

SOCIO-ECONOMIC EFFECTS OF ORGANIC CERTIFICATION OF NEPALESE ORTHODOX TEA

P. Mishra¹ and R.R. Kattel²

ABSTRACT

Organic certified orthodox tea production has high potential of improving agrarian livelihoods, environmental sustainability, and export markets. There has been limited study on economic benefits and social impact of certified orthodox tea production. This study was conducted to identify such impacts in Ilam district of Nepal. Primary data were collected through a pre-tested semi-structural interview schedule by using Kobo Toolbox, Direct Observation, Focus Group Discussions and Key Informant, and secondary data from journals, articles, bulletin, and reports from different organizations. Data were analyzed using economic, and social-related variables in a multiple regression model to identify whether the organic certification contributed to higher household income. The study revealed that price premium received by farmers for organic certified orthodox tea was almost 1.7 times of that received for organic non-certified orthodox tea. Despite higher price available, B/C ratio in case of organic certified growers is not significantly different from that of non-certified orthodox tea growers due to extra labor input and lower yield in certified production. Certified orthodox tea growers have a guaranteed market to sell their products to contracted tea processing factories. Moreover, non-certified growers were also facing problems in credit access and due to low product marketability and selling price as well as insect pests and diseases. Hence, policy focuses on promoting organic certification and increasing yield in organic certified orthodox tea plantations are appreciative.

Keywords: Export, Income, Organic-certification, Orthodox-tea

INTRODUCTION

Agriculture is the way of livelihood in Nepal that majorly anchors economy there. The agricultural sector covers 26.5% of the National GDP employing about 65.6% total population (MoALD, 2019). Agricultural intensification based on external inputs to increase agricultural production was started in Nepal in 1960s after successful introduction of the green revolution in agriculture. This intensification, with indiscriminate use of agrochemicals, resulted in pollution of water, air and soil; degradation of ecosystems; health hazards; and economic losses (Pokharel and Pant, 2008 and 2009). Organic agriculture is one of several approaches to sustainable agriculture development practiced

1 Corresponding Author, MSc. Ag., Department of Agricultural Economics and Agribusiness Management, AFU, 9846556555, Pabmis007@gmail.com

2 Assistant Professor, Department of Agricultural Economics and Agribusiness Management, AFU, 9841373843, rrkattel@afu.edu.np

today, which is ecologically safe, economically viable, and socially acceptable (Scialabba, 1999).

Orthodox tea is also known as 'hill tea' or 'leaf tea' is produced through special process, where top two leaves and a bud from each branch (*due pat eksuiro*) are picked up and processed by hand-rolling or using machines that mimics hand-rolling (Rana, 2007). Demand for hill orthodox tea has always been high in overseas markets due to its distinct naturally occurring aroma, tippy appearance, bright liquor, slightly fruity flavor, and exquisite bouquet (Yami and Khanal, 2002). 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.

A total of 15,685 MT tea is annually exported from Nepal, which is about 90% of total production. Out of this, 80% is sold to India, and only 10% is exported to other countries (NTCDB, 2018).

As people being health-conscious, only quality assured product is high in demand. Thus, organic certified orthodox tea has high exportable potential in the international market and, for globalization, has to follow international processes (Van Der Vorst *et al.*, 2000). Nepal has received a trademark for its hill tea that when certified fulfills the international standard (NTCDB, 2018). Organic certified orthodox tea is fetching a good prices in export markets. However, producers fail to fetch expected benefit from orthodox tea despite high demand for Nepali-certified orthodox tea due to lack of certification by a national agency and laboratories testing residual level of agrochemicals. Most of the certification done by tea factories via international agency at their own cost in a group through the cooperatives (Mohan, 2016). Internationally recognized certifying agencies are National Association of Sustainable Agriculture Australia (NASAA), Institute for Market Ecology (IMO, Switzerland), Ethical and Environmental Certification Institute (ICEA, Italy), Ecocert France, One Cert America, Organic Certification, HACCP, ISO, USDA-NOP, JAS, Organic or Fair Trade (NEAT, 2011).

Organic agriculture, aiming to sustain soil health, ecosystems and people, has been developing very quickly around the world in recent years. Based on the principles of health, ecology, fairness and care, organic agriculture can contribute to environmental benefits and improve livelihoods among resource-poor, smallholder farmers. A different study showed organic certified tea production improved food security and reduced the indebtedness of farmers in India (Panneer selvam *et al.*, 2010. Eyhorn *et al.*, 2007).

