

Research Article**VALUE CHAIN ANALYSIS OF LARGE CARDAMOM IN EASTERN HIMALAYAN ROAD CORRIDOR OF NEPAL: TRADE AND GOVERNANCE****R. R. Kattel*, P. P. Regmi, M. D. Sharma, and Y. B. Thapa**

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ABSTRACT

Large cardamom (*Amomum subulatum* Roxb.) is exportable high value sub-sector of Nepal producing to sell in targeted international markets. This research was done to examine value chain analysis of large cardamom from governance and trade aspects, focusing on value chain map, export scenario, and technology upgrading in eastern Himalayan road corridor (EHRC) of Nepal. Farm level information was collected from Taplejung, Jhapa and Morang districts using set of questionnaire (n=300). Focus Group Discussion, Key Informant Interview and Rapid Market Appraisal were done with enablers and traders. About 32% samples household were commercial farmers having one or more than one hectare cardamom cultivation land. About 27% households used improved dryer for curing and drying whereas majority used (72%) traditional dryer. The cost of production of one kg cardamom was estimated NRs. 656, and farmers received NRs. 344 profit margin from one kg of large cardamom sold at farm. Due to global price fluctuation, price of large cardamom has been declined drastically, although farmers are still in profit with B/C ratio of more than 1.4. The findings revealed that value chain development of large cardamom is not well structural at function, actors and enablers level whereas village/district level collectors, regional and national traders with their association and exporters were performing better marketing instead of governance of small scale producers. About 90% large cardamom was exported to India.. Nepalese traders have a poor capacity and governance to export product in other countries than India due to high entry barrier to global market. There is a potential of forming global value chain development alliance, focusing to financing and upgrading strategy that would be pivotal for large cardamom intervention strategy in improving value chain function.

Key words: Competitiveness, market, trade, commercial farmers**INTRODUCTION**

Large Cardamom (*Amomum subulatum*, Roxb.) is a perennial herbaceous spice crop of Zingiberaceae family, which is known as *Alaichi* in Nepali and renowned as Black Gold and Queen of Spices. Large Cardamom is cultivated in the Sub-Himalayan region of North Eastern India, Nepal and Bhutan. It is grown in cold humid conditions under shade of trees at an altitude between 800-2000 meters above sea level with an average precipitation of 3000-3500 mm spread over about 200 days and with temperature ranging from 6-30°C. Economic yield starts from third year onward after its plantation and its optimal yield period is 8-10 years. The total life span of large cardamom plants is about 20-25 years. There are sixteen varieties of cardamom in the world. Among them five types of large cardamom are in farming practices across Nepal, namely, *Ramsey*, *Golsey*, *Sawney*, *Chibesey*, and *Dammersey*.

Large cardamom is the high value cash crop and main source of cash income for farmers in eastern Himalayan region. It is one of the highest export revenue earning products of Nepal. The International Centre for Integrated Mountain Development (ICIMOD, 2016) reported that over 21,960 households in 37 districts are engaged in its farming in Nepal. Presently, Nepal is the largest producer of large cardamom with 68% share in the market, followed by India (22%) and Bhutan (9%). Nepal is the largest exporter of large cardamom in the world and it exports about 95% of the produce to India alone (ICIMOD, 2016).

Large cardamom, also called as black cardamom is primarily used in savory rice and meat dishes in Pakistan and India. Black cardamom from Nepal traded at about US \$ 20/kg while cardamom from other origins, for example Vietnam, trades at around US \$ 5/kg (ICIMOD, 2016). According to a new report, 5,100 t of large cardamom were exported in 2012/13 which was reducing and only 3,477 t in 2016/17 from Nepal to overseas market (LCEAN, 2018). Taplejung, Panchthar, Ilam, Sankhuwasabha and Terathum are the major cardamom producing districts producing over 80% of the total national production. Out of the total production, Taplejung district shares about 38.2% alone (MOAD, 2017).

Large cardamom is an economically important low volume high value crop due to which, most of the farmers in this region have shifted to the large cardamom cultivation. Compared to the traditional crops, the income from large cardamom is three to four times higher (SNV, 2008). This increased the family income and

enhanced the livelihood of the people in rural community. Some farmers are doing organic cardamom farming but this organic cardamom is not in certified. According to MOAD (2016), Taplejung is the largest producer (total area: 4,500 ha; productive area: 3,950 ha; and total production: 1,410 t), followed by Sankhuwasabha (total area: 3,770 ha; productive area: 2,770 ha; total production: 1,108 t), Panchthar (total area: 2,170 ha; productive area: 1,711 ha; total production: 636 t), Ilam (total area: 1,509 ha; productive area: 1,132 ha; total production: 520 t) and Trehatum (total area: 710 ha; productive area: 627 ha; total production: 247.5 t). Potential districts of large cardamom production in Nepal are Taplejung, Panchthar, Ilam, Tehrathum and Sankhuwasabha districts (Durbar & Nepal 2012),

Value chain analysis encompasses the full range of activities and services required to bring a product or service from its conception to sale in its final markets – whether local, national, regional or global (Chapagain et al., 2014). The main objective of the Global Value Chain Analysis (GVCA) of large cardamom based on the study of Chapagain, Pathak & Rai (2014) and many literatures to provide comprehensive information for market and social benefits by determining various constraints for its cultivation, post-harvest technologies/processing, market access, branding and potential expansion opportunities in its value chain in global context.

