

PERFORMANCE OF INDIAN CARDAMOM INDUSTRY- AN ANALYSIS

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Abstract

Cardamom Industry plays an important role in economic development of the country. With regard to production of small cardamom in Guatemala and India, the analysis showed an upward trend and the growth rate is high in India with 8.64 percent compared to Guatemala. Cardamom production among Kerala, Karnataka and Tamil Nadu, it was positive and statistically significant at one per cent level in Kerala witnessed a significant growth at the rate of 11.43 per cent. The cardamom production was negative and insignificant in both Karnataka and Tamil Nadu. The trend in cardamom production in Idukki District was showing upward trend with the growth rate of 12.46 per cent. Other districts were not significantly performing. Cardamom consumption in India witnessed a significant increase at the rate of 7.40 percent per annum. Cardamom export in Saudi Arabia, Kuwait and USA showed an increasing trend with a growth rate of 25.3 percent in USA followed by Kuwait with 22.18 percent and by Saudi Arabia with 20.78 percent. The import of cardamom to India witnessed a significant increase at the rate of 9.65 percent per annum during the period under study.

Keywords: Cardamom Production, Consumption, Export and Import, Trend, Growth and Magnitude of Variability

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Introduction

Cardamom is regarded as ‘Queen of Spices’, and has an important position in international market. India has been the home of cardamom from time immemorial. It is cultivated vastly in the Western Ghats of South India. India has been the large producer and consumer as well. Guatemala has emerged as an important competitor in the market. Cardamom is one of components in culinary, soft beverages, medicinal purpose both in allopathy and homeopathy and alcohol. Cardamom flavored coffee is famous in Saudi, Oman, Dubai, and the like. During 1979-80 India was the pioneer in cardamom production, but of late, lost its domination to Guatemala¹. Cardamom is the most expensive spice next to saffron. It is marketed globally in the form of whole fruits and to a lesser extent as seeds. The cardamom grew as wild spice in Western Ghats of India till 19th century. Now a day it is a commercial produce. The main alien consumer in the global market is Middle East.

Review of Literature

Suresh (1984) in his thesis 'Economics of cardamom plantation in Kerala', has made a detailed cost benefit analysis of cardamom cultivation, which throws much light into various cost components of cardamom production, processing and marketing. This study was primarily intended for analyzing the economics of cardamom plantation with special reference to high ranges in Idukki district. Various statistical tools have been applied to have a microscopic view of the cost components and the impact of each such element in the net revenue of cardamom plantation. However this study is more or less silent about the marketing problems of cardamom.²

Swaminathan (1985) in his thesis 'Trends in the area, production and export price of cardamom in Kerala, Tamilnadu and Karnataka', made a comparative study of the trends in area, production and productivity of cardamom in the three states of Kerala, Tamilnadu and Karnataka with the basic objective of projecting the probable future share of these states in the international cardamom market. He estimated an annual growth rate of 2.34 percent for cardamom. The researcher has also studied the trends in the export price of cardamom. The thesis focuses on the

¹ Website: <http://www.primaryinto.com/spices.html>.

² Suresh K A, (1984). "Economics of cardamom plantation in Kerala", Unpublished Ph.D. Thesis, Cochin: CUSAT

regional comparison of cardamom production and growth so that allother aspects of the field were left untouched.³

Muhammed Sajjad (1987) in his report 'India's cardamom trade with Middle East' clearly points out the changing pattern of India's cardamom trade with the Gulf countries. With the support of statistical data, economics of cardamom cultivation and the future prospects of the sector have been discussed in detail. According to him, high price of Indian cardamom is the reason for declining export volume and competitive pricing strategy is the only solution to the problem.⁴

Baby Jacob (1985) in his thesis 'Export development of Kerala', studied the export performance of Kerala, analyzing the trends and problems and made a comprehensive analysis of the then prevailing export policies of the Government The performance of pepper and cardamom, being major export items were evaluated well and remedial solutions were recommended to the problems of major export items including pepper and cardamom.⁵

Statement of the problem

India has been the home of spices producing almost all varieties of spices of the world from time immemorial. Spices are one of the important groups of crops grown in India. One or other forms of spices are grown in different parts of the country and play an important role in the economy of the country. The quality of these spices produced and exported from the country continues to be one of the best. Spices are used entirely as seed, bark, bulb, tuber, leaf, flower and powder etc. Cardamom cultivation is confined to a very limited tract of the tropical world. India is the second largest producer of cardamom in the world but the productivity of cardamom in India is far from satisfactory, while comparing it with the productivity of Guatemala. Indian cardamom is superior in quality, and always been out-priced by Guatemala where the home consumption is insignificant. Further, though there is a great demand for cardamom. Hence, it is imperative to

³ Swaminathan S, (1985). "Trends in the area, production and export price of cardamom in Kerala", Tamilnadu and Karnataka, M. Phil Thesis, Madurai: Madurai Kamaraj University.

