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## ECONOMIC ANALYSIS OF INDIAN CARDAMOM AND ITS' EXPORT TRENDS

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### Abstract

Cardamom also popularly known as "Ilachi" is native to South India and Guatemala. Cardamom is known as the Queen of Spices which was two hundred years ago grown wild in South Western India. It was the British who entrenched the cardamom plantations in India. Cardamom belongs to the ginger family with large leaf and more of an aromatic herb with a pungent smell. The seed pods of the plant which as three chambers forms the main part of cardamom for which it is harvested. In India Kerala is the biggest producer of cardamom and supplies both for the local and the International market. The cardamom seed is the most common seasoning agent which is used in the cooking of India and Mid – Eastern countries. Cardamom favored tea is very famous across the Country.

**Keywords:** Cardamom, Mid – Eastern countries, aromatic herb, plantations, Queen of Spices, international market, flavoring

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### Introduction

Cardamom (*Elettaria Cardamom*) the "Queen of Spices" enjoys a unique position in the international spice market, as one of the most sought after spices. From time immemorial, India is known as the home of cardamom. Cardamom is indigenous to the evergreen forests of Western Ghats in south India. Till recently India was the main producer and exporter of this commodity of late Guatemala has emerged as a keen competitor to Indian cardamom in the international market. "The total area under cardamom in India is estimated as 81.113 hectare".

Cardamom is used for flavoring various food preparations, confectionery, beverages and liquors. It is also used for medicinal purpose, both in Allopathy and Ayurveda systems in the middle east countries, cardamom is mainly used for preparation of 'Ghawa' cardamom flavored coffee. It is propagated through seeds. Suckers and tissue culture plant lets. Cardamom plants mature in about 20-22 months after planting poly bag seedlings or rhizomes. Economic yield stands from 3<sup>rd</sup> year onwards after planting, and it continues up to 8-10 years. The total life span of cardamom plants is about 15-20 years; however pseudostem is biannual in nature.<sup>1</sup>

## History of Cardamom

The world doesn't know the actual time period when cardamom originated but it is considered that the cardamom plants firstly came into existence in the monsoon forests of Western Ghats in southern India as wild herbs. A medicinal literature summary written in between 2<sup>nd</sup> century AP in India named Charak Samhita provides as with the first ever written inscriptions about cardamom. It says that cardamom is a significant in many medicines and preparations. Some more books written in Sanskrit language of that time mentioned about cardamom being used in some rituals and ceremonies.

Greeks when initiated their exploration at this time, started importing cardamom as a digestive medicinal herb. It started get used vastly in a number of recipes and drinks due to its heavenly flavor and fragrance. Almost of the countries started to import this spice from India with the emergence of 16<sup>th</sup> century. Till 19<sup>th</sup> century, cardamom grew wild and was searched for the in the monsoon forests. But the British colonies suggested the establishment of plantations and domesticated the crop. Nowadays it is grown as a secondary crop with the coffee plantations.

## Uses of Cardamom

Cardamom is a multitalented and widely used spice. It encompasses variety of uses.

Cardamom is need in adding flavors in both foods and drinks.

- Cardamom is used as cooking spice
- Cardamom is therapeutic in nature, broadly to treat infections in teeth and gums, digestive disorders, throat troubles, skin conditions etc. It is considered beneficial in the treatment of sexual distinction like impotence and premature ejaculation
- Oil of cardamom is used in processed foods, tonics, liquor and perfumes.
- In south Asia, green cardamom is largely included in traditional Indian sweets and in the making of tea.
- In Arabia, Cardamom is used in the preparation of 'Ghawa' a strong cardamom coffee, which shows hospitality among Arabs.
- In Northern Europe, cardamom is an essential ingredient sweet foods.

Cardamom is used as a spice and masticatory, and in medicine. The seeds possess a pleasant aroma and a characteristic, warm, slightly pungent taste. It is used for flavouring curries% cakes bread and for other culinary purposes. It is also used for flavouring liqueurs. In the Arab countries, cardamom is used for flavouring coffee and tea. In medicine, it is used as an aromatic, stimulant, carminative and flavouring agent.

The cardamom capsules contain-Moisture 20%; protein 10.2%; ether extract 2.2% mineral matter 5 4% crude fiber 20.1% carbohydrate 42.1% calcium 0.13% phosphorous 0.16% iron 5.0 mg/ 100 g. The seeds of cardamom contain 2-8% volatile oil. Seeds of green cardamom yield appreciably more oil than those of bleached cardamom.

