Innovative Technologies in Coconut Processing Sector

Coconut Development Board
Ministry of Agriculture, Govt. of India
### Coconut - A Versatile Crop

<table>
<thead>
<tr>
<th>Used as</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>food crop, oilseed, fibre crop medicinal crop &amp; beverage crop</td>
<td></td>
</tr>
<tr>
<td>Coconut leaves</td>
<td>thatches for roof and fencing, midrib for brooms</td>
</tr>
<tr>
<td>Coconut shell</td>
<td>for industrial products, handicraft items</td>
</tr>
<tr>
<td>Coconut trunk</td>
<td>for building materials, flooring materials and handicrafts</td>
</tr>
<tr>
<td>Coconut inflorescence</td>
<td>yield coconut toddy, jaggery</td>
</tr>
<tr>
<td>Coconut fruit</td>
<td>inevitable item in cultural and social functions</td>
</tr>
</tbody>
</table>
Significance of Coconut

- Series of end products with multifarious uses.
- Diverse range of food products that satisfy the human nutritional and health requirements.
- Significant as a national crop.
- Potential export market for coconut products.
- Domestic demand.
Coconut in India

- Coconut is cultivated in 18 states and 3 union territories in the country.
- India is the second largest producer in the world.
- Coconut occupies 1.9 million ha.
- 98% coconut holdings are owned by small and marginal farmers in the country.
- Annual production of coconut is 16 billion nuts.
- Coconut contributes more than Rs.8000 crores annually to GDP.
## Export of Coconut Products from India

(Qty in Tonnes, Value Rs.in Lakhs)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>2010-2011</th>
<th>2011-2012*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Qty</td>
<td>Value</td>
</tr>
<tr>
<td>1</td>
<td>Coconuts (fresh)</td>
<td>15751.89</td>
<td>2267.77</td>
</tr>
<tr>
<td>2</td>
<td>Coconuts (dried)</td>
<td>3889.62</td>
<td>1342.99</td>
</tr>
<tr>
<td>3</td>
<td>Desiccated coconut</td>
<td>900.00</td>
<td>950.00</td>
</tr>
<tr>
<td>4</td>
<td>Other coconuts excluding fresh/dried</td>
<td>10960.17</td>
<td>3080.93</td>
</tr>
<tr>
<td>5</td>
<td>Coconut oil (crude)</td>
<td>30.17</td>
<td>19.26</td>
</tr>
<tr>
<td>6</td>
<td>Coconut oil (refined)</td>
<td>5840.00</td>
<td>6130.00</td>
</tr>
<tr>
<td>7</td>
<td>Other residues of coconut or Copra</td>
<td>1056.67</td>
<td>53.20</td>
</tr>
<tr>
<td>8</td>
<td>Oilcake (Solvent/expellers)</td>
<td>213.77</td>
<td>49.68</td>
</tr>
<tr>
<td>9</td>
<td>Coconut shell (raw)</td>
<td>1870.35</td>
<td>364.80</td>
</tr>
<tr>
<td>10</td>
<td>Shell charcoal</td>
<td>15522.78</td>
<td>2915.44</td>
</tr>
<tr>
<td>11</td>
<td>Copra</td>
<td>29625.03</td>
<td>10935.64</td>
</tr>
<tr>
<td>12</td>
<td>Coconut Shell based Activated Carbon*</td>
<td>38712.12</td>
<td>25550.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>53659.71</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Directorate General of Commercial Intelligence and Statistics, Kolkata

*Compiled from the export returns of Exporters Registered with the Coconut Development Board.*
Value Added Products of Coconut
Value added Coconut Products

- Tender Coconut Water
- Packaged Tender Coconut Water
- Minimal Processing of Tender coconut
- Snow Ball Tender Nut
- Fruit juice blended tender coconut water
Value added Coconut Products - contd...

- Mature coconut water
- Nata-de-coco
- Coconut jelly
- Coconut Vinegar
- Coconut Ice Cream
Value added Coconut Products - contd...

