers, direct observation, focus group discussions and key informant interviews using pre-tested semi-structured questionnaires. The average gross margin per kilogram green leaf was NRs. 17.16 for organic and NRs. 13.15 for conventionally produced ones. The decision of farmers to practice organic orthodox tea production and selection of efficient marketing channel in the study areas was estimated through the Logit model. The involvement of farmers in cooperative and marketing channels followed for the marketing of green leaves and farming years significantly affected the organic cultivation of orthodox tea. The study revealed that the marketing channel; producers–cooperatives–processors–retailers–consumers was found to be the most efficient. The ethnicity, farming experience, and organic production of tea significantly affected the selection of an efficient marketing channel by orthodox tea farmers.

Keywords: *orthodox tea, socioeconomic, organic, efficient marketing*

INTRODUCTION

The need for a sustainable agriculture production system has been comprehended in the recent decade as a modernized system has an increasing toll on human health and adverse environmental effects. Organic farming is one of the best strategies for such a long-term production system with minimal impacts on the health and environment. However, the economic benefit of conversion; conventional farming practice into organic farming has been debatable. Organic farming has lower production costs because of limited opportunities to use chemicals, fertilizers, and pesticides (Gardebroek, 2006). Organic products can also fetch higher prices in the market owing to consumers' willingness-to-pay for better quality and healthier products (Roitner-Schobesberger et al., 2008). However, organic farming often results in lower yields than conventional farming, especially during the transition period (Jouzi, et al., 2017) and the cost of production in organic farming may also be higher due to the relatively high cost of controlling insect pests naturally and more labor required to implement organic farming and operate the farms (Uematsu & Mishra, 2012). But the production and productivity under organic practices are more stable and sustainable than those under conventional ones due to high organic matter content and release of nutrients from crop residues and microbial biomass (Suja et al., 2017). So, organic farming provides smallholder farmers with great opportunities to sustain their farm incomes. Owing to these facts organic agriculture is rapidly growing in all parts of the world especially in developing

countries. The organically managed land area rapidly increased from nearly 15 million in 2000 to 37 million hectares in 2009 of which roughly one third was located in developing countries (Willer, 2011). The market for organic products in those countries is not so good. But due to increasing demand for organic products in European and North American markets and their willingness to pay higher prices for organic and healthier foods enables exporters in developing countries to pay higher prices for organic products. The growth of the organic land area in developing countries was mainly based on increasing exports and demand in markets of developed countries (Parrott et al., 2006).

Nepal also has immense opportunity for organic farming and use it as a tool for the socio-economic development of the nation. Some internationally recognized certifying agencies such as the National Association of Sustainable Agriculture Australia (NASAA), the Institute for Market Ecology (IMO, Switzerland), the Ethical and Environmental Certification Institute (ICEA, Italy), ECOCERT Germany, One Cert America, INDOCERT, HACCP, ISO, JAS, etc. are working on organic product certification and market promotion in Nepal (Khanna & Tripathee, 2018). Orthodox tea is among different agriculture product that is exported and great demand in the European market. 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. The mountainous areas of eastern Nepal have peculiar weather, agro-climate, soil, and geographical conditions that favor tea plantation. Orthodox tea is a major source of livelihood and an export-oriented cash crop of the eastern hills of Nepal. The total area under tea plantation and production was 28595 ha and 24804 MT respectively in Nepal during the year 2018/19. Orthodox tea is different from CTC in taste and quality due to its peculiar production process. The plucked green leaves are withered, rolled, fermented, dried and graded to get the processed orthodox tea (NTCDB, 2020).

Government agriculture plans and policies have recognized tea as an important export commodity. National tea policy (2000), National sector export strategy tea (2017–2021), Nepal Trade Integration Strategy (2016) has identified tea as the most potential exportable commodity and the current Agriculture Development Strategy (2015-2035) has also focused on the value chain development of tea subsector. Both Nepal Trade Integration Strategy and National Export Strategy have focused on the development of the tea sector intending to increase export revenues, diversifying export destinations, and leveraging opportunities in the international market (TEPC, 2018). There is commercial cultivation of tea in 14 districts of Nepal with 9236 commercial farmers. Among them, 59% of farmers are conventional traditionally doing cultivation, 30% of farmers in the process of conversion, and 11% of farmers doing organic tea plantation (NTCDB, 2018). In Nepal, small farmers have a greater share of orthodox tea production than the state-owned tea states (USAID, 2011).

