



Research Article

ORGANIC AGRICULTURAL COMMODITIES MARKETING - A CASE STUDY OF ORGANIC LARGE CARDAMOM IN SIKKIM STATE OF INDIA

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Received: October 26, 2023; Revised: November 26, 2023; Accepted: November 28, 2023; Published: November 30, 2023

Abstract: India is the largest producer of Organic large cardamom and constitutes lion share of world market. The total cost of production of cardamom per hectare was Rs 3,18,836 and the marketing margin for grower was found to be Rs 64274 per ha of Cardamom. The marketing margin for trader was found to be Rs 450 per Kg of Cardamom. The marketing efficiency was very high (10.14) for Cardamom. The average export of cardamom was 884 tonnes (2011-17) and average export value was Rs 75.44 Crores. Pakistan, UAE, UK and USA were the major importers of large cardamom from India. On the contrary, the average import of cardamom was 3376 tonnes (2012-17) and the average import value was Rs 220.12 Crores and concluded that India typically imports more cardamom than it exports due to high domestic consumption. Prices of cardamom for Siliguri and Gangtok markets were very high from April to June months. Premium price for Cardamom, storage godown, auction centre, laboratory for analysis of diseases, improved scientific Cardamom curing device and Cardamom grading and packaging units are essential for cardamom market stakeholders. Separate organic commodity market and sales outlets should be setup and market intelligence and market information system should be strengthened.

Keywords: Organic Large Cardamom, Marketing efficiency, International trade, Supply chain

Citation: N. Rangasamy (2023) Organic Agricultural Commodities Marketing - A Case Study of Organic Large Cardamom in Sikkim State of India. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 15, Issue 11, pp.- 12774-12780.

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Academic Editor / Reviewer: S. K. Yadav

Introduction

Marketing efficiency of an Organic crop largely depends on the cost effective management of operations like organic production, procurement, processing, distribution of crops and its value added products in the supply chain. Efficient market chain leads to enhance the profits of various market stakeholders. Hence, trade of organic agricultural crops is an essential component of agricultural development of a country and has drawn attention of planners, policy makers, researchers and trading communities.

Even though organic agriculture production and trade is gaining importance in recent years, increasing agricultural production is a vital national concern. At one end, high input intensive chemical agriculture is perceived as harmful to sustainability of agriculture and environment while at the other hand, organic agriculture which promotes and enhances agro-ecosystem health, soil biological activity, sustain agriculture productivity and quality of crops, still, concerns are raised about viability of organic agriculture. Still there is a lot of debate about organic agricultural crops. Whether organic crops will feed burgeoning population of world than conventional crops? and whether productivity and returns of organic crops may be higher than conventional crops in supply chains. In spite of the attention which has been paid to organic farming over the last few years, very little accessible information actually exists on the costs, returns and trade of organic crops in India. There is little literature on supply chain economics of perennial organic spice crops in India. Keeping these factors in view, this paper will elucidate the scope and importance of Organic agricultural commodities marketing in India with a case study of Large Cardamom.

The paper is organised in eight sections. Second section presents an overview of organic agri-production and marketing in the world. Section 3 provides different countries organic standards and regulations in the world. Section 4 describes Organic farming and trade from India. Analytical methodology and sampling techniques is presented in the fifth section. Sixth section describes domestic trade of large cardamom.

The supply chain and market stakeholders of Large cardamom has been presented and discussed in section seven. Section 8 explains International trade of large cardamom (Exports, Imports and Prices of large cardamom). The final section summarizes the main findings and conclusions along with policy implications.

An overview of Organic agri-production and marketing in the World

There were 50.9 million hectares of organic agricultural land in the World in 2015, including in-conversion areas. Globally, the Oceania region is having the largest area of organic agricultural land (22.8 million hectares, which is almost 45 percent of the world's organic agricultural land) and other regions with the largest areas of organic agricultural land are Europe (12.7 million hectares, 25 percent) , Latin America (6.7 million hectares, 13 percent) followed by Asia (4 million hectares, 8 percent), North America (3 million hectares, 6 percent), and Africa (1.7 million hectares, 3 percent [1] .

Australia, in the Oceania region, had the largest land under organic production (22.7 million hectares). This was followed by Argentina, in Latin America, which had approximately 3.1 million ha and the United States had 2 million hectares of organic cultivation land. Other countries with significant organic land area, globally, are China, Spain, Italy, France, Germany, Uruguay and Canada.

According to Organic Monitor, Global retail sales of organic food and drink was 81.6 billion US dollars in 2015. The major demand for organic products has been mainly in the North American and European regions (90 percent of organic food and drink sales). In 2015, the countries with the largest organic markets were the United States (35.8 billion euros), Germany (8.6 billion euros), and France (5.5 billion euros). The largest single market was the United States (approximately 47 percent of the world market), followed by the European Union (27.1 billion euros, 35 percent), and China (4.7 billion euros, 6 percent).