The Agriculture Development Strategy (2015-2035) has also focused and prioritized large cardamom in 12th sub-sector among fifteen identified sub-sectors for agribusiness development through value chain approach in Nepal (MOAD, 2014). But, in-depth study is necessary to identify profitability, problems, prospects, export potentiality and reason behind the reluctant to production, and export promotion of large cardamom in global niche markets of India, Pakistan, Sri Lanka, Gulf Countries as well as western market hubs as well. This could help farmers to overcome with the related problem and attract towards market promotion. This results in upliftment of living standard of farmers and speed up the economic growth of the Nepal. In recent year, the price of large cardamom has been declining and cardamom farmers are more vulnerable in the context of unstable market price.

In this context, value chain analysis of large cardamom from eastern Himalayan road corridor was assessed to identify binding constraints, opportunities and threat as well as factors driving production and marketing in competitive environment of production in niche based market horizons.

The broad objective of this study was to analyze the value chain of large cardamom in global market competitiveness in eastern Himalayan road corridor of Nepal from trade and governance aspects. However, the specific objectives were to analyze value chain mapping of large cardamom in eastern Himalayan road corridor; to assess market channel and margin sharing in large cardamom market; and to investigate opportunities, challenge and intervention strategies of large cardamom production and marketing.

MATERIAL AND METHODS

Research Design

Both quantitative and qualitative data were collected from Phungling Municipality, Taplejung during March to June, 2019. Cross sectional data were collected from semi-structural questionnaire with 300 large cardamom producers using simple random sampling technique. The sampling framework was prepared from total household population of 2993 those who were producing large cardamom (50% of the total 5986 households were producing large cardamom in Phungling municipality). Total 10 percent samples were taken from targeting sampling framework using lottery method in simple rand sampling technique. In addition, primary data were collected from Rapid Market Appraisal (RMA) with village, district and regional level large cardamom collectors/exporters in Taplejung, Jhapa (Birtamod) and, Sunsari (Dharan Bazaar) and Morang (Biratnagar), Focus Group Discussion (FGD) with small scale and commercial cardamom producers and Key Informant Interview (KII) was conducted with Municipality, Agriculture Knowledge Centre (AKC) and large cardamom producers and traders association. Furthermore, secondary data were collected related to area, production, yield and export trend of large cardamom in eastern Himalayan road corridor from various sources.

Data collection and analysis

Data were entered and edited in SPSS software and analysis was made in both SPSS and Stata software (version 13.0). Farmers were categorized in two group based on available data and land allocated for large cardamom production: (i) large scale farmers¹ having 1 ha and above land allocated for large cardamom production

¹ Large scale farmer (commercial farmer) is defined having one ha. or more than one ha. of land allocated for large cardamom production in study area where large cardamom is high value export oriented commodity in Nepal. The average land holding for large cardamom production was about 17 ropani (0.85 ha) ranging from one ropani to 190 ropani per household

and (ii) small scale (smallholder) farmers having less than 1 ha land allocated for cardamom production. Mean and frequency comparison were done based on type of large cardamom producers whereas value chain analysis, cost-benefit analysis post-harvest adoption measure adoption, trade analysis and intervention strategy required to promote large cardamom sub-sector in Nepal.

RESULTS AND DISCUSSION

Socio-demographic and economics characteristics

Out of 300 sampled households, about 32% were commercial large cardamom producing farmers having 1 ha and above upland allocated for production whereas 68% were smallholders (small scale farmers) having less than 1 ha land allocated large cardamom production in study areas. The average age of the household head was 35.19 years whereas an average year of schooling was 4.02 years which was found higher among commercial producers as compared to smallholders and it was statistically significant at 1% level. The average family size was 5.9 members whereas about 3.8 economic active household members were found. Total land holding was 22.28 ropani which was statistically significant different and found higher among commercial farmers (40.4 ropani) as compared to smallholders (13.88 ropani). An average land allocated for large cardamom production was 17.01 ropani which was highly significant different among commercial (35.57 ropani) and smallholders (8.42 ropani) farmers. Annual household income was NRs. 381,870 which was statically significant different and found higher among commercial farmers (NRs. 551,997) than smallholders farmers (NRs. 303,030). Average annual household income from large cardamom was NRs. 242,449 with share of about 60% total household income and also found higher among commercial farmers. The average production of large cardamom in 2017/18 was 194.8 kg which was significantly different among commercial farmers (349.2 kg) than smallholders (122.4 kg).

