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Tea Cultivation and its Future Prospect in Lwang, Western Hill, Nepal

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Abstract

Tea is most commonly used famous beverage in the world. Tea plant is referred to as Camellia sinensis or Camellia assamica, the leaf is processed to produce green tea, black tea and oolong tea. In Nepal tea cultivation was started with the establishment of Ilam Tea Kaman in 1863. In Lwang, the first tea cultivation was initiated in 1996 by farmers realizing the similar physical condition similar to the Kanyam of Ilam. Research was aimed to assess the tea cultivation status in Lwang and its future potentiality in the better way. Questionnaire survey for all individual households, key informants discussion, focused group discussion, field visit etc were carried out for the study along with the collection and analysis of secondary data. Initially, 123 farmers were planted tea in Lwang in their barren and cereal crop farm. Leaving 63 households passive or with negligible product, only 60 households are active in tea cultivation and production either selling the tea leaves or preparing handmade tea for selling and house use. The significant impact of tea cultivation in Lwang is on the promotion of tourism especially in home stay and tourism activities in the area where over 10,000 internal and external tourist visits per year. Annual tea production of tea processing plant is 1801 kg which is organic and orthodox. The average cost of production is about Rs 999 per kg which is high because of huge energy consumption which consumes electricity avoiding the use of firewood. The market of Lwang tea was mainly depends on the buyer of Germany, Austria and local market. Based on the 2017 report processing plant net profit is Rs. 147,517. The tea cultivation in Lwang has attracted the farmers because it is successful, it has provided employment and income throughout the year though it requires relatively little investment mainly in initial period and more importantly, the risk of its complete failure is small. Based on local demand and suitability of land for tea farming, it has possibility to expand nearby village. Research outlined that the future expansion of tea cultivation is possible and feasible due to its physical and climatic condition. Local government, stakeholders and farmers need more attention to expand its area and marketization of production promoting brand as LWANG TEA.

Keywords: Tea cultivation, orthodox, investment, consumption, suitability.

Introduction

Tea is the most common beverage and popular than water. It is believed that China is the origin of tea. According to Chinese legend tea was accidentally discovered in 2737 B.C. when a wind blew some tea leaves into a kettle of boiling water belonging to Emperor Sheng Nung. After becoming a popular drink in China, tea was spread to Asian countries through traveling Buddhist monks. Today tea is cultivated in approximately 36 countries in three major varieties: green (unfermented), black (fermented) and oolong (partially fermented). The most important tea producing countries are India, China, Kenya and Sri Lanka but tea is also cultivated in minor quantities in the countries such as Argentina, Brazil, Iran, Vietnam, Korea, Malaysia, Thailand, Australia, USA, Mexico etc (Walker, 2002). Tea plant is a tropical evergreen, with glossy dark-green leaves. It wasn't until 1905 that tea plant received its official Latin name *Camellia sinensis*. This single plant can be processed to produce green tea, black tea and something in between called oolong tea (Benrey and Benrey, 2004). Tea, the natural plant, is botanically referred to as *Camellia sinensis* or *Camellia assamica*, meaning Chinese tea and Assam tea, and is only different in taste and character because of the arena in which it is grown, the type of soil and the altitude and climatic conditions of the area (Walker, 2002).

