India

Introduction

India is located in South Asia, bordered by Arabian Sea and Bay of Bengal, Burma and Pakistan. India is the world's largest democracy and second most populous country emerged as a major power in the 1990s. It is militarily strong, has major cultural influence and a fast-growing and powerful economy.

<table>
<thead>
<tr>
<th>Capital</th>
<th>New Delhi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,319,577,958</td>
</tr>
<tr>
<td>Area</td>
<td>3,287,590 sq km</td>
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<tr>
<td>Languages</td>
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</tr>
<tr>
<td>Currency</td>
<td>Indian Rupee (INR)</td>
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<tr>
<td>Ports &amp; harbours</td>
<td>Chennai (Madras), Cochin, Jawaharlal Nehru (JNPT), Kandla, Tuticorin, Mundra, Mangalore, Krishnapatnam port (KPCT), Kolkata (Calcutta), Mumbai (Bombay), Vishakhapatnam</td>
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<tr>
<td>Exports</td>
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<tr>
<td>Imports</td>
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<tr>
<td>GDP</td>
<td>$2.1 trillion (2015 est.)</td>
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Historical perspective

The history of cashew (Anacardium occidentale L.) in India is only 5 centuries old and very sketchy. It is a confirmed fact that Brazil is the home of cashew. It has also been ascertained that it was carried by Portuguese seafarers and got introduced into the West Coast of India in the Sixteenth Century.

The Wonder Nut Four centuries ago, the adventurous Portuguese came sailing down the Indian coasts and brought with them the priceless tree nut "Cashew", the wonder nut of the world. Cashew came,
conquered and took deep roots in the entire coastal region of India. Cashew found the Indian soil more homely than its homeland.

It is assumed that the Portuguese missionaries brought the cashew tree to Goa in India from Brazil circa 1560-1565 AD. From Goa, this great nut trickled down the Konkan coast and finally arrived in Kerala. This is evidenced by the fact that raw cashew is called “Parangi Andi” in Malayalam, which literally translates to “Portuguese Nut”.

In India, cashew was first introduced in Goa from where it spread to other parts of the country. In the beginning it was mainly used for soil binding to check erosion. Commercial cultivation began in the early 1960s and, over the years, cashew has become a crop of high economy and attained the status of an export-oriented commodity, earning considerable foreign exchange for the country.

**Cashew growing states**

Coastal states of the country are the main production centers. The important cashew growing states of India are Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Orissa and Tamil Nadu. Other states where cashews are cultivated includes Gujarat, West Bengal, Chhattisgarh, Jharkhand and other North-Eastern states.
Area, Production and Yield

Cashew is grown in east and west coast of country. The area includes, Kerala, Karnataka, Goa and Maharashtra along the west coast and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the east coast. To a limited extent it is being cultivated in Chhattisgarh, North Eastern States (Assam, Manipur, Tripura, Meghalaya and Nagaland.

It is extremely difficult to estimate the area under cashew accurately. This is so because cashew cultivation falls into several categories, such as small holder plantation, community plantation, social forestry, corporate sector plantation, government owned forests, soil conservation forests and also due to unsatisfactory methods of data collection and estimation in some states.

Cashew plantation in different states has been taking place in Private sector, forest department and of late by certain state level corporation.

Raw cashew nut is a horticulture produce which is harvested by the farmers usually in the month of March, April and May.
Trade: Import/Export

Average RCN imports into India

Source: UN Comtrade

Kernel exports

Avg cashew kernel export from India

Source: UN Comtrade, EXIM Bank, DGCIS&S
Cashew Processing

India was the first country to hit the world market with cashew kernels and it was she who pioneered cashew processing as an industry. The raw cashew nuts collected from the growing areas are moved to the factories for processing. It is ensured that the raw nuts are thoroughly cleaned and are free from all foreign matter before they are taken for processing. The processing of cashew is done by any of the four methods -- Sun Drying, Drum Roasting, Oil Bath Roasting and Steam Cooking.

Drying of RCN

The RCN soon after harvesting from the field should be dried by spreading it on the drying yard under the sun for a period of 1-3 days depending on the moisture content. The RCN is spread on the drying yard throughout the day and kept in covered place during the night. Once the RCN is dried, it is calibrated, bagged, weighed and tagged with details before sending it to warehouse.

Roasting:

There are three main types of roasting: Open Plan Roasting, Drum Roasting, and Hot Oil Roasting – for more info on roasting, see Cashew Industry – Udupi Pages, Cashew Nut Processing (PDF File), Cashew Roasting Machine

Drum Roasting:

In Drum Roasting, the nuts are heated at high temperature is a rotating drum and then shelled.

