Enhancing the Cardamom Value Chain for Employment-Rich Economic Growth in Nepal

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Contents

List of Tables

List of Figures

Fig. 8: Value Chain Map of Large Cardamom of Taplejung

1. Introduction

Large cardamom is a high value cash crop holding a significant potential for export and income generation for Nepal. Nepal is the leading producer, covering around 68% of the global market (Khanal et al., 2024). It is the major agricultural export commodity and constitutes about 5% of Nepal's total export (Acharya et al., 2021). Although it contributes only 0.3% to national agriculture GDP, large cardamom has become a popular cash crop in Nepal. With approximately 60,000-70,000 families engaged, it serves as a major source of income and livelihood for the farmers particularly in the eastern hills (Budhathoki, 2024). Owing to its high market value and low input requirement, the cultivation has expanded across 57 districts of Nepal (MoALD, 2024). However, Koshi province is the primary center of production, accounting for 86% of the nation's output, of which 30% comes from Taplejung district alone (MoALD, 2024). It is one of the oldest and third most expensive spices and globally renowned as “Queen of spices” (Khatiwada et al., 2019). Owing to its unique flavor and medicinal properties, large cardamom has created a niche in the international market (Singh et al., 2022).

Nepal poses substantial potential to leverage this "black gold" for employment-rich economic growth. Recognizing this sector’s potential, several national and international strategies has prioritized large cardamom as a key development commodity. Due to ecological suitability in marginal hill agroforestry system, low input need and with strong international market demand, Agriculture Development Strategy 2015-2035 (ADS) as well as Nepal Trade Integration Strategy 2023 (NTIS) has prioritized large cardamom as a commodity with comparative advantage (ICIMOD, 2021). International Trade Center also recognizes large cardamom as a potential high-value cash crop for uplifting rural livelihoods for the eastern mid-hills of Nepal. Under the one commodity one priority initiative, FAO Nepal aims to harness the large cardamom sector by strengthening the value chain, establishing tissue culture laboratories, nurseries and promoting good agricultural practices to ensure sustainability of large cardamom farming in Nepal (FAO, 2025). Although these strategies have supported in uplifting the farmers of this sector, several bottlenecks exist across the entire value chain that has been preventing the utilization of full potential. Strengthening the value chain will also strengthen local economies, facilitates better incomes

for farmers as well as stimulates growth in associated sectors of processing, logistics and export. To utilize the full economic potential of this sector, policies regarding investment in the infrastructure, processing techniques, and market access should be made. Such development can create an employment rich environment, aligning with broader economics goals of Nepal.

Statement of the Problem

Our current average national yield is 0.55 MT/ha while the potential yield is 1.5 MT/ha that shows the huge yield gap (MoALD, 2024). Moreover, the production volume has declined by almost 20% and export volume by 7% compared to the last fiscal year (Poudel, 2025). Price variability and fluctuating market is a constant problem faced by cardamom farmers (Bhusal et al., 2020; H. Khatiwada et al., 2024). In addition to that, lack of adoption of disease resistant varieties, aging orchard, limited irrigation availability and use of traditional practices has created irregularity in production and this is ultimately reducing the export to the global market (Dhungana et al., 2024; H. Khatiwada et al., 2024; S. Shrestha, 2025). 72% of farmers still use the traditional curing method that produces inferior product quality and fetch lower price in the market (Kattel et al., 2020a; Shrestha et al., 2018). Similarly, farmers lack technical knowledge regarding value-addition and market expertise that leads to exploitation by the middlemen (Kattel et al., 2020b). Furthermore, Nepal still has not been able to establish a direct trade relation with potential importing countries (Shrestha & Shrestha, 2018). Nepalese export of large cardamom is heavy reliant on India as almost 90% of the total production is exported to India only (Khatiwada et al., 2019). India imports, processes, rebrands as its own and re-exports the Nepalese Cardamom to the Middle Eastern Countries (Acharya et al., 2021; Timsina, 2016)**.** Moreover, the absence of value addition, product diversification as well as development of alternative markets has been limiting the chances of generating employment and raising national income. Our export potential is $117 million and still has unrealized potential of $64 million (ITC, 2025). Thus, addressing these issues is crucial to harness the full potential of Nepal's large cardamom sector. A systematic evaluation of the large cardamom value chain is essential to understand the bottlenecks at various stages to foster the inclusive, employment driven economic growth in Nepal.

Research Questions

1. What is the existing map of the Large Cardamom value chain in Nepal?

2. What are the Strengths, Weakness, Opportunities, Threats and Intervention Strategies in Production and Marketing of Large Cardamom in Nepal?
3. What is the potential intervention in alternative uses, value addition, and export diversification of large cardamom for generating employment opportunities?

2. Literature Review

2.1. Background Information

Large cardamom *(Amomum subulatum* Roxburgh.) is native to sub-Himalayan region of Nepal, India and Bhutan (Peter and Shylaja 2012). Globally, it is known as 'Black cardamom' or 'Nepalese cardamom' and known as "*Aalaichi*' in Nepal. The black cardamom has a distinct flavor and aroma and is considered superior from the other types of cardamom found in the world. Other cardamoms are green cardamom or small cardamom (*Elettaria cardamomum*) commonly found in tropical countries such as India, Guatemala, Indonesia and Sri Lanka, white cardamom (A. Krervanh), grown in Vietnam, Cambodia, Laos, and Southern China, red cardamom (A. tsaoko), native in Southern China, and Aframomum cardamom, grown in the islands of South Africa and Guinea (ICIMOD 2019a; Timsina and Paudel, 2016). Large cardamom has been used by many communities of South Asia for centuries, in their traditional dishes and currently has a huge market in the middle east. Compared to the green variety, large cardamom has a very distinct smoky smell and taste, and brownish to pinkish color, which originates from an ancient drying method.

In general, large cardamom can be grown at altitudes between 600 and 2,400 meters above sea level (masl), where snowfall is usually absent (Shrestha, et al., 2018). Land facing South or Southeast is suitable for growing large cardamom. The best temperature range for the production is 10 to 22 degrees Celsius, but it can grow up to 30 degrees Celsius. Although the plants can withstand temperatures up to 2 degrees Celsius, a decrease in plant growth begins to occur immediately after 4 degrees Celsius (Poudel, 2016). Therefore, low as well as extremely high temperatures are not favorable for its production. Large cardamom is a more water-intensive crop, requiring a relative air humidity of 90% and a soil moisture of 70% (Maharjan et al., 2019). It is a shade-loving plant and grows well within 50% to 60% shade conditions. It thrives in areas with an average annual rainfall of 1,600 to 5,000 mm. Generally, large cardamom can be grown in all types of soils containing more than 1% organic matter and without waterlogging. However, fertile loam soil with a pH of 4.5 to 6.5 (slightly acidic) is considered best for

achieving optimal yields. Red clay soil is not suitable for growing large cardamom plants and needs to be removed (Timsina & Pokhrel, 2018). The crop is commonly incorporated with agroforestry systems that aid in the preservation of soil and water as well as increase nutrient cycling through utilization of nitrogen-fixing trees such as Alnus nepalensis (Avasthe et al., 2021).

2.2. Socio-economic Importance and Uses

Large cardamom is an ancient and valuable spice crop in various regions of the world as a spice as well as traditional medicine. It is widely used in the Middle East and usually mixed with coffee to make Ghawa, a beverage closely associated with the concept of hospitality. It is an essential constituent of garam masala that is extensively used in curries, pickles and biryanis in South and Southeast Asia (Chempakam & Sindhu, 2008). It is commonly baked into beverages in Europe and specifically, in Nordic countries, and used in baking in the form of Finnish Pulla and Scandinavian Julekake (Food52, 2023) Other than these cultures, cardamom seeds are employed in curry powders, sausages, confectionary products and even to flavor tobacco and liquors (Chempakam & Sindhu, 2008; Gopal et al., 20). However, its use is not just restricted to kitchens. It can be used to treat bloated stomach, respiratory, and abdominal pains as well as boost general well-being, cardamom has also been prescribed in Ayurveda and Unani medicine over many centuries (Gopal et al., 2012). This spice is not only valued for its culinary uses but also for its significant medicinal properties. It possesses 1.95 to 3.32 percent of essential oil, among which 1,8-cineole, is the most significant component that provides its distinguishable aroma (Bisht et al., 2011). It has diuretic, gastric, carnal, and cardiac stimulants, contains 23% essential oils, and treats respiratory and throat conditions (Poudel et al., 2018). Similarly, it has analgesic, antimicrobial, and digestive properties which make the large cardamom a staple ingredient of Ayurvedic medicine (Khatiwada et al., 2019; Timsina, 2018). Altogether these applications demonstrate that large cardamom is much more than a spice: it’s a culture, national cuisine, and folk medicine and it could become even much more in the future.

2.3. Large Cardamom in Nepal

In Nepal, it was first introduced to Illam from Sikkim in the year 1853 (Timsina, 2016). The establishment of the Cardamom Development Centre in 1975 marked a significant step in enhancing production techniques and promoting the crop among local farmers. Since then, it has become a popular cash crop serving as a major source of income and livelihood for the farmers of eastern hills (Kattel et al., 2020c). So far,14 varieties have been recognized nationwide among which five of them (Ramsai, Golsai, Dambersai, Jirmale and Bharlange) have been formally registered (Shrestha, 2025). Varietal productivity

is significantly correlated with elevation. For example, Varlange and Ramsai, yield significantly at higher altitude ranges (above 1,500m) than lower altitudes (Tiwari et al., 2025). Table 2. shows the varieties according to the altitude.

Table 1. Varieties of large cardamom commonly grown by farmers in Nepal.

S.N.	**Name of varieties**	**Altitude (m.a.s.l.)**
1	Ramsai	1500-2000
2	Golsai	1200-1600
3	Saune	1000-1600
4	Bharlange	1200-2200
5	Chibesai	700-1200
6	Jirmale	600-1200
7	Dambarsai	600-1200
8	Ramala	1000-1500
9	Serimna	1200-1800
10	Madhusai	1200-1600
11	Ramala	1000-1500
12	Taplejung Golsai	1200-1500
13	Jangu Golsai	600-1200
14	Dzongu Golsai	975

However, the majority of these cultivars do not have full scientific characterization or documentation, but are still selected as landraces by farmers (Shrestha, 2025; Acharya, 2019). Likewise the current processing practices remain largely traditional, limiting value capture by farmers. 72% of the farmers are still using

traditional bhattis whereas only 27% farmers have access to improved and 1% have modern facilities (Shrestha, 2018).