Table 1. Socio-demographic and economic variables by types of large cardamom producers

Variable	Average total (N=300)	Commercial Farmers ¹ (n=95)	Small scale farmers (n=205)	Mean difference	t-value
Age of the household head (Year)	45.19	46.82	44.43	2.39	1.634
Education (Years of schooling)	4.02	6.51	2.86	3.64	7.905***
Family size	5.90	5.94	5.88	0.54	0.211
Economically active HH members (15-59 years age group)	3.84	4.16	3.69	0.45	2.219**
Total own land (Ropani)	22.28	40.40	13.88	26.52	9.539***
Cardamom cultivated land (Ropani)	17.01	35.57	8.42	27.15	14.310***
Total annual HH income (NRs.)	381870	551997	303030	248967	4.881***
Annual HH income from cardamom (NRs.)	242449	381800	177858	203941	4.305***
Annual HH income shared by large cardamom (%)	60.04	67.39	56.63	10.76	3.038***
Cardamom production (kg)	194.8	349.2	122.4	226.8	9.597***

Note: *** and ** indicate significant at 1% and 5% levels, respectively. Source: Field Survey, 2018/19

Global value chain map of Nepalese large cardamom

The emergence of global value chain (GVCs) presents both opportunities and challenges to developing countries. They can benefit from inserting into a GVC through specializing in one stage of the production, or task, which can provide a fast route towards global integration. However, participating in a GVC means overcoming barriers to entry, and climbing the value chain can be a challenge for least developed countries (Nissanke, 2010). Some GVC governance structures can facilitate this process but others may hinder it (Keane, 2013).

This structure may arise when a few buyers can source from many suppliers, reducing the latter's bargaining power. Suppliers to captive GVCs may also find themselves less facilitated in functional upgrading, compared to process/product upgrading. The upgrading processes of low-income/least developed country firms in GVCs

depend not only on conventional development policies (e.g., skills, technology, and investment policy) but also on the way in which firms interact across borders, which governments can influence in the interests of promoting development (Basnett & Keane, 2013)

Wignaraja, 2013) posed an interesting question: can small and medium enterprises (SMEs) participate in global production networks? This is of the utmost relevance for a country like Nepal, where the private sector is overwhelmingly dominated by SMEs. In examining SMEs in the Association of Southeast Asian Nations (ASEAN), Wignaraja (2013) found that the following factors determine their participation in global production networks:

1. foreign equity;
2. access to parent's accumulated learning experience of export production, sophisticated,
3. technologies and management experience;
4. levels of human capital and an educated workforce;
5. international quality certification; and
6. access to commercial bank credit.

Wignaraja (2013 p. 301) reported that a "high degree of trust among firms is regarded as a critical ingredient for developing market-led production networks ... it encourages positive collective action behavior among firms—such as sharing of sensitive information, pooling of technical knowledge and joint production and marketing activities- which is critical in technologically intense, efficient production networks."

Value chain map of large cardamom is presented in Figure 1. Major function of large cardamom were inputs, service provision, cultivation, harvesting, post-harvest handling (drying, curing, tail cutting, sorting and packaging) and marketing from major production districts in eastern Himalayan corridor to export point of Birtamod and Biratnagar. About 90% Nepalese large cardamom exported to India and from India, about 45% Nepalese cardamom exported to Pakistan. Only 10% large cardamom was supplied in domestic markets in Nepal.

Large cardamom was harvested when the capsules were fully matured. This was usually done during September to November, depending on the altitudes and cultivars. Capsule maturity was commonly assessed by opening the topmost capsule of a spike. Ripening of large cardamom capsules on a spike was not uniform, however; the topmost capsules ripen first and those on the bottom last. The harvested cardamom was dried mostly in the traditional dryer using locally available woods as a fuel to heat the furnace. The head and tail of the dried cardamom was removed using scissors and brought to the nearby markets. In Taplegunj, about 32% famers used improved dryer for curing and drying of large cardamom.

The large cardamom postharvest value chain consists of growers, collectors, traders, and exporters. The primary processing steps required by the present market were curing, tail cutting, and grading. Curing was carried out by the farmers, and the remaining steps were done by wholesalers. In Nepal, large cardamom was marketed to village traders, road head collectors (local collectors), regional traders, national traders or exporters, and finally buyers and consumers abroad.

Cardamom produce collected by local collectors were occasionally graded, packed and sold to regional traders and sometimes stored and sold to Birtamod wholesalers in considerable volume. Collected produce was priced according to Birtamod price and provided to the farmers through their respective agents. Some districts traders also graded their collected produce by removing the tail and according to size before sending to Birtamod wherever necessary.

Wholesalers collected cardamom produce from different districts traders and collectors trading by grading, packaging, storing and transporting to the export point – Jogbani/ Biratnagar. This is an international marketing point of cardamom. They grade their cardamom into three categories as Jumbo Jet (JJ), Standard type/Super Deluxe (SD) and usual type (see below pictures) making price variation to the producers as well as for quality selling. Whereas tail cutting, lower moisture (<12%) and bigger size capsules selection fetch the highest price. At present scenario, Nepalese cardamom's traders or wholesaler are not in a position to export the goods directly to the third countries. Hence, Nepalese cardamom exported to the international market via India and Pakistan. Consequently, it makes India as a major market for Nepalese cardamoms so that more than 90% of cardamom exported to India through Birtamod port (Khatri-Chhetri & Upreti, 2017).



Furthermore, district traders or wholesaler can be found in two types. Firstly, those who were directly selling the products to India and another were those who export the products after some refinery process. These processes included further grading (tail cutting), sizing (according to the size of capsules), polishing, and packaging (as per buyer's demand) for some quality improvement. They also managed the transportation from Birtamod to Biratnagar/Jogbani border crossing point. After all the documentation and customs clearance, the cardamom transported to the Siliguri, Delhi and other parts of India (ITC/GoN, 2017). From India, about 45% Nepalese large cardamom is being exported to Pakistan, remaining of few exported in Golf countries and eastern markets and half of large cardamom imported from Nepal is being consumed in India.

