Cashew Industry from Harvesting to Marketing – Opportunity for Entrepreneurship in India with respect to Ghana

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Abstract

Trading was always the backbone of ancient India’s economy. Nowadays it is the same but unfortunately the ratio or contribution of economy from trade (export) is very low as compared to earlier days which was 24.4% contribution in world trade and is now less than 1% contribution in world trade. This is an alarming trend that requires the Indian government’s focused attention. (more Exports less Imports).

Agro products has always been the strength of India, notably spices, dry fruits, rice, vegetables, along with value added products like herbal medicines, herbal products etc. In India, we have a favorable environment for natural resources, availability of labor and different government schemes for farmers and new entrepreneurs.

In this research paper we would like to focus on cashew industry from harvesting to marketing, how we can improve processing industry, opportunities for entrepreneurs, trying to raise contribution from India in world trade; as well as exploring new opportunities to improve the condition of employees related to agro trade along with a focus on the supply chain system. The Cashew Exporting Industry in Ghana is used as a case for comparison.

Keywords- Agriculture, Trade, Cashew industry, Marketing, Supply Chain

Introduction

The cashew nut, a native of Brazil, was introduced to India by the Portuguese about five centuries ago. The cashew kernels are used in confectionery and desserts. It is a versatile nut with many health advantages. Cashew cultivation in India is confined mainly to peninsular India. The Konkan region comprising of Thane, Raigad, Ratnagiri and Sindhudurg is the major tract of cashew cultivation in the state of Maharashtra. Considering the production of cashew nuts and demand for kernels, the processing industry is growing rapidly and hence, an attempt has been made in this investigation to study comparative economics of cashew nut processing units in Ratnagiri district. In the context of growing demand for cashew kernels in the domestic market as well as foreign countries, an attempt has been made in this investigation to review financial performance of cashew processing units in Ratnagiri district.

The cashew industry in India is eminently placed for a (re) examination combining insights from a value chain as well as from the social embeddedness perspective. India in general, and Kerala in particular, has a long engagement with the cultivation and processing of cashew. The industry has been the subject of considerable research; the
themes largely covered but studied independently, include the economics of cultivation, the commercial aspects of import of raw nuts and exports of kernels, and the changing fortunes of the women labour involved in the processing of the raw nuts (Emam Beevi, 1978; Kannan, 1983; Deepa, 1994; CEC, 1999,Lindberg, 2001).

Cashew and Human Health
Cashew (Anacardium occidentale L.) is an important tropical cash crop and is native of Eastern Brazil. It was introduced in India five centuries ago by Portuguese travellers. Cashew is a rich source of protein (21.2 %), carbohydrates (22 %), fat (47 %) and minerals (Calcium, phosphorus and Iron) (Sharma, 2004) and provides 575 kcal of energy per 100 g (Sathe, 1994). As a delicacy, cashew is used in confectioneries, breakfast cereals, health foods, baked goods and as adjuncts in chocolate manufacture. Besides being known as an edible nut, cashew is also known to possess therapeutic value, the potential to treat several common diseases including scurvy, anaemia, cough, urinary complications, liver disorders and diabetes. Its role in treating cardiovascular diseases and obesity is due to the high content of unsaturated fatty acids (Yang et al., 2009). The medicinal uses also extend to treating nervous weakness, general depression and loss of appetite (Puranik, 2003).

World Scenario for Cashew nut industry
In the world, a total area of 49.35 lakhs hectares are under cashew cultivation, while the production stands at 41.47 lakhs tones. Vietnam ranks No.1 in the world by contributing 12.37 lakhs ton production on 3.40 lakh hectare area i.e. contributing 28 % of the worlds production. India ranks 2nd by contributing 15% of the total world production.

