

# Performance of Cashew processing units in Tamil Nadu; A case study in Kanyakumari

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## ABSTRACT

**This study aimed to** analyse the growth rate of export and import ( **quantity or value?**) of raw cashew nuts and Cashew Kernels in India and to carry out the economic analysis (**Investment evaluation efficiency**) of Mechanised and partially mechanised processing units in the Kanyakumari District

The study was carried out in the Kanyakumari District of Tamil Nadu in February 2022. Data were also collected from the official website of DCCD(Directorate of Cashew and Cocoa Development) and the UNCTAD(United Nations Conference on Trade and Development) special issue on cashew nuts.

The growth rate of exports of cashew kernels and import of raw cashew nuts in terms of quantity and value is calculated using CAGR (Compound Annual Growth Rate) and the instability index has also been calculated using Cuddy Della Valle Index(CDVI). Economic analysis of cashew processing units was calculated by categorizing processing units into mechanized and partially mechanized units. 10 samples in each category were selected randomly and analyses like gross returns, net returns, payback period, and break-even point were carried out.

**This study reached to many important results as:** The CAGR of export of cashew kernels in terms of quantity and value is found to be -2.27% and 5.19% respectively. Also, the CAGR of import of raw cashews in terms of quantity and value was found to be 4.91% and 13.27% respectively. The net returns from processed cashew products gave a mechanised business an edge over a partially mechanised firm (a mechanised firm earned a net return of Rs.31126/tonne, whereas a partially mechanised firm received a net return of Rs.18032/tonne). **Also** This study shows that even though mechanization involves a large initial expenditure, mechanisation is a beneficial alternative in the long term.

*Keywords: (Cashew processing, mechanization, cashew kernel export, Marketing, Profits)*

## 1. INTRODUCTION

The Portuguese came sailing along the Indian shores four centuries ago, bringing with them the magnificent tree nut "Cashew," the world's wonder nut. Cashew then established itself throughout India's coastline area and found Indian soil to be more welcoming than its land. It later became a major crop in other regions of India. Global Cashew Council states that the production of cashew at the global level is around 7,20,000-7,90,000 metric tonnes per year(2019-2020). The Indian cashew harvest was down by roughly 50,000 tonnes in 2020-21, according to the International Dried Fruit and Nut Council (INC), due to a variety of factors, including the Covid-19 epidemic. The **export value of indian cashew kernels** in 2021 is Rs.2840.39 Crores. **The import value of indian Raw kernels** is Rs.7331.28 Crores. After Ivory Coast,

India is the world's second-largest producer of raw cashews. India is also the largest consumer of cashew kernels **all over** the world.

According to the Cashew Export Promotion Council Of India (CEPCI), India was the first country **that** introduce cashew kernels to the world market, and it was also the first to commercialise cashew processing. The conversion of raw cashew nuts in the shell to blanched graded kernel form is known as cashew nut processing. Several steps are necessary to process raw cashew nuts to grade cashew kernels such as roasting, shelling, drying, Peeling, grading etc. Kerala, Tamil Nadu, Karnataka, Goa, Andhra Pradesh, Maharashtra, and Orissa are the states with the most processing units. The procedure is extremely labour demanding, and the majority of the workers are women. With a total installed capacity of 1643 thousand MT and an average installed capacity of 0.4 thousand MT **per ??**, the country has 3940 cashew processing facilities.