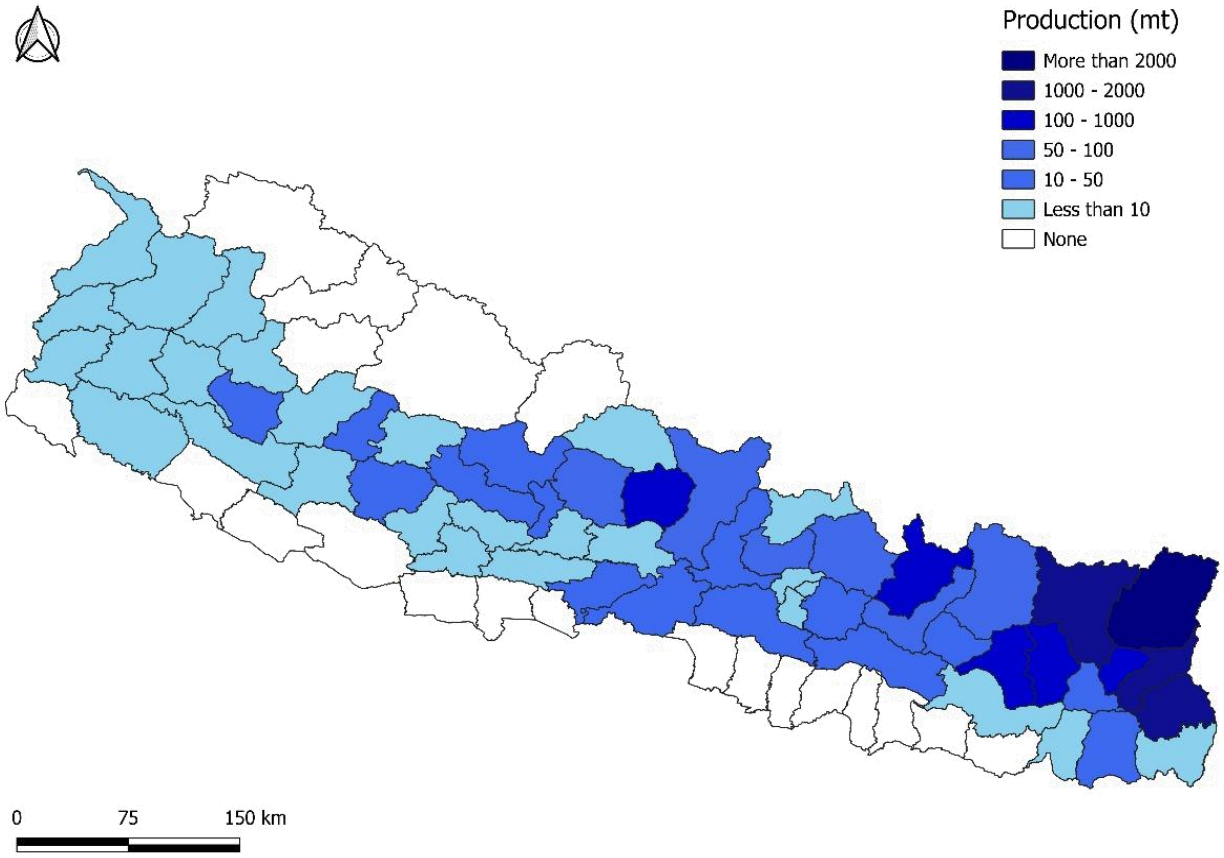


Fig 1. Map of Nepal showing Large Cardamom producing districts

The main hub of large cardamom production in Nepal is in the eastern hill districts with Taplejung, Panchthar and Ilam being the leading districts both in terms of area and production. Taplejung alone produces more than 2,500 tons where there is a wide variation in productivity across the districts. In spite of the smaller production areas, Nuwakot (960 kg/ha), Solukhumbu (740 kg/ha), and Illam (700 kg/ha) have been reported as having the highest yields, which indicates the good agro-climatic conditions and improved crop management there. While the larger producing districts such as Panchthar and Bhojpur demonstrate a relatively low productivity (approximately 420 kg/ha) indicating inefficient input use or improper farming activities.

Moderate level of production is also noted in Khotang, Terhathum and Bhojpur which is an indication of increase in LC in mid-hills in Koshi. In other areas, there are traces of gradual westward extension at Koshi, Gandaki Province, Lamjung (310 ha) and isolated areas in Dolakha, Gorkha, Kaski, Baglung and Rolpa. The map also brings to the fore new production in new districts like Sindhupalchok, Ramechhap, Solukhumbu and Nawalparasi East, can be diversified. Nonetheless, the production is insignificant in most of western Nepal, Karnali and Sudurpaschim, where climatic conditions are not conducive. Large cardamom needs moist and shaded environments that are normally observed in the eastern slopes of Himalaya and the west mid-hills are comparatively drier and less humid in the atmosphere and thus its natural applicability is limited. However, pilot projects in Rolpa, Rukum, Pyuthan, and Baglung indicate that there can be climate-resistant varieties or better irrigation systems in order to check expansion opportunities. Such variation implies that some of the districts are able to maximize the yield with available resources. Necessary intervention strategies are required particular to different locations to improve productivity and maintain the overall value chain.

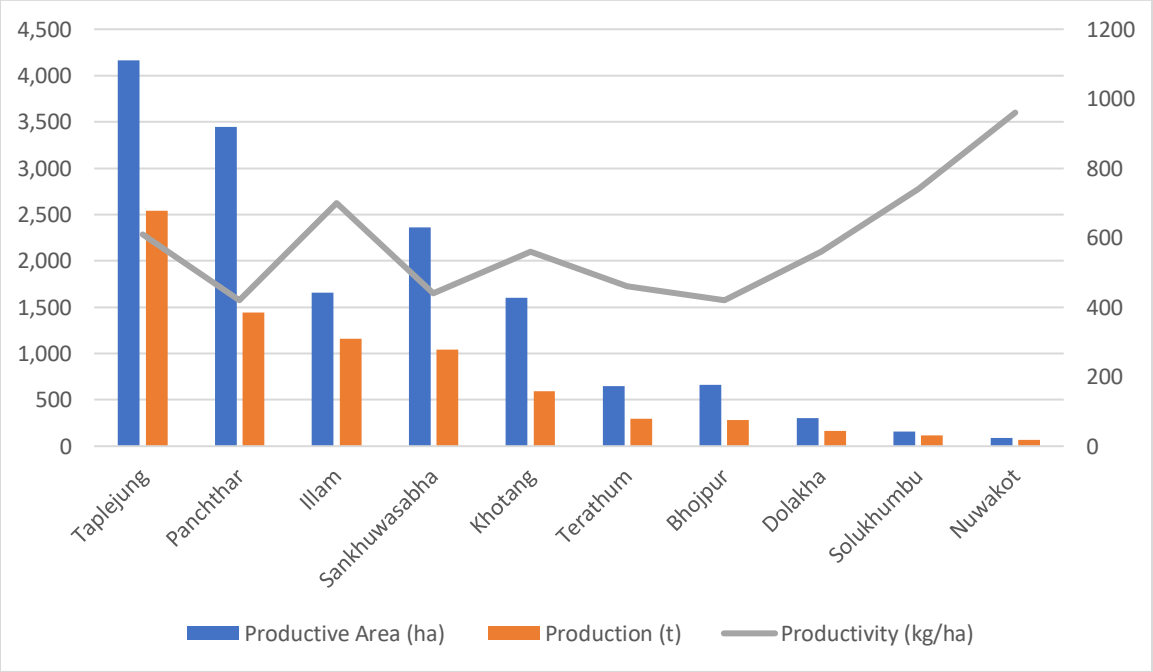


Fig 2. Area, Production and Productivity of top 10 large cardamom producing districts of Nepal

2.4. Market and Trade Dynamics of Large Cardamom

Table 2. Annual Growth Rate of Export of Large Cardamom

Year	Nepal (tons)	India (tons)	Bhutan (tons)	Total (tons)	Annual Growth Rate in Export Quantity (%)
2018–19	3298	724	1698	5721	-
2019–20	3170	1049	2451	6670	16.6
2020–21	8843	1220	1971	12033	89.4
2021–22	5367	1982	3430	10779	-10.4
2022–23	9991	1884	2145	14020	30.1

There's an annual export of USD 55- 65 million. The share in total export is 4 -5% while agricultural export is 12-15%. Currently it provides direct employment to approximately 60,000-70,000 families across Nepal's eastern hills, representing a significant source of rural livelihoods (Budathoki, 2024). With a labor requirement of 180- 220 person-days per ha annually, the peak labor demand season is the harvesting time i.e. September-October. Women's involvement is observed more at the cultivation and processing stage of value addition 8. According to ADS, the estimated employment multiplier is 1: 2.5 meaning that for every one job created the other 2.5 indirect jobs. There is the possibility to create 25,000 to 30,000 additional jobs.

Table 3. Trend of large cardamom export volume and value from Nepal

Year	Exported Quantity (Mt.)	Export Value (NRs.)
2012	5523	3,632,474,412
2013	5321	2,319,134,045
2014	3523	3,254,166,036
2015	3217	4,717,223,752
2016	3006	3,888,374,024
2017	4656	4,503,910,808

2018	4329	3,826,983,423
2019	3358	2,718,022,124
2020	8566	6,895,422,480
2021	5280	4,764,389,360
2022	9931	8,241,513,469

Table 4. Exporting Countries of Large Cardamom from Nepal

S.N.	Countries	Quantity (kg)	Amount (NPR.)	Percentage
1.	India	4,294,550	767 crore 40 lakh 37 thousand	99.8489
2.	United Arab Emirates	6,000	85 lakh 21 thousand	0.1395
3.	France	240	7 lakh 20 thousand	0.0056
4.	Australia	240	3 lakh 84 thousand	0.0056
5.	Switzerland	15	44 thousand	0.0003
	Total	43,01,045	768 crore 37 lakh 6 thousand	100