The major Cashew nut growing countries are as follows:-

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Country</th>
<th>Area (lakh ha)</th>
<th>Production (Lakh Ton)</th>
<th>% of Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vietnam</td>
<td>3.40</td>
<td>12.37</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>9.82</td>
<td>7.28</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Ivory coast</td>
<td>6.60</td>
<td>3.93</td>
<td>9.1</td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>7.58</td>
<td>2.31</td>
<td>5.3</td>
</tr>
<tr>
<td>5</td>
<td>Nigeria</td>
<td>3.30</td>
<td>5.80</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Indian Scenario-
India is the largest area holder of this crop. Cashew ranks as one of the five top agricultural export commodities. Cultivation of cashew in India is confined mainly to the coastal areas. It is grown in 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 Chattisgar, North Eastern States (Assam, Manipur, Tripura, Meghalaya and Nagaland) and Andaman & Nicobar Islands.

In India, a total of 9.82 lakhs ha area is under Cashew nut cultivation. In this area, the total production is 7.28 lakh tonnes. So the productivity is 685 kg/ha which gives employment to 5 lakh people directly or indirectly. A majority of rural women are involved in the cashew nut processing industry.

In the world scenario, India occupies a premier position contributing to over 50% of the world’s exports. Despite India being the largest producer and exporter of cashew nuts, the production of raw cashew nut in the country is far below the requirement of the processing sector.

There is a need to expand and fully utilize the potential, if India has to keep pace with growing global demand, retain market share and stay ahead of the rapidly emerging competition in the world market.

Maharashtra State Scenario-
Maharashtra ranks 1st for the production of Cashew in India. In Maharashtra the total area under cultivation of Cashew is 1,95,762 ha. Within that western Maharashtra i.e. Ratnagiri, Sindhudurg, Raigad, Kolhapur, the area covered is 1,88,790 ha.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>District</th>
<th>Area in Ha</th>
<th>Production in M.T</th>
<th>Total processing units</th>
<th>Capacity of Processing Units (M.T)</th>
<th>Processing at Present (M.T.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ratnagiri</td>
<td>91,350</td>
<td>67,179</td>
<td>141</td>
<td>40,000</td>
<td>24,000</td>
</tr>
<tr>
<td>2</td>
<td>Sindhudurg</td>
<td>56,225</td>
<td>66,003</td>
<td>111</td>
<td>36,000</td>
<td>22,700</td>
</tr>
<tr>
<td>3</td>
<td>Raigad</td>
<td>21,351</td>
<td>20,733</td>
<td>11</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>4</td>
<td>Kolhapur</td>
<td>19,864</td>
<td>45,728</td>
<td>119</td>
<td>22,450</td>
<td>17,395</td>
</tr>
<tr>
<td>5</td>
<td>Others</td>
<td>6,972</td>
<td>19721</td>
<td>37</td>
<td>6,460</td>
<td>3250</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,95,762</td>
<td>2,25,000</td>
<td>419</td>
<td>1,08,110</td>
<td>68,845</td>
</tr>
</tbody>
</table>

In Maharashtra the major areas contributing in the Cashew production are from Konkan region. Other than Konkan region Kolhapur district is contributing more followed by Pune district which is a non Cashew zone where there are 30 processing units. There is a new upcoming non Cashew zone in Chandrapur & Gadchiroli dist.

In Cashew processing, Maharashtra earns more than Rs.1,750 cr/year.

Marketing structure of Cashew nuts in Western Maharashtra as compared to Kerala & Goa

Marketing in respect of cashews involves several players and channels. Marketing begins from the sale of raw cashew nuts by farmers and reaches the level of exporters/retailers for selling of processed and graded kernels to the ultimate consumers.

There was no regulated market for raw cashew nuts in India. Even with the existence of regulated market for cashew, raw nuts were sold by the farmers to the traders / commission agents. Payment of cess and taxes in regulated markets deterred the producers from resorting to regulated markets.

Marketing of raw cashew nuts in India has not yet been organized in a systematic manner except in Kerala & Goa where co-operative marketing societies have a major stake in raw nuts trade. These co-operatives, where the producers were the major stakeholders acted as intermediary between the producers and the processors. The society had collection centers located in the production areas and procured cashew nuts from the growers. The sales price was fixed at Rs. 1.50 per kg above the procurement price and the processors had to lift the produce and bear the transportation cost from the society / collection centers. There was another co-operative set up, which directly procured raw nuts from producers and also had a processing unit on lease. Through this mode, the supply chain was further shortened and was beneficial both to producers and processors.