In Nepal tea cultivation was started with the establishment of Ilam Tea Kaman in 1863 and Soktim Tea Garden in 1865. The credit of initiating the tea cultivation in Nepal goes to the late Gajraj Singh Thapa who had imported tea seedlings and technician from Darjeeling of India. In 1985 five districts Jhapa, Ilam, Panchthar, Terahathum and Dhankuta were declared as the tea growing areas. Since then tea cultivation has accelerated. Tea cultivation was also introduced in the districts viz; Taplejung, Sankhuwasava, Bhojpur, Khotang, Udayapur, Sindhuli, Ramechhap, Dolkha, Sidhuplanchowk, Gorkha, Lamjung, Kaski etc. and other districts having the similar climatic conditions and the potentiality for cultivation of orthodox tea (Subedi, 2057). In Nepal until 2007 it is estimated that about 164 hundred hectare of lands were covered by tea plantation with the production volume of 152 million kg in total. It has provided direct employment to 40 thousand people. The climatic conditions are suitable for Orthodox tea in hilly range and Crush-Tear-Curl in Terai (NTCDB Nepal, 2008). In Nepal tea cultivation was started with the establishment of Ilam Tea Kaman in 1863 and Soktim Tea Garden in 1865. The credit of beginning the tea cultivation in Nepal goes to the late Gajraj Singh Thapa whom had imported tea seedlings and technician from Darjeeling of India. In 1985 five districts Jhapa, Ilam, Panchthar, Terahathum and Dhankuta declared as the tea growing areas thereby expansion of tea cultivation was accelerated (Subedi, 2057). Nepal Tea Development Corporation was established in 1966 by Government of Nepal to aid the development of tea industry. Originally tea leaves produced in Nepal were sold to factories in Darjeeling. Only in 1978 first factory was set up in Ilam for the processing of Tea leaves and few years later another factory was set up in Soktim, Jhapa District. From 1978 to the 1990s, various efforts were made by the Nepal Tea Development Corporation to encourage the participation of small and marginal farmers in the growth and production of Tea as a cash crop. Slowly, the stagnant Tea

industry was evolving into a fully commercialized industry, benefitting the country's economic and socio-economic development. Now tea becomes a major product to export and domestic use as well. CTC and orthodox both tea is producing in Nepal where most of the orthodox tea which has better quality and expensive is exported.

The first tea seedlings in Lwang were planted in 1996. According to the locals this creative idea regarding tea cultivation was generated after the successful implementation of community plantation and increase in greenery around the Lwang village while the non-cultivated lands at the top of the village remained barren. Annapurna Conservation Area Project (ACAP) motivated to plant in the barren along the cereal crop land to local people to replace the traditional farming system realizing the climatic condition of Lwang which is similar Kanyam of Ilam. After having been successful in growing tea, since 2001, tea cuttings are brought from Ilam and seedlings were started to produce in Lwang itself. With encouragement after getting a local handmade tea's market in Germany in 2001, the tea cooperation group of Lwang established a small scale tea processing plant in Lwang village which has become the only plant run by electricity. Thereafter, tea was produced by processing plant collecting the tea leaves from the farmers. Till to date, more than eight hundred twenty thousands of tea seedlings were distributed from ACAP for tea plantation which hoped to cover about 12 hectares of lands. However, relevant research activities that seek to appraise the real status of tea cultivation and linkages with its potentiality to the future development of tea in the region is lacking. Understanding the facts and hoping to help to fulfill the gap regarding tea cultivation and tea processing systems that may raise awareness among the tea cultivation groups, this research was initiated for those who are trying to tap tea cultivation as a means to improve their livelihood.

Methodology

This study was carried out to meet the present status and future prospects of tea cultivation in Lwang. A descriptive and exploratory research methodology is adopted. This study is depends upon the response of the respondents and former tea producer cooperative. Price values and quantities have been compared with available information of 5 to 10 years. A field study along the observation of tea processing plant is conducted accordingly. Designed all questionnaires and filled up with farmers and collected required information from the focused group discussion, key informant interviews and field and processing plant observation. Likewise required secondary data was collected and compiled then analyzed. Both qualitative and quantitative data are applied to analysis and generalize the conclusion.

