

POLICY BRIEF

Harnessing the comparative advantage of large cardamom

KEY MESSAGES

Large cardamom (*Amomum subulatum* Roxb) is endemic to Bhutan, India, and Nepal. The three countries can work together to create a common branding and marketing message to profile and promote large cardamom as a niche product of the Eastern Himalaya, and establish common product standards, production guidelines, and support systems to ensure quality and authenticity of the product.

Large cardamom has unique characteristics, taste, and flavour. A common branding and regional identity can help position it uniquely from other cardamoms in the global spice and pharmaceutical markets.

Joint efforts are needed both to access new markets and to expand the demand in domestic markets by making a range of value-added products.

Large cardamom is a high-value crop that can improve the livelihoods of small farmers and various actors in the cardamom value chain.

Background

The *Hindu Kush Himalaya Assessment* shows that the susceptibility and sensitivity of livelihoods to climate-dependent natural resources is a major concern for many households in the mountains and hills of the HKH. To buffer against shocks and stresses, mountain communities tend to diversify their livelihood options by harnessing opportunities that mountains offer in the form of products that have comparative advantages and unique qualities. Large cardamom, also known as black cardamom or large black cardamom¹, is one such high-value cash crop that provides high returns, has a long shelf-life, is less labour-intensive, and grows well on hill slopes close to streams and on marginal lands under tree shade that are unsuitable for cultivation of other crops^{ii,iii}. Large cardamom favours agroforestry and helps restore ecological health in areas where it is grown by controlling soil run-off, increasing soil nutrients, and creating microhabitat for diverse animals and microorganisms.

This particular species (*Amomum subulatum* Roxb) of cardamom is grown only in Bhutan, India, and Nepal. It is different from cardamom species grown in other parts of world, which are variously described as green, white, or red, based on the appearance of the dried fruit and indexed to fruit size/form such as small, large, and round. Green or small cardamom (*Elettaria cardamom*) is cultivated in India, Sri Lanka, Guatemala, and other tropical countries; large red cardamoms (*Amomum villosum*, *A. costatum* and *A. tsao-ko*) are grown in China and the Hoang Lien Mountain Range of Vietnam; and white cardamom (*Amomum krervanh*) is grown in Cambodia, Thailand, Vietnam, and Laos PDR.

¹ A point of clarification regarding size and colour in the nomenclature: The size of the Chinese Cao Guo is much larger, and the colour of fresh large or black cardamom pods is actually red or maroon, which turn black during processing and storage.

Ecologically, a large cardamom-based agroforestry system is considered more viable and sustainable than rain-fed agriculture, as it can store 3.5 times more carbon and bring 5.7 times more monetary returns to farmers compared to the rainfed systems^{iv}. The large cardamom-based agroforestry system has been sustainably managed by indigenous people and over the years it has evolved and been adopted by other communities.

An overview of the global demand and supply situation reveals that there is significant unmet demand for cardamom in the global market. In 2016, the global cardamom market was valued at USD 67.4 billion. It is expected to grow by 2.50% over the forecast period of 2017–2030^v. At present, cardamom belonging to the genus *Elettaria* dominate the global market. Of the total global export of cardamom, which is presently estimated at 45,000 metric tons, around 35,000 metric tons are from Guatemala and of the genus *Elettaria*. The prices of Guatemalan cardamom are significantly lower compared to those of large cardamom from Bhutan, India, and Nepal^{vi}. It is difficult to trace the separate demand and supply of large cardamom as there is a common harmonized code for all varieties of cardamom in international trade. Green cardamom, white cardamom, and red cardamom produced in different parts of the world share a common trade code or Harmonized Standard (HS) with large cardamom, and most import and export figures provide combined information on large cardamom and other species of cardamoms. Large cardamom-specific information is available at the country level, but once the product leaves Bhutan, India, and Nepal, it is not easy to trace the flow of the cardamom^{vii, viii}.

Given the recent fluctuations in production and market price, there is a need for greater collaboration among Bhutan, India, and Nepal to position large cardamom as a niche product in the global market and invest in research and development. Efforts from all three countries could help highlight the unique attributes of large cardamom and, with right messaging, make it easy for consumers to distinguish them from green, white, and other cardamoms.