Because of the development of regional markets viz. Asia, Latin America, and Africa, world share of organic food sales is decreasing a little.

Asia's share of organic food sales continues to increase. China has the largest market in the region. Food safety, quality issues and consumer awareness in Asia has been a major driver of organic food sales. India, apart from being an exporter, has a growing domestic market for organic products. The rise in the income of the urban middle class and growing population of India has fuelled an increase in the demand for organic food, particularly in the cities.

Organic standards and regulations in the World

Organic agriculture produces products using methods that preserve the environment and abstain from the usage of synthetic materials, such as pesticides and antibiotics. Organic farmers and food processors follow a defined set of standards to produce organic foods and fibres. These organic standards cover the product from farm to table, inclusive of soil and water quality, pest control, livestock practices as well as regulations for utilizing food additives and technologies, such as irradiation. International Federation of Organic Agriculture Movement (IFOAM), the world wide umbrella organization for the organic agriculture movement through its IFOAM Basic Standards for Organic Production and Processing (IBS) sets the standards for organic agriculture, production and processing based on four main principles; Principle of Health, Principle of Ecology, Principle of Fairness, and Principle of Care.

According to the FiBL survey on organic rules and regulations, the number of countries with organic standards is eighty seven (87). Seventeen countries are in the process of drafting legislation. Few countries organic standards and regulations are discussed below:

Codex Standards for Organically Produced Foods

The Codex Committee on Food Labelling developed the Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods in view of the growing production and international trade in organically produced foods with a view to facilitating trade and preventing misleading claims. The Guidelines are intended to facilitate the harmonization of requirements for organic products at the international level, and may also provide assistance to governments wishing to establish national regulations in this area.

The Guidelines include general sections describing the organic production concept and the scope of the text; description and definitions; labelling and claims (including products in transition/conversion); rules of production and preparation, including criteria for the substances allowed in organic production; inspection and certification systems; and import control.

USA

The National Organic Program (NOP) implemented by USDA in 2002 develops the laws that regulate the creation, production, handling, labelling, trade and enforcement of all USDA organic products. USDA requires organic farmers and food handlers to meet uniform organic standards, and make certification mandatory for operations with organic sales of over US\$ 5,000. USDA has accredited approximately 50 US State and private certification programs and over 30 foreign programs.

European Union

The Council Regulation (EC) No. 834/2007 establishes the legal framework for all levels of production, distribution, control and labelling of organic products, which may be offered and traded in the EU. The Council Regulation applies to the following agricultural products, including aquaculture and yeast: living or unprocessed products; processed foods; animal feed; and seeds and propagating material.

Japan

The Japanese Agricultural Standards (JAS Standards) for organic plants and organic processed foods makes labelling of organic products mandatory, in accordance with the revision of the Law concerning Standardisation and Proper Labelling of Agricultural and Forestry Products. The JAS standards for organic products were made in compliance with the Codex Guidelines. According to the Japanese Organic Standards for organic plants and processed foods of plant

origin, only those items to which the certified operators attach JAS logos can be labelled as "organic".

India - National Programme for Organic Production (NPOP) Standards

The Government of India has implemented the National Programme for Organic Production (NPOP) in 2001. The national programme involves the accreditation programme for Certification Bodies, standards for organic production, promotion of organic farming etc. The NPOP standards for production and accreditation system have been recognized by European Commission and Switzerland for unprocessed plant products as equivalent to their country standards. Similarly, USDA has recognized NPOP conformity assessment procedures of accreditation as equivalent to that of US. With these recognitions, Indian organic products duly certified by the accredited certification bodies of India are accepted by the importing countries.

Organic farming and trade from India

Organic farming has been an integral part of Indian farming practices since ancient times. In 2001, the Government of India started the 'National Program on Organic Production' (NPOP). Since then, India's Organic agriculture sector has shown rapid progress. Presently, India ranks 15th in terms of total land under organic cultivation. The cultivated land under certification is around 5.71 million hectare. India produced around 1.35 million metric tonnes (MT) of certified organic products (2015-16) which includes all varieties of food products namely Sugarcane, Oil Seeds, Cereals & Millets, Cotton, Pulses, Medicinal Plants, Tea, Fruits, Spices, Dry Fruits, Vegetables, Coffee, Organic cotton fiber, functional food products etc. Among all the states, Madhya Pradesh had covered largest area under organic certification followed by Himachal Pradesh and Rajasthan.

India exported more than 80 organic products items last year (2015-16) to different countries to the European Union (EU), USA, Australia, Canada, Japan, Switzerland, South Africa and Middle East countries with the total volume of 2,63,687 metric tonnes worth 298 million US dollars [2]. Oil seeds (50%) lead among the products exported followed by Processed food products (25%), Cereals & Millets (17%), Tea (2%), Pulses (2%), Spices (1%), Dry fruits (1%), and others.