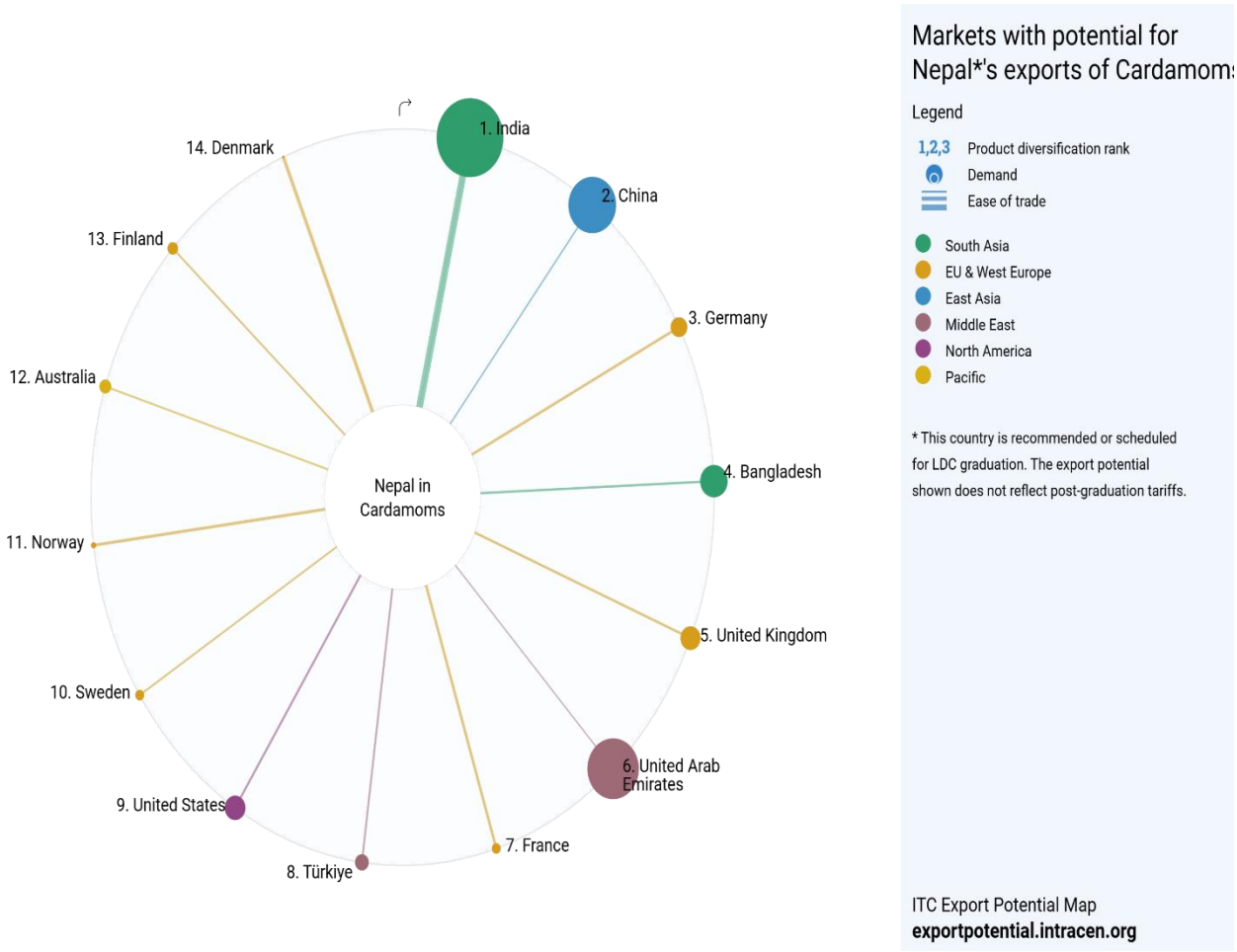


Fig 3. Market Potential of Nepalese Large Cardamom

2.5.Policy Framework and Initiative

2010 — NTIS (first): The first Trade Integration Strategy (NTIS 2010) charted an export roadmap where the country identified key priority goods (19 sectors) and the reforms required to increase exports. Large (cash) cardamom was among the top priority export and the strategy suggested to enhance competitiveness through supply-side aspects and quality infrastructure (e.g. adoption of GAP, improved processing) by means of public- private partnership) (GoN, 2010).

2015 — ADS (2015–2035): A 20-year ADS framework (approved 2015) provides a vision of a self-reliant, sustainable, competitive and inclusive agricultural sector. It focuses more on the development of value-chain among commodities and it pays much attention to commercialization, research and development as well as extension services. ADS is based on pillars of strategies - governance, productivity, profitable commercialization and competitiveness, clearly aimed at ensuring innovations and involvement of the private sector to enhance productivity and market connectivity in high-value crops such as cardamom (ADS, 2015).

2016 — 'Everest Big Cardamom' trademark initiation: In 2016 the government launched a brand name known as Everest Big Cardamom in a collective trademark to safeguard the Nepal cardamom brand in export markets. The Trade and Export Promotion Centre (TEPC) collaborated with the Cardamom Entrepreneurs Association to trademark this mark in India, Pakistan and the Gulf countries at the expense of which the state largely financed. This origin-branding guarantees customers Nepali quality, in a bid to enhance price-premium and quality consciousness of the large-cardamom exports of Nepal (The Kathmandu Post, 2016).

2015–2017 — UNNATI & Challenge Fund pilots: An agri-business Challenge Fund was initiated through the UNNATI programme (pioneered by donors) on eastern Nepal. One of four priority values chains was large cardamom with tea and ginger. Improved nurseries, disease resistant saplings, enhanced drying kiln and post harvest processing were granted as well as market-linkage. The main limitations (e.g. low yield, low drying technology) were met by these pilots so that productivity and quality could be enhanced in Ilam, Taplejung, Dhankuta, etc. (Pradhan, 2023).

2017 National Sector Export Strategy (Large Cardamom): In 2017 ITC assisted the Ministry of Commerce in publishing a sectoral export roadmap of large cardamom. It had a vision of producing and manufacturing Nepali Everest Cardamom of quality and volume to boost the export earnings and sustain itself to grow..The plan provided action plans to enhance cultivation and post-harvest activities, enhance grading/packing and increase foreign markets. It was focusing on greater quality and branding so as to capture greater value in the cardamom value chain and branch out on export destinations (ITC, 2017).

2023 — 'Wah! Alaichi' campaign: The Federation of Large Cardamom Entrepreneurs (FLCEN), introduced Wah! in order to increase its domestic consumption and value addition. In 2023, Alaichi" featuring celebrity chef ambassadors. With the help of the government and donors, this marketing campaign will encourage the use of Nepali cardamom in local cuisine and hospitality. It has created recipe books and media outreach to generate Nepal consumption of cardamom (traditional low volume domestic spice) and value-added products (Limbu, 2024).

2023 — NTIS (revised): In mid 2023, the Nepal Trade Integration Strategy was revised through to 2023-28. The new NTIS increases Nepal list of priority exports (to 32 items) and puts focus on export facilitation and quality infrastructure. It introduces additional agro-exports (spices, fruits, coffee, etc.) and targets to increase the trade-to-GDP. More importantly, NTIS 2023 emphasizes enhancing the trade logistics, standards and certification procedures (customs, labs, SPS measures) in order to support producers to satisfy the international market needs (Karki, 2023).

2024–25 — FAO OCOP: With FAO One Country-One Priority Product, Nepal started piloting cardamom advanced traceability and origin-authentication in 2024-25. The Ilam district launched the

GIES (Geographical Indications of Environment and Sustainability): the bag of cardamom is QR-tagged and connected with the soil-water fingerprinting to guarantee the eco-origin and standard. Additional interventions (e.g. a new tissue-culture lab of disease-free saplings) are meant to support sustainable practices. These science pilots are meant to capture the high-end niche markets with the promise to assure the buyers of the authenticity in Nepali cardamom and standards (FAO, 2025).

3. Methodology

3.1.Research Design

The study was carried out using both quantitative and qualitative techniques. Using both qualitative and quantitative methods will help to generate a clear picture of the large cardamom value chain, its production and marketing limitations and the opportunity of employment creation in Nepal. Qualitative approach was primarily applied for primary data collection including KII, FGD, field observation and stakeholder consultation. This allows data source triangulation and increases validity and reliability of the findings by capturing the perspectives of farmers, traders, processors and institutional actors. Quantitative approach was applied based on secondary data sources such as official records on area under cultivation, production volumes, productivity levels, export volume and prices. This provided a measurable insight into scale, trends and economic contribution of large cardamom at national and district level.

3.2. Study Area

The study was conducted in Taplejung, Jhapa and Ilam districts of eastern Nepal where major actors of the value chain of large cardamon are located. Taplejung district was selected because it produces the highest amount of large cardamom in the country. In Taplejung, Phungling Municipality contributes the most to the domestic and international supply of large cardamom. Jhapa district was chosen because it is a significant trading hub and processing, marketing as well as export activities are mainly carried out in this district. Birtamode municipality of Jhapa district was chosen particularly, as it is the heart of trader groups and cardamom collection-stations. Illam district was selected to capture the institutional and technical perspectives of the value chain. In particular, a visit was made to the Cardamom Development Center in Suryodaya Municipality, which plays a key role in research, extension, and development activities related to large cardamom cultivation and quality improvement.

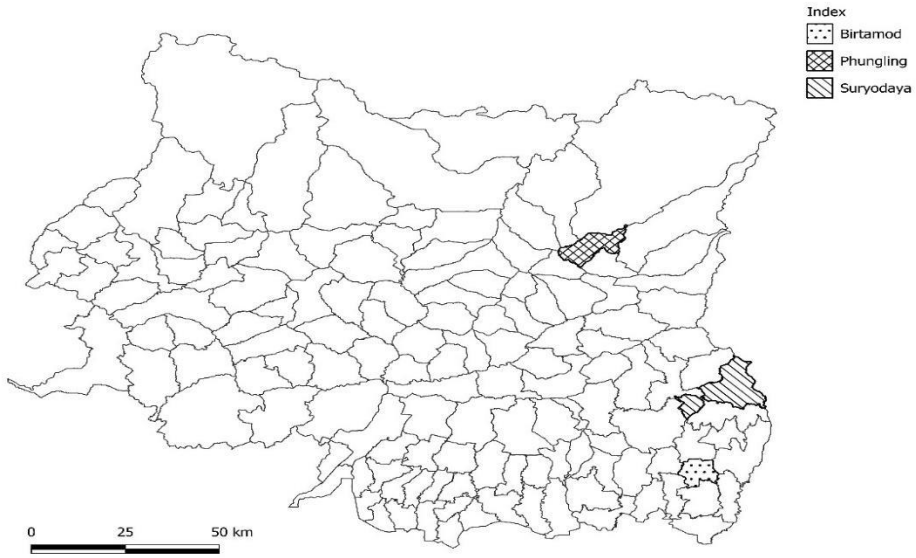


Fig 4. Map of Koshi Province showing the study areas

3.3.Data Collection Methods

3.3.1. Field observation

Direct field observations provided a quick overview of farm conditions, production, post-harvest, processing, and marketing techniques. The value chain map constructed was validated through the field observation.

3.3.2. Focus Group Discussion.

Focus group discussion was conducted by using a predetermined semi-structured checklist to collect the information regarding production and marketing constraints, SWOT elements, value addition practices and employment opportunities.

3.3.3. Key informant interview (KII)

PMAMP Officers and Technicians, respective Municipality Officer, officials from Cardamom Development Center, progressive farmers, farmer leaders, managers of private value addition firms, exporters and collectors were interviewed. These interviews were conducted using semi-structured checklists. It provided specialized information regarding intervention measures, export diversification and employment opportunities.