The government bodies like Ministry of Agriculture and Livestock Development (MOALD), Ministry of Industry, Commerce and Supplies (MOICS), Department of Agriculture (DOA), Department of Food Technology and Quality Control (DFTQC), Trade and Export Promotion Centre (*), Ministry of Finance (MOF)/Department of Custom (DOC), Agriculture Knowledge Centre (AKC), Municipalities, Agriculture Input Centre (AIC) were working as enablers in the study area. Similarly, Nepal Agricultural Research Council (NARC), non-government bodies like Non-Government Organizations (NGOs), The International Centre for Integrated Mountain Development (ICIMOD), UNNATI-Inclusive Growth Project, Large Cardamom Entrepreneurs Association Nepal (LCEAN), Cardamom Development Centre (CDC), Agriculture Cooperatives, Saving and Credit Cooperatives, private sectors like Federation of Chamber of Commerce and Industry (FNCCI), nursery growers, individuals (Local traders), infrastructures, rules, and policy, pocket package system were the enabling agents and policies existed in the value chain of Large Cardamom. The marketing cost of large cardamom from farm to national retailer was NRs. 183/kg whereas market margin was NRs. 650 to local collectors and other traders associated in large cardamom trading. The price spread was NRs. 650/kg whereas market efficiency and producer share were 1.20 and 60.6%, respectively (Table 2).

Table 2. Selling price, marketing cost, margin, price spread and market efficiency of large cardamom

Operations	Farmers	Local collectors	District collectors	Wholesalers	Retailers
Selling price (NRs./kg)	1000	1150	1300	1500	1650
Marketing cost (NRs./kg)		18	55	90	20
Margin (NRs./kg)	344	150	150	200	150
Price spread (NRs./kg)	650				
Marketing efficiency	1.20				
Producer share (%)	60.60%				

Sources: Rapid Market Appraisal, 2019, HH survey, FGD and KII

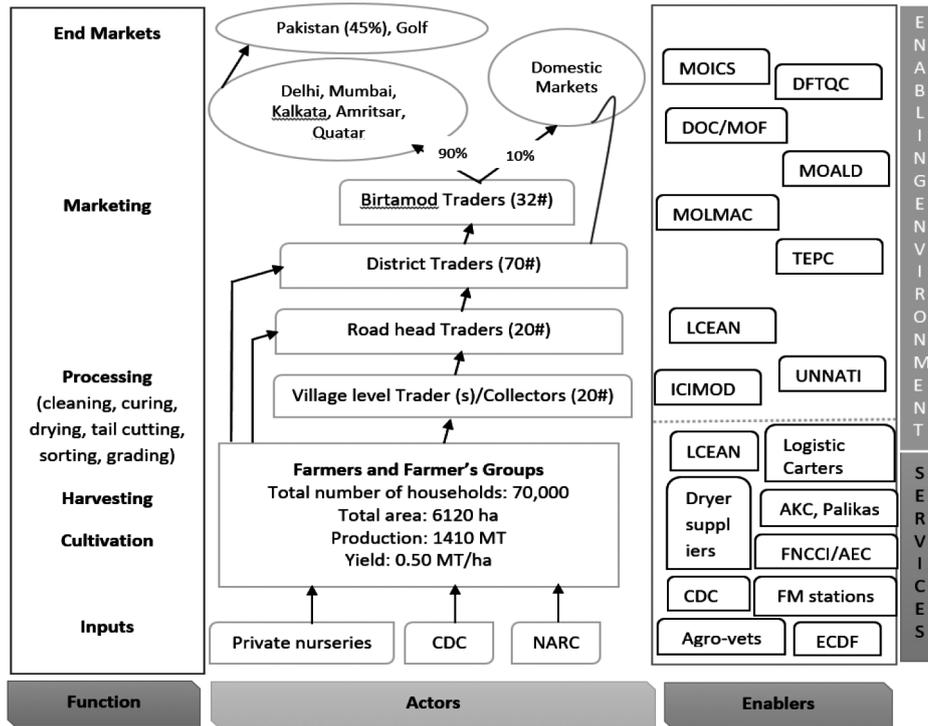


Figure 1. Global value chain map of large cardamom focusing from Taplejung district

Market channel and market share of large cardamom in Nepal

The average area under the cardamom farming per household in the study area was 17.01 ropani² (range 1 to 190 ropani) per household. The physical yield was harvested at the level of about 5 to 35.5 kg per ropani but extremely vary among the context (planting year, crop performance, management practices, inputs use, slope and aspect etc.) Farmers sale almost all the products except few farmers grind into the powder form and mixed with the spice powder, often sold to the local market with the very low post-harvest loss. The total cost of production for one ropani was about NRs. 94,000 (within fifth years), which resulted the cost of production of 1 kg cardamom was estimated NRs. 656 and recent selling price was NRs. 1,000/kg. So, farmers were receiving NRs. 344 profit margin from 1 kg of large cardamom sold from farm level. Till 2016, farmers sold cardamom at NRs. 2,250/kg and they received NRs. 1,594/kg profit margin which was about 71%. Due to global price fluctuation³, price of large cardamom has been declined drastically, although farmers are still in profit with B/C ratio of more than 1.9:1. The net present value is positive and internal rate of return (IRR) is 23% which is greater than required rate of return (RRR). These all estimate of cost and returns are presented in Table 3.