## Cultivation

Cardamom is grown copiously in the tropical plantations of Western Ghats of Kerala at the height ranging from 900 to 1370m above sea level. The cardamom grown in Malabar is considered as the best quality found in the world. Kerala cardamom like Alleppey Green Bold (AGB) 'Alleppey Green Extra Bold' (AGEB) and 'Alleppey Green Superior' (AGS) have creates a world-wide appeal. Large scale cardamoms are grown in the hills of IDUKKI DISTRICT and these hills are known as the cardamom hills. Vandanmedu and Murikkady are the places in Idukki where cardamoms are grown.

## Climate

Cardamom requires a warm moist climate with uniform rainfall. Soil-Fertile, Loamy Soil rich with humus. The plant needs a shade to grow well. Seeds of fully-ripe fruits are sown and when the seedlings are of 25-30cm in height, they are transplanted in other nurseries. Vegetative methods are also used to grow cardamoms.

The following of the plant starts in April-May to July-August and the crops are harvested at an interval of thirty days. The harvested fruits are dried in the sunlight or by flue curing – finally the dried seeds are cleaned, separated and graded according to the weight, color, quality and size.

## Cardamom Plantation Types

India provides all the favorable conditions for the cultivation of cardamom. Differential cultivation patterns make Indian cardamom highly unique in the international market. It requires humid and cool climate followed by good amount of sunshine and appropriate rainfall.

There are **two types** of cardamom grown in India.

- Small (Elettaria Cardamom Maton)
- Large Cardamom (Amomum Subulatum).

Large Cardamom is cultivated in north eastern parts of the country in Nepal, Bhutan, and Sikkim, Darjeeling etc. it has no much significance and is not traded in the market. Small cardamom is produced in the Western Ghats mainly in Kerala, Tamil Nadu and Karnataka.

## Cultivation Pattern

Cardamom is a tropical herb that takes a fairly long period to mature that is 2years. It is a very climate sensitive crop the output largely depends on it. It requires a good amount sunshine and appropriate rainfall. The soil type needed by the plant to prosper is loamy soil enriched with organic matter. Moderate shade also plays a key fact in the high cardamom yield. The propagation of cardamom plant is done through either of the 2 ways that are planting a part of the rootstalk or planting the seedling of the plant. The cardamom plant is considered matured enough to harvest when the cardamom

seeds black or brown though the tree is still green. In India, the planting period of the cardamom plantation is from August to March and is harvested in around the 3<sup>rd</sup> year of the time of plantation in the months of October and November.

### **Propagation of Cardamom**

Cardamom is propagated either vegetative by division of rhizomes or by seedling transplantation. Rhizomes from large clumps of growing plants are taken out, separated into small clumps, each consisting of atleast one old and one young shoot and planted in prepared pits. The method, however, is unsatisfactory for planting large areas as the number of rhizomes obtainable is limited.

Propagation by seedlings is common adopted in North Kanara, Mysore, Coorg, Tamil Nadu and Travancore-Cochin. Seedlings which come up spontaneously in jungle clearings and those which occur in old cardamom plantings are collected and planted in prepared nursery beds until they are required for planting in permanent positions. The seeds may be sown broadcast in favorable positions on cleared land and transplanted into permanent positions when they are sufficiently developed. The sowing time is usually August-October in Coorg, Mysore and North Kanara, and February-March in Tamil Nadu.

Seeds germinate in 6-7 weeks after sowing. Seed beds are prepared on raised ground and seeds are sown broadcast and covered with soft earth. Nurseries are generally opened near stream with abundant water.

The beds are not shaded from the sun until after the seedlings appear. Low pandals are put up, 4-5 feet above the beds to provide shade for seedlings. Seedlings when 3-4 months old are transplanted 6-18 in. apart in nursery beds.

Seedlings are usually kept in the nursery for about two years. The time of planting out seedlings is June-July, before the onset of monsoon rains. Generally two seedlings are planted in each pit, one of which is later used for filling up gaps in the plantation. Frequent weeding's are necessary in the first two years to prevent young cardamom plants from being choked up.

### **Harvesting of Cardamom**

Cardamom comes into bearing in three years after planting, which may be the fourth or fifth year after sowing. Flowering commences in April-May and continues till July- August flowers may be seen almost throughout the year.

The peak flowering period is May-June and as flowers appear for long, fruits ripen irregularly at intervals necessitating several pickings. Fruits are gathered at intervals of 30-40 days. Only those fruits which are just to ripe are picked. This is necessary to prevent capsules from splitting on the drying floors. If picked in the under-ripe stage the fruits shrink on drying and have a shrivelled appearance. Individual fruits are picked with the peduncle and each clump has to be periodically visited to gather the fruits.