3.4. Data Types

3.4.1. *Primary data*

Primary data was collected by using the pre-designed interview schedule and direct interaction with key stakeholders via FGDs and KII.

3.4.2. *3.5.2. Secondary data*

Secondary data was obtained through detailed review of literature relevant to the research topic. Annual reports of AKC and PMAMP, Cardamom Development Center, journal articles, publications of NARC and MOALD, reports from authentic organizations like CBS, NPC, etc. Village Development Committee/s/Rural Municipality/s (VDCs/RMs) Profile, published reports of Ministry of Agriculture and Livestock Development (MoALD), Food and Agriculture Organization (FAO), and Central Bureau of Statistics (CBS), and supporting organizations publications like the Federation of Large Cardamom Entrepreneur Associations of Nepal (FLCEAN), the International Centre for Integrated Mountain Development (ICIMOD), the International Trade Center (ITC) and the Trade Export and Promotion Center (TEPC) was reviewed.

The secondary data was gathered as much as possible to construct the value chain map, get the past data on production, consumption and trade.

3.5.Data Analysis Technique

3.5.1. Value Chain Mapping

An elaborate map of the value chain was developed showing the major actors and enablers, their role in the chain, value addition activities and movement of product from secondary data and validated through field observation.

3.5.2. SWOT Analysis:

Qualitative data from FGDs and KIIs was coded and categorized into SWOT components:

- Strength: Favorable and internal
- Weakness: Unfavorable and internal
- Opportunities: Favorable and external
- Threats: Unfavorable and external

3.5.3. Thematic Analysis

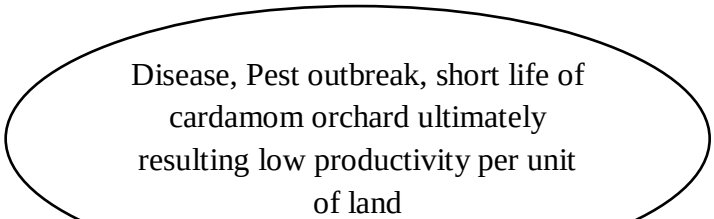
Thematic analysis was applied to FGD and KII data to explore how value addition practices, alternative uses of cardamom and export diversification can enhance employment opportunities at various levels of the chain.

3.5.4. Compound Annual Growth Rate (CAGR)

Used to measure the long-term average growth of area, production, and productivity over the study period.

3.6. Conceptual Framework

It is well-recognized that large cardamom provides good returns compared to other cereal crops like paddy, wheat, etc. Due to this, farmers have been expanding Cardamom cultivated area even by replacing traditionally grown cereal crops. Such practices among rural farmers are making them more dependent upon large cardamom for not only income but for food too. At the same time, they are becoming more vulnerable because of adopting mono-cropping practices by reducing income-desirable opportunities. It is found that most of the large cardamom growers have been adopting traditional cultivation practices that are faulty and misleading. This has resulted in disease and pest outbreaks, short life of cardamom orchards, low productivity per unit of land, and increased cost of production. In the meantime, frequent price fluctuation and decreasing price trends remain the major problems in the marketing of large cardamom among growers. After the harvest of the cardamom, farmers most generally follow cleaning and drying post-harvest practices. Then they soon sell the harvest to acquire money to sustain their livelihood. A major reason behind the lack of holding capacity of large cardamom for some time is none other than the urgent felt need for money. So, farmers sell their commodities to either local collectors/traders or dwelling agents of wholesalers/exporters based in central markets. Sometimes, farmers of the same community fall into the trap of the agents and experience price differences in the same localities. Lack of the auction facility and lack of knowledge of daily market price may have had such consequences. Also, there are price differences for large cardamom in different districts. The price difference is attributed to certain quality parameters and value-addition activities. So, to know this ambiguous nature of trade of large cardamom cash value chain actors was reached and interviewed to assess the qualitative and quantitative data and information.



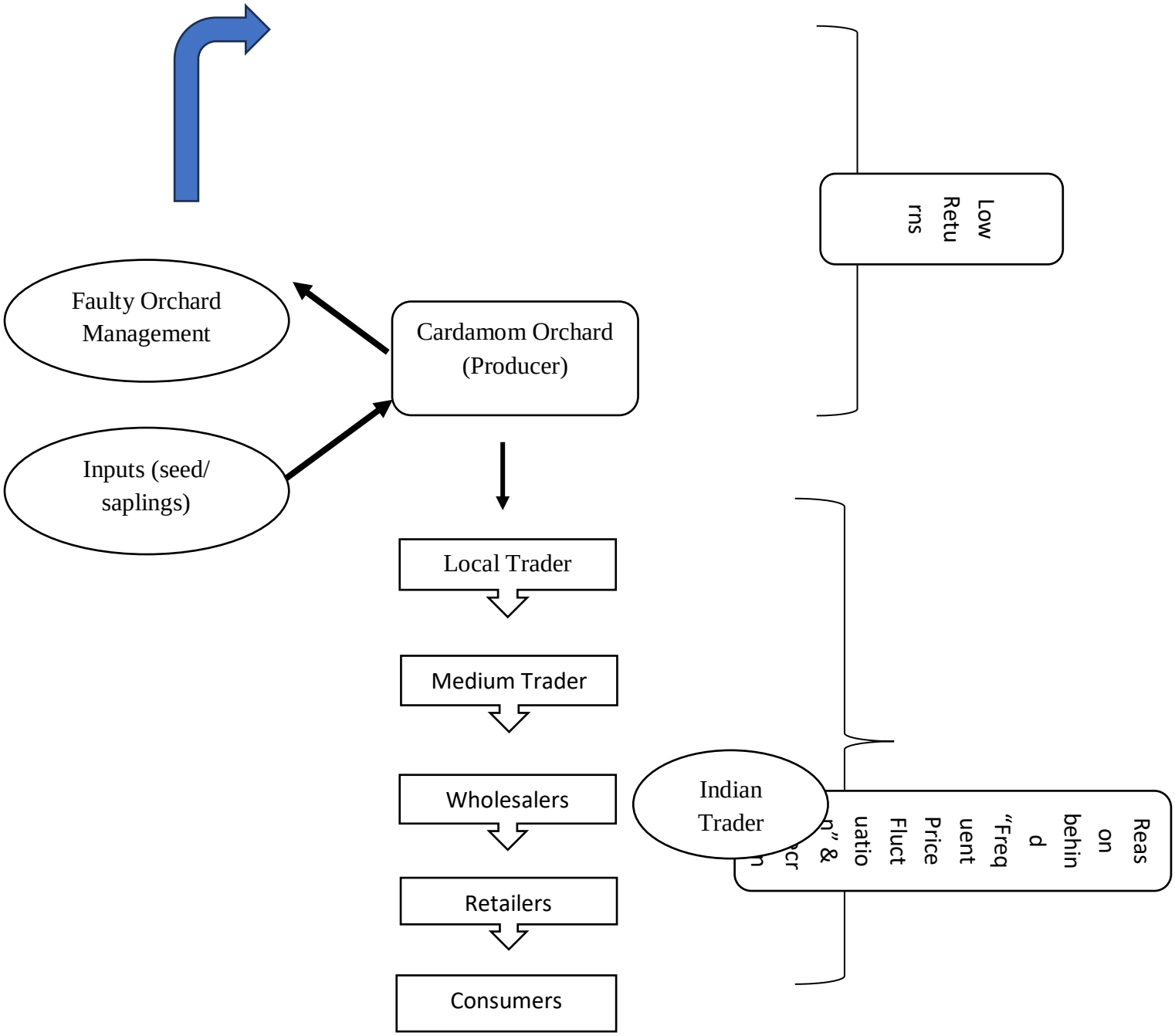


Fig 5. Conceptual framework of the study

4. FINDINGS

4.1. Growth Performance of Large Cardamom in Nepal

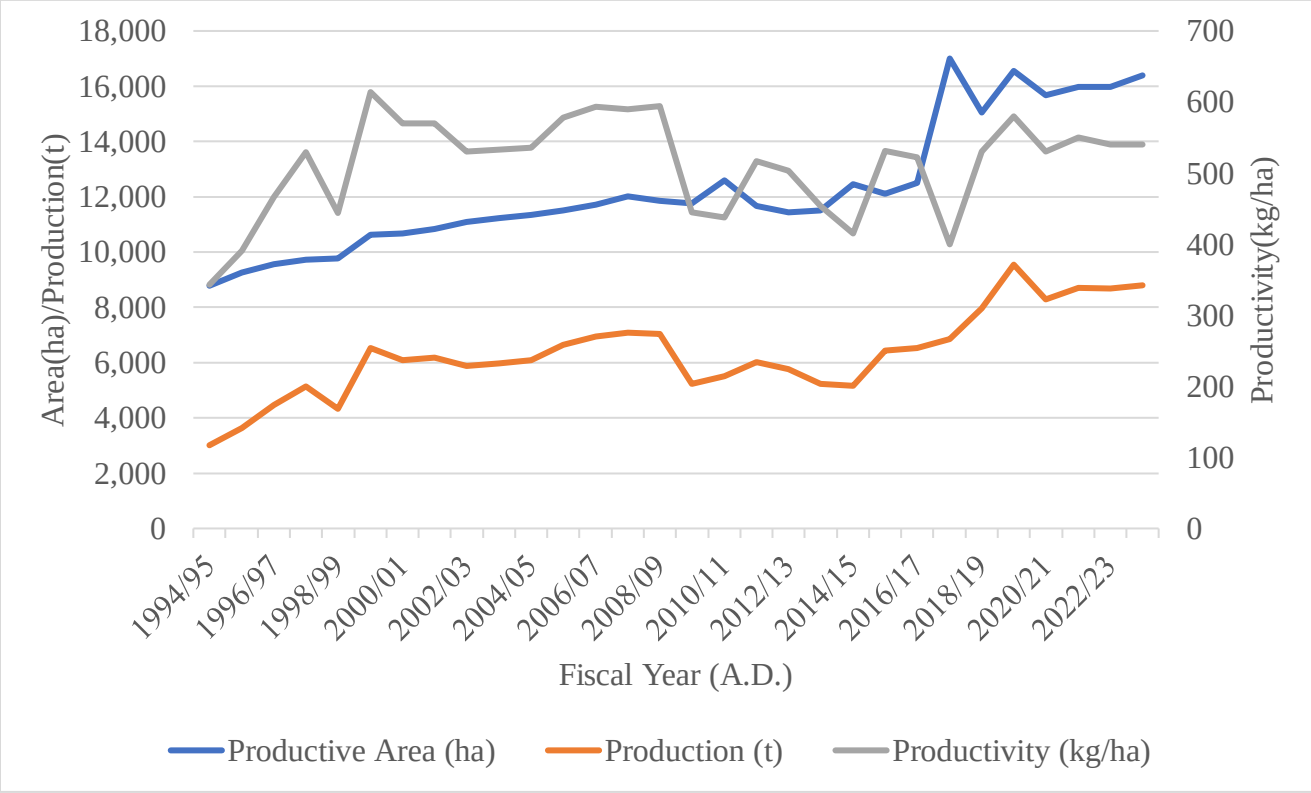


Fig 5. Trend of Area, Production and Productivity of Large Cardamom in Nepal from 1994- 2023 A.D

As shown in the figure the area under cultivation of large cardamom in Nepal has recorded a steady rise over the years and the same has been the trend with the production. The fiscal year 2019/20, reached the highest level in all 3 aspects: area (16,565 ha), production (9,545 tons) and productivity (580 kg/ha). Nonetheless, even after the increase in the number of cultivated lands, in recent years, there has been a decline in yield as well as production. During the fiscal year 2022/23, the cultivated area was 15,975 hectares, volume of production was 8,674 tons, and average productivity was 540 kg per hectare (MoALD, 2024) . Nepal remains as the major global producer of large cardamom but these statistics indicate that the country has started to decline in production and productivity. This shows the necessity to examine in more detail potential problems in the value chain that potentially influence production or export performance.