**Table 1: Processing units across India and their capacities**

| States               | Processing units(Nos.) | Share of processing units(%) <b>(1)</b> | Capacity('000 MT) | Share of installed capacity | Average installed capacity <b>(2)</b> | Utilization('000 MT) |        |       |
|----------------------|------------------------|---|-------------------|-----------------------------|---------------------------------------|----------------------|--------|-------|
|                      |                        |   |                   |                             |                                       | <b>production</b>    | Import | Total |
| Tamil Nadu           | 417                    | <b>10.58</b>                            | 400               | 24.3                        | <b>0.96</b>                           | 294                  | 225    | 519   |
| Kerala               | 432                    | <b>10.96</b>                            | 600               | 36.5                        | <b>1.39</b>                           | 67                   | 320    | 387   |
| Andhra Pradesh       | 175                    | <b>4.44</b>                             | 100               | 6.1                         | <b>0.57</b>                           | 92                   | 0      | 92    |
| Karnataka            | 266                    | <b>6.75</b>                             | 300               | 18.3                        | <b>1.13</b>                           | 45                   | 20     | 65    |
| Goa                  | 45                     | <b>1.14</b>                             | 50                | 3                           | <b>1.11</b>                           | 21                   | 0      | 21    |
| Maharashtra          | 2200                   | <b>55.84</b>                            | 50                | 3                           | <b>0.02</b>                           | 20                   | 0      | 20    |
| North Eastern States | 22                     | <b>0.56</b>                             | 10                | 0.6                         | <b>0.45</b>                           | 15                   | 0      | 15    |
| Orissa               | 350                    | <b>8.88</b>                             | 120               | 7.3                         | <b>0.34</b>                           | 11                   | 0      | 11    |
| West Bengal          | 30                     | <b>0.76</b>                             | 8                 | 0.5                         | <b>0.27</b>                           | 8                    | 0      | 8     |
| Chattisgarh          | 3                      | <b>0.08</b>                             | 5                 | 0.3                         | <b>1.67</b>                           | 0                    | 0      | 0     |
| Total                | 3940                   | <b>100.00</b>                           | 1643              | 100                         | <b>0.42</b>                           | 573                  | 565    | 1138  |

Source :??

**(1) Share of processing units =**

**(2) Average installed capacity=**

It is showed from data in table (1) that Maharashtra has the most number of **Share of processing units** at 55.8%. Kerala, on the other hand, has the highest installed capacity (36.5%)( Reema Jenifer D'Silva, et al,2021). The production of cashew nuts in India is lesser than the capacities of the processing units. Thus, most of the processing units import raw cashew nuts majorly from African countries namely Ivory Coast, Ghana, Tanzania etc. The processed cashew kernels are exported to countries like the USA, Singapore, the Middle East and Japan. It's a potential commodity earning considerable foreign exchange for India. Cashew processing units use a large amount of manual workforce and are thus considered a

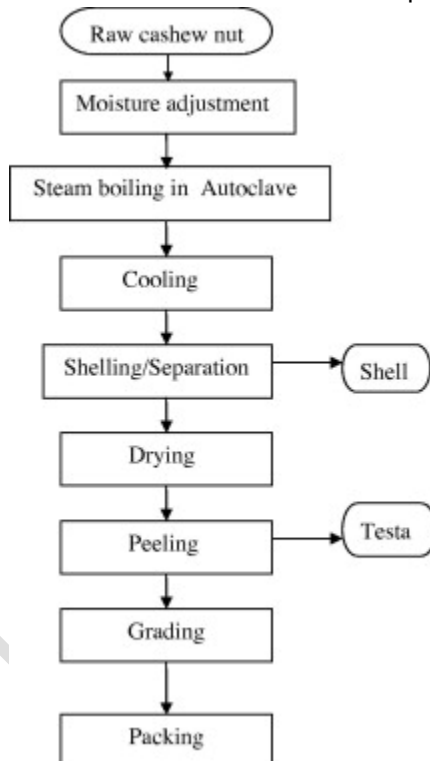
labour-intensive industry. But now due to the shortage of labour force, cashew processing units are being mechanised.

Tamil Nadu has 417 cashew processing units as per the UNCTAD special report on cashew nuts 2021. Kanyakumari is an industrially backward district and cashew processing units were established in this district by industrialists from Kollam. The number of cashew processing industries in the district has been reducing with time due to the shortage of labour and import duties.