⁴ Muhammed A and Sajjad, (1987) "India's Cardamom Trade with Middle East Countries", M.B.A. Project Report, Calicut: University of Calicut.

⁵ Baby Jacob, (1985) "Export Development of Kerala", Ph.D. Thesis, Cochin: Cochin University of Science and Technology, 1985.

study the trend of area, production, consumption, export and import.

The Objectives

The main objective of this paper is to analyse the trend, growth and magnitude of variability in area under cardamom cultivation, production, consumption, export and import of small cardamom in India.

Methodology

The data were collected from Spices Board, Cochin for the period of 2008-09 to 2017-18. Only secondary data were used for the study.

Framework of Analysis

The following tools were used for analysis of the data.

Trend Analysis: Trend in area under cardamom plantation and production of cardamom was estimated using the simple regression equation of the following form.

$$Y = a + bt$$

Where,

- Y = Production in year 't'
- a = Constant
- b = Regression co-efficient
- t = Time in years

Growth Performance and Magnitude of Variability

Nilakantha Rath in his study recommended that in a biological production process like agriculture, Compound growth rate was more appropriate for analysing the growth rate over a period of time⁶. Considering his view, the compound growth rate with regard to production of cardamom has been estimated on the basis of the semi-log or exponential function.

$$Y = a + bt$$

⁶Nilakantha Rath, "A Note on Agricultural Production in India during 1955-78", Study of Growth Rates in Series XIV Indian Society of Agricultural Economics, Bombay.

Where,

Y = Production

t = Time Periods

‘a’ and ‘b’ are the parameters to be estimated.

Compound growth rate = $(\text{antilog } b - 1) \times 100$

The co-efficient of variation (C.V.) was used to measure the magnitude of variability in the production.⁷

Co-efficient of Variation (C.V.) = $(\text{Standard Deviation} / \text{Mean}) \times 100$

Results and Discussions

The trend in growth as well as the magnitude of variability for cardamom Production during the period taken for the study were computed for Guatemala, for different states at all India and for different districts including the study area in Kerala. A brief analysis was also made on Consumption, Import and Export of cardamom in India.

The area under cardamom plantation in India and Guatemala and its percentage to the total is presented in Table 1.

Table 1

THE AREA UNDER CARDAMOM PLANTATION IN INDIA AND GAUTEMALA

Year	Guatemala	(%)	India	(%)	Total	(%)
2008-09	62300	45.68	74090	54.32	136,390	100.00
2009-10	62300	46.60	71400	53.40	133,700	100.00
2010-11	62300	44.18	78712	55.82	141,012	100.00
2011-12	63910	42.57	86214	57.43	150,124	100.00
2012-13	69370	49.82	69870	50.18	139,240	100.00
2013-14	69510	49.84	69970	50.16	139,480	100.00
2014-15	70835	50.31	69970	49.69	140,805	100.00
2015-16	72517	50.85	70080	49.15	142,597	100.00
2016-17	74199	51.69	69357	48.31	143,556	100.00
2017-18	75881	52.26	69330	47.74	145,211	100.00
Average	68312.33	48.38	72899.30	51.62	141211.63	100.00

Source: Spices Board Statistics, Cochin

⁷ Latha Bastine, C. and K.Palanicamy, “An Analysis of Growth Trends of Principal Crops in Kerala”, **Agricultural Situation in India**, March 1994.

It could be seen from Table 1 that area under cardamom in Guatemala rose from 62300 ha in 2008-09 to 75881 ha in 2017-18 during the study period where in India it decreased from 74090 ha to 69330 ha as per spices board record. Area were increased from 69970 in 2014-15 to 70080 2015-16 and again decreased in 2016-17 to 69357 ha. Out of total Guatemala contributed 48.38 per cent of area under cardamom plantation whereas India contributed 51.62 percent. Though India has more area under cardamom plantation it produces less than Guatemala. The productivity is lower than Guatemala.

Trend, Growth and Magnitude of Variability of Area under Cardamom Production in India and Guatemala

To understand the growth rate of area under cardamom cultivation, compound growth rate has been calculated using semi-log method and to analyse the magnitude of variability in production, co-efficient of variation is used. The results are presented in Table 2.