In Nepal, conventional tea productivity is higher than organic tea productivity but due to low product marketability and selling price as well as insect-pests and diseases problems no significant differences in profits (Dhakal and Dahal, 2016). Organic certified orthodox tea growers can sell their products at a higher prices with a guaranteed market (Mohan, 2016). In Nepal majority of tea growers (59%) follow conventional method of tea production while 30% are in conversion, and the rest (11%) as organic certified growers (NTCDB, 2017). These reflect there is need for conversion of conventional growers to organic certified orthodox tea growers. As there has been limited empirical research regarding the actual benefits of certified organic production. This study was conducted to identify socioeconomic effects of organic-certified orthodox tea production in Ilam district of Nepal.

MATERIALS AND METHODS

Jhapa, Ilam, Panchthar, Tehrathum, and Dhankuta are major tea producing districts in Nepal that collectively constituted 'Nepal's Tea Zone'. Ilam, the largest orthodox tea producing district, was purposively selected for this study where Ilam, Suryodaya, and Deumai Municipalities, and Phakphokthum Rural Municipality were sites selected purposively considering concentration of certified orthodox tea growers and organic certification program already applied. Data were collected from a total of 160 households (80 HHs from certified growers and 80 HHs from non-certified growers). Primary data were collected through an interview schedule with orthodox tea growers³, Focus Group Discussions (FGDs), Key Informants Interview (KII), and Direct Field Observations, and secondary from studies conducted by different agencies. Analysis was done by using Statistical Package for Social Science (SPSS, version 20.0), and STATA (version 12.0 software). Data were analyzed using economic, and social related variables in multiple regression model to identify whether the organic certification contributed to higher household income. The multiple regression function estimated in the study can be expressed as

$$Y_i = \beta_0 + \beta_1 Certification_i + \phi X_i + \mu_i \quad (1)$$

Where,

Y_i = Annual household income from the tea sector (dependent variable),

β_0 = constant term,

β_1 = Coefficient of the Certification Dummy (CERTI), and

X_i = other independent variables in the regression model.

The econometric model used in the study is specified as follows:

3 A semi-structured questionnaire was prepared in KoBoToolbox (<https://ee.kobotoolbox.org/x/#YsZV>)

$$\ln Y_i = \beta_0 + \beta_1 \text{Certification}_i + \varphi \sum X_{ki} + \mu_i \quad (2)$$

Where,

$\ln Y_i$ = Annual household income from tea sub-sector (NRs. in natural log) in Income Regression Function

Certification_i = Adoption of organic certification in study area (Yes=1, 0=Otherwise)

X_{ki} = set of explanatory variables in Income Regression Function

μ_i = Error term

RESULTS AND DISCUSSION

Socio-economic characteristics of farm households: Household characteristics (such as family members and age) were almost the same in both certified and conventional orthodox tea growers (Table1). Certified growers differed from conventional producers in this study in that they organized into cooperatives and sold products for export rather than domestic markets. As a result, certified growers had advantages over non-certified growers for a higher premium price of green tea leaves, access to credit, receiving training and technical services (Chen and Scott, 2014).

Table 1. Socio-economic characteristics of certified and non-certified orthodox tea growers.

Variables	Total (n=160)	Certified orthodox tea growers (n=80)	Non-certified orthodox tea growers (n=80)
Gender(Male=1)%	90.0	93.8	91.9
Age of household head (years)	48.33	49.16	47.50
Household size	5.16	5.23	5.112
Economically active HH membe	3.58	3.48	3.687
Tea production area(ha)	0.63	0.64	0.62
Organization		Cooperative	Independent
Market orientation		Export	Domestic market

COST AND BENEFIT

Certified orthodox tea growers were supported by cooperative and private processing factories. Private processing factories made written agreement with cooperatives and farmers for organic production or not to violate the rule of organic production, provided them with training, purchased all their organic tea as well as paid total cost for certification. Yields were found relatively low among the certified orthodox growers as shown in Table 2. This is why the price premium obtained for organic tea, almost double the price available for non-certified tea, barely compensated for the yield difference. Thus, the net income and average profit from tea were not significantly different between the certified and non-certified orthodox tea growers.

Table 2. 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***	-6.64
Costof 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

Note: *** indicates significant at 1% level

As fertilizer was not used in organic certified orthodox tea production, certified growers raised more livestock than non-certified orthodox tea growers for manure. Thus, certified growers fetched significantly higher income from livestock sector (Table 3).

Table 3.Share of different enterprises in household income in the study area.

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

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

BENEFIT FROM ORGANIC CERTIFIED ORTHODOX TEA PRODUCTION

Certified orthodox tea growers have a guaranteed market to sell their products to contracted tea processing factories. Agricultural chemicals sprayed on the plants can last for years and are extremely harmful to farmers' health via contaminated air, water, and foods. As certified orthodox tea production is based on the principles of health, ecology, fairness and care, which also contributed to environmental benefits and improved livelihoods of smallholder farmers. Major benefits of organic certification of orthodox tea as felt by farmers are summarized in Table 4.