According to the NTCDB statistics, 15685 MT of tea worth NRs. 325.26 million was exported from Nepal during fiscal year 2017/18. And catering to almost all of the domestic demand, the total tea production, and the export figure is increasing each year. Orthodox tea is mainly destined for the overseas market, about 96% is exported to America, Germany, Japan, and EU countries, and the remaining 4% is consumed in the domestic market. The main consumers of Nepalese orthodox tea are foreign tourists and wealthy families due to its relatively high price (Poudel, 2014).

Despite the high demand for organic products in the global market and promising export potential, why the farmers were reluctant to adopt organic practices in production and efficient marketing channel for the marketing of the orthodox tea? The main objective of this study

was to identify the factors affecting organic tea cultivation and selection of efficient marketing channels among the orthodox tea growers in Nepal.

MATERIALS AND METHODS

Ilam was purposively selected for this study, as it is the largest and pioneer in the orthodox tea production in Nepal. The research was conducted in the Suryodaya municipality, Sandakpur, Jasbire, Sakejung, Kolbung, Maipokhari areas of the Ilam district which are supposed to be major production and processing site for tea in Nepal. These sites were purposively selected based on the area of tea plantation, numbers of tea growing farmers, amount of orthodox tea production, access to road, and working area of the funding agency. In total, there are 5582 small tea growers in Ilam (NTCDB, 2018) and the study sites are supposed to have around 2200 tea growers. Taking this as sampling frame, 80 tea growers from the Suryodaya municipality and 80 from other rural areas of the Ilam district were selected using a simple random sampling method for gathering information and data required for analysis. Furthermore, interviews with experts, processors, traders, and cooperatives working in the Nepalese tea sector were conducted to gain supplemental and deepened insights into social, economic, and political issues of tea production and marketing in Nepal from the view of stakeholders.

Data collected from the field survey and different other means were coded, tabulated in Micro-Soft Excel, and analyzed by using Statistical Package for Social Sciences (SPSS version 20.0) and Stata (version 14.2). For analyzing key characteristics of farmers, descriptive statistics and independent t-test were used for mean comparison.

Marketing efficiency

The efficiency of different marketing channels was calculated using shepherd's formula and an efficient marketing channel was determined based on shepherd ratio, price spread and producers share in the given marketing channel.

$$\text{Shepherd ratio} = \left[\frac{\text{price paid by consumer}}{\text{total marketing cost}}\right]\text{-1}$$

$$\text{or, } E = O / I*100$$

Where E is the index of marketing efficiency

O is the value added by the marketing system

I is the total marketing cost (cost + margin of intermediaries).

The higher ratio, the higher would be the marketing efficiency and vice versa.

Logit model

Binary logistic regression model has a dependent variable with two possible values such as Yes or No (0, 1). This model itself simply models the probability of output in terms of input and does not perform the statistical classification. So, the decision of farmers to practice organic orthodox tea production and adopt an efficient marketing channel was estimated using the Logit model. The mathematical form of the Logit model used was:

$$\text{Organic}_i \text{ (Yes=1)} = \delta_0 + \gamma \sum Xji + \mu \quad \text{.....(i)}$$

$Organic_i$ = adoption of organic production by farmers in the study area (Yes=1, Otherwise=0). Xji= set of explanatory variables like Age, Gender, Education, Family size, Ethnicity, Training, Cooperative involvement, Plantation area, Farming experience, Marketing channel **in the** Logit model.

μ = error term.

Similarly, the logit model used for accessing factors in the adoption of efficient marketing channel was as

Efficient$_i$ (Yes=1) = $\beta_0 + \gamma \sum Xji + \varepsilon$ ……(ii)

Efficient$_i$ = adoption of an efficient marketing channel by farmers (Yes=1, Otherwise=0).
Xji= set of explanatory variables like Age, Gender, Education, Family size, Ethnicity, Plantation area, Farming experience, Organic cultivation, Production in the Logit model
ε = error term.

RESULTS AND DISCUSSION

Population distribution

The total population of 874 were listed from 160 household surveyed with 444 (50.8%) from Suryodaya municipality and 430 (49.2%) from rest of other areas. This indicates somewhat similar distribution of the population in the study areas.