Please add a table of geographical distribution of exports and imports of cashew from the countries of the world

### Study problem

There are six essential phases in the processing of raw cashews (according to the data collected from the primary survey). Roasting, shelling, drying, peeling, grading, and packaging are among them. Raw cashew nuts are imported and sun-dried before being roasted at a temperature of 80 degrees Celsius. The CNSL is released during roasting and collected as a by-product. The most popular roasting method is drum roasting. Boiling has mostly replaced roasting in recent years because it prevents raw cashews from becoming over-roasted and yields a higher proportion of CNSL. Shelling and peeling are usually done by hand, however, they may now be done by machines. Grading allows you to distinguish between different types of processed nuts, such as White Wholes, Scorched Whites, Baby Bits, Butts, Splits, and so on. White Wholes (WW) gives the highest market price and is favoured in exports. The processed nuts are packed according to the markets in which they will be sold once they have been graded. Nuts that are shipped to other countries are vacuum-packed in pouches or tins.



Source : Babatunde SundayOgunsinaaAdeleke IsaacBamgboye (2014). Pre-shelling parameters and conditions that influence the whole kernel out-turn of steam-boiled cashew nuts. Journal of the Saudi Society of Agricultural Sciences, Volume 13, Issue 1,

## Objective of the study

The cashew processing industry has untapped potential and mechanisation has been advantageous to the cashew processing industry in filling the void created by the labour shortage. In this regard, this study has the following objectives,

- i. Analysing the growth rate of export and import **in terms of quantity and value** of raw cashew nuts and Cashew Kernels in India.
- ii. To carry out the economic analysis **and evaluate investment efficiency** of Mechanised and partially mechanised processing units in the Kanyakumari District

## 2. MATERIAL AND METHODS

### 2.1 Data sources

Both primary and secondary sources of data have been used for the study. The secondary data was collected from the website of DCCD(Directorate of Cashew and Cocoa development) and the UNCTAD (United Nations Conference on Trade and Development) special issue on cashew nuts. The data regarding the economic and materialistic aspects of the processing units were collected from the cashew processing units spread across Kanyakumari District.

### 2.2 Sampling design and method of data collection

For the study, a visit was made to cashew processing units in Kanyakumari and a primary survey was conducted based on the prepared questionnaire. A sample size of 10 processing units in the mechanized and partially mechanized categories was selected randomly and visited to collect information on the performance analysis of cashew processing units.

### 2.3 Method of Data Analysis

The data collected is analysed using the following methods

#### 2.3.1 Compound Annual Growth Rate(CAGR)( Haritha Paul and Ushadevi K.N, 2021)

The Compound Annual Growth Rate (CAGR) is the most often used growth rate indicator for analysing growth and, by extension, export success.

$$CAGR = (V_{final} / V_{begin})^{1/t} - 1$$

Where:

- $V_{begin}$  – beginning value
- $V_{final}$  – final value
- t- Time in years

#### 2.3.2 Cuddy Della Valle Index(Haritha Paul and Ushadevi K.N, 2021)

The instability index is a statistical technique for detecting inconsistencies or variations in time series data. The Cuddy Della Valle index is a tool for determining data instabilities. When the coefficient of

variation is overestimated, this measure de-trends it, indicating the direction of instability. Here's how to calculate CDVI:

$$CDVI = CV \sqrt{1 - R^2}$$

Where,

CDVI is the coefficient of variation (in per cent), CV is the standard deviation to mean ratio, and  $R^2$  is the corrected coefficient of determination. Low volatility is indicated by a low-value index.

The ranges of CDVI are given as follows:

- Low instability = between 0 and 15
- Medium instability = greater than 15 and lower than 30
- High instability = greater than 30

### 2.3.3 Break-even point(K. Harish Kumar and B. Chinnappa, 2009)

A break-even analysis is carried out to determine the minimal production required to recoup the fixed capital invested in cashew nut processing. It is also helpful to note that sales price per unit minus variable cost per unit is the contribution margin per unit. The following formula is used to compute the break-even point.

$$\text{Break even output} = \frac{\text{Fixed costs}}{\text{Price / unit} - \text{variable cost/ unit}}$$

### 2.3.4 Payback Period(K. Harish Kumar and B. Chinnappa, 2009)

The term payback period refers to the amount of time it takes to recover the cost of an investment. The initial investment was divided by yearly net returns to arrive at this figure.

$$PBP = \frac{\text{Initial investment}}{\text{Annual net returns}}$$

Note: To find exactly when payback occurs, the following formula can be used:

$$\text{Payback Period} = \frac{\text{Initial Investment} - \text{Opening Cumulative Cash Flow}}{\text{Closing Cumulative Cash Flow} - \text{Opening Cumulative Cash Flow}}$$

### 2.3.5 Gross Returns

A gross rate of return is the return on an investment before any expenditures or deductions.

