

# Large Cardamom Cultivation-A Review

Sujit Sarkar<sup>1</sup>, Natasha Gurung<sup>2</sup>, Dipak Nayak<sup>3</sup>, Ramu Meena<sup>4</sup> and Bijoy Singh<sup>5</sup>

<sup>1</sup>Scientist, Indian Agricultural Reserach Isntitute, Regional Station, Kalimpong, [Sujitgovt@gmail.com](mailto:Sujitgovt@gmail.com)

<sup>2</sup>Scientist, Indian Agricultural Reserach Isntitute, Regional Station, Kalimpong, [natashagurung23@gmail.com](mailto:natashagurung23@gmail.com)

<sup>3</sup>Scientist, Central institute for subtropical horticulture, Regional Station, Malda, [dipakiari@gmail.com](mailto:dipakiari@gmail.com)

<sup>4,5</sup>Technical officer, Indian Agricultural Reserach Isntitute, Regional Station, Kalimpong

**Abstract**—Large cardamom (*Amomum subulatum* Roxb.) belongs to family Zingiberaceae and order Scitaminae is the most suitable cash crop for the hilly terrain of the state of Sikkim, Darjeeling hill, Nepal, Bhutan, and recently popularized in North East states. For years cardamom has been the single most crucial cash crop to the farmers of these regions. However recent times have shown a steep decline in the land holdings, as well as productivity under large cardamom and it has drastically affected the livelihood of a large section of the rural population therefore, a review of the large cardamom with cultivation, exports, economics, major issues and starties to address those issues are dic=scussed in teails in the present paper.

## 1. INTRODUCTION

Beside magnificent views of Kanchenjunga, sweeping landscapes and lush greenery; the Himalayan belt of Darjeeling and Sikkim is also known for its high quality teas, flavoured large cardamom, sweet mandarin, beautiful flowers and orchids. With the grace of nature, the region is endowed with rich agricultural and horticultural biodiversity especially in genetic diversity, species diversity and ecosystem, diversity. Traditionally agriculture remained as the major source of livelihood to the Himalayan people. The region is home of the major commercial spices of India i.e. Large Cardamom specially Sikkim and Kalimpong of West Bengal. But so far the area was known only for Darjeeling tea to the whole world. Thus, the importance and potentiality of large cardamom remain untapped for long period.

## 2. AREA UNDER LARGE CARDAMOM:

Large Cardamom (*Amomum subulatum*), a member of Zingiberaceae family under the order Scitaminae is one of the main cash crops cultivated in the sub-Himalayan state of Sikkim and Darjeeling District of West Bengal covering. Total area under large cardamom in India is 30,000 ha with a production of 5000 MT. The area of Sikkim and Darjeeling district of West Bengal under large cardamom cultivation as recorded in 2011-12 was 26,459 ha of which 23154 ha was recorded from Sikkim and 3305 ha from Darjeeling district of west Bengal.

## 3. BLACK CARDAMOM DISTRIBUTION

Black cardamom seeds are mainly cultivated in Asian countries such as Nepal, India, Pakistan, Bhutan, China and Vietnam. In India, large cardamom is mainly cultivated in Sikkim and Darjeeling district of West Bengal. Large cardamom is also cultivated in parts of Uttarakhand and in some other North-eastern states.

## 4. PRODUCTION:

India is the largest producer of large cardamom with 54% share in world production, and Sikkim contributes upto 88% of India's production. The annual production varies from 5000-5500 metric tonnes with an average productivity of 175kg/ha. Total production of large cardamom from Sikkim and Darjeeling district of West Bengal in 2011-12 was 3863 MT. Large cardamom production was highest in Sikkim (3237 MT) followed by Darjeeling (626 MT). Among 4 districts of Sikkim, East district (1036 MT) was ranks first in term of production followed by South district (824 MT), West district (722 MT) and North district (655 MT) (Spices Board, 2012).

## 5. ECONOMICS:

The large cardamom based agro-forestry system generates Rs.40-50 crores revenue to the Sikkim State only. A farmer can earn revenue of Rs.25000 to 30000 from one hectare plantations.