Potential to deliver economic benefits and build resilience

Profitable farming and rural enterprise: Large cardamom is a lucrative and attractive livelihood option for mountain communities. It is a high-value, low-volume product and can deliver substantial returns for

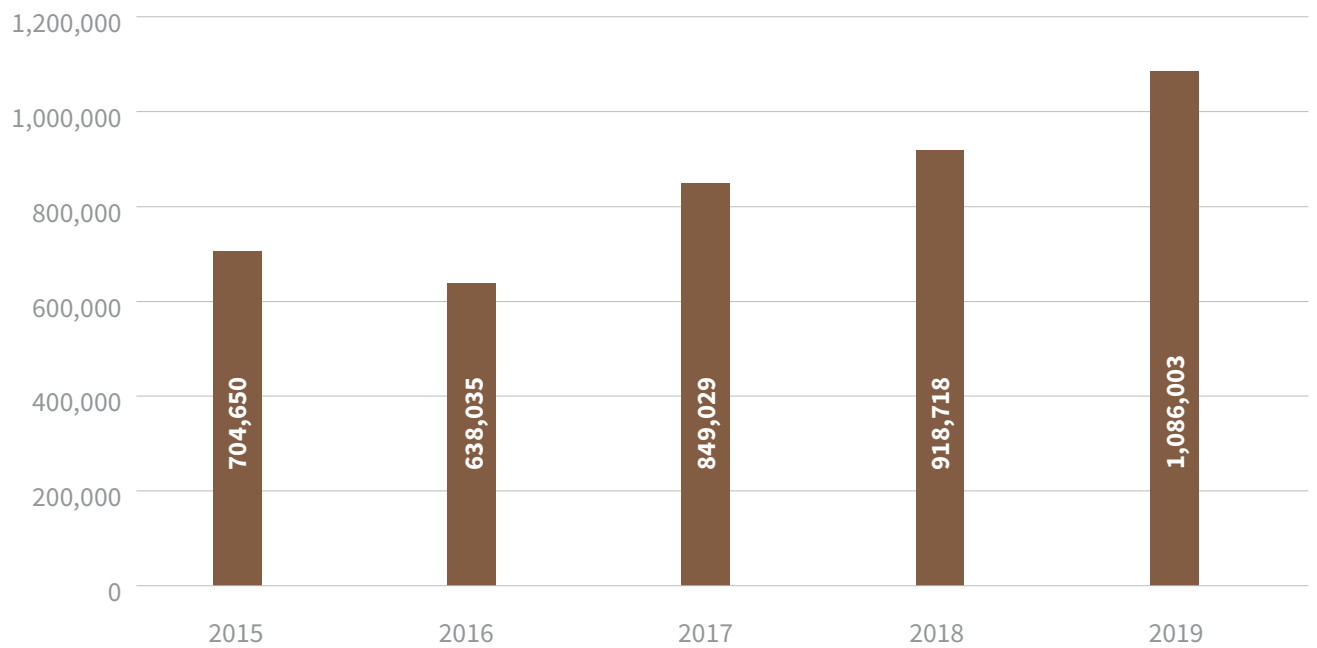
actors at various nodes in the value chain. A financial analysis from Taplejung, Nepal showed that the return on investment was about 160% with a payback period of 4.09 years, and the internal rate of return and benefit-cost ratio of cardamom production was 82.6% and 3.06, respectively^{ix}. A sensitivity analysis showed that even with a 20% increase in the cost of production and a 20% decrease in the selling price, cardamom production would still be profitable and viable^x.

A study conducted in Sikkim, India showed that with total input cost of USD 123 for 1 hectare, the output was USD 1,619 in the large cardamom agroforestry system, and the output to input ratio was estimated at 13.16 compared to only 1.85 for rainfed agriculture^{xi}. A cost-benefit analysis showed that large cardamom agroforestry is 5.7 times more profitable for farmers compared to rain-fed agriculture^{xii}.