### 2.3.6 Net Returns

The return on an investment after charges such as taxes, inflation, and other fees is known as the net rate of return.

$$\text{Net returns} = \text{Gross returns} - \text{total cost}$$

## 3. RESULTS AND DISCUSSION

### 3.1 imports and exports

Table 2 shows that the CAGR for cashew kernel exports quantity and value from India has been dropping over time during the study period (2000-2020). The number of processed cashew kernels exported value from India has been steadily decreasing during 2015- 2016. In 2014-15, India exported quantity was 118952 MT of cashew kernels, whereas, in 2015-16, it shipped 96346 MT. It can be observed that it has decreased significantly since then with a CAGR of -2.27%. This might be attributable to a rise in domestic demand for processed nuts (Mahanthesh Nayak and Manjunath Paled, 2018). The value of cashew exports, on the other hand, has grown at a CAGR of 5.19 per cent. Raw cashew nut imports have been expanding at a CAGR of 4.91%, while the value of cashew imports has been increasing at a CAGR of 13.27%. during the study period (2000-2020).

**Table 2: cashew kernel export and raw cashew nut import in india during the study period (2000-2020).**

| YEAR      | CASHEW KERNEL EXPORT FROM INDIA |                 | RCN IMPORT INTO INDIA |                 |
|-----------|---------------------------------|-----------------|-----------------------|-----------------|
|           | QUANTITY (MT)                   | VALUE (RS. CR.) | QUANTITY (MT)         | VALUE (RS. CR.) |
| 2000-2001 | 89,155                          | 2049.00         | 2,49,318              | 961.00          |
| 2001-2002 | 98,203                          | 1789.00         | 3,55,556              | 950.00          |
| 2002-2003 | 1,04,137                        | 1933.00         | 4,00,659              | 1237.00         |
| 2003-2004 | 1,00,828                        | 1804.00         | 4,52,399              | 1401.00         |
| 2004-2005 | 1,26,667                        | 2709.00         | 5,78,884              | 2191.00         |
| 2005-2006 | 1,14,143                        | 2515.00         | 5,65,400              | 2163.00         |

|                |              |              |              |              |
|----------------|--------------|--------------|--------------|--------------|
| 2006-2007      | 1,18,540     | 2455.15      | 5,92,604     | 1811.62      |
| 2007-2008      | 1,14,340     | 2289.02      | 6,05,970     | 1746.80      |
| 2008-2009      | 1,09,522     | 2988.40      | 6,05,850     | 2632.41      |
| 2009-2010      | 1,17,991     | 2801.60      | 7,52,806     | 3037.09      |
| 2010-2011      | 1,05,755     | 2819.39      | 5,29,730     | 2649.56      |
| 2011-2012      | 1,31,760     | 4390.68      | 8,09,825     | 5338.64      |
| 2012-2013      | 1,00,105     | 4067.21      | 8,92,365     | 5331.74      |
| 2013-2014      | 1,14,791     | 5058.73      | 7,71,356     | 4563.99      |
| 2014-2015      | 1,18,952     | 5432.85      | 9,39,912     | 6570.93      |
| 2015-2016      | 96,346       | 4952.12      | 9,58,339     | 8561.01      |
| 2016-2017      | 82,302       | 5168.78      | 7,70,446     | 8839.42      |
| 2017-2018      | 84,353       | 5870.97      | 6,49,050     | 8850.03      |
| 2018-2019      | 66,693       | 4433.99      | 8,35,463     | 10929.00     |
| 2019-2020      | 67,647       | 3867.165     | 9,38,038     | 8861.58      |
| <b>CAGR(%)</b> | <b>-2.27</b> | <b>5.19</b>  | <b>4.91</b>  | <b>13.27</b> |
| <b>CDVI</b>    | <b>16.04</b> | <b>19.45</b> | <b>16.17</b> | <b>25.89</b> |