Table 1. Gender distribution of population in study area

Gender	Study area				Total	
	Suryodaya		Other areas[1]			
	Frequency	%	Frequency	%	Frequency	%
Male	216	48.65	219	50.93	435	49.77
Female	228	51.35	211	49.07	439	50.23
Total	444	100	430	100	874	100

Source: Field survey, 2018

Family size

Generally, family size of the study area determines the availability of the labors to the tea cultivation activities. The overall average family size of the study area was found 5.46, which was higher than that of national average family size (4.70) and average household size of Ilam (4.5) (CBS, 2011). The average family size of Suryodaya municipality (5.55) was found slightly higher than that of other areas (5.37).

Table 2. Family size of surveyed household by study area

Study area	Suryodaya (n=80)	Others area(n=80)	Overall	Mean difference
Average family size	5.55	5.37	5.46	0.175
Male	2.70	2.74	2.72	0.38
female	2.85	2.63	2.74	0.21

Source: Field survey, 2018

Ethnicity of the sampled households

Brahmin, Chhetri, Janajati, Dalit and Madhesi were mainly found ethic group in the study area. Majority of the orthodox tea grower were Jananjati (69.4%) followed by Brahmin (19.4%), Chhetri (10.6%) and Madhesi (0.6 %) in the study area. Similar, pattern of the ethnicity diversity was found in all areas of study. The details of the ethnicity distribution of the households are presented in table below.

Table 3. Ethnicity of surveyed households by study area

Ethnicity	Suryodaya municipality	Other areas	Total	Chi-square value
	Frequency	Frequency	Frequency	
Brahmin	10 (12.5)	21 (26.2)	31(19.4)	
Chhetri	4 (5)	13 (16.3)	17 (10.6)	
Janajati	65 (81.2)	46 (57.5)	111 (69.4)	12.92***
Madhesi	1 (1.2)	0 (0)	1 (0.6)	
Total	80	80	160 (100)	

Notes: Figures in parentheses represent percentage *Source: Field survey, 2018*

**** Significant at 1% level of significance*

Average landholding and area under tea plantation

The average land under tea plantation was 12.24 ropani in the study area and it was 11.43 ropani for organic and 16.44 ropani in the case of conventional farmers. This finding is similar to the finding of Adhikari et al. (2017), the average tea cultivated area of the households in Ilam was 11.94 ropani. There was no significant difference in the average area of tea plantation among organic and conventional tea farmers. The land features in the study area are presented in Table 1.

Table 4. Average landholding and area under orthodox tea plantation in the study area

Land (ropani)	Overall (N=160)	Organic (n=100)	Conventional (n=60)	Mean difference	p-value
Total landholding	30.26	29.97	31.71	1.73	0.850
Area under tea plantation	12.24	11.43	16.44	5.0	0.422

Source: Field survey, 2018

Economics of orthodox tea production

Farmers were cultivating orthodox tea for more than 40 years in the study area. The cultivation of tea was growing rapidly in terms of both area and production. The average annual productivity of the orthodox tea was 191.49 kg/ropani in the study areas. It was found higher for conventional farmers (409.31 kg/ropani) than for organic farmers (149.21 kg/ropani). The average cost of the production of green tea leaves was found NRs. 40.50 in the study areas. A similar finding was obtained in the study of Adhikari et al. (2017) whose average cost of green leaves was NPR 35.79 per kg.

Table 5. Economics of orthodox tea production in the study areas

Variables	Overall (NRs.)	Organic	Conventional	Mean difference	p-value
Productivity (kg/ropani)	191.49	149.21	409.31	260.16	0.000
Cost per ropani	6284.10	5824.64	8652.10	2827.46	0.003
Cost per kg	40.50	43.96	22.65	21.31	0.000
Selling price per kg	57.01	61.13	35.80	25.32	0.000
Gross margin per kg	16.51	17.16	13.15	4.01	0.019
B/C ratio	1.66	1.70	1.62	0.07	0.828

Source: Field survey, 2018

For organic green leaves, the average cost of production was NRs. 43.96 per kg while it was only NRs. 22.65 per kg for the conventional production system. Though the cost of production for organic green leaves was higher, the gross margin per kg was higher (NRs. 17.16) than for conventionally produced due to higher market price for organic green leaves (NRs. 61.13). The study

revealed that the benefit-cost ratio (B/C ratio) of organic orthodox tea was 1.70 while it was 1.62 for conventional orthodox tea, which was statistically non-significant. Similar to this study, Tiwari et al. (2017), and Pokhrel (2006), found that the benefit-cost ratio of tea cultivation was 1.72 in the Ilam district.