Oil Bath Roasting:

In this method, the nuts get roasted in a bath or cashew shell liquid and also the cashew nut shell liquid (CNSL) is extracted.

Steaming – The in-shell cashews are steamed under pressure to soften the shell. This causes the cashews inside to become loose and easier to remove in time.

Shelling

There are generally two ways of shelling.

Mallet hitting, through semi automatic hand cum pedal operated cutter and semi automatic single operation unit. Mallet/stone is required for shelling drum-roasted nuts. On an average, two to two and a half persons are necessary for completing shelling of 80 kg raw nuts per day. They have to do this for eight hours.

Nowadays fully automatic shelling machines are designed in such a way to reduce broken percentage. Shelling is designed based on stationary raw cashew nut and a simultaneous vertical and axial movement of blades.
Automatic shelling machine performs best with pre calibrated raw nuts, with proper adjustment of gap in between the blades for each size of RCN, broken percentage and uncut percentage reduce to a bare minimum level.

However, steam boiled nuts is decorticated by using hand cum pedal operated cutting unit. Two persons are required for shelling an 80 kg raw nut per day. In both the cases, the nut recovery process is in the range of 90-95%. Despite the fact that workers apply ash on nuts in drum roasted nuts, their hands are exposed to the adverse effects of CNSL. In some factories, labourers in the shelling section are given finger gloves for avoiding the CNSL effect on hands to a certain extent.

The quantity of kernel recovered in drum roasting is slightly lower, when compared with steam boiling, as a spoiled nut burns completely, while it is being roasted.

Steam boiled nuts is cooled for 10-14 hours for making shell brittle. The operation enhances the whole recovery process. Cooling of drum roasted kernels is done for 1-2 hours, so that the CNSL can be drained out and the temperature of the nut can be brought down.

**Drying**

There are three different forms of kernel dryers that are used in general. They are:

- Conventional 8 feet borma dryer, built with brick and mud. The kernels are spread on wire mesh tray and subjected to hot air by putting in a chamber above the furnace.
- Tunnel dryer, in which hot air produced outside, is passed into the drying chamber by using tunnels. Heat utilisation efficiency is more.
- Electrical borma dryers, in which both hot air temperature and flow rate are controlled automatically by thermostatic mechanism. Just four hours are required for drying 400 kg of kernels. It has 120 trays in 4 trolleys with holding capacity of 4 kg. Kernels are subjected to 700°C. Uniform drying and minimum supervision are the main advantages of this system.

**Peeling & Grading**

Peeling is a labor intensive process. Fingernails are normally used for removing testa. The average production capacity of eight hours labor per day is 6-10 kg. The first grading of 7-10 grades is done in this section. Wages are fixed on the basis of whole kernels and this acts as a control for careful work.

The standard specification for Indian cashew kernel is prescribed under the Export (Quality Control and Inspection) Act, 1963. The processors involved in export of kernels only follow the specification very strictly. A high degree of cleanliness is maintained in the grading section. The kernels are sorted out into wholes, splits, broken etc and the wholes are graded into different sizes on the basis of the number of wholes per pound, according to the specification. All the operations are done manually.
Humidification

Humidification of kernels is one of the processes followed in summer for avoiding excessive breakage, during handling and transport. The permissible moisture content after packaging is just 5%.

Packing

Graded kernels are packed in 25-lb (11. 34 kg) capacity tins on weight basis. The tins are subsequently evacuated and filled with carbon dioxide gas with the assistance of packing unit, called ‘Vita pack’, for suppressing the possible insect attack. This also helps in bringing down the likelihood of rancidity. Kernels filled in containers and inert gas is soldered afterwards. Packed tins are then labeled as per grades across the lid, by using special temper proof adhesive. Two tins that contain 25 lb of cashew kernels are packed in a corrugated cardboard carton that is bound by nylon strapping for the purpose of exports. Standard markings are printed on the carton. They include brief description, name of packer, gross and net weight etc. that are printed on the carton. Vita packing system is followed in about 80% of the industries. Tin containers of 25 pound capacity are used for packaging kernel and these tins are packed in carton boxes. In a kernel-filling machine, 4-6 tins are placed on a vibrating platform, while filling by a chute. Blowers that are provided across the chute remove dust and kernels with less weight. The tins are vaccumised and flushed with CO2 with the help of VITAPACK machine and sealed afterwards. The use of CO2 brings down oxidative rancidity and also assists in checking leakage. Any leakage in filled containers can be detected by the hollow sound that comes out while tapping the sides of the tin. Tin tester is also used for checking airtight packing by dipping in water.