Ghaderi pakha of Lwang, the initial tea cultivated area above the Lwang village was taken as the main study site of this research. Ghaderi pakha as well as Lwang village lies in the ward no. 8 of Machhapuchhre Rural Municipality of Kaski district, Gandaki Province, Nepal. Lwang village is situated at about 1400 meters from sea level. It is about 20 kilometers north from the Pokhara. It is a naturally beautiful

Gurung village located along the northeast and southeast facing slopes. Lwang village the catchment of Annapurna Tea Producer Cooperative (ATPC) of Kaski was taken as the universe for the study but due to various constraints whole universe cannot be studied because of the patience in the tea cultivation and permanent out-migration. The active tea farmers who have more than 1 Ropani land and involved directly to the tea production were taken for the study. The farmers who have less than 1 ropani land and passive in production with leaving the tea garden without any care and who are permanently migrated from the village were omitted from the study. In total 60 households were taken for the household questionnaire interview. A focus group discussion with those who are associated with tea farming was conducted to collect the necessary information to fill the gaps of information. Similarly, Tea processing plant or factory was visited and information collected from the processing plant officials according to the Checklist. Required information about the productions and expenses and other essentials data was obtained from the factory accordingly. Necessary secondary data were collected from related office and authorities.

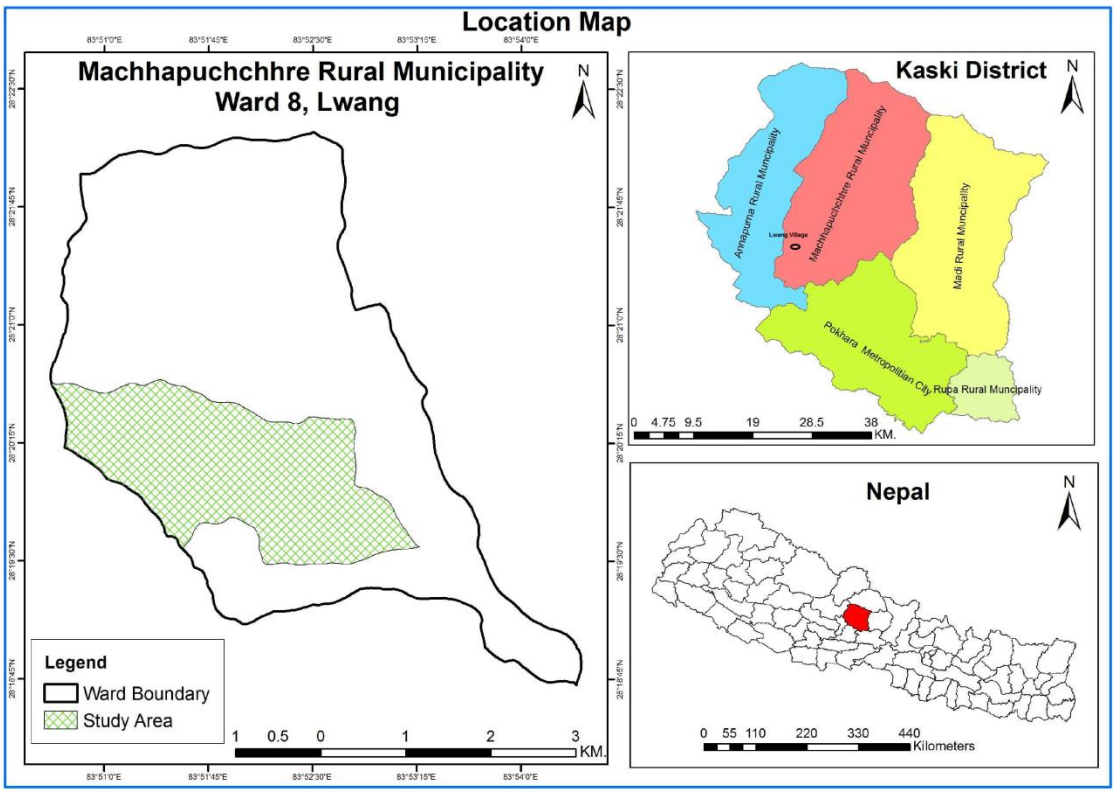

Figure: 1 Location map of study area

Results/Findings

The first tea seedlings in Lwang were planted in 1996. Tea plantation started from the barren land or abandoned. Due to the strong motivation by Annapurna Conservation Area Project and similar geographical and climatic condition of Ilam, local farmers commenced tea cultivation. These seedlings were planted in non-cultivated lands above the Lwang village as a trial. After having been successful in