Source??:

Cuddy Della Valle Index was used to compute the instability index in cashew kernel exports in terms of quantity and value, as well as raw cashew nut imports in terms of quantity and value (CDVI). In terms of quantity and value, the CDVI of cashew kernel exports is 16.04 and 19.45, respectively, indicating mild instability. The CDVI of raw cashew kernel imports in terms of quantity and value is 16.17 and 25.89, respectively, indicating medium instability.

### 3.2 Establishment (investment) costs

From the primary survey, it was found that the cashew processing units were established in Kanyakumari a few decades ago by the industrialists from Kollam(Quilon, Kerala). The district of Kanyakumari is close to Kerala, which is known for its cashew cultivation, processing, and export. As a result of growing government intervention in Kerala as a result of several factors, the processing activity was gradually shifted to the Kanyakumari District. The primary reasons for the relocation of cashew companies from Kerala to the Kanyakumari District are the great availability of cheap labour and the low rates offered to the workers. Women do all aspects of cashew processing, including drying, roasting, shelling, peeling, grading, and packaging. As time progressed, the availability of labour decreased significantly, giving rise to the notion of mechanisation of processing units. This was a watershed moment for cashew processing.

The cost of establishment is more for mechanized units as indicated in table 3 because mechanized units require the purchase of modernized machines and other necessary structures.

Please comment on the importance % of the terms of the investment costs

**Table 3: Establishment (investment costs) costs**

| PARTICULARS                         | MECHANISED<br>(AMOUNT IN LAKHS) | %       | PARTIALLY<br>MECHANISED (AMOUNT<br>IN LAKHS) | %       |
|-------------------------------------|---------------------------------|---------|--|---------|
| Land                                | 4.077                           | 3.59%   | 3.78   | 9.00%   |
| Land development                    | 0.5                             | 0.44%   | 0.5  | 1.19%   |
| Buildings&civil structures          | 50                              | 44.06%  | 30   | 71.46%  |
| Plant&machinery                     | 56.4                            | 49.70%  | 5.2  | 12.39%  |
| Preliminary&preparative<br>expenses | 2.5                             | 2.20%   | 2.5  | 5.96%   |
| Total cost                          | 113.477                         | 100.00% | 41.98  | 100.00% |

Source:??

### 3.3 TYPES OF MACHINERY INSTALLED IN MECHANISED UNITS

The machines installed in mechanized and partially mechanized processing units have been listed in tables 4 and 5. As we see, the expenditure for installing machines is higher in mechanized units when compared to that of partially mechanized units.

**Table 4: Types of Machinery installed in Mechanised units**

| PARTICULARS            | NUMBER | RATE(AMOUNT<br>IN LAKHS) | TOTAL AMOUNT IN LAKHS |
|------------------------|--------|--------------------------|-----------------------|
| Steam boiler           | 1      | 7.2                      | 7.2                   |
| Cashew cutting machine | 1      | 10                       | 10                    |

|                           |       |      |      |
|---------------------------|-------|------|------|
| Borma                     | 1     | 9    | 9    |
| Automatic peeling machine | 1     | 7.5  | 7.5  |
| Grading machine           | 1     | 12.7 | 12.7 |
| Vacuum packing machine    | 1     | 7    | 7    |
| Diesel generator set      | 1     | 3    | 3    |
|                           | TOTAL | 56.4 | 56.4 |

**Source??**

**TABLE 5: Types of machinery installed in partially mechanised units**

| S.NO | PARTICULARS                    | NUMBER | RATE(IN LAKHS) | AMOUNT IN LAKHS |
|------|--------------------------------|--------|----------------|-----------------|
| 1    | Roasting machine               | 1      | 0.35           | 0.35            |
| 2    | Hand-operated shelling machine | 40     | 0.08           | 3.2             |
| 3    | Peeling machine                | 1      | 0.95           | 0.95            |
| 4    | Drying machine                 | 1      | 1.05           | 1.05            |
|      |                                | Total  | 2.43           | 5.235           |