Material and methods

Sampling methodology

Sikkim state is purposively selected because at the beginning of 2016, it is the first Organic state in India as well as Asia and perhaps in the world. Likewise, Large Cardamom is purposively selected to study supply chain economics and trade aspects of organic crops. Because, Sikkim is the largest producer of Large Cardamom in India as well as in the world. To study the supply chain of organic large cardamom and problems faced by different stakeholders in Sikkim, four districts of Sikkim viz. East, West, North and South Sikkim were selected. From the selected districts, following stakeholders viz. growers of large cardamom, traders, organic certification agencies, processing unit, Farmers Producer Organization, Self-help groups, officials of SIMFED, Spices board and NERAMAC were randomly selected and interviewed for this purpose.

Data collection

The primary and secondary data were collected to meet out the objectives of the study. The primary information on cost of cultivation of organic large cardamom particulars, supply chain particulars and problems faced by different market stakeholders in organic cardamom were collected from Sikkim state by using pre-tested questionnaires developed for this purpose. The secondary information on global land area of organic crops and world organic markets details were collected from FiBL & IFOAM – Organics International report (2017). The secondary data on area, production of organic large cardamom and other organic crops were collected from various published documents and from Sikkim Organic mission department. The organic large cardamom exports, imports and prices details (2010-2017) were collected from website of Spices Board and website of Agricultural and Processed Food Products Export Development Authority (APEDA), Govt of India.

The reference period for the primary data collected for this study pertained to the year 2015-16. The data collected from the published sources pertained to the latest year of the availability of data [3-8].

Data analysis

Supply chain economics of organic large cardamom was worked out by using tabular analysis method. The organic large cardamom exports, imports and prices were analyzed by tabular and graphical analysis method.

Sikkim organic production and marketing

Sikkim state was purposively selected because at the beginning of 2016, it is the first hundred per cent Organic state in India as well as Asia and perhaps in the world. Sikkim lies in the Eastern Himalayas between 27° to 28° N latitude and 88° to 89° E longitude. To its North, lie the vast stretches of Tibetan plateau with Nepal in the West, Bhutan and Chumbi valley of Tibetan Autonomous Region in the East and Darjeeling district of West Bengal in the South. Sikkim has basically an agrarian economy with a total geographical area of 7096 sq km, out of which only 10.5 per cent is available for cultivation. The net cultivated area of Sikkim has remained around 74,000 ha (inclusive of large cardamom plantations) for last decade. Sikkim is nonetheless geographically diverse due to its location in the Himalayas, the climate ranges from subtropical to high alpine. In Sikkim, agriculture is the main occupation of the people. Agriculture in Sikkim is the basis of the socio-cultural pattern of the territory. Sikkim is blessed by a fertile land that largely supports agriculture. The topography and the climatic condition of Sikkim is favourable for agriculture in Sikkim. Major crops grown in the State are Maize, Paddy, Wheat, Millet, Buckwheat, Pulses, Spice crops and Oilseeds. This sector contributes around 40 per cent towards State Gross Domestic Product (SGDP).

Table-1 Area and production of important market potential crops of Sikkim (2010-11 to 2014-15)

SN	Crop	Year	Total	
			Area ('000 ha)	Production ('000 MT)
1	Buck wheat	2010-11	4.390	4.060
		2011-12	4.460	4.160
		2012-13	3.560	3.380
		2013-14	3.630	3.490
		2014-15 (Estimated)	4.380	3.880
2	Ginger	2010-11	8.510	45.890
		2011-12	8.900	49.500
		2012-13	9.250	51.568
		2013-14	9.300	52.110
		2014-15 (Estimated)	9.857	52.532
3	L. Cardamom	2010-11	15.020	3.510
		2011-12	15.600	3.681
		2012-13	16.010	3.842
		2013-14	16.620	3.860
		2014-15 (Estimated)	17.020	3.981
4	Turmeric	2010-11	0.850	2.970
		2011-12	1.000	3.500
		2012-13	1.300	4.680
		2013-14	1.700	4.945
		2014-15 (Estimated)	1.723	5.023
5	Cymbidium orchid	2010-11	26	12
		2011-12	30	24
		2012-13	35	30
		2013-14	37	32
		2014-15 (Estimated)	38	32

Source: Sikkim Organic Mission Department, Govt. of Sikkim [3]

Identified marketable potential crops

In view of the current agricultural scenario in the State and based on secondary information following five crops were identified which were having good market

potential from Sikkim:

1. Large Cardamom
2. Ginger
3. Turmeric
4. Buckwheat
5. Cymbidium

Out of these five crops, the Large Cardamom was purposively selected to study supply chain economics and trade aspects of organic crops. Because, Sikkim is the largest producer of Large Cardamom in India as well as in the world and it is having very good market and export potential.