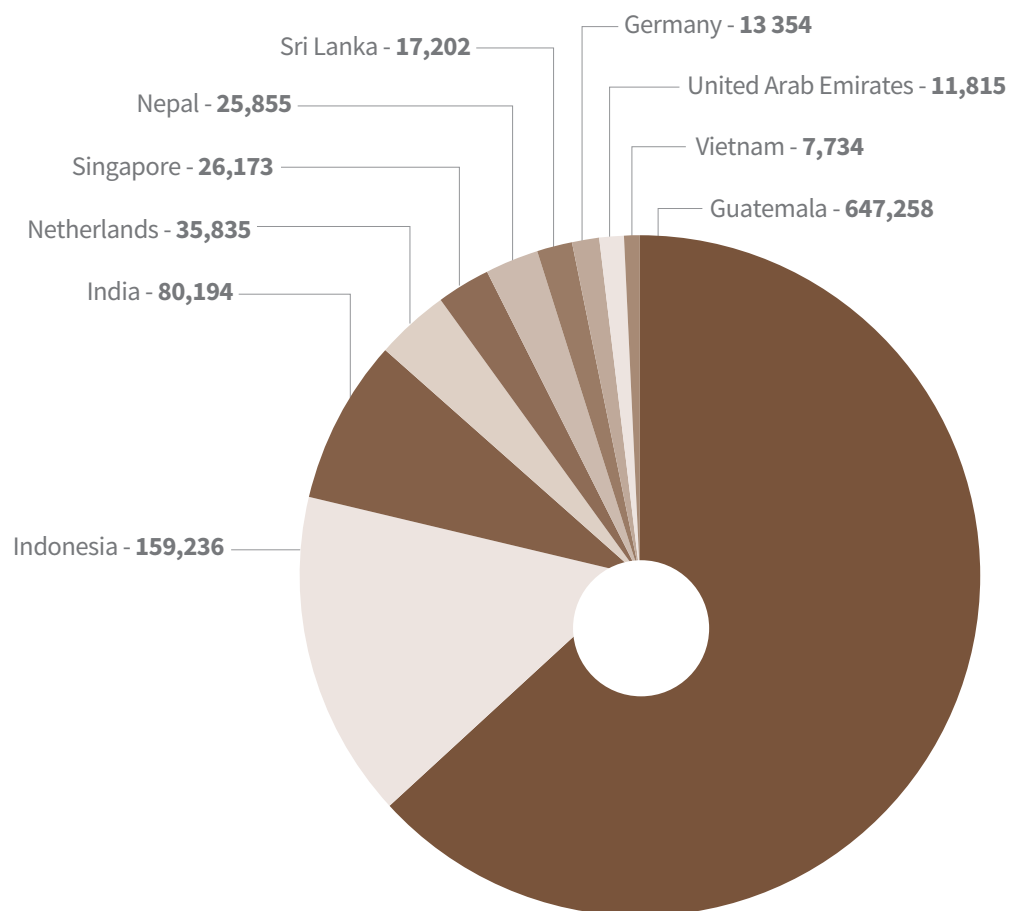
Export revenue generation: As one of the top export commodities capable of generating valuable foreign currency for Bhutan, India, and Nepal, large cardamom can help reduce trade deficits. In 2019, Bhutan exported 1,375 tonnes of the product, with an export value of USD 16.66 million, equivalent to BTN 1,247 million^{xiii}. That same year, Nepal exported 5,240 tonnes worth USD 27.38 million, equivalent to NPR 3,294 million^{xiv}. India exported cardamom worth USD 801.94 million in 2019, of which the share of large cardamom is not specified^{xv} (Spices Board of India 2021).

The total export value of cardamoms, which include large cardamom from this region as well as green, white, and red cardamom from other parts of the world, has reached over USD 1,000 million (Figure 1), with Guatemala having the largest share of 60%, followed by Indonesia with 15%, and only 10% from Bhutan, India, and Nepal (Figure 2).

Ecologically suitable: Large cardamom is an ecologically sympatric sciophyte and grows well in association with other trees. It is traditionally grown on marginal and degraded slopes, and hence popularly referred to in Nepali as 'kholso ko sun' (literally, 'gold of the swamplands'), a reference to its preferred habitat^{xvi}. This means it does not compromise the ability of other crops to thrive and compete for land that is otherwise used for food production. Large cardamom agroforestry is also reported to store 3.5 times more carbon, and the conservation value for water (81%) and soil (87%) is higher for cardamom agroforestry as compared to rainfed agriculture^{xvii}.