Flexible Packaging (Moulded Vacuum Packaging) with nitrogen as inert gas is a better method for bringing down the heaviness and incurs less cost of packing. MVP system produces consistent rectangular blocks that range in size from 500 gm to 25 kg. This is a big improvement in quality production with the advantages of transport, handling, display, stock count, etc. The vacuum barrier bag and cardboard box are fully recyclable. The rectangular shape of primary packs ensures that the movement is minimum during transportation and handling, providing the maximum protection to the contents. The removal of air and gas flush bring down the incidence of rancidity and bacterial growth.

CNSL Extraction

Oil expeller (15 HP) is used for extracting CSNL. After extracting oil, it is transferred to the boiling unit, where it is subjected to 1000C for 4 hours for evaporating moisture and cooled for 10-12 hours in settling tanks.

On an average, 5-6 barrels of CNSL are extracted every day, in a well-developed industry. Each barrel is of 200 liters. About 200 ml of crude CNSL can be derived per kg of shell and the quality is checked by chemical method. The CNSL that is extracted is applied in break lining, paint and varnish industry and mostly exported for more revenue.

Processing cost of steam boiling requires a slightly higher than drum roasting. It has an added advantage of good quality of CNSL extraction as an extra benefit.
Cashew Nut Shell Liquid (CNSL) can be considered as a potential natural source for monomers for polymer production. Cardanol, its main constituent possesses special structural features, which can be chemically transformed into specialty and high value products/polymers. The significance of CNSL is evident from the fact that CNSL and its products are cited a large number of patents reports and monographs and reviews.

Currently, India is the world leader in CNSL production. In 2015-16 India exported 11,678 tonnes of CNSL, with Korea and US being the top buyers.

Cashew Apple

Cashew apple can be used for preparation of various products. About 60-70 % raw juice with 9-10% soluble solids can be obtained. The cashew apple contains 87.5% moisture, 11.6 % of carbohydrate and 0.2% protein. Cashew apple is one of the richest sources of vitamin C (0.26%) and minerals.

Goa is the only place in India where cashew fenny has been distilled for the last four centuries or more.

The cashew apple is left to ripe fully on the tree and when it falls down the grower collects the fruit and separates the fruit from nut. All the fruits are put in one place and pressed by the legs or with the help of screw press so that juice is collected.

The apple from which the juice is extracted is used again to collect some more juice. Weight is kept on the squeezed apple and the juice that comes at this stage is called cashew neera. This neera is being consumed as a beverage.
Fresh cashew apple is available during the cashew season from March 15 to June first week. And fruit is collected during of 3 p.m. daily and if there is more demand the juice is taken out immediately, if not juice is taken once in three or four days. Other than its own apple Goa gets cashew apple from Maharashtra based on demand.

The juice that is collected from screw press or leg pressing is kept for 3 to 4 days in a big vessel where it gets fermented.

After fermentation of the cashew apple juice they put in a big copper vessel which has an approximate capacity of 45-50 liters. The process of the fenny extraction is drawn below. The juice or alcohol that is collected in the bottle is called “URRAK”. Usually out of 45 liters of cashew apple juice only 20 liters of Urrak will be extracted. The left over in the copper vessel is thrown out as waste. The alcoholic content in this Urrak is 45 -50% and this cannot be kept for long period and its shelf life is 3 months. Therefore the Urrak is again put in the copper vessel and mixed with cashew apple juice at 2:1 ratio. The above mixture of Urrak and juice is heated again where in the output is cashew fenny with an alcoholic content of 75 - 80%. From 30 liters of Urrak and 15 liters of cashew apple juice 18 – 20 liters of fenny will be extracted. If one wants pure fenny the ratio of Urrak and juice is changed (2.2:0.8) so that the alcoholic percentage can be increased.

Some of the bottling companies go for filtration of fenny before bottling them. There are also companies, which use additives to reduce the smell. The bottling companies also store the fenny for 1 to 1.5 years, as the fenny aged will have more taste and value.

Fenny is used as a healthy drink, used for medicine purpose for stomach disorder, etc. Medicinal roots are added to the fenny and taken as drink. It is a low investment industry.

The area is notified for extraction of alcohol/fenny from cashew apple from the state government. The excise department will conduct auction for the land and the highest bid will be given the permission for extraction of fenny for a period of 1 year.