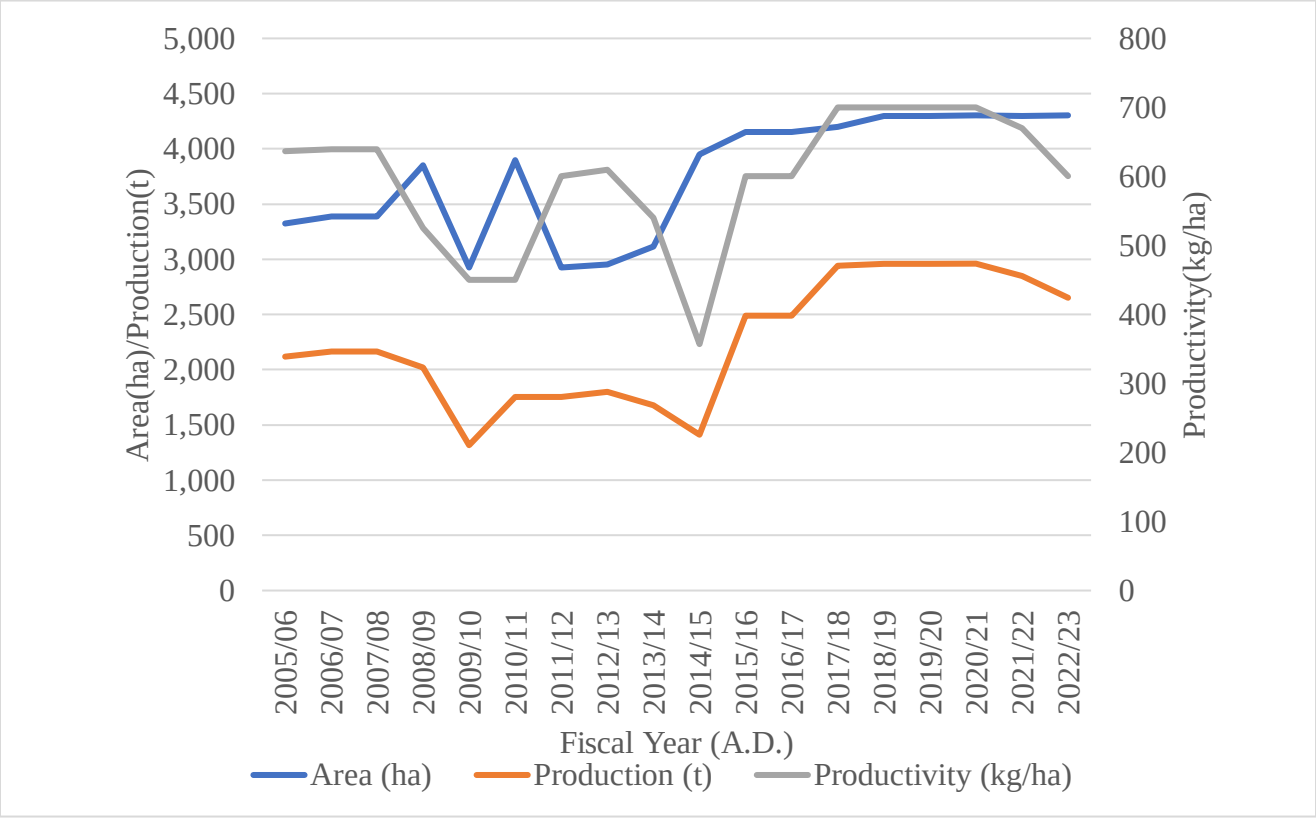


Fig 6. Area, Production and Productivity of Large Cardamom in Taplejung from 2005- 2023 A.D

Taplejung is one of the highest producing regions and it contributes the most to the total national output. The data in the form of time series on the production of large cardamom in Nepal reveals significant fluctuations in the area cultivated and in productivity in the last twenty years. Between 2005/06 and 2008/09, productivity fell by 637 kg/ha to 525 kg/ha due to disease outbreaks and problems of management despite an increase in cultivated area. The significant fall in 2009/10 (450 kg/ha) and 2014/15 (357 kg/ha) confirms years of intense production stress, which may be caused by pests and diseases and climatic shocks. Nonetheless, since 2015/16, the productivity has recovered and stabilized at the level of 600700kg/ha with the highest production being 2018/19 and 2019/20 with nearly 3,000 tons. More recently, despite the maintained area under cultivation of over 4,000 ha, the production and above all, productivity have recorded a slight decrease since 2021/22, indicating that there still are yield limitations in the crop production. Since 2005/06, the cultivation area has grown by approximately 25 percent but production by only 20 percent, which shows that a comparatively lower output growth compared with area growth. The productivity has been recorded between 450kg/ ha and 700kg/ ha with an average of

about 596kg/ ha thus showing long term stagnation. This implies that production has mainly improved due to increment in area but not due to yield. Inconsistency in productivity highlights the importance of interventions focusing on the management of diseases and pests, orchard rehabilitation, climate-resilient approaches, and enhanced management practices.

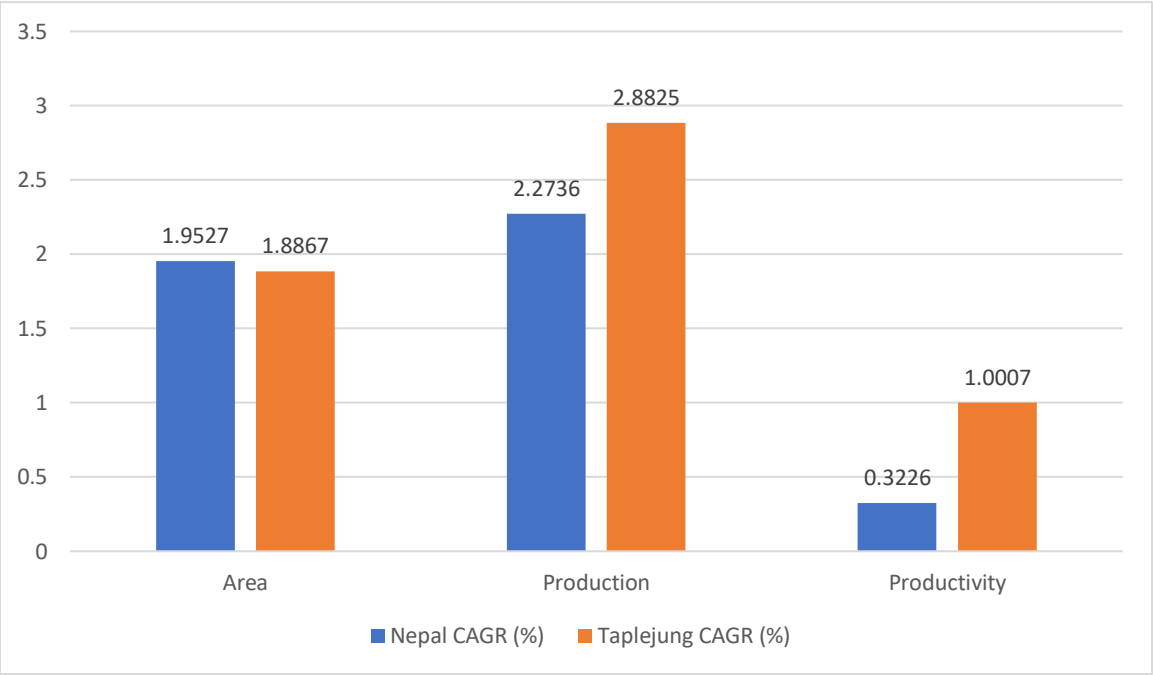


Fig 7. Compound Annual Growth Rate of Area, Production and Productivity of Taplejung district and Nepal

According to the analysis of compound annual growth rate (CAGR), Nepal and Taplejung had a consistent growth in the area of cardamom cultivation with a rate of approximately 1.9 percent. Nevertheless, Taplejung (2.88) has shown a higher growth in production, which is rather positive in comparison with the national average (2.27) and is, therefore, better performing. The productivity however, is a different case: national productivity has been virtually flat at 0.32 percent, and Taplejung has been recording small improvements at 1.0 percent/year. These results indicate that although the expansion of the area has led to general development in Nepal, the productivity gains were not very high, and specific interventions are necessary in orchard management, input utilization, and research-extension relationships to remain competitive over the long term.