FIGURE 1**GLOBAL EXPORT VALUE OF CARDAMOM, NUTMEG, AND MACE (in 1000s of USD)**

Source: ITC trade map

FIGURE 2**SHARE OF EXPORT VALUE BY TOP 10 EXPORTING COUNTRIES IN 2019**

Source: ITC trade map



Gender friendly: There is good scope for women to participate as active value chain actors in various processes along the large cardamom value chain. At present, curing, tail-cutting, and grading of cardamom pods is generally undertaken by women. They are increasingly involved in value addition work at the processing centres^{xxix}. Though marketing activities are mostly done by men, the increase in household income has empowered women financially and socially^{xx, xxxi}.

Compatible with integrated farming: Large cardamom has traditionally been grown by ethnic communities, especially by forest-dependent households. Large cardamom agroforestry is well suited to local traditions and practices that are based on an integrated crop-livestock-forestry system. The crop is suitable not only for smallholder marginal farmers, who grow this to supplement income, but also for medium and large farms that grow it as a main cash crop.

Multiple health benefits: Large cardamom is widely used in the food and pharmaceutical sectors of South Asia and the Middle East. Bioactive compounds present in cardamom have allelopathic, analgesic, anti-inflammatory, antioxidant, anti-ulcer, cardio-adaptogen, and hypolipidemic properties. Large cardamom also has antimicrobial properties. For instance, petroleum ether extracts of large cardamom have shown antimicrobial properties against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*^{xxii, xxiii} and *Bacillus cereus*^{xxiv}. Likewise, the acetonetic, methanolic, and ethanolic extracts^{xxv} of large cardamom showed antimicrobial inhibitory activity against *Streptococcus mutans* and *S. aureus*, and antifungal inhibitory activity against *Candida albicans* and *Saccharomyces cerevisiae*^{xxvi}.

Policy pointers

Policy pointers	Issues and implications	Recommended actions
Large cardamom needs a unique identity to distinguish it from other cardamoms in the global spice market	<p>All three countries (Bhutan, India, and Nepal) have prioritized large cardamom as an export commodity with high potential. Nepal listed large cardamom in its National Trade Integration Strategy (2010–2015 and 2016–2020). Bhutan included it as an important product under its ‘One Gewog One Product (OGOP)’ Development Project. The Government of Sikkim, India, has emphasised promotion of this crop to support rural livelihoods. However, in recent years, large cardamom has been facing increased competition from green and white cardamoms produced in other parts of the world. It loses its identity after it reaches the international market, as there is a common Harmonized System (HS)² code for all varieties of cardamoms.³</p> <p>Large cardamom has unique compositional characteristics, taste, and flavour. A common branding and marketing message and common regional standards can help position it uniquely, distinguishing it from other cardamoms in the market. There are good examples from the region, such as Darjeeling tea, in which the word and logo are protected as GI and backed by the following statutes in India (Trademarks Act 1999; and Geographical Indications of Goods [Registration and Protection] Act, 1999). The word ‘Darjeeling’ is also registered as a Community Collective Mark (CCM) in the European Union.</p>	<p>Bhutan, India, and Nepal may put forward a proposal to the Trade Statistics Branch of the United Nations Statistics Division to revise the HS code for cardamom. There could be a separate four-digit code for nutmeg and mace, and a six-digit code more specific to green, white, and large cardamoms. This will help to distinguish and understand market dynamics, demand and supply trends, and the price of large cardamom in the international market.</p> <p>The three countries may create a common branding and marketing message to position large cardamom as a niche product of the Eastern Himalaya, and establish guidelines, product standards, codes of conduct, and legal support systems to assure quality and authenticity of product claims. The common, regional branding could be supported with information on the chemical characteristics and uses of large cardamom, and promoted through targeted communication, media, and participation in regional and international trade fairs.</p>
Collaborative value chain linkages need to be strengthened for better market access	<p>The bulk of large cardamom produced in Bhutan, India, and Nepal moves to other countries without any value addition and product diversification. The harvested and dried capsules are mostly exported in raw form with minimal preprocessing, which includes tail cutting, grading, and packaging in 40 kg sacks. Domestic consumption is very low. In Nepal, for instance, domestic consumption is 1%; the remaining 99% is exported to and via India^{xxvii, xxviii}.</p> <p>There is no doubt that further development of the market is crucial to improving the sustainability and viability of the large cardamom value chain. Efforts are needed both to access new markets such as manufacturers of traditional medicine in China and spice markets in the Middle East, and to expand the domestic market by making a range of value-added products such as cardamom tea masala, cardamom biryani powder, cardamom mouth freshener, and so on.</p> <p>Transboundary cooperation is imperative to strengthening horizontal and vertical linkages among value chain actors to achieve economy of scale and secure better prices while assuring the genuineness and authenticity of claimed products.</p>	<p>Set up innovation and start-up centers to create entrepreneurship along value chains for ensuring quality – from drying, collection, tail cutting, grading, and packaging to improving access to cleaner solutions for processing large cardamom.</p> <p>Reduce risks by creating value-added and diversified products from large cardamom pods such as cardamom tea masala or curry powder from the seeds to table runners and other products from cardamom stalk fibers; explore the potential for extracting essential oils and making perfumes and other aromatic products.</p> <p>The formation of large cardamom entrepreneurs’ networks at the country and landscape levels is proposed to achieve economy of scale and sharing of information, knowledge, and infrastructure for collective storage, warehousing, and long-term storage. The network can play an important role in assuring authenticity and sensitizing farmers and traders to the critical importance of meeting quality. It can also help farmers and traders meet trade requirements and access new markets with a range of value-added products.</p>