- Desiccated Coconut
- Coconut Chips
- Coconut milk
- Coconut Skimmed Milk
- Coconut jam
- Pinacolada (coconut milk with pineapple juice)
- Spray Dried Coconut Milk powder
- Virgin Coconut Oil
Value added Coconut Products - contd...

Margarine

Coconut Flour

Coconut Honey

Dietary fibre from coconut residue

Coconut Souffle
COCONUT NEERA

Sweet nutritious and Refreshing Beverage

A Healthy Drink
www.fnc.doai.com
Value added Coconut Products from Neera

- Toddy
- Refined Sugar
- Jaggery / palm sugar
Organic palm sugar from neera sold in USA, for US$4 per 430gm from Indonesia.
Coconut palm sugar
Products from coconut by-products

Coconut shell powder

Coconut Shell Charcoal

Activated Carbon

Coconut Wood products

Coconut based handicrafts
Value added Coconut Products - contd...

Products from coconut by-products

Coconut Leaf

Leaf Midrib

Coirpith

Husk and coir

Coir geotextiles
Projects in a nutshell (Capacity 1 MT of finished products)

<table>
<thead>
<tr>
<th>No</th>
<th>Product</th>
<th>Raw material</th>
<th>Investments (Excluding land)</th>
<th>Returns (IRR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tender Coconut Water</td>
<td>5000 Tender Coconuts</td>
<td>45-50 lakhs</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>Desiccated Coconut</td>
<td>10000 coconuts</td>
<td>50-55 lakhs</td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>Coconut milk</td>
<td>5000 coconuts</td>
<td>60-65 lakhs</td>
<td>18%</td>
</tr>
<tr>
<td>4</td>
<td>Spray Dried Coconut Milk Powder</td>
<td>20000 coconuts</td>
<td>330-350 lakhs</td>
<td>22%</td>
</tr>
<tr>
<td>5</td>
<td>Virgin Coconut Oil</td>
<td>16666 coconuts</td>
<td>75-80 lakhs</td>
<td>22%</td>
</tr>
<tr>
<td>6</td>
<td>Copra</td>
<td>7000 coconuts</td>
<td>10-12 lakhs</td>
<td>15%</td>
</tr>
<tr>
<td>7</td>
<td>Shell Powder</td>
<td>12000 shells</td>
<td>55-60 lakhs</td>
<td>16%</td>
</tr>
<tr>
<td>8</td>
<td>Shell Charcoal</td>
<td>30000 shells</td>
<td>25-30 lakhs</td>
<td>16%</td>
</tr>
<tr>
<td>9</td>
<td>Activated Carbon</td>
<td>3 T of shell charcoal</td>
<td>470-500 lakhs (9 T capacity)</td>
<td>24%</td>
</tr>
<tr>
<td>10</td>
<td>Coconut Chips</td>
<td>10000 coconuts</td>
<td>40-45 lakhs</td>
<td>22%</td>
</tr>
</tbody>
</table>
Profiles of Coconut based Projects
Technology developed by CDB in association with Defence Food Research Laboratory

Technology Transfer fee: 3.50 lakhs

Nutritious and thirst quenching.

Good rehydration medium for patients suffering from gastroenteritis and intestinal disturbances.

Known to have been given even intravenously during famine and wars.
Nutritional attributes of tender coconut water

- Undiluted, unpolluted, unpoisoned natural drink.
- Zero fat, zero cholesterol and zero added sugar.
- Rich in the essential electrolytes like sodium, potassium, magnesium, calcium and phosphorus.
- Possess therapeutic properties with vitamins, minerals and protein.
PROCESS FLOW

COCONUT WATER

FILTERING

ADDITIVE MIXING

CONCENTRATION

PACKING

RETORTING

COOLING

FINISHED PRODUCT
PACKAGED TENDER COCONUT WATER
Global Brands

Vita Coco

ZICO

100% pure coconut water

11.2 FL OZ (330mL)

PURE PREMIUM COCONUT WATER

natural

natural

all natural
Global Brands

[Images of various coconut-based beverage products, including O.N.E. Organic Coconut Water, Real Coconut Water/Pulp, and Coco Fresco Light.]
Project cost (10000 nuts per day)