Table 2

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF AREA UNDER CARDAMOM PLANTATION IN GUATEMALA INDIA DURING 2009 – 18

<i>Country</i>	<i>Semi – log</i>		<i>R²</i>	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Guatemala	4.774 (0.006)	0.011 ** (0.001)	0.944	2.57	7.66
India	4.891 (0.019)	-0.005 ^{NS} (0.003)	0.263	-1.14	7.57

Source: Computed from Table 1; ****** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

The results of the analysis in Table 2 reveal that the trend in area under cardamom plantation in Guatemalais positive and statistically significant at one percent level and there is a significant increase in the area under cardamom plantation whereas in India it is negative and decreased in the area under Cardamom plantation during the period under study.

The decadal analysis shows in Guatemala spectacular performance in growth rate of 2.27 percent. The analysis reveals that area under cardamom plantation in India had decreased at the rate of 1.14 percent per annum during 2009 and 2018.

It is also inferred from Table 2 that area under cardamom plantation in Guatemala and India showed a sizeable variation of 7.66 percent and 7.57 percent during the period under study.

The cardamom production in India and Guatemala is presented in Table 3.

Table 3

THE CARDAMOM PRODUCTION IN INDIA AND GAUTEMALA DURING 2009 – 18

Year	Guatemala	(%)	India	(%)	Total	(%)
2008-09	21,414	65.59	11235	34.41	32,649	100.00
2009-10	22,912	67.40	11080	32.60	33,992	100.00
2010-11	22,764	67.83	10795	32.17	33,559	100.00
2011-12	26,360	64.59	14450	35.41	40,810	100.00
2012-13	36,241	72.13	14000	27.87	50,241	100.00
2013-14	35,000	68.63	16000	31.37	51,000	100.00
2014-15	30,000	62.50	18000	37.50	48,000	100.00
2015-16	36,000	60.11	23890	39.89	59,890	100.00
2016-17	32,000	63.92	18060	36.08	50,060	100.00
2017-18	20,000	49.20	20650	50.80	40,650	100.00
Average	28269	64.19	15816	35.81	44085	100.00

Source: Spices Board Statistics, Cochin.

Table 3 reveals that cardamom production showed a decreasing trend in Guatemala from 21414 tones during 2008-09 to 20,000 during 2017-8 whereas in India it shows an upward trend from 11235 tones during 2008-09 to 20650 tones during 2017-18. Guatemala and India contributed 64.19 percent and 35.81 percent out of total.

Cardamom production in Guatemala increased continuously from 21414 tones during 2008-09 to 36241 tones during 2013-14 and declined to 30000 tones during 2014-15 again increased to 36000 tons in 2015-16 and declined to 20,000 during 2017-18. In India there was a continuous increase from 14450 tones during 2011-12 to 20650 tones during 2017-18 and there was a fluctuation during 2008-09 to 2010-11.

In total there was continuous increase from 32649 tones during 2008-09 to 51000 tones during 2013-14. There was fluctuations between 2014-15 and 2017-18 and decreased to 40650 tones.

Trend, Growth and Magnitude of Variability of Cardamom Production in India and Guatemala

To understand the growth rate of Cardamom Production, compound growth rate has been calculated using semi-log method and to analyse the magnitude of variability in production, co-efficient of variation is used. The results are presented in Table 4.

Table 4

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF CARDAMOM PRODUCTION IN GUATAMALA AND INDIA DURING 2009 – 18

<i>Country</i>	<i>Semi – log</i>		R^2	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Guatemala	4.378 (0.068)	0.011 ** (0.011)	0.123	2.57	22.48
India	3.987 (0.035)	0.036 ^{NS} (0.006)	0.836	8.64	27.66

Source: Computed from Table 3. ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It is observed from Table 4 that the trend in both Guatemala and India are positive and statistically significant at one per cent level. It implies that cardamom production in these countries showed an upward trend during the period under study.

The growth rate is high in India with 8.64 percent followed by Guatemala with 2.57 percent. Guatemala had a low growth rate but it had consistency in production during the period under study.

It is further inferred from Table 4 that the production of cardamom in India showed a sizeable variation of 27.66 percent whereas Guatemala showed a variation of 22.48 percent. India had consistency in cardamom production during the period under study.

CARDAMOM CULTIVATION IN VARIOUS STATES OF INDIA

Cardamom is cultivated in Kerala, Karnataka and Tamil Nadu in Western Ghats of India. The state-wise area under cardamom plantation from 2008-09 to 2017-18 and its share on total in percentage is presented in Table 5.