In Maharashtra, the Cashew nut processing industry as well as the marketing system is not well organized as it is in Kerala and Goa. Many farmers sell the collected and dried nuts to the traders in the local market. The traders sell the raw Cashew Nuts further to the processing industry owners. The processing industries process the Cashew Nuts and send to the distributors in
nearby cities as well as in local market either by creating their own brand or in loose. Cashew kernels are a high value commodity. In order to compete directly in the world market, high level of standards, branding and marketing is required to be maintained by the processors. Standards for raw nut quality like moisture content, and cleanliness of nuts are needed to improve trade.

Export –Import Scenario of Cashew nut in India-
In order to fulfill the raw material requirement India has to import the raw material from different countries. The following fig. highlights the export- import scenario of India in brief-

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Export- Import Particulars</th>
<th>Quantity (Lakh Ton)</th>
<th>Value in Crores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Import of raw Cashew nuts</td>
<td>8,922</td>
<td>5331.12</td>
</tr>
<tr>
<td>2</td>
<td>Export of Cashew kernels</td>
<td>1,040</td>
<td>4067.21</td>
</tr>
<tr>
<td>3</td>
<td>Export of cashew CNSL (OIL)</td>
<td>9,192</td>
<td>2984</td>
</tr>
</tbody>
</table>

- The domestic market is consistently in a position to absorb the extra production of cashew nuts without much change in the price of Cashew Nut.
- In Maharashtra, there is a wastage of cashew apple to the extent of more than 10 Lakh Ton every year. This can be utilized for the preparation of fruit juice, syrup, candy, jelly, pickles, cashew wine fenny & used as a bio-fuel also. This will be the value addition for the cashew.

Importance of Local Export Houses
Apart from Kollam(Kerala) based processors, there are a few from within Panruti (TN) which have larger processing facilities and export to various destinations. However, the volumes they deal in are low compared to the Kollam processors. They buy the processed kernels from small processors, clean the kernels further, sort it much more finely, dry it and vacuum pack it for export. They also import raw nuts for many small processors, who buy, process and then are free to sell the kernels to anyone (not necessarily to the local export house that has imported the raw nuts for them). The local export houses do not have
the resources of the Kollam processors, so when the latter enter the local market either for the purchase of raw nuts or for kernels, the local export houses slow down their operations. The small processors, as we have noted earlier, prefer these monoliths from Kollam for their better price and cash transactions. (Interestingly, a similar pattern is observed when Indian traders, with containers waiting to be filled, enter the raw nut market in northern Mozambique. In these cases, small and medium sized processors there cannot compete with their prices for raw nuts and withdraw from the market.) Each of the local exporters sources their kernel requirements from 25–30 small processors located in various villages that surround Panruti town. But the small producers are not dedicated suppliers of kernels to these houses. They have a loosely knit relationship. At any point of time, the small processors are free to sell their produce to any one they prefer. The power of the export house is very fragile and they have little control over the price and the conversion cost. This feature is in sharp contrast to many other known industrial clusters, where export houses have a tight reign over the entire supply chain and enjoy so much power that any shock in the market can easily be passed on to the nodes further upstream in the chain. Thus, the small processors of Panruti enjoy a great level of freedom while simultaneously having the advantages of a cluster. In this sense, the cluster is unique with the power and control not concentrated in the hands of a few. The presence of local export houses enables the small processors not to be entirely drawn into the otherwise dominant Kollam network.

Role of Traders
Cashew traders are mainly from the Chettiar caste and are involved in three different ways- as direct procurers of raw nuts, as commission agents and as traders of imported nuts. Some traders act as intermediaries between the cashew processors (mainly in Kollam, Kerala) and cashew growers. The processor who appoints the trader as his agent provides the capital required for procurement and transportation. The agent in turn uses his knowledge and contacts to procure the required quantity and quality of raw cashew from the region for which he is paid a commission. As mentioned earlier, there are not enough raw nuts grown in India to meet the processing capacity. Some traders from this region also trade in imported nuts and sell them in small quantities to the processing houses in South Arcot, Kanyakumari districts of Tamil Nadu and sometimes also to Karnataka and Andhra Pradesh processors. But in terms of scale, this is very small compared to their domestic trading activities.