## 6. USES:

It is used as a spice in several ayurvedic preparations. It contains 2 to 3 % of essential oil and possesses medicinal properties like carminative, stomachic, diuretic, cardiac stimulant, antiemetic etc. Beside these, the spice finds its use in a variety of practical fields as below-

## 7. MEDICINAL USES

It has many health benefits.. It is also reported that large cardamom seeds are used as preventive as well as curative measure for throat troubles, congestion of lungs, inflammation

of eyelids, digestive disorders and in the treatment of pulmonary tuberculosis. Beside these, it has many other medicinal uses-

- The decoction of seeds is used as a gargle in infection of teeth and gums. Chewing black cardamom seeds helps to cure loss of appetite.
- Black cardamom is also an important antidote to several health problems like bronchitis, colic, fatigue and stress.
- Indians believe that black cardamom can cure obesity and consumption of this helps in proper digestion.
- Black cardamom is used as a carminative and a stimulant; it is effective in relieving indigestion and flatulence.
- Large cardamom seeds are considered as an antidote to either snake venom or scorpion venom
- Black cardamom is used to treat halitosis.
- It can heal respiratory problems like asthma and other types of respiratory spasms.
- Black Cardamom seeds have anti-inflammatory properties and they help in the reduction of muscle spasms.

#### Culinary Uses

Large cardamom has a pleasant aromatic odour, due to which it is extensively used for flavouring vegetables and many food preparations in India. Here is a brief list illustrating the various ways in which these seeds can be used.

- The leaves of the plant are cooked and consumed as greens, the roots are boiled and eaten like potatoes, flowers are used as a garnishing agent in salads and other recipes and the pods are often steam-cooked and added in pulses.
- Black Cardamom is frequently included in several Indian sweet dishes and punches. It is also used as a flavoring agent in pickles and custard.
- In India, it is used as a pan masala and added in betel leaf preparations. It is widely used in the preparation of *Biriyani*. Rice puddings, flans and porridges taste great with a pinch of black cardamom.
- Black Cardamom is an important ingredient in Scandinavian bakery products and Danish pastries. In Sri Lankan cuisine, the pods are generally added to spicy beef and chicken curries.
- When a small amount of this spice is added to coffee cakes, it produces a stimulating flavor. Black cardamom seeds are used to flavor tea.

## 8. NUTRITIONAL VALUE OF LARGE CARDAMOM

Large cardamom is a good source of minerals like potassium, calcium, and magnesium. Additionally, it is also an excellent source of iron and manganese. Further, these aromatic pods are rich in many vital vitamins, including riboflavin, niacin, vitamin-C that is essential for optimum health. One black cardamom pod contain the following components (<http://www.myfitnesspal.com/>)-

**Table 1: Nutritional component of large cardamom**

| Components    | Quantity |
|---------------|----------|
| Calorie       | 6        |
| Potassium     | 22 mg    |
| Total carbs   | 1 g      |
| Dietary fibre | 1 g      |

Black cardamom seeds have some essential oils, the chemical constituents of which are listed below.

**Table 2: Essential oils in large cardamom**

| Essential Oils | Percentage | Essential Oils | Percentage |
|----------------|------------|----------------|------------|
| a-terpineol    | 45%        | β-phellandrene | 3%         |
| Myrcene        | 27%        | 1,8-cineol     | 2%         |
| Limonene       | 8%         | Sabinene       | 2%         |
| Menthone       | 6%         | Heptane        | 2%         |

## 9. EXPORT OF SPICES

Indian economy is basically agrarian and hence exports of food and agricultural products assume greater significance in our national economy. In 2014-15, the export of spices from India maintained its increasing trend both in terms of volume and value. Total 8,93,920 tons of spices and spice products valued Rs.14899.68 crore (US\$2432.85 Million) was exported from the country against 8,17,250 tons valued Rs.13735.39 crore (US\$ 2267.67 Million) in 2013-14, registering an increase of 9% in volume and 8% in rupee terms and 7% in dollar terms of value.

## 10. EXPORT OF LARGE CARDAMOM:

Export of large cardamom increased during the 1980s. A ten-fold increase in export volume with a three-fold increase in unit price was achieved in the last decade, making large cardamom a major economic cash crop for the state. The export of large cardamom too witnesses a significant jump over the years. In 2010-11, total 775 tonnes were exported adding 4462.90 lakh to Indian economy which increased to estimated 1110.00 tonnes in 2013-14 and earned Rs. 7961.15 lakh. In 2013-14, the total spice exported was 817250 (est) tonnes and earned Rs. 1373539.26 lakh (2267.67 million US \$).

## 11. IMPORT:

The import of large cardamom gradually decreased over the years. In 2009-10, total 6000 tonnes of large cardamom was imported with a value of Rs. 6719.00 lakh which decreased to 3705 tonnes with a value of Rs. 21406.20 lakh, whereas the total amount of spices our country is importing has increased over the years. In 2009-10, total 106,700 tonnes spices were imported with a value of Rs.110045.75 while in 2013-14 it is estimated to import 130010 tonnes with a value of Rs.290513.76. the import data indicates that in spite of major producer of large cardamom still the country has to import to meet the domestic demand. Hence, the productivity increment of large cardamom through improved cultivar and technology is highly essential to meet the national demand.