2 19.65 ropani =1 hectare; 1 ropani = 508.74 square m

3 Global market fluctuation of large cardamom due to lowering of price of Indian large cardamom, increased in supply from other countries, barrier to entry to international market, lower consumers' preference and actual price fixation.

Table 3. Cost advantage and other economic statements of the large cardamom in study area

Particulars	Unit	First Year	Second year	Third Year	Fourth Year	Fifth year	Total
Area	Ropani	17.01					
Production	kg	0.00	245.11	596.88	607.43	607.43	
Yield	kg/Ropani	0.00	14.41	35.09	35.71	35.71	
Cost ²	NRs./Ropani	36390.00	10700.00	10720.00	17120.00	19120.00	
Marketed surplus	kg	0.00	14.12	34.39	35.00	35.00	
Price	NRs./kg	1000.00	1000.00	1000.00	1000.00	1000.00	
Intercrop gross margin	NRs./Ropani	1000.00	0.00	0.00	0.00	0.00	
Uttis (wood)	NRs./Ropani	0.00	0.00	0.00	0.00	15000.00	
Gross revenue	NRs./Ropani	0.00	14122.81	34385.96	35000.00	50000.00	
Gross margin	NRs./Ropani	-35390.00	3422.81	23665.96	17880.00	30880.00	
Average cost	NRs./kg		742.49	305.52	479.36	535.36	
Discounted cost (12%)	NRs./Ropani	32491.00	8530.00	7630.00	10880.00	10849.00	
Discounted benefit (12%)	NRs./Ropani		11259.00	24475.00	22243.00	28371.00	
NPV		-27212.00	2729.00	16845.00	11363.00	17522.00	21247.00
IRR							23%
B:C ratio		0.20	1.30	3.20	2.00	2.60	1.90

Source: Authors' estimation based on FGDs and field observation.

The profit margin of exporters were estimated for various quantities (50 kg, per kg, 150 sacks, 300 sacks) to show that even at low margin traders make profit due to volume sales. Farmers benefited more with gross profit margin of 71%. There were a low transaction volume in terms of few kilograms. Farmers were scattered and deal in low quantity. Hence, traders have taken the opportunity to work as collectors by collecting cardamom from the nearby farmers and even with 4% profit margin he/she could earn about NRs. 0.68 million to NRs. 1.372 million in small (150 sacks) and large (300 sacks) consignment. Similarly, a high profit margin (10%) for Birtamod traders and there were risk during transportation until it was sold in the Delhi market (Figure 2).

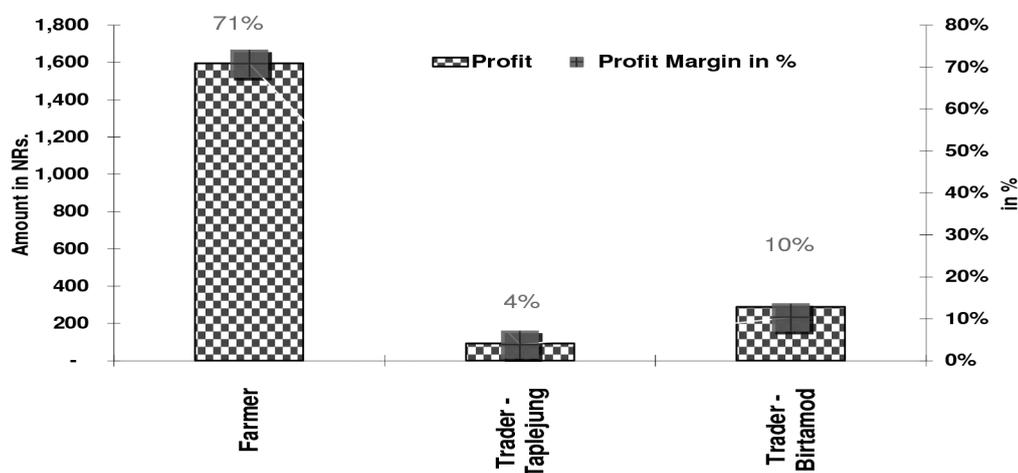


Figure 2. Profit margin at various stages of the cardamom value chain actors

Postharvest functions of large cardamom

Curing, drying, storage and processing of large cardamom by farmers type in study area are presented in Table 4. About 27% large cardamom producers used the improved method⁴ of curing and drying whereas 73% used traditional method⁵ in the study area. The use of improved dryer was found higher among commercial farmers (49.5%) as compared to smallholder farmers (16.8%) which was found statistically significant difference at 1% level. About 19% farmers adopted the crops/income diversification practices in cardamom farm growing fruits (kiwi, banana, citrus, etc.) which was found higher among commercial farmers (32.6%) than smallholder farmers (13.2%). About 0.3% farmers used solar drying and 80% used wood fired drying for curing whereas 1.3% used for electric or gas drying in study area. About 7% farmers used bamboo basket for storage, 66% used air tight sacks and 10% used spread in naked floor for storage of large cardamom at farm level. About 73% farmers used cardamom cleaning, 62% for curing and 4% for tail cutting in the study area. About 22% farmers used grading, 1% grinding of large cardamom from processing. Eight percent of farmers did size grading, 24% did color grading, 18% for boldness grading and 7.7% did fairness grading in the study area (refer Table 4 in details).