About Large Cardamom (*Amomum subulatum*)

Large cardamom a member of Zingiberaceae family under the order Scitaminae is one of the main cash crop cultivated in the sub- Himalayan state of Sikkim, covering an area of about 16,520 ha. Though, it is also cultivated in some of the other North Eastern States, Nepal & Bhutan, but Sikkim share a greater percentage in terms of area and production. It is used as a spice and in several ayurvedic preparations. It contains 2 to 3 per cent of essential oil and possesses medicinal properties like carminative, stomachic, diuretic, cardiac stimulant, antiemetic etc. Large Cardamom has a pleasant aromatic odour, due to which it is extensively used for flavouring vegetables and many food preparations in India. The crop grows well under the shade of forest trees at an altitude ranging from 1000 – 2000 meters with an annual rainfall of 3000-3500 mm. Deep and well drained soils with a loamy texture are best suited for cardamom.

There are mainly five popular cultivars of large cardamom, viz. Ramsai, Golsai, Shawanay, Varlangey and Seremna are found in Sikkim. Its propagation is mainly done through suckers and seed. Virus diseases are not transmitted through seeds and therefore, the seedlings are free from viral diseases.

Harvesting

Large Cardamom should be harvested when the seeds of the topmost capsules turn brown. To enhance maturity, bearing tillers are cut to a height of 30-45 cm and left for another 10-15 days for full maturity. Special knives are used for harvesting spikes. Harvesting of cardamom is done by knife. College of Agricultural Engineering and Post-Harvest Technology (CAEPHT) university has developed improved harvesting knife for the harvesting of large cardamom for the cost of Rs 200. Harvesting season is August -October /November-December. It helps in efficient harvesting of large cardamom capsules with reduced work and more output compared to the conventional harvesting knife.

Yield: 400-500 kg dried capsules /ha.

Post Harvesting Practices

Curing capsules in Traditional Bhatti

Freshly harvested capsule contains 80-85 % moisture. It is to be dried immediately by drying in a traditional kiln called bhatti. The kiln is constructed using mud and bricks. The raw cardamom is spread over the drying platforms. Hot smokes from firewood are passed through the capsules. The process takes 35-40 hrs for complete drying i.e. till the capsules become hard and grilly in texture and turn dark brown. Sometime the capsule gets dried excessively or unevenly resulting in poor appearance and loss of aroma.

ICAR's Improved Large Cardamom Dryer

The improved dryer was designed by the CIAE, Bhopal and ICAR Research Complex for NEH Region, Umiam, Meghalaya. The dryer is run using an electric motor or diesel engine. The capacity of the dryer is 600 kg per batch (curing time 12 hrs). The dryer would be economical if used by the community on hiring basis. Since uniform temperature is maintained inside the curing chamber, the quality of cured capsules is good.

Packaging

The properly dried capsules should be allowed to cool and then packed in polythene lined jute bags.

Table-2 Area and production Of Large Cardamom in India

SN	Year	Area (Ha)	Production (Tonnes)	Per cent change in area	Per cent change in production
1	2010 – 11	26984.00	3918.00		
2	2011-12	26460.00	3860.00	-1.94	-1.48
3	2012-13(P)	26060.00	4145.00	-3.42	5.79
4	2013-14(Est)	26060.00	4465.00	-3.42	13.96
5	2014-15 (Adv.Est)	26387.00	4850.00	-2.21	23.79
6	2015-16(P)	26387.00	5315.00	-2.21	35.66
7	2016-17(EST)	26787.00	5623.00	-0.73	43.52
	Average	26446.00	4597.00		

(Est): Estimate ; (P): Provisional, Source: Spices Board, Govt.of India [4]

Table-3 State wise area and production of Large Cardamom in India

Year	Sikkim Area (Ha)	Sikkim Production (Tonnes)	West Bengal Area (Ha)	West Bengal Production (Tonnes)	Total area (ha)	Total Production (Tonnes)	Percent Share of Sikkim in Total production	Percent Share of West Bengal in Total production	Total
2011-12	23155	3234	3305	626	26460	3860	83.78	16.22	100
2012-13(P)	22755	3483	3305	662	26060	4145	84.03	15.97	100
2013-14(Est)	22755	3744	3305	721	26060	4465	83.85	16.15	100
2014-15 (Adv.Est)	23082	4075	3305	775	26387	4850	84.02	15.98	100
2015-16(P)	23082	4465	3305	850	26387	5315	84.01	15.99	100
2016-17(EST)	23482	4684	3305	939	26787	5623	83.30	16.70	100
Average	23052	3948	3305	762	26357	4710	84.00	16.00	100

(Est): Estimate ; (P): Provisional Source: Spices Board, Govt.of India. [4]

Table-4 Comparison with Exporters grades in Siliguri, West Bengal. Grade as per trader's view.

SN	Grade name	Specification (width)	Trade name used in Siliguri by own trader	Grade wise share in bulk sample
1	Extra bold hand pick	> 1.5 cm	T. O. Shooter	16.24 (5.92–27.72)
2	Medium bold tail cut	> 1.4–< 1.5 cm	Seven star	19.47 (11.10–29.17)
3	Medium tail cut	> 1.3–< 1.4 cm	BSS JJ	18.00 (5.26–23.02)
4	Chhota tail cut	> 1.2–< 1.3 cm	Kenstar	18.42 (10.87–28.87)
5	Pan variety or Pan dana tail cut	< 1.2 cm	Pan	27.87 (15.45–48.85)

The bags may be stored on a wooden platform to avoid absorption of moisture, which may result in fungus growth damaging the stored produce.