## 12. MAJOR IMPORTING COUNTRIES:

Total 726613.13 tonnes of spices was exported in 2012-13 from India making Rs. 1211275.80 lakh in Indian treasury. The major amount of spices was exported to USA (71087.00 tonnes and Rs.211572.30 lakh) followed by China (25751.31 tonnes and Rs. 201791.56 lakh) and Vietnam (60907.90 and 63595.26 lakh).

## 13. MAJOR ISSUES:

The large cardamom in the region is mainly cultivated using traditional methods without much intervention of modern science. However, recently it encountered several problems which calls for modern scientific inputs, like-

### 1. Decline in Area and Production:

Both the area and production under large Cardamom in Sikkim has marginally decreased from 23729 ha in 2008-09 to 22755 (est) ha by 2012-13 and production from 3675 tonnes (2008-09) to 3483 tonnes (2012-13). The area and production of large cardamom in West Bengal remain almost constant over the last 3-4 years. Total 3305 ha were cultivated in West Bengal with a production of 625 tonnes in 2008-09. In 2012-13, the area under large cardamom was 3305 ha with production of 662 tonnes.

The area under large cardamom experienced a decrease over the years. Total area under cultivation in 2008-09 was 27034 ha which declined to 26060 ha . the production has marginally increased from 4300 tonnes to 4465 tonnes during the same period.

## 14. POOR POST HARVEST PROCESSING

Freshly harvested capsule contains 80-85% moisture. It has to be dried immediately for long perishability and use. Farmers of the region uses traditional kild called as bhatti to dry the capsule which turn the colour of capsule into black or dark brown. Moreover, the uneven and sometime excessive burning of the capsule results into poor appearance and loss of aroma

in the traditional bhatti. Thus it loses the edge in market competition and fetch low price.

## 15. RAPID SPREAD OF DISEASE:

Recently, the widespread occurrence of leaf blight disease has become the major concern to the large cardamom growers. The fungus known as *Colletotrichum gloeosporioides* was responsible for leaf blight as reported by Indian Cardamom Research Institute in 2011. The viral chirkey and furkey disease has become common phenomena in most of the fields. The disease spread was more on account of farmers ignorance, and lack of control mechanism.

## 16. CLIMATE CHANGE:

“Large cardamom needs a lot of moisture and water in soil. But over the years, winters have become longer, drier and warmer. The soil’s moisture content has reduced which has allowed pathogens to flourish rapidly.

## 17. LACK OF INPUTS

Lack of quality planting material is the major constraint in Darjeeling hills to maintain the productivity and quality.

## 18. LOW MARKET PRICE

Low market price due to poor processing is the major obstacle the farmers of Darjeeling Himalaya are facing.

## 19. POOR EXTENSION SERVICE AND COVERAGE

The extension service and coverage is very poor and limited, as a result there is a huge technological and knowledge gap among the farming communities.

## 20. FUTURE POLICY:

- 1) Collaborative research programme of sister institution to identify the improved cultivar, disease free variety, improved planting material, disease control mechanism etc.
- 2) Community led extension approach for collective cultivation, post harvest processing and marketing
- 3) Mechanization of large cardamom cultivation and post harvest operation
- 4) Establishing market linkage through cardamom growers association
- 5) Establishing water harvesting structure and ensuring the water availability for irrigation throughout the year.

- 6) Establishing of certified nurseries and monitoring through research institution to ensure regular supply of healthy planting materials.
- 7) Crop insurance in case of hailstorm, drought, landslide other climatic risk.
- 8) Establish separate market or auction centre in each block to minimize the margin of middlemen and ensure the fair price to the large cardamom growers.
- 9) Replantation scheme with healthy planting materials as most of the plantation are old and productivity is very low.

**References:**

- [1] Bhattarai N K, Deka T N, Chhetri P., Harsha K N and Gupta U. Livelihood improvement through sustainable large cardamom cultivation in North Sikkim. International Journal of Scientific and Research Publications, 2013, Volume 3, Issue 5.
- [2] Gudade B.A, Chhetri P, Gupta U, Deka T.N. and Vijayan A.K. Traditional practices of large cardamom cultivation in Sikkim and Darjeeling. Life sciences leaflet, 2013, pp62. [Http://lifesciencesleaflets.ning.com](http://lifesciencesleaflets.ning.com)
- [3] <http://www.myfitnesspal.com/>
- [4] [www.indiaspices.com](http://www.indiaspices.com)