**SOURCE??**

### **3.4 Comparison of variable costs and fixed costs incurred in mechanized and partially mechanized processing units**

The raw materials used for processing are imported from countries like Ivory Coast, Senegal, Tanzania, Gambia and other African countries since the production level of raw cashews in India is lesser than the processing capacities of the units. The cost of raw materials ranges from Rs.90-120 based on the quality of the raw cashew nuts. Here, the raw material cost is taken as Rs.100. It contributes to the largest share of variable costs of processing in both mechanized and partially mechanized processing units(55% and 52.11% respectively). The imported raw cashews are transported from the Tuticorin Port to the processing units by lorries. Sales tax and import tax of 5% and 2.5% respectively are also a significant part of the variable costs. Mechanised and partially mechanized units differ much in labour. Partially mechanized labour employs around 60-200 women labourers for shelling and grading whereas mechanized units consist of 10-20 labourers. In this study, the number of labourers in partially mechanized units is taken as 60 and the number of labourers in mechanized units is taken as 10. The

processing unit operates around 250 days a year. Mechanised units process 1.5 tonnes of raw cashew nuts in a day, whereas, partially mechanized units process 1 tonne a day.

**Table 6: Comparison of variable costs incurred in mechanized and partially mechanized processing units**

| Variable costs                  | Mechanised (Amount in Rs) | Percentage of total variable costs | Partially mechanised(Amount in Rs) | Percentage of total variable costs |
|---------------------------------|---------------------------|------------------------------------|------------------------------------|------------------------------------|
| Raw material                    | 1,00,000                  | 55                                 | 1,00,000                           | 52.11                              |
| Labour                          | 2450                      | 1.35                               | 13600                              | 7.089                              |
| Packing material                | 660                       | 0.36                               | 105                                | 0.054                              |
| Transportation cost             | 26120                     | 14.49                              | 26620                              | 13.87                              |
| Sales tax(5%)                   | 7500                      | 4.16                               | 7500                               | 3.91                               |
| Import tax(2.5%)                | 25000                     | 13.87                              | 25000                              | 13.029                             |
| Electricity                     | 1110                      | 0.61                               | 833                                | 0.434                              |
| Utilities                       | 6341                      | 3.51                               | 4387                               | 2.286                              |
| Interest on working capital(8%) | 11006                     | 6.1                                | 13826                              | 7.205                              |
| <b>Total Variable Costs(A)</b>  | <b>1,80,187</b>           |                                    | <b>1,91,871</b>                    |                                    |

Source:

**Table 7 Comparison of fixed costs and total costs incurred in the processing units**

| Fixed costs                  | Mechanised(cost in Rs) | Percentage of total Fixed costs | Partially mechanized (Cost in Rs) | Percentage of total Fixed costs |
|------------------------------|------------------------|---------------------------------|-----------------------------------|---------------------------------|
| Depreciation                 | 2558                   | 25.89                           | 1634                              | 20.84                           |
| Service and maintenance cost | 533                    | 5.39                            | 300                               | 3.83                            |

|                                |          |       |          |       |
|--------------------------------|----------|-------|----------|-------|
| Permanent Labour               | 1990     | 20.14 | 4200     | 53.57 |
| Interest on fixed capital(12%) | 4800     | 48.58 | 1706     | 21.76 |
| <b>Total fixed costs(B)</b>    | 9881     |       | 7840     |       |
| <b>Total costs(A+B)</b>        | 1,90,068 |       | 1,99,711 |       |

Source:

Please comment on table7 according its data

Depreciation is calculated using the straight-line method. The depreciation in mechanized units is higher than that of the partially mechanized units. (Rs.2558 and Rs.1634 respectively) The interest in fixed capital is the most contributing factor to fixed costs.