The Importance of the Domestic Market
The Kollam export market uses the kernels from the Panruti cluster in a covert way due to the poor processing conditions that prevail. What sustains the small processors in Panruti, apart from the export houses of Kollam, is the booming domestic market for cashew. Many small processors in Panruti sell their produce only in the domestic market, through wholesalers of grocery, who supply retailers. In the state of Tamilnadu, such wholesalers are found in Salem in the west, Virudunagar in the South, Chennai and Vellore in the north and Nagapattinam in the east. Panruti processors have explored these grocery hubs and supply cashew kernels on a regular basis. The wholesalers place orders over the telephone and the consignment reaches them via road transport. Payments are made at regular intervals. Cashew supplied to this market is packed in plastic pouches of 1kg, ½ kg and tins of 5 kg. Such packages contain whole nuts but of varying sizes. There is a generic brand that many Panruti
processors use for packets, such as “Bombay Cashew” but there are several individual brands too. Much of the transaction in the domestic market is based on trust and not on legally binding contracts. Consequently, the power of the wholesaler is stronger than the processors who supply the cashew. While the wholesalers do not pay so much attention to the size of the nuts, they often defer the payments. Usually, one consignment is kept as credit. Essentially, that amount of capital gets locked up for the processors. If the processor quits the market, he can never recover the outstanding balance. Since the transactions are not based on any legal contract, enforcing compliance is impossible. Despite this obstacle, the processors from Panruti supply extensively to wholesalers in the domestic market. Their scale of operation is suited to the demand for cashew from thousands of wholesalers spread across the country. Each order will range from 50 kg to 500 kg. The capital required to procure the required raw material and the processing cost is manageable for many small processors. The orders are placed at regular intervals throughout the year, enabling processing to take place during the entire year. The big export houses are not prominent in the growing domestic market, since the transaction costs of engaging in so many business deals are high. The scenario might change when the state decides to open the retail sector for Foreign Direct Investment when supermarket chains may emerge as an important channel for retailing. Until then, the role of wholesales and small retailers ensure secure markets for Panruti processors, in a growing domestic market based on growing middle classes in India. However, processors from Panruti need to be aware of increasing food safety standards in the domestic market as well.

Supply of raw materials

These interventions have resulted in improved planting materials (seeds and grafts); rehabilitation of old unproductive farms through canopy substitution with scion materials from high yielding trees, selective thinning, pruning, and chemical control of weeds, pest and disease.

Ghana- Case in Point

Cashew trees, which may live for thirty to forty years, start bearing fruit in the third or fourth year. They grow in warm regions, with an annual rainfall of 1,000 to 3,000 m.m., mainly in Central and South America, Asia and Africa. If we take Ghana as a case in point, we will find that in Ghana, cashews are grown in Northern, Upper West, Brong Ahafo, Ashanti, Volta, and Greater Accra regions. The nuts may be kept for about a year provided they are properly dried and immediately after harvesting (maximum moisture 9%) and properly stored to prevent mould. Usually the nuts are sun-dried and constantly turned over for several days until the kernels rattle in the shell. Packaging is done in Jute/Poly Propylene woven bags of 50 or 25 kg use as export standard. The cashew kernels are the main commercial product of the cashew tree. The kernel, which is the edible part of the nut, contains 47% fat (of which 87% are unsaturated fatty acids); 21% protein, 22% carbohydrates, and the remaining 10% made up of other substances including calcium, phosphorus, iron and various vitamins, the main ones being A,D and E.