Table 5**State-wise Area under Cardamom Plantation in India during 2009 – 18**

Year	Kerala	Karnataka	Tamil Nadu	Total Area
2008-09	41,036	27,944	5,110	74,090
2009-10	43,432	22,858	5,110	71,400
2010-11	42,532	31,080	5,100	78,712
2011-12	46,980	33,884	5,350	86,214
2012-13	39,660	25,050	5,160	69,870
2013-14	39,730	25,080	5,160	69,970
2014-15	39,730	25,080	5,160	69,970
2015-16	39,680	25,240	5,160	70,080
2016-17	39,080	25,117	5,160	69,357
2017-18	39,080	25,135	5,115	69,330
Average	41,094	26,647	5,159	72,899
Share (%)	56.37	36.55	7.08	100.00

Source: Primary Data

It could be seen from Table 5 that the total area under cardamom cultivation in India is 728993 hectares, out of which 56.37 per cent contributed by Kerala, 36.55 percent contributed by Karnataka and 7.08 per cent by Tamil Nadu. The area under cardamom plantation showed a downward trend from 41036 ha to 39080 ha and but, increasing between the year 2008-09 and 2011-12 was 41036 ha and 46980 ha respectively.

The area under cardamom plantation in Karnataka showed a downward trend from 27944 ha in 2008-09 to 25135 ha in 2017-18. There were decreases in area under cardamom plantation except the study period 2010-11 to 2011-12.

In Tamil Nadu there was no change in area under cardamom cultivation with 5100 ha except the study period 2011-12 with 5350 ha. Though Tamil Nadu has a marginal contribution in cardamom cultivation, it has consistency in area under cardamom production.

Trend, Growth and Magnitude of Variability of area under cardamom in different States of India

To understand the growth rate of area under Cardamom Plantation, compound growth rate has been calculated using semi-log method and to analyse the magnitude of variability in area under Cardamom Plantation, co-efficient of variation is used. The results are presented in Table 6.

Table6

Trend, Growth and Magnitude of Variability of State-wise Area under Cardamom Plantation in India during 2009 – 18

<i>States</i>	<i>Semi – log</i>		<i>R</i> ²	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Kerala	4.642 (0.015)	-0.005 ^{NS} (0.002)	0.390	-1.14	6.18
Karnataka	4.455 (0.035)	-0.006 ^{NS} (0.006)	0.119	-1.37	12.64
Tamil Nadu	3.712 (0.004)	0.000 ^{NS} (0.001)	0.001	0.00	1.40

Source: Computed from Table 5; ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It could be understood from Table 6 that the trend in area under cardamom plantation in all states is negative except Tamil Nadu and statistically not significant at five per cent level. It implies that area under cardamom plantation in these states showed a downward trend during the period under study.

The growth rate is zero in Tamil Nadu since there was much change in area under cardamom plantation during the period under study. There was a negative growth rate in both Kerala and Karnataka.

It is also inferred that the area under cardamom plantation in Tamil Nadu showed a lowest variation of 1.40 per cent followed by Kerala with a variation of 6.18 percent and Karnataka with 12.64 percent variation. There was a consistency in area under cardamom plantation in Tamil Nadu.

The state-wise cardamom production in India from 2008-09 to 2017-18 and its share on total in percentage is presented in Table 7.

Table 7**State-wise Cardamom Production in India during 2009 – 18**

(In Tons)

Year	Kerala	Karnataka	Tamil Nadu	Total Area
2008-09	8,550	1,845	840	11,235
2009-10	7,800	2,315	965	11,080
2010-11	7,945	1,840	1,010	10,795
2011-12	11,440	2,010	1,000	14,450
2012-13	11,350	1,800	850	14,000
2013-14	14,000	1,050	950	16,000
2014-15	16,000	1,000	1,000	18,000
2015-16	21,500	1,440	950	23,890
2016-17	15,650	1,435	975	18,060
2017-18	18,350	1,450	850	20,650
Average	13,259	1,619	939	15,816
Share (%)	83.83	10.23	5.94	100.00

Source: Spices Board Statistics, Cochin

It is seen from Table 7 that the total cardamom production in India is 1,58,160 tones, out of which 83.83 per cent contributed by Kerala, 10.23 percent by Karnataka and 5.94 percent by Tamil Nadu for the period under study. Kerala stands first in cardamom production in India.

In total cardamom production increased from 11235 tones to 20650 tones during the period under study.

Cardamom production in Kerala was increasing continuously from 8550 tones to 18350 tones during the period under study. There was not much fluctuation expect in the years 2015-16 and 2016-17.

In case of Karnataka there was a fluctuation with a range between 1450 tones and 2315 tones during the study period.

Tamil Nadu had small fluctuations in the years of 2010-11, 2011-12 and 2014-15, remaining years remained the same.

Trend, Growth and Magnitude of Variability of State-wise Cardamom Production in India

In order to ascertain the growth rate in cardamom production, compound growth rate has been calculated using exponential method and to analyse the consistency of production, co-efficient of variation is used. The results are presented in Table 8.