growing tea, since 2001, tea cuttings are brought from Ilam and seedlings were started to produce in Lwang itself hoping that it will help provide tea saplings internally. With encouragement after getting a local handmade tea's market in Germany in 2001, the tea cooperation group of Lwang established a small scale tea processing plant in Lwang village which has become the only plant run by electricity. Thereafter ACAP has been giving more focus on tea promotion activities in and around Lwang village. Now, privatization of cooperation is in Progress.

In Nepal, more than 43 varieties of tea have been planted of mainly *Camellia sinensis* or *Camellia assamica* species. In Lwang, 7 varieties of tea seedling have been planted namely Takda 78, Takda 383, Takda 83, Gumti, Aanw adi, Tarapur and Fok Tsering dominating by Takda 78. Lwang tea either by produced in processing plant or by local people handmade is organic orthodox. Based on the last one year's income of the household, remittance dominates the income source of respondent household which is about 47 percent of 60 households following by the agriculture 17 percent and then business and homestay seems emerging income source of community. Job and services is found relatively low which about of 3 percent of each.

Tea Cultivation and Production

Landholding Pattern

Land defragmentation is found in the study area where almost tea farmers have a range of land below 30 Ropani (1.52 *ha.)* Land owned them which is 73 percent of total tea farmers.

Land Use Pattern

Most of the tea farmers have been used for paddy field which is equivalent to 33 percent and Bari for cereal crop like maize millet, potato etc is about 16 percent. It indicates the farming system of the village is still cereal crop for paddy, maize and millet. Barren or abandoned land is found quite high having 19.17 percent. Tea cultivation land is 14.82 percent of their total land. Their land is also used for plantation, fruit orchid and kharbari which now only used for grass and fodder.

Tea Seedling Plantation

Tea seedling planation was initiated in 1997 in Lwang. Hence maximum age of the tea bushes is 21 years old. It is continuously ongoing even though rate of increment is less nowadays. Average seedling plantation in 1 ropani land is about 650 numbers. Table 1 shows the 35 percent of respondent family has planted less than 2000 tea seedlings of 21 respondents. About 22 percent respondent family has planted 4000-6000 tea seedlings only 10 percent family has planted more than eight thousand tea seedlings in their own land.

Table: 1 Tea Seedling Plantation

Range of Planted Seedling No.	No. of Farmers	Percentage
<2000	21	35
2000-4000	12	20
4000-6000	13	22
6000-8000	8	13
>8000	6	10
Total	60	100

Source: Field Survey, 2018

Tea Seedling Distribution by ACAP

ACAP has been supported to the village for overall tea cultivation in Lwang. Major activity for tea cultivation by ACAP is to provide and distribution of tea sapling to the farmers along the development of its nursery. According to the table 2, more than 820 thousand tea seedlings have been distributed to the farmers of Lwang and nearby villages.

Table: 2 Tea Seedling Distribution by ACAP

Year	No of Tea Seedlings	Year	No of Tea Seedlings
1996	44,922	2007	51,680
1997	29,710	2008	38,100
1998	26,600	2009	57,555
1999	66,689	2010	11,150
2000	97,000	2011	5,950
2001	61,177	2012	10,650
2002	25,861	2013	15,000
2003	18,450	2014	8,830
2004	63,035	2015	10,700
2005	101,440	2016	6,000
2006	68,060	2017	2,000
Total			820,559

Source: NTNC-ACAP, Lwang 2018

Economic perception to Tea Cultivation

Most of the farmers or respondents agree that the tea cultivation in Lwang brought an economic change within the village mostly toward to tourism. It is become a tourism attraction and economic opportunities increased along the employment and income form the direct sell of tea. Out total, 88 percent farmers agree with economic opportunities raised by the tea cultivation. Only 12 percent of them are not agreed with the economic changes by the tea cultivation. (Table: 3)