Table 4. Curing, drying, storage and processing of large cardamom by farmers type

Variables	Commercial farmers	Smallholder farmers	Total	Chi Square Value
Curing and drying method				
Improved kiln	46 (49.5)	34 (16.8)	80 (27.1)	34.307***
Traditional kiln	47 (50.5)	168 (83.2)	215 (72.9)	
Crop/income diversification at cardamom farm (Yes)				
Used solar drying for curing (Yes)	1 (1.1)	0 (0.0)	1 (0.3)	2.165
Using wood fired drying for curing (Yes)	61 (64.2)	178 (86.8)	239 (79.7)	20.503***
Using electric/gas dryer for curing (Yes)	4 (2.0)	0 (0.0)	4 (1.3)	1.879
Storage in bamboo basket (Yes)				
Storage in air tight sacks (yes)	64 (67.4)	134 (65.4)	198 (66.0)	0.116
Spread in naked floor store (Yes)	10 (10.5)	20 (9.8)	30 (10.0)	0.043
Cleaning (Yes)	73 (76.8)	147 (71.7)	220 (73.3)	0.875
Curing (Yes)	68 (71.6)	118 (57.6)	186 (62.0)	5.414**
Tail cutting (Yes)	2 (2.1)	10 (4.9)	12 (4.0)	1.300
Grading (Yes)	13 (13.7)	52 (25.4)	65 (21.7)	5.219**
Grinding (Yes)	2 (2.1)	1 (0.5)	3 (1.0)	1.751
Size grading (Yes)				
Color grading (Yes)	13 (13.7)	59 (28.8)	72 (24.0)	8.111***
Boldness grading (Yes)	9 (9.5)	45 (22.0)	54 (18.0)	6.847***
Fairness grading (Yes)	2 (2.1)	21 (10.2)	33 (7.7)	6.047**

Notes: Figures in parentheses resemble percentage. *** and ** indicate significant at $p < 0.001$, and $p < 0.05$ levels, respectively.

Source: Field survey, 2018/19 in Taplegunj district

- 4 The improved method of curing is an indirect heating system that uses heated air and a flue gas pipe arrangement to dry capsules. The capacity of improved Bhatti varies from 200 kg to 400 kg of fresh capsules in 17 to 24 hours drying time having excellent product quality with maroon colour and 2 to 2.4 percent volatile oil content (Singh & Pothula, 2013). The cost of establishment improved Bhatti is about US\$ 500-800 and very few cardamom producers were adopted this curing method in the study area due to high cost of initial investment, lack of awareness on its benefits and poor access to finance in eastern Himalayan areas of Nepal.
- 5 The traditional bhatti is a drying kiln prepared by farmers and used for curing fresh large cardamom capsules; it is designed based on direct heating system, and drying time is 25 to 40 hours The fuel efficiency of this system is found very poor (Rao, Mande, & Kishore, 2001); it requires about 2.5 kg of firewood to produce 1 kg of dried capsules (Sharma, Sharma, & Sharma, 2009). The quality of large cardamom capsules cured in traditional method is very poor having dark brown, a smoky flavor, the quantity of charred and cracked capsules is high, as is the loss of volatile oil. Albeit, building and maintenance cost of traditional bhatti is low as compared to improved once. Furthermore, a traditional bhatti can be made easily using locally available materials and requires no scientific knowledge (Singh & Pothula, 2013).

Current status of production, export trends and barrier to entry of Nepalese large cardamom

Attempts to explore the production and marketing problems were also done in FGDs conducted in study sites. Major production problems were identified as insect pest infestation, low and declining price of the products, rising price of inputs in higher proportion, low quality saplings, lack of proper shedding, lack of the infrastructure *viz.* road, wild animal threat, poor private capital formation and lack of access to credit in large volume for expansion of the production scale. Similarly, major marketing problems identified were low and exploited farm gate price, low producers' share on retail price, fluctuating price, unavailability of efficient marketing information, lacking facilities for drying, processing, and storage at the local level. The major challenges were the intense competition from neighboring countries, which ultimately created the huge problem in the international market, as the product was mostly exportable.

There were three major cardamom species such as *Ramsey*, *Chibese* and *Golsey* planted in Taplejung district. Farmers usually did weeding in the garden. There were farmer's groups and cooperatives in limited number. Normally, cardamom was harvested during end of September to December and marketing started from after curing, drying and hauling from October to March/April (Table 5).

Table 5. Seasonal calendar of large cardamom

Functions	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Poush	Marga	Falgun	Chaitra	Baisak	Jestha	Asad	Srwan	Bhadau	Aswin	Kartik	Mangsir
Cultivation												
Harvesting												
Drying												
Hauling												
Marketing												

The average price of dry cardamom ranged from NRs. 600-1,050 per kg but, depends on the season and days within the season. Farmers were getting primary information about the price of products from neighboring farmers and collectors. The government of Nepal highly prioritized to the large cardamom as an export potential crop that has high value but volume is low. It was a climate sensitive crop; therefore, export quantity was generally depending on the production inside the country.