Table 8

Trend, Growth and Magnitude of Variability of State-wise Cardamom Production in India during 2009 – 18

<i>Country</i>	<i>Semi – log</i>		<i>R²</i>	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Kerala	3.838 (0.044)	0.047 ** (0.007)	0.845	11.43	35.09
Karnataka	3.331 (0.067)	-0.025 ^{NS} (0.011)	0.398	-5.59	25.82
Tamil Nadu	2.972 (0.023)	0.000 ^{NS} (0.004)	0.000	0.00	7.13

Source: Computed from Table 7; ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It is observed from Table 8 that the cardamom production was positive and statistically significant at one per cent level in Kerala. It implies that cardamom production in Kerala witnessed a significant growth during the period under study. The analysis reveals that quantum of cardamom production in Kerala had increased at the rate of 11.43 per cent. It is also referred from Table 7 that the magnitude of variability of cardamom production is 35.09 percent.

The cardamom production was negative and insignificant in both Karnataka and Tamil Nadu. In case of growth rate Karnataka had negative and Tamil Nadu became nil.

The magnitude of variability of cardamom production, among three states Tamil Nadu had low variation of 7.13 percent followed by Karnataka with 25.82 percent. It implies that Tamil Nadu had more consistency than other states in India.

District-wise Area under Cardamom Cultivation in Kerala

Kerala is the hub of cardamom production and leading state in cardamom producing states of India. Cardamom is cultivated in various districts of Kerala. The district-wise area under cardamom plantation is presented in Table 9.

Table 9

District-wise Area under Cardamom Plantation in Kerala during 2009 – 18

(In Hectares)

Year / District	Idukki	Wayanadu	Palakadu	Other Districts	Total Area
2008-09	33080	4106	2754	1940	41880
2009-10	33080	4106	2754	1650	41590
2010-11	32723	4115	2754	1648	41240
2011-12	33076	4120	2754	1290	41240
2012-13	31740	4120	2754	1046	39660
2013-14	31810	4120	2754	1046	39730
2014-15	31170	4125	2755	1680	39730
2015-16	31170	4120	2750	1640	39680
2016-17	31170	4120	2750	1040	39080
2017-18	31170	4120	2750	1040	39080
Average	32019	4117	2753	1402	40291
Share (%)	79.47	10.22	6.83	3.48	100.00

Source: Spices Board

It could be understood from Table 9 that the total area under cardamom cultivation is 4,10,940 hectares in Kerala. Out of the total Idukki district stands first with 79.47 percent during the period under study.

In case of Idukki District the area under cardamom plantation showed a downward trend from 33080 ha during 2008 – 09 to 31170 during 2017-18. Except the year 2011-12, the area under cardamom plantation hiked slightly with 33076 ha.

The area under cardamom plantation in Wayanadu, Palakadu and other district had no fluctuations during the period under study.

Trend, Growth and Magnitude of Variability of District-wise Cardamom Production in Kerala

In order to ascertain the growth rate in area under cardamom plantation, compound growth rate has been calculated using exponential method and to analyse the consistency of area under cardamom plantation, co-efficient of variation is used. The results are presented in Table 10.

Table 10

Trend, Growth and Magnitude of Variability of District-wise Area under Cardamom Plantation in Kerala during 2009 – 18

<i>District</i>	<i>Semi – log</i>		R^2	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Idukki	4.525 (0.003)	-0.004 ** (0.001)	0.855	-0.92	2.73
Wayanadu	3.614 (0.000)	0.000 ^{NS} (0.000)	0.581	0.00	0.15
Palakadu	3.440 (0.000)	0.000 ^{NS} (0.000)	0.539	0.00	0.07
Other Districts	3.251 (0.064)	-0.021 ^{NS} (0.010)	0.350	-4.72	24.63

Source: Computed from Table 8. ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

Table 10 explains that the trend in area under cardamom plantation was negative and statistically significant at one percent level in Idukki Districts. It reveals that area under cardamom plantation in Idukki District.

The area under cardamom plantation in Wayanadu, Palakadu and other districts were not significant and there was no growth in Wayanadu and Palakadu and Idukki and other districts had negative growth.

The magnitude of variability of area under cardamom plantation was low in Palakadu district with a variation of 0.07 per cent. It implies that there was no change in area under cardamom plantation and had consistency in area under cardamom plantation. Idukki district had 0.15 per cent of variation whereas Idukki district had a variation of 2.73 percent.

The district-wise cardamom production is presented in Table 11.