- Land: 60 cents
- Building-3000 sq ft: Rs.20 lakhs
- Plant & machinery: Rs.40 lakhs
- Electrification works: Rs.10 lakhs
- Preliminary & pre-operative expenses: Rs.5 lakhs
- Working capital (Margin money): Rs.15 lakhs

Total: Rs.90 lakhs

Machinery

Feed Conveyors for washed nuts
Automatic boring and sucking system
TCW collection tank
TCW filtering unit
Treatment Chamber
Double Head Filling Machine
Pouch Sealing Machine
Can Seaming Machine
Machinery

Conveyor for filled pouches/cans
Steam boiler
Pasteurizer
Thermal validation system
UV Chamber
Air Compressor
Packaging machine for pouches

Product yield

- 10000 coconuts would yield about 2000 litres of tender coconut water

Internal Rate of Return - 20-22 %
ECONOMIC FEASIBILITY

- Capacity: 2500 litres / day
- Sales turnover: Rs.1.875 crores
- IRR: 18 percent
- Payable period: 3 - 4 years
- Employment potential: 30 persons
- Source of Technology: Coconut Dev. Board
- Know how fee: Rs.3.5 lakhs plus service tax
Minimal Processing of Tender coconut

- Technologies for minimal processing of tender coconut have been developed by Health Magic Foods, Bangalore for retaining the flavour and to prevent discolouration.
- The process involves dipping (partially) dehusked tender coconut in an enzymatic solution for three minutes.
- The product has a shelf life of 30 days
- The product can be packed in plastic crates and insulated chill boxes for transporting and storage.
Process Flow

1. Harvesting of Tender Coconut
2. Trimming the husk manually
3. Dipping in preservation solution
4. Shrink wrapping
5. Storing in cooler
6. Transporting to selling place
### Project Cost (3000 nuts per day)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Requirement</td>
<td>50 cents</td>
</tr>
<tr>
<td>Building -3000 sq ft</td>
<td>Rs.27.0 lakhs</td>
</tr>
<tr>
<td>Machinery</td>
<td>Rs.5.0 lakhs</td>
</tr>
<tr>
<td>Quality Control-HACCP</td>
<td>Rs.5.0 lakhs</td>
</tr>
<tr>
<td>Lab Eqpts</td>
<td>Rs.2.0 lakhs</td>
</tr>
<tr>
<td>Preliminary &amp; Preoperative</td>
<td>Rs.3.0 lakhs</td>
</tr>
<tr>
<td>Working Capital Margin</td>
<td>Rs.6.0 lakhs</td>
</tr>
</tbody>
</table>

### Financial Projections

- **Annual Sales Revenue**: Rs.270 lakhs
- **Breakeven point**: 45%
- **IRR**: 21%
The dehydrated shredded flesh of coconut known as desiccated coconut is often used as a substitute to grated coconut in food preparations such as curries, cakes, sweets and chutneys. Confectionery and bakery units are the main consumers of desiccated coconut. Total production of DCP is about 50,000 MT mainly concentrated in Karnataka and Tamil Nadu. Exports amount to about 2000 Tones.
**DESICCATED COCONUT**

### Project Cost (One Ton/Day capacity)

- **Land (cost variable)**: 50 cents
- **Building 2000 sq. ft. (Process Area)**: Rs.18 lakhs
- **Plant & Machinery**: Rs.25 lakhs
- **Preliminary and pre-operative expenses**: Rs. 5.00 lakhs
- **Electrification**: Rs.5.00 lakhs
- **Working capital (M Money)**: Rs.10.00 lakhs