4.2.Value Chain Analysis

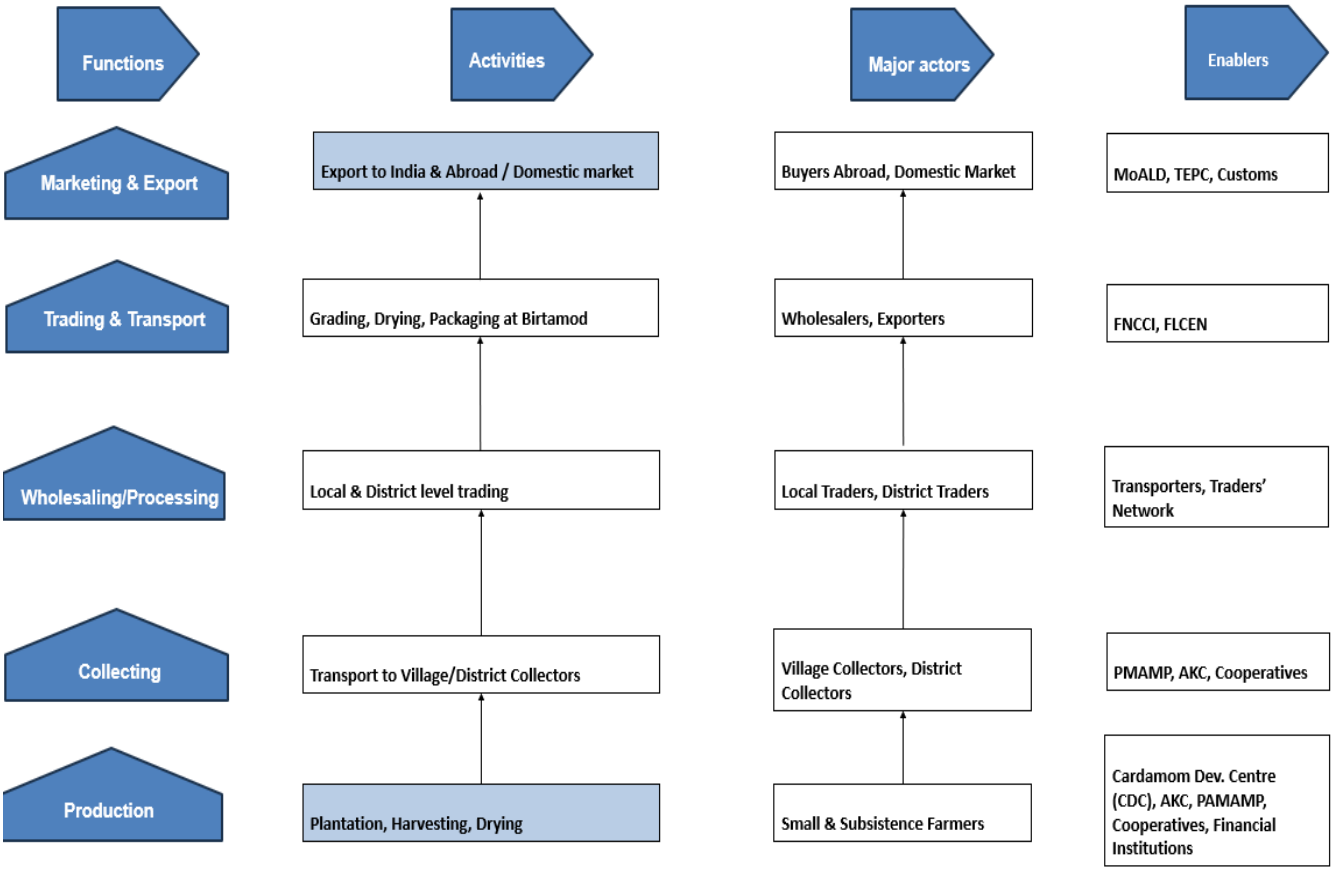


Fig. 8: Value Chain Map of Large Cardamom of Taplejung

4.2.1. Primary Actors and Their Roles

Farmers/Producers: The cultivation of large cardamom in Nepal demonstrates significant geographical expansion, extending from Taplejung in the east to Rolpa in the west. The historical development reveals that cultivation began in 2016 when inhabitants of the eastern hills brought plants from Sikkim during salt trading expeditions. The transformative moment occurred during the drought of 2015 (2072 BS) in Sikkim, when prices escalated to NPR 2,000-2,500 per kilogram, prompting farmers to abandon traditional crops like rice and millet in favor of cardamom cultivation.

The farming practices reveal considerable variation in sophistication. While some farmers continue to rely on traditional methods without fertilizer application, progressive farmers have adopted improved techniques including organic fertilization using pig and cow dung, which has demonstrated the potential to double production yields. The commodity's resilience is evident in its ability to provide returns even on

marginal lands without significant intervention, though optimal performance requires proper irrigation and fertilization.

Collectors and Traders: The collection and trading system operates primarily through the Nepal Federation of Large Cardamom Entrepreneurs, which serves as the central coordinating body established in 2064 BS. The organization focuses not only on trade facilitation but also provides crucial support for drying and processing activities. Quality assessment and grading occur at the collection stage, with price differentials of NPR 100 for dusted versus undusted cardamom and NPR 200 for graded versus ungraded products.

A significant challenge within this segment involves the manipulative practices of Indian traders who engage in what stakeholders describe as "dadagiri" (bullying behavior). These traders compel Nepali suppliers to create invoices in Indian Rupees even when payments are made in Nepali currency, creating statistical discrepancies that may underrepresent actual trade volumes by 1-2 billion NPR annually.

Processors and Value Adders: The processing sector demonstrates remarkable innovation in product diversification. At processing facilities, approximately 650 kilograms of cardamom undergoes an 18-hour process to produce seven liters of essential oil. The sector has developed multiple value-added products including cardamom powder in various packaging sizes (25g, 50g, 100g), whole capsule packages for retail (500g, 1kg) and bulk export (10kg, 15kg, 50kg).

The utilization extends beyond primary products, with processing waste finding commercial applications. Cardamom husks serve as thickening agents in the paint industry and natural flavoring components. Additional innovations include mouth fresheners created by processing cardamom seeds mixed with silver leaf, and cardamom-flavored orthodox tea tailored for niche markets. This comprehensive approach exemplifies optimal resource utilization where products transform into commercially viable outputs.

4.2.2. Support Services and Enablers

Government and Development Organizations The institutional landscape supporting large cardamom development in Nepal demonstrates a complex web of national and international interventions, each with distinct contributions and limitations. The Prime Minister Agriculture Modernization Project (PMAMP),

Nepal's largest agricultural initiative with a 10-year duration (2073-2082 BS) and an estimated cost of NPR 130 billion, has provided substantial infrastructure support including subsidies for improved dryer construction in Taplejung and other major cardamom-producing districts. PMAMP's four-component approach includes small commercial agriculture production center development and commercial agriculture production programs directly relevant to cardamom sector development.

The Agriculture Knowledge Center (AKC) has complemented PMAMP's infrastructure investments by providing technical support and capacity building initiatives. However, stakeholders express significant concerns about the quality and relevance of technical assistance, particularly regarding the disconnect between theoretical training and practical field applications.

The Cardamom Development Center (CDC) operates as a key component of Nepal's agricultural research infrastructure, distributing tissue culture saplings intended to improve genetic material quality and disease resistance. However, field performance of CDC-distributed materials has proven disappointing, with tissue culture varieties demonstrating poor adaptation to actual farming conditions. Plants frequently become malnourished in field environments, failing to achieve expected productivity levels while requiring transplantation at specific developmental stage (Pencil size) that CDC facilities struggle to provide consistently.

International Development Organization Contributions

Swiss Contact's Nepal Agricultural Market Development Programme (NAMDP), known locally as "Sahaj" (meaning 'facilitate' in Nepali), represents one of the most significant international interventions in Nepal's agricultural sector. *Sahaj is a bilateral initiative of the Government of Switzerland and the Government of Nepal, implemented by Swisscontact (as lead agency) and Centre for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED).* Operating through three successive phases spanning a 12-year horizon, NAMDP focuses on private sector-led sustainable economic development with particular emphasis on employment and income generation for rural populations. In the large cardamom sector, Swiss Contact has provided crucial support for grading systems, quality improvement initiatives, and market linkage development, as evidenced by stakeholder testimonials regarding enhanced farmer understanding of quality parameters and price differentiation.

The Food and Agriculture Organization (FAO) has recently intensified its engagement with Nepal's large cardamom sector through the One Country One Priority Product (OCOP) initiative. Nepal's large

cardamom has achieved recognition as a profitable enterprise with a Benefit Cost Ratio (BCR) of 2.74:1, significantly higher than other cereal crops, demonstrating its potential for marginal land utilization and environmental protection through green cover maintenance and soil erosion reduction. FAO's current initiatives include innovative geo-environmental traceability systems aimed at supporting environmentally sustainable production, strengthening digital traceability mechanisms, and enhancing market access capabilities.

A particularly significant development involves the Codex Trust Fund's support for the Bhutan-India-Nepal (BIN) collaborative project, representing the Fund's first group project initiative where the three countries have developed significant working relationships and intend to leverage their collective position to promote new work on large cardamom standards. This trilateral approach addresses the regional nature of large cardamom production and trade while establishing international quality standards that could enhance Nepal's export competitiveness.

The International Centre for Integrated Mountain Development (ICIMOD) implemented the transformative Himalica project (2012-2018) specifically targeting cardamom production resilience in Taplejung district. Given Nepal's position as the world's largest large cardamom producer, ICIMOD's pilot project focused on building resilience in the cardamom production system through climate-resilient farming practices, value-added product development, and crop diversification strategies. The project's location in Taplejung proved strategically important, as this district represents Nepal's largest cardamom producing region and serves as a model for replication in other high-altitude production areas.

Research and Extension Services The research infrastructure demonstrates significant gaps between theoretical approaches and practical farmer needs. Research stations conduct trials with substances like Trichoderma and Pseudomonas, which stakeholders perceive as superficial interventions that fail to address fundamental farmer challenges. The timing of research activities proves problematic, with students conducting studies during Falgun-Chaitra (February-March) when post-harvest activities occur, rather than during the more relevant Mangshir (November-December) period.

Stakeholders emphasize the need for location-specific research stations, given that cardamom varieties and their associated challenges vary significantly with altitude. The current centralized approach fails to capture the ecological diversity that characterizes cardamom cultivation across Nepal's varied topography.

4.3.SWOT Analysis

2.1 Strengths (Favorable and Internal)

Ecological and Agricultural Advantages Nepal possesses exceptional ecological conditions for large cardamom cultivation, with the crop demonstrating remarkable longevity and productivity. Plants can remain productive for 25-30 years, providing sustained income generation for farming households. The crop's adaptability to marginal lands, including rocky terrain where conventional agriculture struggles, represents a significant comparative advantage.

The geographical expansion of cultivation from traditional eastern regions to districts across multiple provinces demonstrates the crop's environmental adaptability. Specific varieties such as Golsai, Dambarsai, and Bharlang produce large-sized capsules classified as A-grade, commanding premium prices in domestic and international markets.

Market Position and Export Potential Nepal benefits from established trade relationships, particularly with India, where 98% of production currently finds market access within 15 days of harvest. The commodity functions as a cash crop, providing immediate liquidity to farming households. International recognition has begun to develop, as evidenced by Nepal's participation in Dubai agricultural exhibitions, where visitors expressed surprise at Nepal's cardamom production capacity, previously assuming exclusive Indian cultivation.

Institutional Framework

The Nepal Federation of Large Cardamom Entrepreneurs, established in 2064 BS, serves as the primary coordinating institution that has been instrumental in reducing syndicate practices that previously exploited farmers. This organization provides essential organizational structure facilitating coordination among farmers, collectors, and exporters while implementing quality improvement initiatives. However, the institutional landscape reveals significant coordination gaps between various development interventions.