Area and production Of Large Cardamom in India

[Table-2] shows that the average production of Large Cardamom was 4597 tonnes. The average area was 26,466 ha. The production was fluctuating from a minimum of 3860 tonnes to a maximum of 5623 tonnes and the cultivation area remains almost same. The production had continuously increased over the years from 2011-12. It is obvious from [Table-3] that major production of large cardamom is concentrated in two states of India viz. Sikkim and West Bengal. Sikkim is the largest producer of large cardamom and constitutes lion share of Indian and world market. The average production of India was 4710 tonnes and average area was 26,357 ha (during the period from 2011 to 2017). Sikkim had contributed 84 percent in total production (3948 tonnes) and remaining 16 per cent of production (762 tonnes) was from West Bengal and the cultivation area remains almost same for both the states.

Grade specification of Large Cardamom (*Amomum subulatum* Roxb.) capsules in Sikkim and Darjeeling District of West Bengal, India

It is obvious from [Table-4] that Large cardamom grading for exports is carried out based on five categories of grades viz. Extra bold hand pick, Medium bold tail cut, Medium tail cut, Chhota tail cut and Pan variety/ Pan dana tail cut (5)

Domestic trade

Large Cardamom trade is mostly carried out by the local merchants, middlemen and established local traders in Sikkim. The local traders of Sikkim are selling cardamom to wholesalers/traders in Siliguri regulated market (West Bengal) and from Siliguri regulated market, it is sold to Delhi, Kolkata and other markets. But, open auction system has been introduced since two years back with the joint efforts of Spices Board and NERAMAC. This auction system has become a great boon for the cardamom growers of Sikkim, as it provides better price and transparency. NERAMAC also procures Large Cardamom from farmers and trade it. In addition to that few traders are purchasing from NERAMAC/Spices Board through open auction and selling it to Delhi traders and from Delhi, it is sold to

Uttar Pradesh (Kanpur), Punjab (Amritsar) and Maharashtra (Mumbai) markets. The cardamom is sold based on size, colour (Black), moisture (around 20 percent moisture) and appearance. The Spices Board is also regulatory Authority for export of spices to international markets. If any dealer/exporter wants to export Large Cardamom or any other spices from India, he needs to obtain Certificate of Registration as Exporter of Spices from the Spices Board.

Supply chain for Large Cardamom

Although India is exporting organic products to other countries, in general, Organic products domestic trade in India is not well developed so far. Still, it is in infancy stage and organic supply chain operations are still facing lot of constraints. Because, most of these exports were done by big corporates, commercial farmers and institutional organic growers. Keeping these factors in view, a case study was conducted to illustrate the supply chain of Organic Large Cardamom in Sikkim.

Supply chain economics of Large Cardamom was worked out by using simple tabular analysis method. Supply chain parameters like marketing cost, marketing margin and marketing efficiency was considered for this purpose and price spread analysis was worked out for December, 2015 for Gangtok market (for Bada dana variety). For estimating the costs and returns of Cardamom, the expenditure on various inputs like field preparation, planting material, labour cost, plant protection, sprayer and implements, pruning, organic certification cost etc. were considered. For estimating the marketing cost and margins, data collected from various market intermediaries were analysed.

Marketing Efficiency was calculated by using the following Shepherd formula [6]:

$$\text{Index of Marketing efficiency (ME)} = (V/I - 1)$$

Here, V = Value added cost and I = Total marketing cost. Higher the ratio, higher is the efficiency and vice versa.

It is apparent from table 5 that the total cost of production per hectare was Rs 3,18,836 and the cost of production (Fresh capsules) per kg was Rs 227.74 respectively. The component wise cost analysis revealed that organic manures and fertilizers cost was the highest as 49.16 per cent in total cost of production of organic cardamom followed by planting material (37.64 per cent), field preparation for planting (3.14 per cent), labour cost (3.14 per cent) and irrigation cost was 2.82 per cent. The remaining items contributed less than 5 per cent of total cost.