**Total**: Rs.63.00 lakhs

### Equipment / Machinery details

- Washing tank with spray arrangement
- Hot dip blancher tank
- Disintegrator provided with screens and aluminum trays
- Hot air tray drier with blower
- Sieving machine
- Storage bins
- Heat sealing machine

### Yield

- **Raw material**: 10,000 coconuts
- **Desiccated coconut**: 1 tone

### Internal Rate of Return

18-20 %
**COCONUT OIL**

**Project Cost** (3 tonnes/day capacity)

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land (cost variable)</td>
<td>30 cents</td>
</tr>
<tr>
<td>Building 2000 sq.ft.</td>
<td>Rs 15.00 lakhs</td>
</tr>
<tr>
<td>Plant and Machinery</td>
<td>Rs.20.00 lakhs</td>
</tr>
<tr>
<td>Preliminary and pre-op expenses</td>
<td>Rs. 5.00 lakhs</td>
</tr>
<tr>
<td>Electrification</td>
<td>Rs 5.00 lakhs</td>
</tr>
<tr>
<td>Working capital (Margin Money)</td>
<td>Rs.10.00 lakhs</td>
</tr>
</tbody>
</table>

**Total**

Rs.55.00 lakhs

**Machinery**

- Copra cutter
- Bucket elevator
- Steam jacketed kettle
- Oil expeller
- Screw conveyor
- Crude coconut oil storage tanks
- Filter press
- Micro filter
- Filtered oil storage tanks
- Volumetric filling machine
- Baby boiler

**Yield**

- Raw material: 5 tonnes of copra
- Finished product: 3 tonnes Coconut oil

**Internal rate of Return**

16-18%
Fully matured coconuts are used for the preparation of chips. The coconut kernel is cut in to the form of chips using chipper. The cut chips are soaked in sugar or salt solution for about 40 minutes. The chips are then backed in hot air oven till the products attains golden brown colour.
Coconut chips sold at Rs.120/- for 40gm in China, produced in Thailand
Process Flow

Coconut

Removal of shell

Removal of Testa

Cutting in to pieces

Slicing of Kernel

Blanching

Osmotic Dehydration (1 hr/40 min)

Drying (4 hrs)

Packaging
Project Cost

- Land                      - 40- 50 cents
- Building -2000 sq ft @ Rs. 800 per sq ft - 16.00
- Plant & Machinery          - 18.00
- Electrical Installations   - 3.00
- Preoperative Expenses      - 1.00
- Working Capital Margin      - 4.00
Total                      - 42.00

Machinery
- Coconut Slicing machine
- Hot air Owen
- Mixing tank for sugar coating
- Steel utensils and vessels
- Nitrogen flush packing machine

Yield
- Raw Material Per day : Fully ripened Coconut - 10000 per day
- Yield per day : Coconut Chips - 1000 kg

Internal rate of Return -22%
Coconut Milk & Milk Cream

- Ready to use product for households recipes, beverages, ice creams, sweets, desserts etc.
- Fresh taste of coconut without the bother
- Very convenient for house holds, hotels, bakeries.
- Blends easily with food preparation.
- Keeps fresh for a period of 6 months with all nutrients in tact.
# Coconut Milk / Cream

## Project Cost (10,000 nuts/day)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>1 acre (cost variable)</td>
</tr>
<tr>
<td>Building-4000 sq ft</td>
<td>Rs.30 lakhs</td>
</tr>
<tr>
<td>Plant &amp; machinery</td>
<td>Rs.60 lakhs</td>
</tr>
<tr>
<td>Preliminary and pre-operative expenses</td>
<td>Rs.05 lakhs</td>
</tr>
<tr>
<td>Electrification</td>
<td>Rs.15 lakhs</td>
</tr>
<tr>
<td>Margin money for working capital</td>
<td>Rs.15 lakhs</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Rs.125.00 lakhs</strong></td>
</tr>
</tbody>
</table>

## Machinery / Equipment

- Hammer mill
- Elevator
- Screw press
- Coconut milk storage tanks
- Vibrating sieving machine
- Coconut residue mixer
- Additive mixing tank
- Emulsifier
- Homogenizer
- Pasteurizer
- Volumetric filling machine
Exhaust box
Can seaming machine
Horizontal rotary retort
Hot air drier
Agro waste vertical boiler
Sterilization tank
Coconut residue storage bins.