**Government bodies/NGOs**

**THE CASHEW EXPORT PROMOTION COUNCIL OF INDIA**

The Cashew Export Promotion Council of India (CEPC) was established by the Government of India in the year 1955, with the active cooperation of the cashew industry with the object of promoting exports of cashew kernels and cashew nut shell liquid from India. By its very set up, the Council provides the necessary institutional frame-work for performing the different functions that serve to intensify and promote exports of cashew kernels and cashew nut shell liquid.

The Council provides the necessary liaison for bringing together foreign importers with member exporters of cashew kernels. The enquiries received from the foreign importers are circulated amongst Council members.
The Council also extends its good offices in settling complaints amicably in the matter of exports/imports either on account of quality and/or variation in fulfillment of contractual obligations.

The Council undertakes publicity abroad with a view to projecting the 'Product Image' which serves to highlight and focus attention on the high quality and superiority of Indian cashews.

The Council participates in specialized International Food Fairs/Exhibitions and general fairs abroad. As the Council represents the whole industry, it arranges display of products received from members free of cost. The enquiries received are circulated amongst the members for them to contact the parties abroad for business negotiations.

**Address: The Cashew Export Promotion Council of India**

_Cashew Bhavan, Mundakkal, Kollam 691001, Kerala, India_

_Tel: +91 474 2742704 / 2761003_

_Fax: +91 474 2749973_

_E-mail: cepci@cashewindia.org_

**Directorate of Cashew Research**

Research on cashew was first initiated in the early 1950s. Indian Council of Agricultural Research (ICAR), sanctioned ad hoc schemes for Research Centers located at Kottarakkara (Kerala), Ullal (Karnataka), Bapatla (Andhra Pradesh), Daregaon (Assam) and Vengurla (Maharashtra). In 1971, ICAR also sanctioned All India Coordinated Spices and Cashew Improvement Project (AICS and CIP) with its Head Quarters located at CPCRI, Kasaragod. The CPCRI Regional Station, Vittal (Karnataka) was given the mandate to carry out research work on cashew while four University Centers (Baptala, Vridhachalam, Anakkayam and Vengurla) were assigned the research component on cashew under AICS and CIP. During the V and VI plan three more centres (Bhubaneswar, Jhargram and Chintamani) came under the fold of AICS and CIP and with shifting of work of Anakkayam centre to Madakkathara. The recommendations made by the Quinquennial Review Team (QRT) constituted by ICAR in 1982, working group on Agricultural Research and Education constituted by the Planning Commission for VII Plan Proposals and the Task Force on Horticulture constituted by ICAR had resulted in the establishment of National Research Centre for Cashew at Puttur on 18th June 1986 which was upgraded and renamed by ICAR in 2009 under XI Plan as Directorate of Cashew Research (DCR). Subsequent to the bifurcation of AICS and CIP, the headquarters of All India Coordinated Research Project on Cashew was shifted to DCR, Puttur. At present, this Coordinated Research Project is operating in ten centers and a sub centre distributed in major cashew growing areas of the country. There are also three co-operating centers.

**Address: Directorate of Cashew Research**

_Post Darbe, Puttur-574202, D.K., Karnataka - 574202._

_dircajures@gmail.com, dircajures@yahoo.com, dircajures@rediffmail.com_

_Phone: 08251 - 231530, 230902, 236490 [Office]_

_Fax: 08251 – 234350_
Kerala State Cashew Workers Apex Industrial Co-operative Society Ltd (CAPEX)

Kerala State Cashew Workers Apex Industrial Co-operative Society Ltd., No.IND (ST) 12, Quilon was registered in the year 1984 with an objective to work as an Apex Society to take care of the operations of the 10 primary co-operative societies under Government of Kerala.

Capex-Kerala State Cashew Workers Apex Industrial Co-Operative Society LTD. It is an apex society is to procure raw nuts, distribute the same to the primaries and get it processed by the primaries and market the processed kernels. All these are done to provide continuous employment and job security to the workers who were thrown out of their job at the time of taking over. It is established in 1984 Kollam was the Headquarters of CAPEX. The employee’s strength of the 10 factories is above 5000. The factories such as Chengamanadu, Chathannoor, Eruva, Pathiyoor.

More than 90% of the workers were women and belongs to backward classes. CAPEX is the only largest Cashew Processing Unit in the Co-Operative Sector under Industrial Department, Govt of Kerala. CAPEX used to purchase or import raw Cashew and Export the kernels in large qualities 80% of our sales is by way of Export CAPEX has a capacity to process 18000 MT of Raw Cashew nuts per annum.