Table-5 Cost of production of Large Cardamom (Rs /Kg)

Large cardamom production cost (Rs)				
SN	Particulars	Cost /hectare (Rs)	Cost (Rs/Kg)	Per cent of total Cost
	Field preparation (clearing site, pit marking and digging)	10000	7.14	3.14
	Planting material	120000	85.71	37.64
	Manures & Fertilizers (Organic)	156750	111.96	49.16
	Plant protection (Organic)	3000	2.14	0.94
	Weeding cost	3000	2.14	0.94
	Sprayer & implements	4500	3.21	1.41
	Irrigation cost	9000	6.43	2.82
	Labour (Family/Hired)	10000	7.14	3.14
	Organic certification cost	2586	1.85	0.81
	Total cost of production (Rs/ha)	318836		100.00
	Yield/Ha in Kgs (Fresh capsules)	1400		
	Cost of production per kg (Fresh capsules)	227.74	227.74	

Table-6 Marketing cost, marketing margin and marketing efficiency of Organic Large cardamom

SN	Particulars	Large Cardamom		
		Cost /unit (Rs)	Rs / Kg	Per cent
1	Marketing cost and Margin			
2	Marketing cost incurred by grower			
	Labour charges for harvesting	10000	7.14	62.50
	Cleaning cost	5000	3.57	31.25
	Grading and curing cost (1400 kg)	1000	0.71	6.25
	Sub total	16000	11.43	100.00
	Packing cost –Dry capsules (400 kg)	240	0.60	26.97
	Loading charges	250	0.63	28.09
	Transport cost	400	1.00	44.94
	Sub total	890	2.23	100.00
	Total Marketing cost	16890		
	Total Marketing cost /Kg	42.23		
	Farmer selling price (Rs /Kg)	1000		
	Net returns (Rs /ha) = Total returns from Dry capsules – Total cost of production/ha- Total marketing cost of Dry capsules	64274		
3	Farmer Market margin /kg	160.69	160.69	
4	Trader marketing cost			
	Transport cost	4800.00	12.00	66.67
	Trader commission	2000.00	5.00	27.78
	Packing cost	400.00	1.00	5.56
	Trader purchase price (Rs /kg)	1000.00		
	Selling Price of traders/kg	1468.00		
6	Total marketing cost for trader /kg	18.00	18.00	
7	Trader market margin /kg	450.00	450.00	
a.	Trader total profit /kg	180000.00		
8	Consumer Price (Rs /Kg)	1468		
9	Marketing Efficiency	10.14		

The marketing cost, marketing margin of different stakeholders and marketing efficiency for organic cardamom had been presented in table 6. It was observed from table that the marketing cost for grower was Rs 42.23 per /kg of Dry Cardamom. In that, labour charges for harvesting (fresh capsules) were 7.14/Kg, cleaning cost was 3.57/Kg, and grading and curing cost was 0.71 /Kg respectively. In addition to that transport cost (Dry capsules) was Rs 1/Kg , loading charges was 0.63 /Kg and packing cost was 0.60 /Kg respectively. The marketing margin for grower was found to be Rs 160.69 /Kg of Cardamom. Similarly, the marketing cost for trader was Rs 18.00 per /kg of Dry capsule Cardamom. In that, transport cost was highest as 66.67 per cent, followed by trader commission was 27.78 per cent and packing cost was 5.56 per cent respectively .The marketing margin for trader was found to be Rs 450.00 /Kg of Cardamom

Finally, it was also concluded that marketing efficiency was very high (10.14) for Organic Cardamom in the supply chain owing to lower marketing cost, higher value of commodity and lesser number of market intermediaries in the supply chain and found that Organic cardamom cultivation was very much profitable to farmers and traders were also receiving huge profit due to trade of Cardamom. The results obtained in the present study were in conformity with the findings of

Rangasamy [7] who also worked out the cost of production and net returns of organic mango in India and it was concluded that cost of production was higher for organic mango than in-organic mango and net returns was higher for organic than inorganic mango and the marketing efficiency was very high (6.20) for organic mango.

Problems and requirements for Cardamom production:

1. Foorkey disease, Chirkey disease and Blight (*Colletotrichum gloesporioides*) diseases are major diseases affecting economic yield of this crop.
2. Labour is the major problem during harvesting period.
3. Shade nets are required for Cardamom farmers.
4. Sprinkler irrigation facilities are required for farmers to save water.
5. Water storage tank is required for irrigation purpose.
6. Quality disease free planting materials are essential.
7. Bamboos are essential for raising Cardamom nurseries.
8. Organic manure, Organic fungicide & pesticides are requisite for farmers

Required marketing infrastructure

1. Storage godown and auction centre is essential for continuous supply of quality organic produce to the market.
2. Laboratory should be setup for analysis of diseases like Foorkey disease, Chirkey disease and Blight (*Colletotrichum*) diseases.
3. Improved scientific Cardamom curing device is essential to the farmers which should be better than traditional method of curing Cardamom (Traditional Bhatti).
4. Sorting, grading, labelling, branding and packaging is not done in proper manner. Hence, Cardamom grading and packaging unit is also essential .
5. Premium price should be given for organic cardamom producers and all organic agricultural commodities.
6. Separate organic products market and organics sales outlets should be set up .
7. Market intelligence and market information system should be strengthened for organic products.

International trade of Large Cardamom

Export of Large cardamom from India

It is evident from [Table-7] that quantity of exports of cardamom was decreasing from India and it was increasing in value terms. The quantity of exports of cardamom had decreased from a minimum of 19.86 per cent to a maximum of 55.81 per cent from the year 2011-12. The average export of cardamom was 884 tonnes and average export value was Rs 75.44 crores.