Yield of products/by-products

- Raw material: 10,000 ripe green coconuts
- Coconut cream (main product) 2,500 kg
- Coconut cream residue 500 kg

Internal Rate of Return 20-22 %
Spray Dried Coconut Milk Powder

- Highly convenient to use for households / hotels, bakeries and ice cream parlours.
- Reconstitute quickly with water for instant use.
- Occupies less storage space.
- Highly economical for bulk consumer.
- Keeps fresh for a period up to 1 year.
Process Flow

Matured Coconut Kernel
- Washing
- Blanching
- Disintegration
- Mixing with Hot Water
- Extraction of Milk
- Filtration / clarification
- Mixing of emulsifiers & stabilizers
- Thermal Processing
- Concentrating
- Spray Drying
- Packing
- Storage
SPRAY DRIED COCONUT MILK POWDER

Project Cost (Capacity 20,000 nuts/day.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>1 acre</td>
</tr>
<tr>
<td>Building-8000 sq ft</td>
<td>Rs. 60 lakhs</td>
</tr>
<tr>
<td>Plant &amp; machinery</td>
<td>Rs. 175 lakhs</td>
</tr>
<tr>
<td>Electrification</td>
<td>Rs. 30 lakhs</td>
</tr>
<tr>
<td>Preliminary &amp; pre-operative expenses</td>
<td>Rs. 25 lakhs</td>
</tr>
<tr>
<td>Working capital (M money)</td>
<td>Rs. 40 lakhs</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Rs. 330.00 lakhs</strong></td>
</tr>
</tbody>
</table>

MACHINERY

- Hammer mill
- Elevator
- Screw press
- Coconut milk storage tanks
- Vibrating sieving machine
- Coconut residue mixer
- Additive mixing tank
- Emulsifier
- Homogenizer
- Pasteurizer
- Volumetric filling machine
MACHINERY (Contd….)

- Exhaust box
- Can seaming machine
- Horizontal rotary retort
- Spray drier
- Agro waste vertical boiler
- Sterilization tank
- Coconut residue storage bins

Product yield
20000 coconuts would yield about 1000 kgs of coconut milk powder

Internal Rate of Return 22-24%
A Premium Grade Oil extracted directly from fresh coconut kernel through wet processing

Clear transparent oil

Extensive Medicinal uses

Keeps fresh for a period up to 1 year.

Virgin Coconut Oil Improves Brain Health in Alzheimer’s Patients

Combination of virgin coconut oil with a low-carb diet is proved to be very successful in stopping autism.

Antibacterial, antiviral, and antiprotozoal activities of virgin coconut oil are documented
Fresh Coconut meat

Coconut milk

Centrifugation

Fermentation

Separation of oil

Removal of residual moisture

Virgin Coconut Oil
VIRGIN COCONUT OIL

Project cost (15000 coconuts per day)

Land - 40 cents
Building -3000 sq ft (Process Area) - Rs.27 lakhs
Plant & machinery - Rs.45 lakhs
Electrification works - Rs.10 lakhs
Preliminary & pre - operative expenses - Rs. 5 lakhs
Working capital (Margin money) - Rs.10 lakhs

Total - Rs.97 lakhs

Machinery
Hammer Mill/Disintegrator
Blanching Tank
Screw conveyor
Screw Press
Vibratory Screen
Collection Tank - Milk
Milk feed Tank
Tubular Centrifuge
Oil Collection Tank
Machinery (Contd....)