Exportation and Delivery

The cashew nuts when dried are stored in dry jute or sisal bags in well ventilated dry rooms. Shipment takes place as early as possible after drying within a maximum period of 90 days to avoid deterioration and spoilage of the raw nuts. In terms of quantity, minimum requirement should be one 20ft full container load. As an export requirement the following should be written
on the package- Name of product, country of origin, name of importer and net weight. The shipment of the product is within 30 days. Payment is by Letter of Credit, and inspection is done by S.G.S or equivalent inspection company. Currently 30 countries produce cashew nuts for export and/or domestic consumption. According to estimates from the World Bank, around 97% of world cashew production comes from wild growth and small farms while remaining 3% come from planned plantations. In Ghana, recognised buying agents do the networking and aggregate nuts from producers for the exporters on contract basis. The exporters in most cases provide funds in advance for the purchase on agreed terms. These transactions are however based on mutual trust between the exporter and the agent. Average minimum prices are determined by exporters after negotiation with principals of importing companies based on world market prices at the beginning of the season. Major exporters from Ghana include Sri-Krishna Products Limited, Ghana National Procurement Agency (GNPA), BET Export Ghana Ltd., OLAMGh. Ltd, and Jonaya Co. Ltd

Sale to final consumer
Only 2% of the raw cashew nuts are processed locally, while the remaining 98% are exported to India.

Elimination and Product recycle
There are 21 roasting companies in Ghana adding flavour and taste to 42 tons of kernels for the domestic market. The only medium processing company in Ghana is Mim cashew products.

Challenges- Strength and Weakness Inputs (seeds, fertilizers, nurseries, etc.)

Precise and measurable challenges-
- Limited access to good planting materials; seed dealers/nurseries are found only in a few cashew producing areas.
- The majority of cashew farmers experience severe difficulties in obtaining necessary inputs; the use of agrochemicals for controlling pests and diseases has become inevitable.

Production- (productivity, diseases, etc.)
Precise and measurable challenges-
- High incidence of pest infestations, weak extension services.
- Production is mostly carried out by small holder farmers (88%) which normally results in low productivity. The cashew industry in Ghana exists of only 12 processing companies with total installed capacity of 2,137 ton per year. The only medium processing company is Mim cashew products.
- Devastating effects from sucking pests lead to secondary infections and subsequent losses in yield and quality. Frequent bush fires are challenges to cashew industry as well.

Harvest, transport, drying, shelling, pulping, fermentation and packaging of the homogenous seeds
Precise and measurable challenges-
- Inadequate transport facilities and frequent fluctuations in the price of fuel have resulted in high cashew transport costs that are major bottlenecks on the side of processing companies.
- The cashew nuts are collected in bulk and packed into sacks obtained from associations by untrained personnel. Moreover, there are only bad road networks to cart the raw nuts to the marketing centers.

Services- standards, finance, assurance, customs, transport, quality control, exportation
Precise and measurable challenges-
• There is limited access to working capital and high costs of capital.
• Raw cashew nuts are marketed between March and June each year without much structured organization to the underlying process.
• Since this is an activity restricted to only few months in the year, there are no exclusive traders for raw cashew nuts. This has resulted in middlemen playing an important role in the marketing of nuts, and thereby reduced the margin or dividends accrued by cashew farmers.

Solutions: Strengths and Opportunities of value chain Inputs (seeds, fertilizers, nurseries, etc.)

Precise Solutions-
So far, the Cocoa Research Institute in Ghana (CRIG) has been mandated to handle cashew research. Apart from the CRIG, national universities and the council for scientific and industrial research (CSIR) are also involved in cashew-related research. These bodies should intensify their efforts to enable cashew farmers to get the needed seeds and nurseries on time, and also identify the seeds that are suitable for the Ghanaian environment. The government should subsidies the seeds, nurseries and fertilizers to farmers.

Production: (productivity, diseases, etc.)

Precise Solutions-
The cashew development project is providing technical support to district agricultural development units (extension units) as well as to cashew farmers regarding appropriate methods for cashew production. It also supplies farmers and processors with important market information. This body should intensify its efforts to reach more farmers. The disease control division of the Ministry of Food and Agriculture should provide proper disease control mechanisms to farmers

Harvest, transport, drying, shelling, pulping, fermentation, packaging of the homogenous Seeds.

Precise Solutions-
The quality of cashew kernels depends on the quality of raw nuts. The following is a list of some of the various factors exporters should consider throughout the process from harvesting to shipment, to ensure quality of their raw cashews:
• The nuts should be harvested only after they have fallen to the ground.
• The nuts should be sun-dried immediately after harvesting.
• During the drying process (which normally lasts two to three days), the nuts density should not exceed 20kg per square meter.