Address: CAPEX
P.B. No.262, Kadappakkada,, Kollam 691008.

Office
0474-2742499
0474-2742996
Fax:0474-2747153
Email: cashewcapex@rediffmail.com

Karnataka Cashew Manufacturers Association (KCMA)

The Karnataka Cashew Manufacturers Association (KCMA) was established in 1955 under the Indian Companies Act, VII of 1913, by seven members then, with the object of promoting the Cashew Industry in Karnataka. Since its inception, the Association has grown many folds to reach the current membership of over 120 members in the districts of Dakshina Kannada, Udupi, Uttar Kannada and Kasargod. The unity of the members of the Industry has made the association gain its acceptance in the state as well as in the national scenario.

The quality processing concept adopted by our industries has yielded rich dividends and "MANGALORE CASHEWS" are now preferred world over. In the recent years, many of our members have also been honoured and awarded by the state and Central Governments for production, processing and various other related activities.

The association has been active in dissemination of information to all the members on various aspects connected with the cashew industry. It tries to effectively take up the issues affecting its members with
the concerned authorities and provide the necessary relief. It also through its programs tries to educate its members on various aspects of the cashew trade. We have also been able to interact with the different departments of the State and Central Governments whereby desired results have been achieved.

In the last 60 years, there has been a lot of change in the business and economical environment of our region, to which our industries have contributed a lot. Over 450 units directly employing more than 60,000 workers, of which 95% are women especially from the weaker sections of the society. This has improved the living standards of the rural population of the area, elevating the socio-economic status of this rural belt.

Mr. J.N.A. Hobbs was the founder President of the Association in the year 1955 followed by 13 Presidents to date who include Mizar Govinda Pai, Rem Fernandes, Mizar Sadananda Pai, Bola Ramanath Kamath, G. Giridhar Prabhu, Walter D'souza, M. Madhavaraya Prabhu, M. Yeshwanth Pai, Muralidhar V. Prabhu and Kalbavi Prakash Rao, Gopalkrishana Kamath, Kiran Kumar Kodgi, K Sudhakara Kamath, B Rahul Kamath and Ganesh Kamath at present day.

Address: Karnataka Cashew Manufacturers Association
201-205, Suprabhath Building,
Bejai, Kapikad, Mangalore 575004, India
Telephone: +91-824-2223287
E-mail: kcma.mlr@gmail.com

The Directorate of Cashew nut and Cocoa Development

The Development of Cashew was first introduced in the early 50’s and was hand in glove with the Research and Development of the ICAR looked after by Indian Cashew nut and Spices Committee till the beginning of 3rd plan period. Cashew Development was taking place from the beginning through adhoc schemes sanctioned by the erstwhile Cashew nut and Spices Committee. In the post independent era from the beginning of 3rd Plan, no central agency was there to devote an individual attention for the development of cashew in India. The Directorate of Cashew nut Development established in 1966 as a primary field functionary under the Union Ministry of Agriculture gave a greater impetus for the development of cashew in a more scientifically oriented manner. This marked the first step towards the integration and co-ordination of Cashew Development in association with developmental agencies of States and Research Institutes. Now, the cashew development and research go hand in hand conceiving whatever technological advancements taking place in the research front is becoming an integral part of the developmental efforts. The Directorate of Cashew nut Development which was handling only cashew got the mandate for development of cocoa in 1997. Though cashew and cocoa enjoys different parameters, both are economical cash crops of the country and in 1997-98 the Directorate of Cashew nut and Cocoa Development started driving both the crops on similar tracks.
Mr Venkatesh Hubballi is the present director of DCCD.

**Odisha State Cashew Development Corporation Ltd**

The Odisha State Cashew Development Corporation Ltd. was incorporated under The Companies Act, 1956 on 6th April, 1979 for development of cashew in the State of Odisha. The main objective is to give thrust on development of cashew plantation and strengthen the economy of the State by commercially exploiting cashew crop in the State.

The Odisha State Cashew Development Corporation Ltd. was declared as Nodal Agency for development of cashew in the State of Odisha during the year 1993.

**Address:** 2nd floor, F-4 Block Indradhanu Market Complex, I.R.C Village, Bhubaneswar-751015  
**Phone:** (0674) 2555532, 2550855, 2556590, 32950  
**Fax No.:** (0674) 2555532  
**Email:** contact@oscdc.com