The multiplicity of support organizations including PMAMP, AKC, Swiss Contact, FAO, ICIMOD, and international development partners while providing diverse expertise and resources, has created implementation challenges due to insufficient coordination mechanisms. Different organizations often duplicate efforts or implement contradictory approaches, as evidenced by stakeholder concerns about technician rotation policies that undermine local capacity building efforts.

Unnati, another development partner mentioned by stakeholders, has contributed to farmer support systems, though specific program details remain less documented compared to larger institutional interventions. The involvement of municipal governments in pest management programs, including distribution of pesticides like Imidacloprid, demonstrates local government engagement, though stakeholder express concerns about environmental sustainability of chemical-intensive approaches.

2.2 Weaknesses (Unfavorable and Internal)

Technical and Production Limitations Significant knowledge gaps exist among farmers regarding optimal cultivation practices. Many producers maintain the misconception that cardamom requires minimal inputs, leading to suboptimal yield realization. Altitude-specific variety selection remains poorly understood, with farmers often imitating practices from other regions without considering ecological appropriateness.

Processing capabilities remain limited, with only 5-10% of farmers engaging in value addition activities. Traditional sun-drying methods, while producing desired smoky flavors, require extensive time and labor investment. Electric drying alternatives have proven problematic, producing rapid external drying while internal moisture retention leads to storage problems and quality degradation.

Infrastructure and Technology Deficits Laboratory facilities in Nepal fail to meet international standards required for export certification and quality verification. Transportation infrastructure to alternative markets like Bangladesh proves time-consuming and costly. Storage facilities for export consolidation present significant challenges, with minimum container requirements of 5-10 tons creating financial risks for individual exporters.

Market Development Constraints Domestic consumption remains minimal at only 2% of total production, indicating limited local market development. Efforts to increase hotel and restaurant usage have proven ineffective. Export market diversification faces substantial barriers, including complex certification requirements for Middle Eastern markets and strict phytosanitary standards for European destinations.

2.3 Opportunities (Favorable and External)

Market Expansion Potential Global production declines in India and Bhutan have created price surge opportunities that Nepal can capitalize on through expanded cultivation and increased production. Middle

Eastern markets, particularly Dubai, demonstrate strong demand recognition, with cardamom prices reaching NPR 2,000-2,500 compared to Nepal's export prices of NPR 1,200-1,300, indicating substantial value capture potential.

The discovery of cardamom's cooling properties for hot climates and its essential role in biryani preparation suggests expanding market opportunities in regions with similar climatic conditions and culinary traditions. Bangladesh represents a significant potential market once tariff negotiations achieve resolution.

Value Addition and Product Development The successful development of essential oils, flavored teas, handicraft materials and pharmaceutical applications demonstrates untapped potential for product diversification. International market recognition of Nepali cardamom's unique characteristics provides branding opportunities that can differentiate products from Indian and Bhutanese competitors.

Policy and Investment Environment Growing political attention, exemplified by Parliamentary advocacy from leaders like Hon. Yogesh Bhattarai, suggests potential policy support development. The comprehensive institutional support framework involving PMAMP's substantial financial commitment (NPR 130 billion over 10 years), FAO's international market development initiatives, Swiss Contact's market facilitation programs, and ICIMOD's climate adaptation research creates a favorable environment for sector development.

However, institutional coordination remains a critical challenge. The proliferation of development partners, while providing diverse expertise and resources, has created implementation inefficiencies due to overlapping mandates and insufficient coordination mechanisms. The technical transfer challenges, like technician transfer and rotation policies that undermine local capacity building, reflect systemic weaknesses in institutional design rather than individual program failures.

The recent FAO initiative for geo-environmental traceability represents a significant advancement toward addressing international market access requirements, while ICIMOD's climate adaptation focus addresses long-term sustainability concerns. The BIN collaborative framework through the Codex Trust Fund offers unprecedented opportunities for regional cooperation and standard harmonization that could transform Nepal's competitive position in international markets.

2.4 Threats (Unfavorable and External)

Market Access and Trade Barriers Significant tariff barriers impede market diversification, with Bangladesh imposing 35% duties on Nepali imports while providing zero-duty access to Bhutanese cardamom. Pakistan maintains 40% duties while demanding low-price imports, creating unfavorable terms of trade. Bhutan's strategic advantage in re-exporting Indian cardamom to Bangladesh undermines Nepal's competitive position.

Regulatory and Quality Standards Harmonized System (HS) code classifications combine all cardamom types, preventing accurate tracking of large cardamom-specific trade data and market trend analysis. European markets maintain stringent phytosanitary standards that current Nepali production cannot satisfy. Halal certification requirements for Middle Eastern markets create additional complexity and cost burdens.

Climate and Production Risks Climate change impact have become pronounced through irregular rainfall patterns that affect flowering and fruit formation. Temperature extremes and prolonged moisture create fungal development risks and rhizome rot problems. Pest infestations, particularly hairy caterpillars and borers, threaten production stability, while recommended control measures often prove impractical for farmer implementation.

Competitive Pressures Indian trader dominance in key markets, supported by established infrastructure including registered companies and cold storage facilities, creates competitive disadvantages for Nepali exporters. China's indigenous cardamom varieties limit market entry opportunities in what could otherwise represent a significant export destination.

4.4. Price dynamics of large cardamom in Nepal

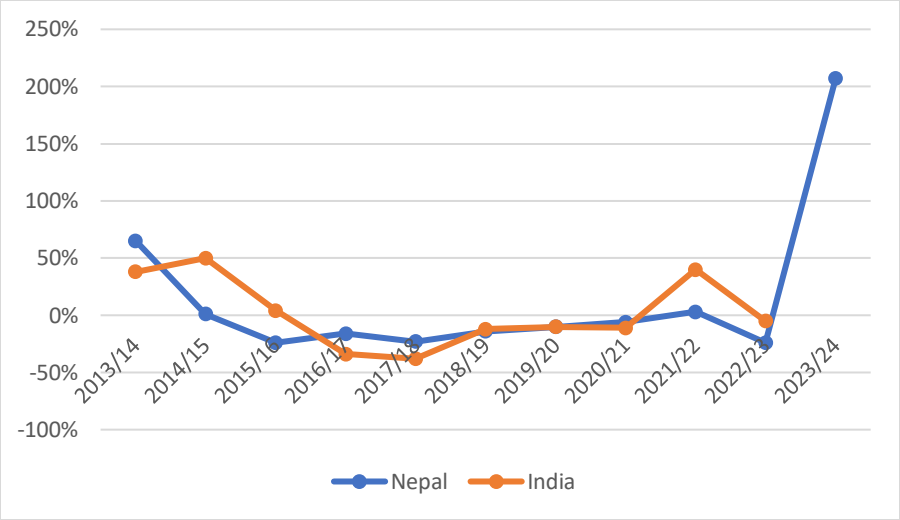


Fig 9. Year to Year Large Cardamom Price fluctuation in Nepal and India

From the figure 8., we can observe high fluctuation in price in both India and Nepal in price. The sharp decrease in the price of large cardamom between 2013 and 2016 can be attributed to several factors. Firstly, there was an overproduction of cardamom due to favorable weather conditions and increased cultivation in major producing countries like India, Nepal, and Bhutan (*ITC*, 2024). This oversupply led to a significant drop in prices. Additionally, the global economic slowdown and reduced demand in key markets further exacerbated the price decline. Lastly, fluctuations in oil prices and currency exchange rates also played a role in the market instability during this period. Whereas the exact reversal has been seen in 2023/2024 where price of large cardamom has seen a huge increase in price primarily due to low production.

Price volatility reasons

1. Indian Market: The price of Large Cardamom in Nepal is not controlled by the Government of Nepal (GoN) or the Federation of Large Cardamom Entrepreneurs Nepal (FLCEN). Instead, it is influenced by the market in Siliguri, India. The FLCEN in Birtamod, Jhapa, receives price information from Siliguri and disseminates it to district level traders, who then pass it on to village level trader**.** The Spices Board India (SBI) facilitates auctions for large cardamom, in Delhi, Siliguri, or Kolkata which helps establish the price for large cardamom in India**.** Indian consumption of large cardamom plays a role in price determination. As most of the Large Cardamom's are consumed internally, within the country, prices can vary according to the local demand. Prices of large cardamom in India are also determined by rainfall as Large Cardamom is a heavily reliant in water, less rainfall can result in reduced production which will pushes prices highe***r***.

Indian traders have a monopoly on price fixation. This monopolistic situation (by buying around 90% of the Nepalese large cardamom produced and controlling the logistics) can influence the price of large cardamom in Nepal and Nepali exporters have limited leeway in negotiating prices. The Indian market's demand and grading criteria set the benchmark for Nepalese large cardamom prices. Fluctuations in India's own production of large cardamom due to factors like weather or pest issues can lead to increased demand for Nepal's cardamom, thus driving up prices. In India production of large cardamom are mainly done in Sikkim and Darjeeling.

2. International demand and re- routing: India often re-exports the imported large cardamom from Nepal to other countries like Pakistan and the Middle East, where the Nepali product is preferred. This re-exporting practice can affect the export prices and, consequently, the domestic prices in Nepal

3. Quality of cardamom (grade): The price can vary significantly depending on the quality type of cardamom. In Nepal, large cardamom is graded into three categories: Jumbo Jet (JJ), Standard/Super Deluxe (SD), and Chalanchalti/ Ilami (CC) with price differences of up to NPR 1,000 between them. The characteristics that determine the quality and thus the price include larger size, removed tail, 12% moisture content, and light brown color

4. Production: The price of large cardamom in Nepal is significantly affected by the country's production levels. When production in Nepal and other major producers like India and Bhutan falls, the increased demand leads to higher prices. The status of large cardamom production, insect pest infestation, diseases, and management practices, could indirectly influence pricing through impacts on yield and quality. The output of large cardamom in Nepal has seen significant year-on-year drops due to factors such as drought and pest problems, which contribute to the price volatility. The price of large cardamom in Nepal is influenced by production costs, including land preparation, nursery management, planting, interculturing, disease control, and harvesting labor.