² The Harmonized System (HS) is an international nomenclature for the classification of products. It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the HS for classifying goods is a six-digit code system.

³ The six-digit code has three parts. The first two (HS-2) identify the chapter the goods are classified under, e.g., 09 = coffee, tea, maté, and spices. The next two digits (HS-4) identify groupings within that chapter, e.g., 09.02 = tea, whether flavoured, 09.08 = cardamom, nutmeg, and mace. The next two digits (HS-6) are more specific, e.g., 09.02.10 green tea (not fermented), 09.08. 31 = cardamoms, neither crushed nor ground and 09.08.32 = cardamoms, crushed or ground. In case of tea, the four-digit code does not club other products, and the six-digit code provides specific information about tea, such as green tea (not fermented). In the case of cardamom, however, the four-digit code includes nutmeg and mace, and the six-digit code does not provide specific information on green, white, and large cardamoms.

Policy pointers

Issues and implications

Recommended actions

Building the resilience of a large cardamom agroforestry system will help ensure sustainable production and improve price competitiveness

The cost of production of large cardamom in the Eastern Himalaya is high. As a result, cardamom traders and spice and herbal companies are substituting black cardamom with other cardamoms (though these have different flavours and tastes) that sell at very competitive prices, i.e., at USD 5/kg^{xxix}.

Large cardamom traditionally grows on marginal lands, particularly in seepage areas of hill slopes under partial shade of trees such as alder (*Alnus nepalensis*). However, over the years, communities have started to shift plantations from seepage areas to rain-fed croplands. Some communities have also converted their rain-fed crop lands (maize and millet fields) to large cardamom farms. Due to overexposure of the crop to sun, inappropriate shade trees, poor crop management, and climate stress, large cardamom have become more susceptible to fungal and viral diseases (commonly referred to as *chirkey* and *furkey*) and pests. As a result, crop productivity has remained stagnant despite the increase in input costs. A quick comparison showed that the cost of production of green cardamom in Guatemala, red cardamom in China, and white cardamom in Cambodia is lower than it is for large cardamom.

There is a need to reduce the cost of production by improving yield per unit cost with appropriate crop management practices, and the development of high-yielding varieties. With greater understanding of micro-climatic habitat requirements, a comprehensive package of good practices can be developed for building the resilience of a large cardamom agroforestry system.

Similarly, there are a number of varieties that are reported to have better resistance to diseases and climate shocks. However, existing policies in Bhutan, India, and Nepal are not conducive to maintaining a repository and facilitating the exchange of germplasm.

The development of a package of good practices can improve yield and reduce climate stress by integrating key elements of resilient agriculture, taking water, soil health, shade tree, and other crop management practices into consideration. The solutions should be cost- and labour-effective, gender friendly, and scalable.

The three countries may form a task force (expert group) to design and develop varieties with common parameters for morphological, genetic, and functional traits, and set up a mechanism for the smooth exchange of germplasm and maintenance of repository (mother stocks).

Notes

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