Table-7 Export of Large cardamom from India

Year	Export Qty (Tonnes)	Export Value (Rs. Lakhs)	Per cent change in qty	Per cent change in value
2011-12	934.91	6829.99		
2012-13(P)	1,217.00	6,254.59	23.17	-8.42
2013-14(Est)	1,110.00	7,961.15	15.77	14.20
2014-15 (Adv. Est)	665.00	8,403.90	-40.58	18.72
2015-16(P)	600.00	7,550.70	-55.81	11.52
2016-17(EST)	780.00	8,265.50	-19.86	22.95
Average	884.49	7544.31		

Source: DGCIS., Calcutta/Shipping Bills/Exporters' Returns [8]

It is apparent from [Table-8] that Pakistan, UAE, UK and USA were the major importers of large cardamom from India. Pakistan was the major importer of large cardamom from India followed by UAE, UK and USA were other importers from India. Overall Pakistan imports volumes fluctuated between 370 tonnes to 967 tonnes. Similarly, UAE import volumes fluctuated between 20 tonnes to 87 tonnes. From 2011 to 2016, imports of cardamom by UK increased from 35 tonnes to 72 tonnes, but USA import volumes had shown decreasing trend from 2012 to 2016. Although, import volumes fluctuating from 2011 to 2016 for these countries, the export values increased dramatically due to price increase over the years.

Import of Large cardamom into India

India is the world's largest consumer market for large cardamom and it is the largest exporter and producer of large cardamom in the world. Unlike other importing countries, India produces a substantial amount of cardamom domestically that is consumed at home.

Table-8 Country-wise export Of Large Cardamom from India (Qty. In Tonnes & Value in Rs. Lakhs)

Country name	Pakistan		UAE		UK		USA		Total (Incl.Others)	
Year	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
2011-12	719.52	4859.99	87.30	726.3	35.12	382.89	30.84	286.93	934.91	6829.99
2012-13(P)	905.11	4489.86	29.27	162.06	52.34	223.89	69.51	425.51	1217.22	6254.63
2013-14(Est)	967.86	7471.32	20.00	75.42	30	221.86	9.54	133.91	1110.00	7961.15
2014-15 (Adv.Est)	471.14	5633.31	42.99	475.07	54.16	673.64	6.73	105.51	665.00	8403.90
2015-16(P)	370.02	4999.26	64.03	720.01	71.91	663.09	23.2	312.14	600.00	7332.50
Total	3433.65	27453.74	243.59	2158.86	243.53	2165.37	139.82	1264.00		

Source: DGCI&S Kolkata/Exporters' Returns/DLE from Customs [8]

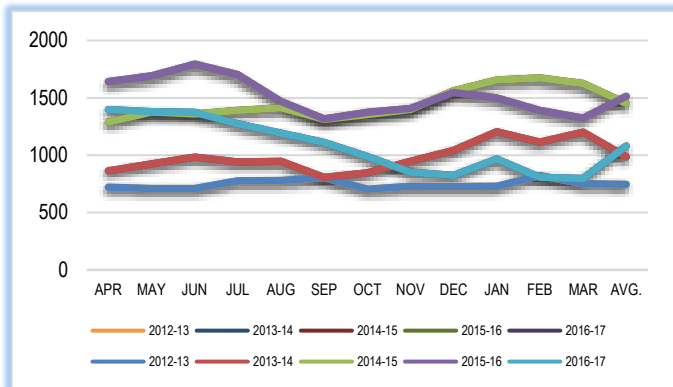


Fig-1 Price analysis of Large Cardamom (Monthly average price for Siliguri market)

Taking into consideration, international trade flows (imports and exports) and domestic production, India consumed approximately an average of 6000 MT of Large Cardamom during the period from 2010-11 to 2016-17 and the import values increased dramatically due to price increase over the years. On the contrary, the average import of cardamom was 3376 tonnes (2012-17) and the average import value was Rs 220.12 Crores and concluded that India typically imports more cardamom than it exports due to high domestic consumption.

It is obvious from [Table-9] that Indian imports fluctuated between 2750 tonnes to 3895 tonnes. If we look at production and imports figures, there was slight variation in production and imports. Likewise, the comparison of exports and imports figures had shown that imports were higher than exports. India was also importing large cardamom from neighbouring countries viz. Nepal and Bhutan to meet huge domestic demand.

Table-9 Import of Large cardamom into India (Qty. in tonnes & value in Rs. lakhs)

Year	Quantity(Tonnes)	Value(Rs.Lakhs)
2012-13	3,895	14558.80
2013-14	3,705	21406.20
2014-15	2,750	19060.00
2015-16(P)	3,410	30795.48
2016-17(E)	3,120	24241.56
Average	3376	22012.41

(E): Estimate (P): Provisional, Source: DLI from customs / DGCI&S., Calcutta [8]

Price analysis of Large Cardamom

It is evident from table 10 that the cardamom yearly average prices were increasing from the year 2012-13, 2013-14 and reached the peak price in the years viz. 2014-15, 2015-16 and started decreasing from 2016-17 to 2017-18. The graph clearly shows that Siliguri market prices were comparatively higher than Gangtok market.