Table 4. Types of benefit reported from certified orthodox tea growers

Benefits	Index	Ranking
Price security	0.94	I
Market guarantee	0.92	II
Environmental benefit	0.86	III
High price	0.70	IV

Notes: Benefits, identified in HHs survey, were ranked from 1 to 0.2 in 5 point scale (1= very high, 0.8= high, 0.6= medium, 0.4=low, 0.2=very low)

Similarly, low selling price, insect pests and diseases, and reduced access to credit because of not being a member in any cooperative were major problems faced by non-certified growers (Table 5). Smallholder farmers often borrowed money for crop inputs (fertilizer, pesticides) at very high interest rates (Panneerselvam *et al.*, 2011) that indebted them and impacted their livelihood.

Table 5. Key Issues on production and marketing.

Problems	Certified growers (n=80)		Non-certified growers (n=80)	
	Index	Rank	Index	Rank
Shortage of labor	0.94	I	-	-
Low production	0.86	II	-	-
Problem of local transportation	0.7	III	0.73	III
Low selling price			0.96	I
Insect-pests and diseases	-	-	0.92	II
Lack of financial resources	-	-	0.70	IV

Notes: Problems identified in HHs survey 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)

IMPACT OF CERTIFICATION ON ANNUAL TEA INCOME

An income regression model was used to identify factors determining the annual tea income; estimated results are shown in Table 6.

The value of the coefficient of multiple determinations (R^2) is 63%. It indicates the variation in the annual household income from orthodox tea sector explained by the independent variables included in the Ordinary Least Square (OLS) regression model. In addition-statistic (21.54) confirms the stability of the overall regression equation and joint significant at 1% level ($P=0.000$) in explaining HHs tea income. VIF is 1.44 and none of the variables has value higher than 1.9; it means there is no multicollinearity between independent variables included in the model. Error terms are also randomly distributed.

The model revealed that organic certified orthodox tea production practice is negative and highly significant with household income from the orthodox tea subsector. Similarly, tea cultivated land (Log tea land) hacter in log, is found positively significant at 1% level to determine household income from the tea sector. As well, education was positively and statistically significant at 5% level. Other independent variables in the model such as age of HH head, gender of HH head, HH size, and access to credits were positive but statistically non-significant. Similarly, independent variables such as number of economically active members, ethnicity, and migrated members were negative but statistically non-significant.

Organic certified orthodox tea production practice had a negative relationship with HHs income due to orthodox tea. The reason behind this is a low volume sold. Although organic tea fetches a higher price per unit, the productivity is low. Méndez *et al.*, (2010) reviewed the effects of organic and fair trade certifications for coffee producers in Central America and found that farmers did receive higher prices for their product, but the volume sold per producer was quite low.

Table 6. Regression estimates for determinants of income from tea (NRs. in natural logarithms).

Variables	Coefficients	Standard error	T	P
Economic active members in number	-0.042	0.03	-1.07	0.286
Certification *Production	0.0001	0.00	2.42	0.017
Age of HH head	0.0008	0.00	0.19	0.849
Gender of HH head (Dummy)	0.168	0.17	0.98	0.330
Ethnic group (Dummy)	-0.203	0.10	-1.92	0.057
Education (Dummy)	0.267**	0.13	2.09	0.039
Household size	0.066	0.04	1.81	0.072
Livestock holding(LSU)	-0.085**	0.04	-2.34	0.021
Certification adopted (Dummy)	-0.539***	0.14	-3.60	0.000
Log tea land (ha in log)	0.865***	0.08	11.07	0.00
Migrated member (Dummy)	-0.102	0.10	-0.98	0.329
Access to credit	0.072	0.10	0.71	0.476
Constant	9.52***	0.33	28.67	0.00
F (12, 147)	= 21.54***			
Probability> F	= 0.000			
R ²	= 0.63			
Adjusted R ²	= 0.60			
Root MSE	= 0.55			
VIF	= 1.4			

Note: *** and** indicate significance at 1% and 5% levels

CONCLUSION

Certified orthodox tea growers were supported by cooperative and private tea processing factories. Certified orthodox tea growers have a guaranteed market to sell their products to contracted tea processing factories. But, yields were found relatively low among the certified orthodox growers, and price premium, almost double of the non-certified orthodox tea price, barely compensated the yield difference. Thus, the net income and average profit from tea were not significantly different among certified and non-certified orthodox tea growers. High focus must be laid on increasing production in organic certified orthodox tea plantations.

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