### 3.5 Gross returns obtained from various products

Please comment on table8 according its data

**Table 8: Gross returns obtained from various products**

| Products             | Gross Returns from mechanized units(Rs/tonne) | Percentage to Gross returns | Gross Returns from partially mechanized units(Rs/tonne) | Percentage to Gross returns |
|----------------------|---|-----------------------------|---|-----------------------------|
| Cashew kernels       | 201600  | 95.403                      | 200000  | 95.254                      |
| Cashew shells        | 6250  | 2.957                       | 6250  | 2.976                       |
| Cashew husk          | 900   | 0.425                       | 900   | 0.428                       |
| Cashew rejections    | 688   | 0.325                       | 938   | 0.446                       |
| CNSL                 | 1875  | 0.887                       | 1875  | 0.893                       |
| <b>Gross returns</b> | 211313  |                             | 209963  |                             |

Source:

We obtain 200-250 kilogrammes of cashew kernels, 625 kilogrammes of cashew shells, 90 kilogrammes of husk, 37.5 kilogrammes of rejects, and 75 litres of CNSL for every tonne of raw cashew processed. The graded cashew kernels are exported to countries like Japan, Korea, USA and Singapore. This varies

as per the variety of the raw cashew nut, its quality and the method by which the raw cashew nuts are processed. The cashew kernels can be sold at a rate of Rs.800-Rs.1200 based on the quality and the markets in which they are sold. CNSL is also exported or sold in the domestic market. The cashew shells are mostly used by the processing industry as a fuel for roasting or even sold in the markets to be used as a fuel. The cashew rejections and cashew husk are sold to bakeries. Because the shelling and peeling are done by labourers in partially automated units, the rate of rejection is higher. Because they use a boiling and cutting process rather than roasting and shelling, the cashew kernels obtained are greater in automated units. Here in the case of partially mechanized units, we have obtained 200 kg of cashew kernels which are priced at Rs.1000/kg. Cashew shells and cashew husk are priced at Rs.10/kg. Rejections are priced at Rs.18.35/kg. CNSL is priced at Rs.25/litre.

### 3.6 economic evaluation

The economic viability of mechanised and partially mechanised processing units is analysed using the break-even point and Payback period. From the table, the break-even point for mechanised and partially mechanised processing units is 140.5 and 118 tonnes. At the break-even point, the revenues of the business are equal to its total costs and its contribution margin equals its total fixed costs. From table 9, the payback period for mechanised and partially mechanised processing units is 2.14 and 1.48 years respectively. The partially mechanised units have a lesser payback period. But, in places where there is a labour shortage mechanised units are profitable.

**Table 9:Results of different analyses performed**

| Particulars             | Mechanised | Partially Mechanised |
|-------------------------|------------|----------------------|
| BEP(Tonnes)             | 140.5      | 118                  |
| Payback period(years)   | 2.14       | 1.48                 |
| Gross returns/tonne(Rs) | 211313     | 209963               |
| Net returns/tonne(Rs)   | 31126      | 18032                |

Source:

#### 4. CONCLUSION

Cashew processing is traditionally a labour-intensive industry. The labour force consisted mainly of women. nowadays cashew processing industries are being mechanised due to labour shortage. The owners of the industry state that, after the introduction of the MNREGA programme by the government of India, the labour force available has been drastically reduced since the drudgery in cashew processing industries is more. Installation of improved machinery can also increase the cashew kernel recovery percentage. We can see the advantage of a mechanised firm over that of a partially mechanised firm from the net returns obtained from the processed cashew products(a mechanised firm received a net return of Rs.31126/ tonne whereas a partially mechanised firm received a net return of Rs.18032). So, mechanisation is a profitable option in the long run even if it requires high investment initially.

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**ABBREVIATIONS**

DCCD- Directorate of Cashew & Cocoa Development

UNCTAD- United Nations Conference on Trade and Development

CAGR-Compound Annual Growth Rate

CDVI- Cuddy Della Valle Index

INC- International Dried Fruit & Nut Council of India

UNDER PEER REVIEW