The first crop obtained in the third or fourth year is usually small, higher and sustained yields are obtained in subsequent year's Upto the tenth or fifteenth year, depending upon the type cultivated, after which the plants become exhausted.

### **Drying and Curing with Cardamom**

The fruits are dried after harvesting either in the sun on barbecues of beaten earth or by artificial heat in drying houses.

Artificial drying takes about 48 hours and cardamoms so dried retain their green color, which is much liked in European and American markets Sun drying, on the other hand, takes 3-5 days, but the mucilaginous coats on the seeds remain intact in sun-dried capsules and the seeds possess a characteristic sweetish aroma.

A certain amount of bleaching also takes place during sun-drying and the capsules attain a straw color. Dried capsules are hand-rubbed and winnowed to remove stalks, calyces and foreign matter, and then bagged.

The average yield of dry capsules from a well maintained cardamom estate is 100-150 lb. per acre.

### **Chemical Composition of Cardamom**

Moisture 8.3%; volatile oil 8.3%; total ash 3.7%; non-volatile ether extract 2.9%; crude fiber 9.2%; crude protein 10.3%; calcium 0.3%; phosphorus 0.21%; sodium 0.01%; potassium 1.2%; iron 0.012%; vitamin B, (thiamine) 0.18 mg/100 g; vitamin B (riboflavin) 0.23 mg/100 g; vitamin C (ascorbic acid) 12.0 mg/100 g; niacin 2.3 mg/100 g; vitamin A 175 International Units (I.U.) per 100 g. of seeds.

Cardamom oil of commerce is obtained by the distillation of the whole fruits of cardamomum. The cardamom oil is a colorless or pale yellow liquid with a penetrating, camphoraceous odor and a strong pungent taste. The main constituents of the oil are – cineol, terpineol, terpinene, limonene, sabinene and terpineol in the form of formic and acetic esters. Cardamom oil is used in flavouring beverages <sup>2</sup>.

The chief importing countries of Indian cardamom are – Arabia, Sweden, U.K., and U.S.A Germany and Middle East countries.

### **India is one of the major Producers and Suppliers of Cardamom**

Though India is one of the major producers and suppliers of cardamom the Middle Eastern countries are the consumers where they use it mainly in beverages like tea and coffee and as a flavoring agent for the baked products in Scandinavian countries. The Western Ghats in India cultivates more than 80,000 hectares of cardamom. Indian cardamom is offered to the international markets in different grades:

<http://www.biologydiscussion.com/economic-botany/spices/cardamom-history-cultivation-and-uses-spices/51993>.

'Alleppey Green Extra Bold' (AGEB), 'Alleppey Green Bold' (AGB) and 'Alleppey Green Superior' (AGS) are names that register instant appeal worldwide. Cardamom oil is a precious ingredient in food preparations, perfumery, health foods medicines and beverages. India, a traditional exporter of cardamom to the Middle East countries where it goes mostly into the preparation of 'Ghawa' - a strong cardamom - coffee concoction without which no day is complete or no hospitality hearty for an Arab. Indian cardamom enjoys a premium preference in the Middle East, Japanese and Russians who relish it for its distinct enriching properties.

### **Origin and Distribution**

Cultivation of cardamom is mostly concentrated in the ever green forests of Western Ghats in South India. Besides India, cardamom is grown as a commercial crop in Guatemala and on small scale in Tanzania, Sri Lanka, El Salvador, Vietnam, Laos, Thailand, Cambodia, Honduras, and Papua & New Guinea. The optimum altitudinal range on growing cardamom is 600 to 1500 mtr above MsL. The cardamom growing regions of South India lies within 8 - 30 degree N latitudes and 75-78 degree longitudes<sup>3</sup>.

### **Review of Export performance of Spices during 2016-17**

Indian spices exports have been able to record strident gains in volume and value. Spices exports have registered substantial growth during the last five years, registering a compound annual average growth rate of 10% in rupee terms and 5% dollar terms of value and India commands a formidable position in the World Spice Trade.

During 2016-17, a total of 9,47,790 tons of spices and spice products valued Rs.17664.61 crore (US\$2633.30 Million) has been exported from the country as against 8,43,255 tons valued Rs.16238.23 crore (US\$ 2482.83 Million) in 2015-16 registering an increase of 12% in volume, 9% in rupee terms and 6% in dollar terms of value..

