

Cardamom



1. Introduction :

Small Cardamom (*Elettaria cardamomum*) belongs to the family Zingiberaceae. Cardamom, called the "queen of spices", is the world's third-most-expensive spice after vanilla and saffron, averaging US\$ 10 per kilogram at auction rates. It is used as a spice in culinary preparations and confectionery and also finds use as medicine. The oil contained in the seeds and pods are used in perfumes and as a stimulant.

2. International Scenario :

Guatemala, India, Srilanka, Tanzania, El Salvador, Vietnam, Laos, Cambodia and Papua New Guinea are the major cardamom growing countries. The world production of cardamom is around 36000 tonnes /annum. Guatemala with a production of 23000 tonnes is the largest producer of cardamom followed by India and Tanzania. The major cardamom exporting countries are Guatemala, India and Indonesia. The major consuming countries of cardamom are West Asian countries, Pakistan, Scandinavian & European countries, USA and Japan. The West Asian countries have the maximum consumption with only India, UAE and Saudi Arabia accounting for 60% of the consumption followed by Denmark, Finland, Norway, Iceland accounting for 16% and Japan and USA, each accounting for 2.5 % each. The major importing countries include Saudi Arabia, Kuwait, UAE, China, Japan, Honk Kong, Netherlands, Singapore and USA.

3. National Scenario :

India has been a dominant producer of cardamom. It is the second largest producer of cardamom in the world. The state wise area and production of cardamom is given in Table-1.

Table 1 :State-wise area and production of cardamom in India (2005-06)

Sr.No.	State	Area (ha)	Production (tonne)
1	Kerala	41367	9765.00
2	Karnataka	27173	1775.00
3	Tamil Nadu	5255	1000.00
	Total	73795	12540.00

Source : Spices Board

India consumes almost 90% of the domestic production of cardamom. About 5-8% of its total production, is exported, mostly the premium grade. India also exports value added products of cardamom like cardamom oil, and oleoresins to the European countries. Saudi Arabia, Japan, Malaysia, UK, Kuwait are the major countries that import cardamom and value added products of cardamom from India. Saudi Arabia (42%) followed by Japan (39%) are the largest markets for Indian cardamom. The total export of cardamom from the country is given in Table 2

Table 2 : Year-wise export of cardamom from India

Sr.No.	Year	Qty (tonne)	Value (Rs.lakh)
1	2002-03	681.90	4707.40
2	2003-04	756.80	3691.70
3	2004-05	642.50	2362.40
4	2005-06	862.90	2682.10
5	2006-07	650.00	2236.00

Source : Spices Board

Of late, India is also exporting organic cardamom, the details of which are given in Table 3

Table 3. Item-wise export of organic cardamom from India

Item	Cardamom		Cardamom powder		Total	
	Qty(t)	Value (Rs.lakh)	Qty(t)	Value (Rs.lakh)	Qty(t)	Value (Rs.lakh)
2003-04	0.6	3.28	-	-	0.6	3.28
2004-05	1.35	7.51	-	-	1.35	7.51
2005-06	0.89	4.03	-	-	0.89	4.03
2006-07	-	-	0.1	0.7	0.1	0.7
2007-08	0.09	0.65	0.03	0.12	0.12	0.77

Source : Spices Board

4. State Scenario:

Kerala is the leading producer of cardamom in the country constituting 78 % of the total production from 56% of the area under cardamom in the country. The district- wise area and production of cardamom in Kerala is given in Table 4

Table 4: District wise area and production of cardamom in Kerala (2004-05)

Sr.No.	Districts	Area(ha)	Production(tonne)*
1	Kollam	7	-
2	Pathanamthitta	664	82
3	Kottayam	200	25
4	Idukki	32,856	7,931
5	Palakkad	2,756	229
6	Malappuram	70	3
7	Kozhikode	220	-
8	Wayanad	4,110	345
9	Kannur	128	-
10	Kasaragod	367	1
	Total	41,378	8,616

* Cured cardamom Source : Farm Guide 2007

Idukki in general and Udumbanchola, Peeremadu and Devikulam talukas in particular are the main cardamom growing tracts of Kerala.

The agro-climatic conditions prevailing in Kerala is highly congenial for high biological activity and quick decomposition of farm residues. Such an agro-ecosystem is advantageous to shift to organic farming on commercial scale. Incidentally, many of the Accreditation agencies (Commodity Boards) have their headquarters in Kerala. Besides, many internationally recognized NGOs working for organic farming are active in Kerala, since long.