Table 11**District-wise Cardamom Production in Kerala during 2009 – 18**

(In Tons)

Year / District	Idukki	Wayanadu	Palakadu	Other Districts	Total Production
2008-09	7828	360	330	32	8550
2009-10	7077	365	330	28	7800
2010-11	7233	388	290	34	7945
2011-12	10520	610	284	26	11440
2012-13	10540	557	234	19	11350
2013-14	13040	651	290	19	14000
2014-15	15000	690	290	20	16000
2015-16	20430	680	300	90	21500
2016-17	15030	314	295	11	15650
2017-18	17915	357	69	9	18350
Average	12461	497	271	29	13259
Share (%)	93.98	3.75	2.05	0.22	100.00

Source: Spices Board

It is seen from Table 11 that the total cardamom production in Kerala is 1,32,585 tones, out of which 93.89 per cent contributed by Idukki District and remaining districts having less than five percent each. Idukki district stands first in cardamom production in Kerala as well as India.

In total cardamom production increased from 8550tones to 18350tones during the period under study.

Cardamom production in Idukki district was increasing continuously from 7828 tones to 17915 tones during the period under study. There was not much fluctuation except in the years 2015-16 with 20430 tones.

In case of WayanaduDistricts there was a fluctuation with a range between 314 tones and 690 tones during the study period.

There was no remarkable fluctuation in cardamom production in other districts of Kerala.

Trend, Growth and Magnitude of Variability of State-wise Cardamom Production in India

In order to ascertain the growth rate in cardamom production in various districts of Kerala, compound growth rate has been calculated using exponential method and to analyse the consistency of production, co-efficient of variation is used. The results are presented in Table 12.

Table12

Trend, Growth and Magnitude of Variability of District-wise Cardamom Production in Kerala during 2009 – 18

<i>Districts</i>	<i>Semi – log</i>		R^2	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Idukki	3.790(0.044)	0.051 ** (0.007)	0.861	12.46	37.05
Wayanadu	2.645 (0.000)	0.006 ^{NS} (0.724)	0.016	1.39	30.87
Palakadu	2.612 (0.000)	-0.038 ^{NS} (0.087)	0.322	-8.38	27.97
Other Districts	1.572 (0.000)	-0.037 ^{NS} (0.255)	0.158	-8.17	79.93

Source: Computed from Table11, ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

Table 12 explains that the trend in cardamom production was positive and statistically significant at one percent level in Idukki District. It reveals that area under cardamom plantation showed an upward trend in Idukki District. Its growth rate was 12.46 per cent. The magnitude of variability was 37.05 percent which is high among all districts without consistency.

The cardamom production in Wayanadu, Palakadu and other districts were not significant. With regard to growth of cardamom production in Wayanadu district was 1.39 percent, other districts had a negative growth.

The magnitude of variability of cardamom production was 30.87 percent in Wayanadu and 27.97 percent in Palakadu district. It implies Palakadu had more consistency than other districts.

Consumption of Cardamom

The cardamom is a consumable-agricultural produce. It is consumed by people in various ways such as cookery, medicines, liquor and the like.

The consumption of cardamom in India and the absolute as well as percentage increase or decrease over the previous years and the trend values are presented in Table 13.

Table 13

The Consumption of Cardamom in India during 2008-09 to 2017-18

(In Tones)

Year	Cardamom Consumption	Increase / Decrease	Percentage Increase / Decrease	Trend Value
2008-09	10250	-	-	8463
2009-10	8100	-2150	-20.98	9330
2010-11	9205	1105	13.64	10197
2011-12	10350	1145	12.44	11064
2012-13	11628	1278	12.35	11930
2013-14	12400	772	6.64	12797
2014-15	14205	1805	14.56	13664
2015-16	18390	4185	29.46	14531
2016-17	14140	-4250	-23.11	15398
2017-18	14970	830	5.87	16264

Source: Spices Board

It could be seen from Table 13 that cardamom consumption in India increase from 10250 tones in 2008-09 to 11628 tones in 2012-13, making a 12.35 percent increase over previous year. It is also observed from table that there was a gradual increase in cardamom consumption from 2013-14, except 2016 when there was 23.11 percent decrease over the previous year.

It is seen from Table 13 that the trend value of cardamom consumption showed an increasing trend. The trend value had increased from 8763 tones in 2008-09 to 16264 tones in 2017-18.

Trend, Growth and Magnitude of Variability of Cardamom Consumption

The annual growth rate of consumption of cardamom in India and the magnitude of variability during the period under review are presented in Table 14.