As compared to the total export target of spices fixed for the period 2016-17, the total export of Spices has exceeded the target in terms of both volume and value. Compared to the target of 8,70,000 tons valued Rs.15725.12 crore (US\$2419.25million) for the financial year 2016-17 the achievement is 109% in terms of volume and 112% in rupee and 109% dollar terms of value<sup>4</sup>.

### **The Price of Cardamom in India**

The price and its' trend of Cardamom is very important from the Economics point of view in India. Cardamom is a high value product and produced in selective areas but its' share in International Trade is significant in the Economic Development of this Country. The variation in the price per kilogram is high every year over decades. The following table presents the price of Cardamom over decades.

**Table 1 Price of Cardamom in India From 1991 To 2016**

Sl.no	Year	Price per Kilo in Rupees.
1	1991-1992	274.22
2	1992-1993	456.66
3	1993-1994	350.06
4	1994-1995	259.81
5	1995-1996	188.8
6	1996-1997	396.68
7	1997-1998	254.90
8	1998-1999	570.34
9	1999-2000	418.66
10	2000-2001	588.21
11	2001-2002	601.80
12	2002-2003	536.90
13	2003-2004	346.16
14	2004-2005	500.00
15	2005-2006	217.00
16	2006-2007	313.20
17	2007-2008	503.48
18	2008-2009	538.16
19	2009-2010	876.62
20	2010-2011	968.22
21	2011-2012	645.61
22	2012-2013	686.89
23	2013-2014	617.60
24	2014-2015	889.45
25	2015-2016	1339.00

**Source:** Spices Board of India 2016.

The above table clearly shows that the price of Cardamom varies from Rs.274.22 to Rs. 1339 per kilograms over a period of sixteen years which is nearly five hundred times more. It is easy to note that a change in price of cardamom is volatile. High degree of variation is really a threat to the cardamom planters and traders in India since it's' independence. The following table presents the estimates of compound growth rate.

**Table 2 Estimates of Compound Growth Rate**

Variable	Regression Coefficients		R <sup>2</sup>	CGR
	a	b		
Cardamom Price	5.5581* (37.83)	0.0467* (4.727)	0.49	4.78

**Note:**

- \* indicates 5 per cent level of significance
- Figures in brackets represent the t-values

The Compound Growth Rate of the price of Cardamom in India was 4.78 during a period of 16 years from 1991-92 to 2015-16. This kind of Cardamom price trend in the India had impact on its export over the same period of time. The following table presents the Export of

Cardamom in quantity and values.

The Export of cardamom is the year 1992-92 was just 544 tones which was increased to tones in the year 2015-16. As a result, the value of export of cardamom in Rs. 1557.41 Lakhs in 1991-1992 increased to Rs.44, 982.51 Lakhs in 2015-16. In between the period the variation both in quantity and value of export of cardamom varied tremendously. This is a major economic issues in general in the Indian Cardamom Industry over several decades.

**Table 3 Export of Cardamom (Small) from India**

Years	Quantity (Tons)	Value (Rupees-Lakhs)
1991-1992	544	1557.41
1992-1993	190	750.57
1993-1994	387	1454.83
1994-1995	257	762.61
1995-1996	527	1296.97
1996-1997	226	869.67
1997-1998	370	1266.78
1998-1999	476	2525.27
1999-2000	676	3270.72

2000-2001	1545	8468.02
2001-2002	1031	6780.00
2002-2003	682	4707.42
2003-2004	757	3691.70
2004-2005	650	2389.50
2005-2006	862	2682.10
2006-2007	655	348.10
2007-2008	500	2475.00
2008-2009	750	4726.50
2009-2010	1975	16,750.25
2010-2011	1175	13,216.25
2011-2012	4650	36,322.28
2012-2013	2372	21,215.04
2013-2014	3600	28,380.88
2014-2015	3795	32,346.75
2015-2016	5,500	44982.75

**Sources:** Spices Statistics IV Edition year 2004 and statistics Division Spices Board, Cochin 2016, Vol: V Page No: 38.

The following table presents the estimates of compound growth rate.

**Table 4 Trend in Price and Export of Cardamom**

Variable	Regression Coefficients		R <sup>2</sup>	CGR
	a	b		
Export	5.368* (25.704)	0.10777* (7.670)	0.71	11.38

**Note:**

- indicates 5 per cent level of significance

- Figures in brackets represent the t-values.

Despite high variation in the price of Export of Cardamom in India, the compound growth rate for the given period was found as 11.38. The various economic and social issues connected with the cardamom Industry in general should be solved with the help of the state governments and the central government. The present analysis clearly revealed that there is much scope for Cardamom Industry in the country for its expansion and domination of high quality Indian cardamom in the world market in the future.

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### End Notes

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