Marketing channels

Altogether, three marketing channels were identified that had been mostly operating for green leaves marketing in Nepal. Alike, Adhikari et al. (2017) stated that local traders and cooperatives were involved in the collection and delivery of green tea leaves to the processing factories in Nepal. Among different channels, the most prevailed channel in Nepalese orthodox tea marketing was the producer-cooperative-processors/factories.

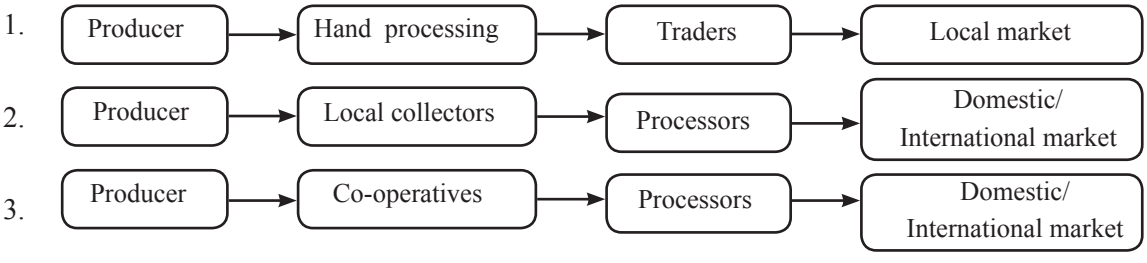

Figure 1. Marketing channels of green leaves

Marketing efficiency

Marketing efficiency was determined by using Shepherd's formula. But Shepherd's formula alone can't determine the efficiency of the marketing channel. So, price spread and the producer's share were also analyzed to determine the most efficient marketing channel for orthodox tea marketing in Nepal. The third marketing channel (producer-cooperatives-processor) was found most efficient for the marketing of orthodox tea in Nepal as it had the highest Shepherd's ratio and moderate producer's share, price spread. Though channel 1 had the highest producers share, and price spread, its lowest Shepherd's ratio made it less efficient than channel third.

Table 6. The efficiency of different marketing channels of orthodox tea

Marketing channels	Producer's share (%)	Price spread (%)	Shepherd's ratio	Efficiency Ranking
Channel 1	50	50.00	0.31	II
Channel 2	33.53	66.40	0.44	III
Channel 3	35.3	64.70	0.46	I

Source: Field survey, 2018

Determinants of organic tea cultivation and selection of efficient marketing

To identify the factors influencing organic orthodox tea cultivation and adoption of efficient marketing (channel 3) for the marketing of orthodox tea, the Logit regression model was used. Based on focus group discussion major determinants of organic selection were identified as, involvement in a cooperative, years of experience, family size, training, and cultivation area. The likelihood ratio chi-square (LR chi^2 =118.98) for the model was statistically significant at 1% level of significance which revealed the model has good explanatory power. The pseudo R^2 was found at 0.83.

The Logit model showed three variables statistically significant for organic production of orthodox tea. Cooperative involvement and marketing channel followed for the marketing of green leaves were found statistically significant at 1% level of significance and the experience of farmers was found statistically significant at a 5% level of significance.

Table 7. Factors determining organic orthodox tea production

Variables	Coefficient	Standard error	p-value	dy/dx
Cooperatives (#)	7.216***	2.318	0.002	0.384***
Education	-0.322	0.247	0.194	-0.00059
Age	-0.024	0.074	0.748	-0.00004
Gender (#)	-0.184	1.938	0.924	-0.00034
Ethnicity (#)	2.876	1.855	0.121	0.01274
Family size	0.016	0.255	0.948	0.00003
Plantation area	0.049	0.046	0.285	0.00009
Farming experience	-0.337**	0.163	0.040	-0.00062**
Training (#)	-1.97	1.799	0.273	-0.00366
Marketing channel (#)	6.556***	2.122	0.002	0.40383**
Constant	3.039	5.550	0.584	
Number of observations	= 160			
Log Likelihood	= -11.517			
LR chi^2	= 118.98			
Prob>chi^2	= 0.000			
Pseudo R^2	= 0.837			

*Note: ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. dy/dx indicates marginal effect and (#) indicates dummy variable.*

The involvement of farmers in cooperative was positively significant ($p<0.01$) on the adoption of organic cultivation practices of tea. This positive significance of institutional involvement may be due to a cooperative certification scheme in orthodox tea cultivation and training on organic cultivation through cooperative.