The Cashew Development Project (CDP) coordinates cashew-related activities in the country. It provides technical backstopping to activities, provides market information through its website www.ghanacashewproducts.com, lobbies on behalf of the cashew sector and strengthens production sector.
The farmers should be trained by the Cashew Development Project on the best method of cashew production and the government should provide roads to the production centers. Investors should be motivated by the government for example by tax holidays for the first ten years in the production and processing of cashew nuts in Ghana for home consumption and export.

Services- standards, finance, assurance, customs, transport, quality control, exportation.

Precise Solutions-
Non-governmental organizations as most notably the Trade and Investment Program for a Competitive Export Economy (TIPCEE), Technoserve and the Adventist
Development and Relief Agency (ADRA) are supporting national extension staff with training on technical issues and business management. Ghana Standards Board and the Food and Drug Board watch over the quality and safety of cashew products (development of quality standards). Currently, some cashew value chain stakeholders (producers, processors and exporters) benefit from credit facilities offered by the Agriculture Development Bank and Export Development and Investment Fund (EDIF). The cashew value chain promotion in Ghana has to be integrated into national policies and strategies. And also the farmers should form associations to enable them to access funds and also have greater bargaining power in terms of prices and advocating against government policies which are not in their favor. Many African countries have considerable comparative advantages within the agricultural sector because of their natural resources. Moreover, globalisation provides opportunities for integrating developing countries into the global economy and can thereby reveal options for building up and strengthening national economies. In this context, African countries could use the comparative advantage they have to significantly increase their share of international economic growth and, thus, support their own sustainable economic development and poverty alleviation. More than 40% of the global cashew crop is produced by about 2.5 million small farmers in Africa. The vast majority of these farmers live in rural areas and struggle to make as little as € 90 to € 300 per year through the production of cashews. Such low incomes results from a number of factors, including low yields, poor quality nuts and a lack of business skills. Cashew farmers in Africa rarely organise themselves into associations, which leads to a weak bargaining position with dealers.

For the above challenges the various government institutions such as the Ministry of Trade and Industry and the Ministry of Food and Agriculture should take initiatives to increase the competitiveness of African cashew production and achieve a sustainable reduction in poverty. These should be done through training on the proper use of farm tools and provision of quality seedlings and nurseries, and also they should be encouraged to form associations. Secondly, success in the global market place depends on the production of high volume of superior nuts. Therefore, governments should focus on helping cashew farmers meet international quality standards by providing advice and training on every stage of the production process (e.g. good maintenance, increasing yields, post harvest handling, and cooperative management and speciality market requirements). With a 32% share of the global nut market, cashews are highly priced in Europe and North America and demand is growing in China and India. The global market is growing at an annual rate of between 2.5% to 4% and has a turnover of more than 1 billion Euros each year. Linking African Small holder farmers to this market through improved information systems and the promotion of African brands will enable them to increase their income substantially.

Conclusions
As the demand of cashew nut grows, the area under cashew crops is also increasing. But this trend is constrained. Research and development presently - focuses on implementing good cultivation practices and developing high yielding varieties, pest resistant crops and other technologies to improve the productivity and quality of cashew. In order to balance the gap in supply-demand, India imports various forms of cashew. India needs to take necessary actions to improve productivity, cultivation practices and food safety standards in the
cashew processing sector. Limited data is available on the processing efficiency of different unit operations by manual and mechanical means in cashew processing. There is also a need for an informative survey of other problems in Indian cashew units, so as to re-focus research and development. Such measures will ensure greater value of Indian cashew at the global markets.

India is largest producer, processor, exporter and second largest consumer of cashew in the world. Since cashew processing industries are small and cottage category units and no conventional and techno-economically cost effective pollution abatement systems are in operation elsewhere, it has become necessary to study the entire cashew nut processing industry sector in India to suggest techno-economically feasible environmental standards. Even though the pollutant emission load into environment by a single cashew nut unit is low, it has been observed that the total emissions load by number of such units in a cluster causes considerable environmental degradation. The cashew nut processing by cooking (steam roasting) process, which is relatively less pollution intensive and an alternative process to roasting process may be considered to reduce the environmental discharge load.

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