Kerala being the home of many spices has a major share in the export of organically produced cardamom from India. The World Bank jointly with Spices Board of India and International Trade Centre, Geneva is implementing programmes for improvement and promotion of organic production of spices (including cardamom), certification and export of selected spices, in Idukki and Wyanad districts. Besides, Spices Board, Cochin is implementing a grant-in-aid programme to promote organic cultivation of spices.

5. Organic Farming :

Cardamom is being grown in the Western Ghats of India, which is one of the 26 bio diversity hot spot of the world. However, in order to make the cultivation more profitable it is being subjected to intensive production practices which includes indiscriminate application of chemical fertilisers and pesticides. These along with various other factors have altered the soil

micro climate and nutrient cycling in the agro -forest system thus affecting ecosystem and sustainable production of cardamom in these areas. It is in this context, that organic cultivation of cardamom becomes relevant. Further, the demand for organic products from the health conscious consumers also encourages the cultivation of organic cardamom. The guidelines for organic farming is enclosed in **Annexure I**.

6.0 Organic Production 6.1 Selection of site

Small Cardamom (*Elettaria cardamomum*) thrives well in areas having warm humid climate and fairly well distributed annual rainfall (1500 - 4000 mm). A temperature range of 18-28 0 C and an altitude of 600-1200 m above MSL is ideal. The crop requires 40-60% shade for proper growth and flowering and cannot withstand heavy wind . Being a surface feeder, availability of moisture during dry period is essential.

Cardamom requires loamy soil, which is acidic (pH range of 4.2 to 6.8), rich in humus and nitrogen and low to medium available phosphorus and potassium. The soil should be well drained as the crop cannot tolerate water logging.

6.2 Cultivars and Varieties

Traditionally, cultivars / types such as Malabar and Mysore and Vazhukka have been grown in Kerala, The Malabar cultivar is suitable for areas from 600 to 1200 m above MSL, Mysore/ Vazhukka cultivars are suitable for cultivation in areas from 900 to 1200 m above MSL. Many high yielding varieties such as ICRI-1, ICRI-2, PV-1 and PV-2 and also selections such as "Njallani" are commonly grown in Kerala.

6.3 Land preparation

The land should be cleared of jungle plants, shrubs and trees. Development activities such as terracing, contour formation, leveling, etc., may be taken up, wherever it is necessary. Terraces should be made across the slope at required distances.

6.4 Pits for planting

Pits of 60 x 60 x 35 cm to 90 x 90 x 45 cm is prepared during the summer months and the topsoil is retained separately for refilling at the time of planting. About 1/3 of the pit should be filled with top soil and the rest with 1:3 mixture of organic manure and top soil.

6.5 Propagation

The crop is propagated through seeds and rhizomes. In Kerala farmers are switching to vegetative propagation.

6.6 Planting

The recommended spacing for Mysore and Vazhukka is 2 m x 2 m to 3 m x 2 m and for Malabar

cultivars it is 1.5 m X 1.5 m to 2 m X 2 m, depending upon the local conditions such as soil type, fertility, etc. Immediately after planting, the plant base is mulched with available leaf litter to protect the soil from erosion and to conserve the moisture. Planting should be done diagonally to the slope to control erosion.

6.7 Mulching and earth work

Soil is dug to a depth of 9-12 cm around the baseline of 90 cm to enhance root proliferation. Earthing up during December and February, around the plant base with topsoil to cover the rhizome is beneficial for the root development. Mulching is reported to enhance root proliferation in addition to conservation of moisture and maintenance of optimum root temperature.

6.8 Nutrition management

Organic manures improve the physical characteristics of the soil, in addition to their nutrient supply. Application of organic manures such as Neem Cake/ bone meal / vermicompost @ 1.1,1.5,1.75 t / ha and manure @ 6, 10 and 15 t / ha may be applied during the first, second and third year in May/June. The manures should be thoroughly covered with soil after application. For the subsequent application during September, organic manures should be on the basis of proper soil testing. Soil testing facilities are available at Indian Cardamom Research Institute, Myladumpara, Idukki. Precautions may be taken to avoid residues of fertilizers and chemicals, beyond the acceptable level for organic food.

6.9 Irrigation

Cardamom requires regular water supply and dry spell especially during summer and also during tillering and flowering, adversely affects fruit set. In Kerala, irrigation is required generally from January to May. Therefore, in drought prone areas, water conservation measures i.e., farm pond, check dam, water collection trenches etc., may have to be constructed. Efficient irrigation methods such as drip and sprinkler are also recommended in cardamom. Small farmers (resource poor farmers) may adopt pitcher irrigation or spot application methods to increase the water use efficiency. In case of drip irrigation, water at the rate of 4-6 l per clump per day can be given.