The marketing of green leaves directly to processing factories through groups and cooperatives was positively significant ($p<0.01$) on the adoption of organic cultivation practices of tea. Likewise, the experience of farmers was negatively significant ($p<0.05$) on organic tea cultivation. With a one-year increase in the experience of farmers in tea cultivation, the probability of adopting organic cultivation practices decreases by 0.06%. New farmers are likely to adopt organic tea cultivation than old farmers. This may be due to the reduction of productivity with time, farmers shift to inorganic cultivation. Also, most of the experienced farmers are large growers and find inorganic cultivation more profitable than organic.

The result from Logit regression for factors affecting the selection of marketing channels for the marketing of green leaves by tea farmers indicated that only cultivation practices and ethnicity are statistically significant holding other factors constant. Organic cultivation of tea was positively significant ($p<0.01$) on the selection of marketing channels by farmers for selling their green leaves. The probability to sell green leaves directly to the processor by organic farmers is 61.58 % more as compared to inorganic. This may be due to the contract of factories with organic farmers for their produce.

Table 8. Factors determining the selection of an efficient marketing channel for green leaves

Variables	Coefficient	Standard error	p-value	dy/dx
Age	-0.014	0.050	0.774	-0.0001
Gender (#)	-1.037	1.341	0.439	-0.0109
Ethnicity (#)	-3.277**	1.487	0.028	-0.0273**
Education	-0.020	0.055	0.711	0.0002
Family size	0.360	0.228	0.115	0.0038
Plantation area	-0.029	0.043	0.503	-0.0003
Organic cultivation (#)	5.995***	1.490	0.000	0.6158***
Farming experience	0.141*	0.073	0.054	0.0014*
Production	0.00003	0.0002	0.842	4.0444
Constant	0.199	4.081	0.961	
Number of observations	= 160			
Log Likelihood	= -18.706			
LR chi^2	= 66.61			
Prob>chi^2	= 0.000			
Pseudo R^2	= 0.640			

*Note: ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. dy/dx indicates marginal effect and (#) indicates the dummy variable.*

The study revealed the ethnicity of the farmer had a negative and statistically significant impact on the selection of the marketing channel. Brahmins have a 2.7% less probability of selecting an efficient marketing channel for the marketing of green leaves as compared to other ethnicities. Brahmins were more likely to sell their products through other channels than selling directly to factories or cooperatives. This may be due to the formation of cooperatives and groups by lower ethnic groups as compared to Brahmins. This finding is supported by Karki et al. (2011) who found most of the rural smallholder farmers do organic farming and supply their products directly to factories through cooperatives or groups.

CONCLUSION

Consumers are witnessing a shortage of organic products in markets of developed as well as developing countries although organic farming is one of the most flourishing segments in developing countries. Compared to environmental and health issues, economic motives play a vital role in conversion from conventional to organic production practices in countries like Nepal. So, from a practical perspective, the study finding encourages farmers to convert to organic orthodox tea production from conventional as the margin per kg, and the benefit-cost ratio is more in organic production compared to conventional. Additionally, the study was aimed to determine the efficiency of different marketing channels of orthodox tea and find out the most efficient marketing channel to expand and increase the market opportunity of Nepalese orthodox tea. The analysis showed that organic orthodox tea plantation is a profitable business and potential export commodity of Nepal to the European market. The marginal sloppy hilly areas of the eastern part of Nepal can be utilized for organic production of orthodox tea.

Channel-III (Producer – Cooperatives – Processor – Retailer – Consumer) was found to be the most prominent and efficient marketing channel. There should be joint co-ordination among the stakeholders such as green leaves producers, processing factories, and traders

for efficient marketing. A finding of the research showed that cooperative involvement, years of experience, and marketing channel plays a significant role in organic orthodox tea production. Similarly, the ethnicity of households, organic cultivation, and years of farming plays a significant role in adopting an efficient marketing channel. From the study, it can be concluded that the involvement of farmers in cooperatives helps in easy organic certification and increase the bargaining power of the farmers which finally decreases the marketing margin and makes marketing more efficient. So, farmers should be encouraged to involve in cooperatives and social organizations.

ACKNOWLEDGMENT

The authors would like to acknowledge the Department of Agriculture Economics and Agribusiness Management, Agriculture and Forestry University, Chitwan, and UNNATI Inclusive Growth Program for financial support to accomplish this study.

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