Table: 3 Economic Perceptions

Particular	Number of Respondents	Sector	Number of Respondents	Percentage
Agree	53(88%)	Tourism	53	88
		Employment	38	63
		Direct Sell	43	72
Disagree	7(12%)	No Impact	7	12

Source: Field Survey. 2018

Household Level Income

Basically farmer sells tea leaves to the factory, sells homemade tea to visitors and consume homemade themselves. Total income of household includes all of these earning by a farmer in a year. According to the table 4, 60 percent of households' annual income is below Rs. 25,000 following the 22 percent of income range of Rs. 25000-50000. 8 percent respondents' family earn per year Rs 50000-75000, 5 percent earn Rs 75000-100000, 3 percent earn Rs 100000-125000 and only 2 percent earn more than Rs 125000 per year from tea.

Table: 4 Household Level Incomes from Tea

Income range	Number of Respondent	Percentage
<25000	36	60
25000-50000	13	22
50000-75000	5	8
75000-100000	3	5
100000-125000	2	3
>125000	1	2
Total	60	100

Source: Field Survey, 2018

According to data, household level income is dominated by income from handmade tea sell to the visitors in the village which is equal to 54 percent and 33 percent of tea is used for house and gift purpose. Only 13 percent of income of respondent households is from tea leaves selling. Average income of per households is Rs. 26,938. The cost of homemade tea is Rs. 800 to Rs. 1000 per kg, plucked tea leaves cost is Rs. 50 per kg.

Tea Processing Plant

Tea Processing Plant is established in 2003 after the positive response of homemade tea sell in Nepal and abroad. The plant is probably only one that runs by electricity in Nepal. Processing Plant or factory helps to maintain the uniform quality of tea production. There are different process and steps to prepare orthodox tea. Firstly, plucked tea leaves are put in the withering board where moisture of the leaves reduced in required level. Rolling is another process after the withering and rolled thoroughly. After completion of rolling, rolled leaves are placed for fermentation to give the required color and aroma. Fermented materials are necessary to dry in dryer panel. Then tea is ready after drying and it is sieved for the grading like SF, SFT, TGBOP, TFFOP etc. higher quality to lower.

Tea Leaves Collection and Tea Production

Tea processing work is very crucial for orthodox tea. In every year tea leaves (having two young leaves and one bud) is plucked from the topmost part of tea bushes in the end of March to October. Leaves harvesting duration covers about seven to eight months, in which most farmers plucked their tea leaves in intervals of 6-8 days from the same tea bushes. In the year 2017, 6037 kg of tea leaves has been collected by tea processing plant. Moreover, in the processing plant which is locally known as factory, has had produced in same time 1,753 kg of tea of different grades. Tea collection trend is slightly increasing. (Table: 5)

Table: 5 Tea Leaves Collection and Production by Plant

Year	Tea Leaves collection in *Kgs*	Tea Production in *Kgs*
2009	5,200	1,351
2010	5,602	1,433
2011	5,382	1,398
2012	5,524	1,413
2013	5,450	1,363
2014	5,315	1,329
2015	5,560	1,390
2016	5,745	1,436
2017	6,037	1,725

Source: ATPC Lwang, 2018

Income and Expenditure

According to the ATPC, Lwang, total income from the tea factory is Rs 1,912,867 and total expenditure is Rs. 1,765,350 standing the profit Rs. 147,517 and profit is about 7.7 percent based on the 2017 income and expenses. Main income of factory is by selling of different grade tea. Production capacity of processing plant and supply of tea leaves is unbalance because total tea produced by the plant is about 10 percent of its total capacity. Trends of both income and expenses are increasing way. It was found in some year like 2013, 2015 the profit became negative or in loss due to the low production of tea leaves due to hailstone, lack of electricity and degradation of produced tea, market problems tec. Market of tea in Lwang even in Nepal is not consistent which cause the loss of production.