In 2013/14 country exported about 4,914 t of large cardamom which value was NRs. 4,270.3 million which equivalent approx. USD 4.27 million. The production was decreased by 3.85% compared to previous year 2012/13, however, the value was increased by 9.84% compared to year 2012/13 (TEPC, 2015). Moreover, the market of Nepalese cardamom totally depends on Indian market because 90% of the production exported to India via Britamod port of the Jhapa district. Additionally, a small proportion of the production exported to other countries such as Germany, China, Singapore, Bangladesh and so on (MOAD, 2015). Table 6 presented a trading scenario of Nepal's large cardamom into the world market for a period of six years (2009- 2014).

Table 6. Trading of large cardamom in Nepal

Buyers	Exported in 2009	Exported in 2010	Exported in 2011	Exported in 2012	Exported in 2013	Exported in 2014	Tariff (%)
India	16957	20331	30460	45646	19190	22190.7	0
Bangladesh	21	0	0	0	0	0	23.75
Canada	0	0	0	14	0	0	0
China	0	0	4	3	0	0	0
Pakistan	321	53	0	0	0	0	5.00
Singapore	0	25	0	0	0	0	0
UAE	83	92	95	111	0	0	0
Ukraine	0	0	111	0	0	0	0
UK	0	0	76	0	0	0	0
Korea	0	0	0	0	0	0.43	0
World	17382	20500	30746	45774	19190	22191.13	0

Source: MOAD (2015); Unit: US\$ '000'

National Sector Export Strategy of Large Cardamom has been developed for 2017 to 2021 in the initiation of International Trade Center and Government of Nepal. In fiscal year 2016/17, about 3,477 MT of large cardamom was exported in India and the average price per kg was NRs. 1,132 which generated NRs. 3,936 million revenue for the country. Within 8 year from 2009/10 to 2016/17, annual export volume growth has been decreased by 5% (i.e. 265 MT annual average export demand has been decreased, see Figure 3) whereas price has been increased by 26% in on average. In fiscal year 2017/18, the price of large cardamom was found very low as compared to previous year (i.e. NRs. 958/kg) due to global market demand and price fluctuation that makes farmers and traders more vulnerable in the eastern part of Nepal (LCEAN, 2018). Until now the fluctuation of quantity has shown indifference with the price fluctuation in case of cardamom (Figure 3).

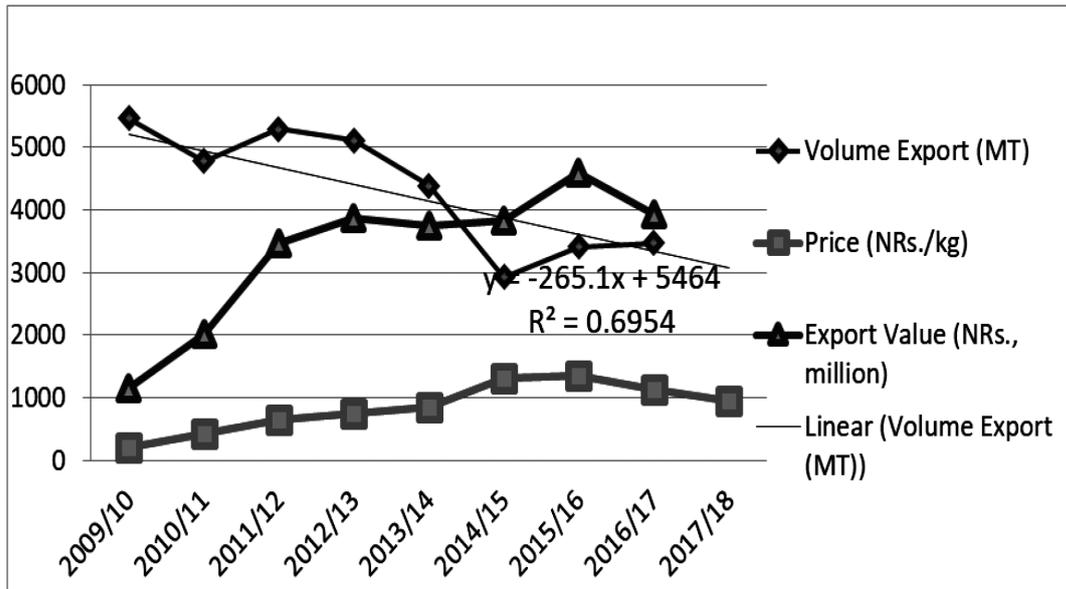


Figure 3. Export and price trends of large cardamom in Nepal

Sources: DOC/MOF (2017); LCEAN (2018)

Value chain upgrading strategy and governance of large cardamom

Upgrading strategies need for value chain in different stages like inputs and services, production, collection, trading, even for the processing, backward-forward linkage, vertical - horizontal linkage and creation of good governance are presented in Table 7. Main gaps were identified in these different value chain levels for suggesting potential interventions with the helped of study gathered information from field investigation and reviewed data synthesis. Recommendations were expected to help to identify the new openings and opportunities for short-term as well as long-term interventions of global value chain development of large cardamom.