Table 14**TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF CONSUMPTION OF CARDAMOM IN INDIA DURING 2008-09 TO 2017-18**

<i>Country</i>	<i>Semi – log</i>		<i>R²</i>	<i>CGR(%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Consumption	3.909 (0.000)	0.031 ** (0.001)	0.751	7.40	25.13

Source: Computed from Table 13. ****** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It is observed from Table 14 that the trend in consumption of cardamom was positive and statistically significant at one percent level. It reveals that cardamom consumption in India witnessed a significant increase during the period under study. The analysis indicates that the cardamom consumption in India is increasing at the rate of 7.40 percent per annum during the period under study. It is also inferred from Table 14 that the cardamom consumption in India had sizeable variation during the study period under the study with 25.13.

Export of Cardamom

The small cardamom has more demand in the local and global market because of its aroma and flavour. The export usually takes place after our consumption from the production of cardamom.

The consumption of cardamom in India and the absolute as well as percentage increase or decrease over the previous years and the trend values are presented in Table 15.

Table 15**EXPORT OF CARDAMOM FROM INDIA DURING 2008-09 TO 2017-18**

Year	Export	Increase / Decrease	Percentage Increase / Decrease	Trend Value
2008-09	750	-	-	1213
2009-10	1975	1225	163.33	1685
2010-11	1175	-800	-40.51	2156
2011-12	4650	3475	295.74	2628
2012-13	2372	-2278	-48.99	3099
2013-14	3600	1228	51.77	3570
2014-15	3795	195	5.42	4042
2015-16	5500	1705	44.93	4513
2016-17	3850	-1650	-30.00	4985
2017-18	5680	1830	47.53	5456

Source: Spices Board Statistics, Cochin.

It could be seen from Table 15 that cardamom export from India increase from 750 tones in 2008-09 to 5680 tones in 2009-10, making a 163.33 percent increase over previous year. It is also observed from table that there cardamom export from India increase from 1175 tones in 2010-11 to 3600 tones in 2013-14, making a 51.77 percent and 47.53 percent in 2017-18 increase over previous year.

It is seen from Table 15 that the trend value of cardamom export showed an increasing trend. The trend value had increased from 1213 tones in 2008-09 to 5456 tones in 2017-18.

Trend, Growth and Magnitude of Variability of Cardamom Export

The annual growth rate of export of cardamom and the magnitude of variability during the period under review are presented in Table 16.

Table 16

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF EXPORT OF CARDAMOM IN INDIA DURING 2008-09 TO 2017-18

<i>Particulars</i>	<i>Semi – log</i>		R^2	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Export	3.010 (0.120)	0.080 ** (0.019)	0.682	20.23	51.54

Source: Computed from Table 15. ****** Significant at 5 percent level; CGR – Compound Growth Rate; C.V: Co-efficient of Variation

It is observed from Table 16 that the trend in export of cardamom from India was positive and statistically significant at one percent level. It reveals that cardamom export from India witnessed a significant increase during the period under study. The analysis indicates that the cardamom export from India is increasing at the rate of 20.23 percent per annum during the period under study. It is also inferred from Table 14 that the cardamom export from India had sizeable variation during the study period under the study with 51.54 percent.

The cardamom is exported to various countries. They are importing cardamom from India regularly and the demand for cardamom is day-by-day increasing. The country-wise export of Indian cardamom is presented in Table 17.

Table 17**COUNTRY-WISE EXPORT OF CARDAMOM FROM INDIA DURING 2009 -18**

Country / Year	Saudi Arabia	UAE	Kuwait	USA	Qatar	Japan	Other Countries	Total Export
2008-09	525	85	25	15	12	15	73	750
2009-10	1185	193	60	40	20	20	457	1975
2010-11	705	12	35	21	10	11	381	1175
2011-12	3098	555	117	39	40	46	755	4650
2012-13	1777	148	112	55	13	8	259	2372
2013-14	2000	463	89	64	42	36	906	3600
2014-15	2486	445	114	71	41	37	601	3795
2015-16	3969	493	198	119	63	70	588	5500
2016-17	2500	494	153	96	0	55	552	3850
2017-18	3750	625	187	147	62	57	852	5680
Average	2200	351	109	67	30	36	542	3335
Share (%)	65.96	10.53	3.27	2.00	0.91	1.06	16.27	100.00
Rank	1	2	3	4	6	5	7	0

Source: Spices Board Statistics, Cochin

It could be seen from Table 17 that the total cardamom export from India was 33,347 tones during the period under study. Out of which 65.96 percent of cardamom was exported to Saudi Arabia followed by 10.53 percent to United Arabian Emirates and the remaining were in single digit. Saudi Arabia stands first in importing cardamom from Indian during the period under study by importing 525 tones in 2008-09 to 3750 tones in 2017-18.

Trend, Growth and Magnitude of Variability of Country-wise Export of Cardamom

The annual growth rate of country-wise export of cardamom and the magnitude of variability during the period under review are presented in Table 18.