6.10 Shade Regulation

Direct sunlight is detrimental to the growth and development of cardamom. Partial sunlight of 40 to 60 per cent at canopy level is congenial. Tree species such as Karuna (*Vernonia arborea*) Corangati, Chandana Viambu(*Cedrella toona*), Njaval(*Syzygium cumini*) tree etc., are some of the commonly grown shade trees in cardamom plantations. The canopy of the shade trees should be managed taking into account the "aspects/ slope direction" for desired shade requirement (shade regulation). South-Western slopes should be provided with more shade than North-

Eastern slopes.

6.11 Weed control

Weeds compete with cardamom for water and nutrients thus affect the development of clump, especially during the initial stages of growth. In general, two or three hand weeding around the plant base at bi-monthly interval is recommended. In sloppy areas, weeding with the help of spade/ mechanical means should be avoided, as it may lead to soil erosion.

6.12 Trashing

Trashing consists of removing old tillers and dry leaves and leaf sheaths. This operation may be carried out once in a year at any time one month after completion of the final harvest. The trash material can also be used as mulch.

6.13 Pest management

The major pests of cardamom are thrips, shoot/panicle/ capsule borer and root grubs. It is found that fish oil insecticidal soap (FOIS), sodium (2.5%) and 2.5% tobacco extracts reduces the thrip damage. Root grub menace can be managed by judicious integration of mechanical and bio-agents like entomo pathogenic fungus *Beauveria bassiana* (for beetles) and *Metarrhizium anisopliae* and entomo pathogenic nematode *Heterorhabditis* sp. *Vitex negundo*, *Lantana camara*, *Spathodea companulata* and *Chrysanthemum* possess insecticidal properties. The white fly population can be maintained at a very low level by parasitoids *Encarsia septentrionalis* and *E. dialeurodis* and predators *Mallada bonninensis*.

6.14 Disease management

Diseases such as leaf spot, leaf rot and collar rot (in nursery), clump rot, Katte (virus transmitted by banana aphid) are common in cardamom plantations. Proper drainage and field sanitation is necessary to control diseases. Weed plants, which are alternative hosts for vectors should be controlled. Application of bio-agent *Trichoderma* species has been found to be effective against fungal diseases.

6.15 Harvesting

In general, cardamom starts yielding from 2-3 year onwards and the yield stabilizes after 4th year. Reports suggest that the HYVs can yield dry cardamom @ 120 kg/ha, 360 kg/ha and 510 kg/ha during the second, third and subsequent years. In the current model a stabilised yield of 400 kg/ha has been considered from the 7th year onwards. Timely harvest and scientific post

harvest operations are the factors affecting the quality of the produce.

Capsules, which are just ripening but not fully ripe, should be handpicked at fortnightly intervals. This should be followed by various unit operations such as washing, drying, cleaning, grading, packing and marketing of the produce. Cardamom is traded as bulk and graded produce. It is graded by using sieves and the price is based on the size, colour and freshness. The 7mm and above grades with fancy green colour commands a premium price in the market. In the instant case, a conservative sale price of Rs. 400 has been considered for working out the economics for organic cardamom.

7. Financial Aspects :

7.1 Unit Cost

Taking into account the general package of practices recommended for organic cultivation of cardamom the unit cost has been worked out and the details are given in Annexure II . The unit cost for organic organic cultivation of cardamom works out to and a summary of the same is given below:

Year	Unit cost (Rs./ha)
1	71,800
2	60,700
3	80,100
Total	212,600

7.2 Margin money

The percentage of margin/down payment to investment cost prescribed is 4,10 and 15 % for small, medium and large farmers respectively. The rest of the investment cost will be provided as bank loan. Margin considered in the present model is 10%.

7.3 Bank loan

Bank loan of 85 -95% shall be available from the financing institution. Bank loan considered in the model is 90%.

7.4 Rate of interest

The rate of interest to be charged to the ultimate borrower would be guided by RBI guidelines issued from time to time. However, the ultimate lending rate has been considered as 12% of working out the bankability of the model scheme. 7.5 Security Banks are guided by RBI guidelines issued from time to time in this regard. 7.6 Economics The detailed techno economic parameters and economics are presented in Annexure III and Annexure IV 7.7 Financial Analysis Detailed financial analysis is given in Annexure V. The project is found financially

viable and bankable.

The major financial indicators of the project are as under : NPW @ 15% - Rs. 85623.48 B:C ratio - 1.19 IRR - 33.28% 7.8 Repayment schedule Based on the cash flow the detailed repayment schedule has been worked out. The detailed repayment schedule is furnished in the Annexure - VI. The repayment period works out to 10 years including 3 years grace period. 8.

Conclusion :

Organic cultivation of cardamom is a technically feasible, financially viable and bankable activity.