Hot Air Dryer for Partially Defatted coconut powder/granules
Packing machine with Compressor & Packing line
Pumps and Accessories
Piping & accessories

Product yield
10000 coconuts would yield about 600 Kg of virgin coconut oil

Internal rate of Return -18-20%
**COCONUT SHELL POWDER**

**Project Cost (One tonne/day capacity)**

- Land require: 40 cents (cost variable)
- Building (2000 sq. ft.): Rs.10.00 lakhs
- Plant and Machinery: Rs. 25.00 lakhs
- Preliminary & pre-op expenses: Rs.5.00 lakhs
- Electrification works: Rs. 10.00 lakhs
- Working capital (Margin Money): Rs. 10.00 lakhs
- **Total**: Rs.60.00 lakhs

**Machinery**
- Hammer mill
- Storage bin
- Impact pulveriser
- Cyclone
- Bag filler
- Air blower
- Sieving machine

**Yield**
- Raw material: 12,000 shell
- Shell powder: 1 tonne
- IRR: 18%
Coconut Shell Charcoal

- Superior in quality when compared to wood charcoal.
- Ideal raw material for high quality activated carbon.
- Better calorific value than other agro waste and hence ideal for use as fuel in smitheries, bakeries and foundries.
Coconut Shell Charcoal

Project Cost (one tonne/day)
- Land (cost variable) 35 cents
- Building 1000 sq. ft. Rs.4.0 lakhs
- Plant machinery Rs.18 lakhs
- Preliminary & pre-op expenses Rs.2.0 lakhs
- Electrification Rs.1.0 lakh
- Margin for working capital Rs.5.0 lakhs

Total Rs.30.00 lakhs

Machinery
- Drum kiln with chimney

Yield
- Raw material 30,000 coconut shells
- Coconut shell charcoal 1 tonne

Internal Rate of Return 16-18 %
Activated Carbon

- Activated carbon is widely used in the refining and bleaching of vegetable oils and chemical solutions.
- At present five units are functioning.
- Total production estimated at 5000 MT.
- Anticipated growth is 20%
Activated Carbon

Project cost (9 tons/day)

Land
Building  12000 sq.ft
Plant & Machinery
Preliminary & pre-op expenses
Electrification
Working capital (Margin Money)

Total

Machinery
Jaw crusher
Hammer mill
Vibrating feeder
Elevator
Carbonisation kiln
Soaking tanks
Cyclones
Pneumatic filling machine

One acre. (cost variable)
Rs. 60 lakhs
Rs. 300.00 lakhs
Rs.30.00 lakhs
Rs.40.00 lakhs
Rs 70.00 lakhs
Rs.500.00 lakhs

Coolers
Centrifuge
Rotary drier
pulverizer
Sieving machine
Rotary kiln with heat recovery unit

Yield
Raw material 90,000 shells
Activated carbon 1 tonne

Internal Rate of Return 24%
TECHNOLOGY MISSION ON COCONUT
The Govt. of India sanctioned the Central Sector Scheme “Technology Mission on Coconut” (TMOC) during the year 2001-02 (January 2002)

- Scheme implemented on a project mode.
- Issues addressed include product diversification and by product utilization and market promotion, productivity improvement through management of pest and diseases.
Objectives of Technology Mission

- Horizontal and vertical integration of ongoing Govt. programmes
- Ensure concurrent attention to all the links in the production, post harvest and consumption chain.
- Maximize benefits from the investment and infrastructure created for coconut development
- Promote diversification and value addition and skilled employment
- Disseminate technologies
ICAR/CSIR Institutes

SAU’s

NGO’s

ANY RESEARCH ORGANIZATIONS HAVING CAPACITY

DEVELOPMENT OF TECHNOLOGIES

DEMONSTRATION OF TECHNOLOGIES

ICAR/CSIR Institutes

SAU’s

NGO’s

ANY RESEARCH ORGANIZATIONS HAVING CAPACITY

ADOPTION OF TECHNOLOGIES

FARMERS

REGISTERED COOPERATIVE SOCIETIES/GROUP OF FARMERS

ENTREPRENEURS
Technology Mission on Coconut

- Mission programme launched in support of entrepreneurs/industrialists/product manufacturers
- Provides technical and financial support
- Covers areas like pest and disease management, product diversification, market research and market promotion
- Extends 25% grant in aid for adoption of technologies in the field of value addition