Table 7. Strategy for value chain upgrading and good governance of large cardamom in study areas

Value chain level	Situation analysis	Key Gaps	Intervention activities
Inputs, services, and technology	Producers were operating their small-scale cardamom production business based on whatever quality of inputs; lack of seeds varieties as per elevation, and loan available.	Difficulties in timely and sufficient availability pesticides, low-quality inputs, credit input and technical services.	Capacity building of agro-vets, collective input marketing, initiation of groups managed technical and inputs providers.
Production	Cultivated in the relatively steep slopes, scatter production pockets in the small scale, heavy dependency on rained and residual moisture; incidence of disease (mainly, <i>Chhirke-Furke</i>).	Low-risk bearing capacity, poor management skills, and accounting, lack of integrated nutrient and pest management skills, lack of year-round irrigation facility	Development of the sloppy cardamom production technology; product management policy guides for minimum residual aspect of trade; maintenance of proper shade through the suitable trees.
Marketing, price, and trading	Cardamom marketing went through multiple layers of the transaction, starting from the collection at the household level to the export to India.	Local style drying of produce; price fix mainly by the collectors, internationally organized traders from India; poor quality testing facilities and high requirement by the importing countries.	To keep the farmers cultivating cardamom, start the buy-back program at the reasonable price, that support the farmers in the time of severe market failure; the minimum support price;; facilitation in the context of Good and Service Tax (GST).
Grading and Processing	Grading and proper packaging were not practiced expect to discard the damaged one.	Lack of knowledge and infrastructures for grading, packaging, and processing; labor shortage and high wage rate.	Train farmer for grading and packaging the product; recommendation and installation of high mechanized, labor-saving methods for the tail removing practice; loan and subsidy.
End market	Farmers did not approach end market with their product.	Low and fluctuated produce price; lack of market information; lack of coordination of producers and traders	Proper dissemination of market information; development of mobile application for market information; increase the role of DCCI, training on business plan development.
Backward linkage	Direct contact between agro-vets, nursery raisers ;poor access from farmers side to service providers and financial institutions	Lack of drought, insects, and diseases tolerate domain specific varieties; face the problems on financial institutions for collateral; lack of information and crop insurances	Research and Development (R & D) for domain-specific suitable varieties; promotion for diseases free seedlings; create awareness about government initiatives for the agriculture load and crop insurances; Lunching soil testing programs (mobile type).
Forward linkage	Dry cardamom sold directly to the local traders (mostly); low level of trust, lack of processing knowledge and infrastructure	Mistrust between collector and farmers regarding the pricing of the product.	Develop harmonious coordination among key market actors in the forward side through; Forward contract; Establishment of modern drying infrastructure and processing plant
Vertical integration	The poor approach of producers to upper-level organizations related to seedling production, production technology, output processing and service delivery	Lack of specially focused cardamom policy; lack of coordination among the institutions involving in cardamom sectors; lack of bilateral agreement in trade.	Advocate the farmers' groups, cooperatives to establish the norm on the cardamom farming through Municipalities; facilitate the micro-finance linkage
Horizontal integration	Producer groups created the good interaction and cooperation among producers for sharing technical, financial, managerial aspect of production, market information; seedling purchasing; produce selling in the bulk.	Lack of sufficient facilities (driers, irrigation, sprayers); primitive irrigation system (mainly flooding); lack of irrigation water source in the dry season; labor shortage and high wage rate	Establishment of Cardamom farming groups at village, municipality and district level; established the modern irrigation facilities; mechanization the farming practice including the post-harvest operations
Governance	Poor bargaining power among farmers with traders and weakly flowed price information	Lack of proper price information, many traders and poor governance among farmers	Establish price flow mechanism and increasing capacity of farmers to enhance good governance.

Sources: Household survey (2018/19), FGD with producers and RMA among traders

CONCLUSION

The average area under the cardamom farming per household in the study area was 17.01 ropani. The annual household income and income from large cardamom among commercial farmers were significantly different and higher as compared to smallholders. Average annual household income from large cardamom was NRs. 242,449 with share of about 60% total household income and also higher among commercial farmers. Major function of large cardamom were inputs, service provision, cultivation, harvesting, post-harvest handling (drying, curing, tail cutting, sorting and packaging), and marketing from major production districts in eastern Himalayan corridor to export point of Birtamod and Biratnagar.

The cost of production of one kg cardamom was estimated NRs. 656 and recent selling price was NRs. 1,000/kg. About 27% large cardamom producers used the improved method of curing and drying whereas 73% used traditional method in the study area. About more than 90% large cardamom was exported to India from Nepal and very little percentage was consuming in national level without any value addition practices. Nepalese traders have a poor capacity and governance to export product in other counties than India due to high entry barrier to global market and lack of standard met for export. This study recommends potential of forming global value chain development alliance, financing and upgrading strategy that would be pivotal for large cardamom with key intervention strategy for improving value chain function in eastern Himalayan road corridor of Nepal.

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(Footnotes)

- 1 Commercial farmers is defined as large scale large card*amom producers based on land holding in the study area.
- 2 Total operational cost for one ropani large cardamom enterprise is estimated around NRs. 11,469, mainly, human labour cost (NRs. 4500), fertilizer cost (NRs. 3250), irrigation cost (NRs. 1219) and other input and harvesting cost (NRs. 2500) per year required as an operational cost for a ropani large cardamom enterprise.