Table: 6 Income and Expenditure (2009-2017)

Year	Income	Expenditure	Profit
2009	1,012,987	852,806	160,181
2010	1,074,629	871,053	203,576
2011	1,188,234	998,610	189,624
2012	1,271,509	1,080,403	191,106
2013	1,294,375	1,322,457	-28,082
2014	1,390,000	1,345,920	44,080
2015	1,500,530	1,520,495	-19,965
2016	1,592,801	1,427,197	165,604
2017	1,912,867	1,765,350	147,517
Total	12,237,932	11,184,291	1,053,641

Source: ATPC, Lwang, 2018

Trends of Income and Expenditure (2009-2017)

Trend of income is increasing along the expenses. Last three year cost benefit ratio is also improving. Factory itself manages tea farm including the weeding, pruning and plucking the tea leaves. Hence their major expenses go to the wages which is 38 percent and 30 percent to the salary of regular staffs. There is 5 working staff in the factory and tea farm. (Table: 7)

Table: 7 Expenditure Heading of Plant 2017

Expenditure Type	Amount in Rs.	Percentage
Salary	540,000.00	30
Electricity	229,510.00	13
Fuel	114,000.00	6
Wages	688,490.00	38
Other	227,570.00	13
Total	1,799,570.00	100

Source: ATPC, Lwang, 2018

Cost of production per kg organic orthodox tea by processing plant is Rs. 999 and cost of selling is 1109. Profit of tea per kg produced is Rs. 110. Past three years, tea is not exported to foreign. Production quantity of tea in Lwang is comparatively low and foreign business party need mass quantity even quality tea production. Nepali users of orthodox tea are increasing and tea produced here is easily sold to market. Tea produced in Nepal itself has problems regarding to the international market due to the lacking in quality maintain, market chain and direct access. But now, local market of Nepal and nearby cities consumed the tea produced in Lwang.

Tea Farm Management

Due to the lack of manpower and migration, farmer started to lease the tea farm to the factory. Factory started to manage tea farm itself including the weeding, clearing, pruning and plucking. But most of the farmers keep some farm themselves for home use and handmade tea. According to field study, about 75 percent farmers have leased their farm to the factory. But some of them sell tea leaves to the factory.

Future Prospects

Problems and Measures

Tea farmers and processing plant are facing some problems about the tea farm and market as their expectation in initial stage. Migration and remittance is lacking the man power. Consistent market mechanism is also another challenge for the processing plant. Limited plantation area of tea farm hindering the increment in production and cost benefit. Numbers of livestock keeping practice of farmers is scaring the manure for tea farm which result the low production of tea leaves. Some problems are recorded during the field survey and group discussion with farmers along with the possible solutions.

Table: 8 Problems and Possible Solution

Problems	Number of Respondent	Possible solution
Lack of manpower	57	Lease to factory and manage properly using applicable technology
Limited tea plantation and low production	16	Extension of tea farm initiated by farmer and tea factory
Remoteness	17	Access road construction
Manure	12	Organic manure and livestock farm development
Marketing	27	Accessing the marketing channel to foreign country as well local
High production cost	31	Management and cost effective processing plant

Source: Field survey, 2018

Respondents' views toward the role of development of tea cultivation in Lwang are focused to the farmers themselves and tea factory. Government role is important after the initiation of farmers and factory owner. Community role is moderate.

Due to the organic tea farming in Lwang, pest and disease effect is relatively low. Some farmer faced few of pest and disease and there no way to use chemical pesticides and other chemical. It is strictly banned to use of chemical fertilizer. Some disease and pests are controlled naturally and some controlled by fire and clearance. The main diseases of the tea farms are red rust and *Kalopoto and* pests are so rare.

According to the field study 14 of respondents (23 percent) faced disease and pest problems on tea farm and 46 of respondents (77 percent) have not faced the problem. This is believed that the organic farming has helped to minimize the pest and disease effects.