Products eligible for grant in aid under TMOC

<table>
<thead>
<tr>
<th>Water Based</th>
<th>Kernel Based</th>
<th>Shell Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packed Tender Coconut Water, Coconut Vinegar, Nata de coco</td>
<td>Coconut cream, Spray Dried Milk Powder, Desiccated coconut powder, virgin Coconut oil, Ball copra</td>
<td>Shell Charcoal, Activated Carbon, Shell powder</td>
</tr>
</tbody>
</table>
Processing and product diversification

(a) Development of technologies

- 100% of the project cost limited to Rs.75 lakhs for all the Govt. institutions and cooperative societies.
- 50% of the project cost limited to Rs.35 lakhs for NGO’s, Individual entrepreneurs and other research organizations

(b) Demonstration of technologies

- 100% of the cost limited to Rs.75 lakhs all the Govt. institutions and cooperative societies.
- 50% of the cost limited to Rs.35 lakhs for the NGO’s, Individual entrepreneurs and other organizations.

(c) Adoption of technologies

- Back-ended credit capital subsidy limited to 25% of the cost not exceeding Rs.50 lakhs for NGO’s, Individual entrepreneurs and other organizations.
Market research and promotion

(a) Market research
- 100% of the cost limited to Rs.25 lakhs for Govt. agencies and cooperative societies.
- 50% of the cost limited to Rs.12.50 lakhs for Individuals, NGO’s and other organizations.

(b) Market Promotion
- 100% of the cost limited to Rs.25 lakhs for Govt. agencies and cooperative societies
- 50% of the cost limited to Rs.10 lakhs for NGO’s and private institutes.
Technology Demonstration Centre and Quality Testing Laboratory, Vazhakulam, Aluva

- NABL accredited laboratory
- Facilities for analysis of chemical and microbiological parameters for all products.
Impact of Technology Mission

Products developed

- Virgin coconut oil (CFTRI)
- Defatted coconut powder (CFTRI)
- Coconut water based Vinegar (CFTRI)
- Coconut water and milk based beverages like Pinacolada (Nadukkara Agro Processing Co.)
- Convenience based foods – nata-de-coco, jelly, chips (TNAU)
- Snow ball tender coconut (CPCRI)
- Minimally processed tender coconut (KAU)
- Coconut rice mix, coconut cubes, filling mix, chutney powder (CFTRI)
Impact of Technology Mission

- Blended oil (CFTRI)
- Machinery for ball copra making (RRL, TVM)
- Refinement of packaging for snow ball, chips, minimally processed coconut, edible copra, handicrafts. (IIP)
- Tender coconut punching & shaping machine. (Veepees Industries Pvt. Ltd.)
- Utilization of tender coconut husk for making compost and hardboard. (CCRI)
Impact of Technology Mission

- Coconut honey form matured coconut water (CFTRI)
- Coconut spread from matured coconut water (CFTRI)
- Coconut lessi for tender coconut (CFTRI)
- Coconut souffle (CFTRI)
- Whey-protein powder (CFTRI)
- Wet chutney powder (CFTRI)
M/s. VSA Foods & Beverages Pvt. Ltd, Dindigul, Tamil Nadu

Project cost: Rs.153.96 lakhs
Financial assistance: Rs.34.225 lakhs
Capacity: 10000 nuts per day
Products: Tender Coconut water
M/s. Anu Coco Food Products Pvt. Ltd.