5. Market structure: There is a lack of efficient marketing information and facilities for drying, processing, and storage at the local level. Nepal's poor market infrastructure, characterized by a lack of accredited laboratories, platforms for auctions, and warehouse facilities, has further weakened the country's export capacity. Cleaning, tail cutting, and grading are mostly done in Siliguri, India. There is a need to grade products within the country, based on factors like size, tail cutting, moisture content, and color, also influences the pricing for farmers and traders. For this to happen however, proper infrastructure

must be built and facilities where cleaning, tail cutting and proper grading should be built within Nepal and development of unique HS code for large cardamom must be developed**.**

6. Minimum Support Price: There is a need for government intervention to stabilize prices by setting a fixed price during harvesting season and protect farmers from rapid fluctuations and traders' monopolies**.** This minimum support price is a form of market intervention by the government to ensure farmers have a guaranteed price and market for their produce**.**

7. Direct Market Access and Government Policy: Direct access to the international market will influence the price of large cardamom in Nepal and will bring price stability. Whereas, any changes in demand or import policies in India can directly impact the prices in Nepal**.**

3. EMPLOYMENT GENERATION AND VALUE ADDITION ANALYSIS

3.1 Current Employment Patterns

Agricultural Employment Large cardamom cultivation currently provides direct employment to farming households across multiple provinces, with cultivation expanding from traditional eastern regions to include districts in central and western Nepal. The crop's 25-30 year productive lifespan ensures sustained employment generation over extended periods. However, the seasonal nature of operations, particularly during harvesting and processing periods, limits year-round employment intensity.

Women's participation in the value chain demonstrates significant potential, exemplified by entrepreneurs like Maya Gurung who has created employment opportunities for 15 women through handicraft production using cardamom leaves. This entirely female-operated enterprise generates sales worth NPR 100,000-150,000 during 3-4 day fair events, indicating substantial income-generating potential.

Processing and Manufacturing Employment Value addition activities, while currently limited to 5-10% of farmers, demonstrate significant employment multiplication potential. Essential oil production requires specialized skills and creates opportunities for technical employment. The handicraft sector utilizing cardamom leaves has proven capable of supporting skilled artisan employment with products commanding premium prices in both domestic and international markets.

3.2 Value Addition Opportunities

Product Diversification Potential Current value addition demonstrates remarkable scope, with successful development of essential oils, powdered products, flavored teas, mouth fresheners, and handicraft materials. The utilization of processing waste as paint industry inputs and natural flavoring components exemplifies circular economy principles that can create additional employment opportunities in downstream industries.

The development of cardamom-infused herbal teas represents a growing niche market segment that combines traditional knowledge with contemporary health consciousness trends. Organic certification potential, similar to coffee sector developments, could command premium prices while creating employment in certification and quality assurance activities.

Technology and Innovation Requirements Stakeholders emphasize the need for improved processing technologies beyond manual operations. Investment in modern processing equipment could enhance productivity while creating technical employment opportunities. However, the balance between mechanization and employment generation requires careful consideration to ensure technology adoption supports rather than displaces labor opportunities.

3.3 Export Diversification Strategies

Market Development Employment Export market diversification requires substantial investment in market development activities, including trade missions, certification processes, and relationship building. These activities can create employment opportunities in international trade, marketing, and business development sectors. The experience of participating in Dubai agricultural exhibitions demonstrates the employment potential in international market development activities.

Quality Assurance and Certification Employment Meeting international market requirements creates employment opportunities in quality testing, certification management, and compliance monitoring. The development of laboratory facilities to international standards would generate technical employment while supporting export market access objectives.

Logistics and Distribution Employment Export diversification requires enhanced logistics capabilities, creating employment opportunities in transportation, warehousing, and distribution management. The current 45-day transportation time to Dubai markets indicates potential for efficiency improvements that could support logistics sector employment growth.

5. Conclusion and Policy Recommendation

The analysis reveals that large cardamom possesses exceptional potential for employment-rich economic growth in Nepal, constrained primarily by knowledge gaps, infrastructure limitations, and market access barriers rather than fundamental production or market demand challenges. The crop's inherent advantages, including ecological adaptability, extended productive lifespan, and growing international recognition, provide a strong foundation for sector development. The value chain demonstrates significant potential for vertical integration and horizontal diversification, with successful examples of essential oil production, handicraft development, and specialty food products indicating viable pathways for employment generation. However, realizing this potential requires coordinated interventions addressing technical capacity, infrastructure development, and market access simultaneously. The research findings emphasize that sustainable sector development depends on farmer-centered approaches that build upon existing knowledge systems while introducing appropriate technologies and market linkages. The institutional framework provided by the Nepal Federation of Large Cardamom Entrepreneurs offers a platform for coordinated development efforts, but requires strengthening to address emerging challenges and opportunities effectively.

Table 5. Policy Recommendation with specific action plan

Policy Pillar	Recommended Policy Actions	Implementation Requirements	Responsible Institutions
Pillar 1: Strengthening Production Systems	- Scale up climate-smart irrigation systems (sprinklers, community channels) through subsidies and farmer cooperatives - Establish farm level pest/disease surveillance using mobile diagnostics and trained extension agents - Invest in long term R&D on cardamom varieties, pest resistance, and postharvest drying techniques.	Subsidies, extension support, digital tools, research funding, and farmer researcher collaboration.	MoALD, NARC, Local Governments, CDC, Universities, Private Extension Services

Policy Pillar	Recommended Policy Actions	Implementation Requirements	Responsible Institutions
Pillar 2: Expanding Processing & Value Addition	- Promote the adoption of modern kilns/dryers by providing subsidies, training and cooperative owned - Support local consumption by awareness, fairs and diversified products (tea, herbal blends, essential oils) - Ease lab testing and certification to tap into high-end international markets.	Subsidy schemes, lab certification systems, quality standards enforcement.	MoALD, DFTQC, FNCCI, Cooperatives, Private Sector
Pillar 3: Enhancing Market Access	- GI certification and a distinct HS code on Nepalese cardamom - Register Nepal cardamom trademarks in key export markets - Diversify trade by having partnerships with all major export markets in the Middle East and ASEAN countries.	International registration, bilateral trade negotiations, legal and technical support.	MoICS, TEPC, MoFA, FNCCI, IP Section, Exporters, FLCEN
Pillar 4: Entrepreneurship, Employment & Inclusion	- Provide targeted entrepreneurship support for women and youth (finance, mechanized tools, incubation, trade fair participation) - Promote agro-tourism in cardamom-producing regions through farm visits, homestays, and spice trails- Leverage digital marketing and partnerships with content creators to brand cardamom as a premium niche product.	Access to credit, capacity-building programs, tourism infrastructure, digital platforms.	MoICS, FNCCI, Local Govts, Banks, MoF, Youth Networks
Pillar 5: Enabling Environment & Future Readiness	- Permission of FDI in cardamom processing/value addition after graduation from LDC	Policy reforms, stakeholder platform creation, incentive	MoF, MoICS, MoALD, CDC, Youth

Policy Pillar	Recommended Policy Actions	Implementation Requirements	Responsible Institutions
	- Provide youth participation programs in quality control, digital marketing and incubation of start-ups.	packages, incubation programs.	& Innovation Hubs

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7. Appendix

Table 5. Area, Production and Productivity of Large Cardamom in Nepal from 1994- 2023 A.D

Year (A.D)	Productive Area (ha)	Production (t)	Productivity (kg/ha)
1994/95	8,782	3,010	343
1995/96	9,252	3,622	391
1996/97	9,553	4,456	466

1997/98	9,725	5,146	529
1998/99	9,770	4,335	444
1999/00	10,627	6,530	614
2000/01	10,668	6,080	570
2001/02	10,840	6,179	570
2002/03	11,095	5,880	530
2003/04	11,220	5,983	533
2004/05	11,347	6,086	536
2005/06	11,498	6,647	578
2006/07	11,712	6,950	593
2007/08	12,015	7,087	590
2008/09	11,849	7,037	594
2009/10	11,766	5,232	445
2010/11	12,584	5,517	438
2011/12	11,665	6,026	517
2012/13	11,434	5,753	503
2013/14	11,501	5,225	454
2014/15	12,460	5,170	415
2015/16	12,120	6,440	531
2016/17	12,511	6,528	522
2017/18	17,004	6,849	400
2018/19	15,055	7,954	530
2019/20	16,565	9,545	580
2020/21	15,668	8,289	530
2021/22	15,975	8,714	550
2022/23	15,975	8,674	540
2023/24	16,382	8,808	540

Table 6. Area, Production and Productivity of Large Cardamom in Taplejung from 2005- 2023 A.D

Year (A.D)	Area (ha)	Production (t)	Productivity (kg/ha)
2005/06	3,324	2,118	637

2006/07	3,386	2,165	639
2007/08	3,386	2,165	639
2008/09	3,850	2,021	525
2009/10	2,925	1,316	450
2010/11	3,900	1,755	450
2011/12	2,925	1,755	600
2012/13	2,952	1,802	610
2013/14	3,112	1,680	540
2014/15	3,950	1,410	357
2015/16	4,150	2,490	600
2016/17	4,150	2,490	600
2017/18	4,200	2,940	700
2018/19	4,299	2,958	700
2019/20	4,299	2,958	700
2020/21	4,302	2,960	700
2021/22	4,299	2,851	670
2022/23	4,303	2,650	600
2023/24	4,165	2,541	610

Table 7. Area, Production and Productivity of Top 10 Large Cardamom producing districts of Nepal in the FY 2081/82 B.S.

S.N.	District	Productive Area (ha)	Production (t)	Productivity (kg/ha)
1.	Taplejung	4,165	2,541	610
2.	Panchthar	3,443	1,442	420
3.	Illam	1,655	1,159	700
4.	Sankhuwasabha	2,364	1,040	440
5.	Khotang	1,604	596	560
6.	Terathum	647	298	460
7.	Bhojpur	665	279	420

8.	Dolakha	300	168	560
9.	Solukhumbu	158	117	740
10	Nuwakot	90	68	960

Table 8. Price Changes of Large Cardamom in Nepal

Year	**Price of Large Cardamom in Nepal**	**Year to year percentage change in price in Nepal**
2012/13	1500	
2013/14	2475	65%
2014/15	2,500	1%
2015/16	1,902.13	-24%
2016/17	1,604.46	-16%
2017/18	1,240.06	-23%
2018/19	1,071.87	-14%
2019/20	959.74	-10%
2020/21	901.01	-6%
2021/22	923.70	3%
2022/23	700	-24%
2023/24	2,150	207%

Table 9. Price Change of Large Cardamom in India

Year	Price of Large Cardamom in India (Rs)	Year to year percentage change in price in India
2012/13	1091.12	
2013/14	1501.136	38%
2014/15	2254.66	50%
2015/16	2353.46	4%
2016/17	1558.304	-34%
2017/18	959.52	-38%
2018/19	843.696	-12%
2019/20	760.672	-10%
2020/21	675.28	-11%
2021/22	943	40%
2022/23	899.504	-5%

Table 10. Compound Annual Growth Rate of Area, Production and Productivity of Nepal and Taplejung district

Variable	Nepal CAGR (%)	Taplejung CAGR (%)
Area	1.9527	1.8867
Production	2.2736	2.8825
Productivity	0.3226	1.0007