Table 18**TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF COUNTRY-WISE EXPORT OF CARDAMOM FROM INDIA DURING 2008-09 TO 2017-18**

<i>Country</i>	<i>Semi – log</i>		<i>R²</i>	<i>CGR(%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Saudi Arabia	2.816 (0.121)	0.082 ** (0.020)	0.686	20.78	54.22
UAE	1.739 (0.297)	0.115 ^{NS} (0.048)	0.417	30.32	62.26
Kuwait	1.482 (0.105)	0.087 ** (0.017)	0.767	22.18	54.17
USA	1.192 (0.080)	0.098 ** (0.013)	0.880	25.31	64.09
Qatar	1.231 (0.392)	0.011 ^{NS} (0.063)	0.004	2.57	72.98
Japan	1.032 (0.167)	0.077 ^{NS} (0.027)	0.504	19.40	60.58
Other Countries	2.278 (0.179)	0.069 ^{NS} (0.029)	0.415	17.22	48.11

Source: Computed from Table 17. ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It is observed from Table 18 that the trend in country-wise cardamom export in Saudi Arabia, Kuwait and USA are positive and statistically significant at one percent level. It implies that country-wise cardamom export in these countries showed an increasing trend during the period under study.

The growth rate is high in USA with 25.31 percent followed by Kuwait with 22.18 percent and by Saudi Arabia with 20.78 percent since the consumption had increased in USA and Kuwait and Saudi Arabia during the period under study.

It is further inferred from Table 18 that the country-wise export of cardamom to USA showed a sizeable variation of 64.09 percent followed by Kuwait with 54.17 percent. The variation in Saudi Arabia is low which indicates that the country had consistency in import of cardamom from India during the period under study.

Import of Cardamom to India

The cardamom is produced in large scale in India. Out of the production a substantial quantity is regularly exported to various countries. We are the largest producer and consumer as well. However we import cardamom from global market to meet the country's requirement.

The import of cardamom to India and the absolute as well as percentage increase or decrease over the previous years and the trend values are presented in Table 19.

Table 19

THE IMPORT OF CARDAMOM TO INDIA DURING 2008-08 TO 2017-18

(In Tones)

Year	Import	Changes in Absolute Value	Changes in Percent	Trend
2008-09	743	-	-	743
2009-10	864	122	16.36	864
2010-11	986	122	14.06	986
2011-12	1107	122	12.33	1107
2012-13	1229	122	10.98	1229
2013-14	1110	-119	-9.65	1350
2014-15	2285	1175	105.86	1472
2015-16	850	-1435	-62.80	1593
2016-17	1720	870	102.35	1715
2017-18	2000	280	16.28	1836

Source: Spices Board Statistics, Cochin.

From Table 19 it is observed that there is a substantial increase in import of cardamom to India during the period under study except during 2013-14 and 2015-16. It increased remarkably from 1110 tones in 2013-14 to 2285 tones in 2014-15 thereby making an annual growth rate of 105.86 percent as compared to previous year. So the quantum of import of cardamom increased considerably due to increase in consumption during the period under study.

The year 2015-16 experienced a substantial decrease in annual growth rate by 62.80 percent over the previous year owing to changes in import policy of the government.

Trend, Growth and Magnitude of Variability of Cardamom Import

The annual growth rate of import of cardamom and the magnitude of variability during the period under review are presented in Table 20.

Table 20**TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF IMPORT OF CARDAMOM TO INDIA DURING 2008-09 TO 2017-18**

<i>Particulars</i>	<i>Semi – log</i>		R^2	<i>CGR (%)</i>	<i>C.V (%)</i>
	<i>Constant</i>	<i>Regression Co-efficient</i>			
Import	2.862 (0.083)	0.040 ^{NS} (0.013)	0.524	9.65	41.01

Source: Computed from Table 19, ** Significant at 5 percent level; CGR – Compound Growth Rate; C.V – Co-efficient of Variation

It is observed from Table 20 that the trend in import of cardamom to India was positive and statistically significant at one percent level. It reveals that cardamom import to India witnessed a significant increase during the period under study. The analysis indicates that the cardamom export from India is increasing at the rate of 9.65 percent per annum during the period under study. It is also inferred from Table 20 that the cardamom import from India had sizeable variation during the study period under the study with 41.01 percent.

Conclusion

Indian Cardamom Industry is performing well. We are one of leading cardamom producing country and stands in second place in global market next to Guatemala. However productivity is low compared with Guatemala. Consumption is also increasing day-by-day. Export shows an upward trend. Import is also increasing substantially. Indian Cardamom Industry has potential to increase its production.

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