Foreign Market

Before establishing the tea processing plant, handmade tea was exported to foreign market. Inspiring from this, processing plant was established in 2003 investing by 16 local farmers. Until three years ago, tea of Lwang was exported to the foreign market in Germany and Austria. Tea of grade first and second grade was completely exported and rest of it consumed in local market. But it is not certified till as organic product and quantity is too small against their demand. Their interest was focused in Lwang and could not establish the business network. Tea market of Nepal is not stable and consistence due several technical problem and Tea in Lwang could be part of its impact.

Tea farm extension is possible and yield of the processing plant can be increased simultaneously which help to make wide market for the tea in foreign market. Organic practice of tea cultivation in Lwang has possibility to attract the foreign tea

business man based on the past experiment. It needs to make own brand, organic verification, maintain quality etc. to compete in the global market because foreign tea market is wide and competitive.

Supporting Agencies

Role of ACAP

Lwang village is one of the seven sectors of Annapurna Conservation Area (ACA) that expands over 6729 sq. km. and is the largest conservation area of the country. Agro-forestry has been the focus program of Lwang Sector. In 1996, the tea cultivation was initiated in the village in small scale as a pilot project and today plantation covers an area of 23 hectares. ACAP played facilitating role in all their efforts since beginning. As a part of facilitating the local initiatives, ACAP distributed more than 820 thousand tea sapling in 50 percent subsidy and free of cost to the Dalit. ACAP also motivated to the village for the tea cultivation through necessary visits, interaction along the technical support as well. It also played a role of mediator with the foreign market. Tea sapling nurseries were established and supported to farmer to do this. Technical manpower also prepared and transferred knowledge accordingly. As result, a tea processing plant is operational, tea farm is managed and a nursery has been running by them. Even though, with this all effort in tea cultivation, new motivational and extensive support is essential from ACAP for the future development and marketing. A lateral and radical coordination with government and relative organizing could be expected from ACAP in future for the sustainable development of the tea cultivation in Lwang. As it based in Lwang village, local people can take more advantage for tea cultivation, farm expansion and marketing in future as well.

Role of Government

Land use and domestic production policy of Government Federal to Local may privileged the local farmers and factory as well because of the appropriate alternative crop in the region. Government has not supported to the tea cultivation in Lwang yet. But the local government of the area trying to promote the tea cultivation in the region and support for marketing because the tea in Lwang is not only of local identity but also the whole of Machhapuchhre Rural Municipality. Cultivated land is going to barren, local productivity is decreasing and outmigration is increasing. To address these problems in future, tea cultivation in Lwang and nearby villages will be the best option with the initiation of government.

Consequences of Tea Cultivation

Tourism Development

Tea cultivation in Lwang provided villagers not only new opportunity but also earned an identity of the village in the region. It is first tea farming area of the western part of Nepal. This initiative was undertaken as a piloting measure. Now that the tea is in production with processing unit established locally. A main

attraction for the tourism has been provided by the tea cultivation and garden. Gurung culture and tradition interlinking with the scenic view of tea garden with the Machhapuchhre Himal and promotional policy of Government Nepal created an emerging tourism destination for the region. Income source of the village has diversified with the promotion of tourism and homestay. In future, it can be clearly pictured for its brightness. The users of tea produced in Lwang are increased due to the flow of visitors. Hence tea cultivation not only helps to develop the tourism destination but also create the market of produced tea. House building and construction are modified with their tradition and culture minimizing the modern design. Now 12 households are included in Lwang community homestay and one hotel is operated accordingly.