Table-10 Price analysis of Large Cardamom (Badadana Grade)

SN	Year	Siliguri market Average price (Rs/Kg)	Gangtok Market Average price (Rs/Kg)
1	2012-13	746.64	681.95
2	2013-14	984.21	938.21
3	2014-15	1450.09	1409.16
4	2015-16	1512.61	1470.91
5	2016-17	1079.82	973.94
6	2017-18	771.50	600.64
	Average	1090.81	1012.47

Source : Regional Office of Spices Board – Gangtok [4]

It is noticeable from [Fig-1] and [Fig-2] that monthly average prices of Siliguri and Gangtok markets were very high during the months from April to June months.

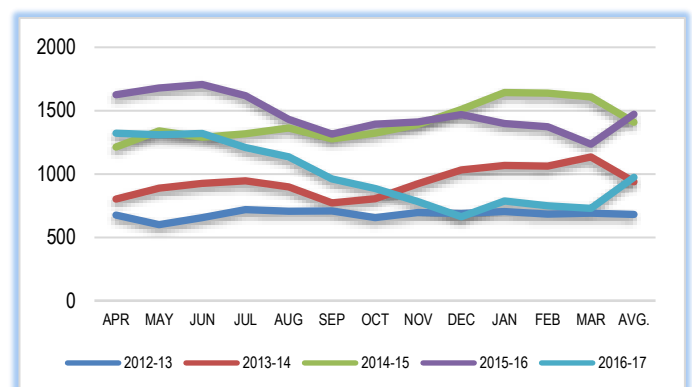


Fig-2 Price analysis of Large Cardamom (Monthly average price for Gangtok market)

It started declining during the period from July to October and again had shown upward trend from December to February and mixed trend in the month of March. It was concluded that prices of both these markets almost exhibit same trend pattern. Figures clearly show that Siliguri market prices were comparatively higher than Gangtok market.

Conclusions and Policy implications

This paper has concluded that India exported more than 80 organic products items last year (2015-16) with the total volume of 2,63,687 metric tonnes worth 298 million US dollars. At the beginning of 2016, Sikkim state is the first hundred per cent Organic state in India as well as Asia and perhaps in the world. Sikkim is the largest producer of large cardamom and constitutes lion share of Indian and world market and India is the largest producer, consumer and exporter of large cardamom in the world.

The total cost of production of cardamom per hectare was Rs 3,18,836 and the marketing margin for grower was found to be Rs 64274 /ha of Cardamom. Similarly, the marketing margin for trader was found to be Rs 450 /Kg of Cardamom. The marketing efficiency was very high (10.14) for Organic Cardamom owing to lower marketing cost, higher value of commodity and lesser number of market intermediaries. It could be concluded that premium price for organic cardamom, storage godown, auction centre, laboratory for analysis of diseases, improved scientific Cardamom curing device and Cardamom grading and packaging units are essential for cardamom market stakeholders to boost cardamom trade. Separate organic commodity market and sales outlets should be setup and market intelligence and market information system should be strengthened for organic products.

International trade of cardamom figures revealed that the average export of cardamom was 884 tonnes (2011-17) and average export value was Rs 75.44 Crores. Pakistan, UAE, UK and USA were the major importers of large cardamom from India. On the contrary, the average import of cardamom was 3376 tonnes (2012-17) and the average import value was Rs 220.12 Crores and concluded that India typically imports more cardamom than it exports due to high domestic consumption. Monthly average prices of cardamom for Siliguri and Gangtok markets were very high during the months from April to June months.

Application of research

This research findings will be useful to promote organic agriculture commodities trade and increase market efficiency of various market stakeholders involved in organic Large cardamom cultivation, processing and marketing.

Research Category: Agricultural Economics

Abbreviations: IFOAM-International Federation of Organic Agriculture Movement
NOP-National Organic Program, USDA-US department of Agriculture
NPOP-National Program on Organic Production
APEDA-Agricultural and Processed Food Products Export Development Authority
NERAMAC-North Eastern Regional Agricultural Marketing Corporation

Acknowledgement / Funding: Author is thankful to National Institute of Agriculture Marketing, Ministry of Agriculture and Farmers, India welfare for providing funds to carry out this study and Department of Agricultural Economics, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Chengal pet, 603201, Tamil Nadu, India

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University: SRM Institute of Science and Technology, Chengal pet, 603201, India
Research project name or number: Organic agricultural commodities marketing in Sikkim State of India

Author Contributions: Sole Author

Author statement: Author read, reviewed, agreed and approved the final manuscript. Note- Author agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Sikkim

Cultivar / Variety / Breed name: Large Cardamom (*Amomum subulatum*)

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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