Environmental Protection

Tea plant can live to be hundreds of years old and remain firmly rooted in the ground and field. It is deep rooted and evergreen plant which gives the greenery within the area except pruned time. Tea plant itself capable to protect the soil erosion through the root and also protect from the direct rain and its erosional speed. According to the villagers, the land before tea cultivation is almost barren and abandoned and used for grazing to livestock. If land is abandoned, its degradation rate will ultimately high and soil erosion make other natural hazards also. Tea cultivation in the area is not only the source of income but support to environment by greenery, controlling soil erosion and land degradation. Likewise, farmers in this area are affected by wildlife depredation. Cereal crops are damaged by the wildlife especially maize, soya bean, rice, millet etc. raise the people wildlife conflict. Tea cultivation cannot damage by any wildlife and it gives the best alternatives for farmers. Hence it can be expected that the human wildlife conflict could be minimized by the tea cultivation along the greenery, soil conservation and control natural hazards.

Conclusion

Tea cultivation in Lwang has positive impact to the rural economy despite the various problems. Earning from the tea leaves selling, employment opportunities and tourism development is the major significance development of Lwang village. Farmers accept that it is better than cereal crop and long term income source. It has change the traditional farming system toward the cash crop farming. Migration and remittance has dominated the income source of local people resulting to hindrance in expansion of tea cultivation. Low income due to the low cultivation is the main problem. The findings of the study are as follows:

- The cultivation of tea in Lwang has positive economic impact to the farmers utilizing their barren land and cereal crop farm.
- Tea cultivation has promoted tourism in Lwang by creating the attraction in the region.
- Tea cultivation expansion is possible due to the attitude of local people and feasible geographic and climatic condition.

- Handmade tea is also attraction for farmers due to high earning than tea leaves selling to the factory.
- Farmers planted tea only in their 12 percent land of total holding which is less than barren. But there is possibility to expand tea cultivation on that.
- Production cost of tea processing plant is high which is about Rs. 999 comparing to the cost of sell Rs. 1109 per kg due to the electricity based processing along the high yield capacity plant. And yield of tea leaves from the farm is low due to the inadequate manure and care.
- Average earning from tea cultivation of each household is about Rs. 26,000 per year which is comparatively low.
- Tea farmers started to lease their farm to the factory owner due to the lack of manpower. Because of family members 53 percent live outside of village either in Nepal or abroad.
- Farmers and factory owner initiation toward the development of tea is crucial to the development tea cultivation in Lwang along the government support. Government has not supported to tea cultivation in Lwang yet.
- Marketing of tea seems not organized and proper managed which is a similar problem of whole Nepal tea industry.
- Lwang tea has not certified as Organic product due to nominal product and lack of initiation.

Recommendation

Tea cultivation provided villager not only a new opportunity but also earned new identity in the region. Tea farmers and other villagers are benefited directly and indirectly. Development of tea farming and production could be permanent income source for all. All stakeholders should be focused toward the development of tea in Lwang for income generation and tourism development simultaneously. Some problems can be solved in local farmer level and some critical problems should to solve with the strong coordination of community, factory and government. Some suggestion to improve the tea cultivation can have listed as:

- Tea cultivation area is low as compare to available land of farmers. Expansion of tea cultivation should be carried out with applying proper land use policy of government, management policy of tea processing plant owner and motivation of farmers.
- The tea yield at present is very low but with production of adequate fertilizer at local level and its regular application and proper management can increase tea yield by three folds. Therefore, overall attention should be given to obtain organic fertilizer and timely required application. So establishment of the entrepreneurs that produce organic manure and pesticides at local level should be emphasized.
- Energy consumption for tea processing is very high which is aggravated by often inefficient operation and may improper fittings of the machines. This has clearly supported for the raising of production costs. Therefore, immediate restructuring of energy supply mechanism particularly the heater

and dryer, should be done and temperature reading mechanism should also be maintained during processing for efficient operation of energy consumption and improved production quality.

- Marketing of tea should be improved through publication and establishment of marketing network. ATPC or factory owner should be developed a permanent international and local retail market. A website needs to be created for advertisement of its products to international market.
- The availability of certified organic products helps to compete in the world tea markets and to receive the premium price. Therefore, tea product of Lwang should be certified from organic certification agency.
- Farmers who are migrated or have barren and abandoned land should be utilized by providing to appropriate other farmers or factory owner in lease.

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