Project cost: Rs.239.7 lakhs
Financial assistance: Rs.43.625 lakhs
Capacity: 25000 nuts per unit
Products: Tender Coconut Water
M/s. Anu Coco Food Products Pvt. Ltd.
Automation of tender coconut water processing system
DFRL, Mysore
Automation of tender coconut water processing system

DFRL, Mysore
Automation of tender coconut water processing system
DFRL, Mysore
M/s. Keratech coconut oil manufacturing Co., Engandiyoor, Trissur

<table>
<thead>
<tr>
<th>Project cost</th>
<th>Rs.58.79 lakhs</th>
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<tbody>
<tr>
<td>Financial assistance</td>
<td>Rs.13.56 lakhs</td>
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<tr>
<td>Capacity</td>
<td>10000 nuts per day</td>
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<tr>
<td>Products</td>
<td>Virgin coconut oil</td>
</tr>
</tbody>
</table>
M/s. Sritara Agrotech, Andhra Pradesh

Project cost : Rs.191.5 lakhs
Financial assistance : Rs.39.66 lakhs
Capacity : 20000 nuts per day
Products : Virgin Coconut Oil
M/s. Sritara Agrotech, Andhra Pradesh
M/s. Sritara Agrotech, Andhra Pradesh
M/s. Mosons Extractions, Thalassery

**Project cost**: Rs.74.75 lakhs  
**Financial assistance**: Rs.11.25 lakhs  
**Capacity**: 5000 coconut per day.  
**Products**: Coconut oil
M/s. Mosons Extractions, Thalassery
M/s. AMS Group, Pattambi

Project cost: Rs.310.74 lakhs
Financial assistance: Rs.50 lakhs
Capacity: 50 MT copra crushing per day
Products: Coconut Oil
SKM Food – Oil Division, Erode

Project cost: Rs.3.21 Crores
Financial assistance: Rs. 50 lakhs
Capacity: 200 MT / day
Products: Coconut Oil
M/S. Sri Akshaya Agro Processing, Tiptur, Tumkur

Project cost : Rs.108.00 lakhs
Financial assistance : Rs.19.457 lakhs
Capacity : 30000 nuts per day
Products : Desiccated Coconut Powder
Project cost: Rs.186.57 lakhs
Financial assistance: Rs.23.905 lakhs
Capacity: 4000 Kg DC per day
Products: Desiccated Coconut powder
M/s. Swastika Coco Products Pvt. Ltd, Kundapura
M/s. Vittal Agro Industries, Kanhangad

Project cost: Rs.242.99 lakhs
Financial assistance: Rs.50 lakhs
Capacity: 1440 tons p.a
Products: Desiccated Coconut powder
M/s. Vittal Agro Industries, Kanhangad
Ball copra unit
E. Godavari Dist. Andhra Pradesh

Project cost: Rs.12.80 lakhs
Financial assistance: Rs.3.20 lakhs
Capacity: 15 lakhs ball copra per year
Products: Ball copra
M/s. Kalpaka Chemicals Pvt. Ltd, Tuticurion, TN

- **Project cost**: Rs. 162.27 lakhs
- **Financial assistance**: Rs. 33.05 lakhs
- **Capacity**: 126 MT shells / day
- **Products**: Activated Carbon
EBE Liza Enterprises,
Tamilnadu

Project cost : Rs.103.10 lakhs
Financial assistance : Rs.20.58 lakhs
Capacity : 1.50 MT per day
Products : Activated carbon
Project cost: Rs.605.00 lakhs
Financial assistance: Rs.50.00 lakhs

Capacity: 4 tons per day
Products: Activated carbon
M/s. Srinithi Agro Industries, Salem, TN

- **Project cost**: Rs. 92.35 lakhs
- **Financial assistance**: Rs. 20.15 lakhs
- **Capacity**: 15 MT shells / day
- **Products**: Shell powder
M/s. Kongunad Agro Products, Kangayam

Project cost: Rs.225 lakhs
Financial assistance: Rs. 50 lakhs
Capacity: 22.50 tones of shell powder per day
Products: Coconut Shell Powder
M/s. Kongunad Agro Products, Kangayam
Shell Charcoal unit, Kangayam
Shell Charcoal unit, Kangayam
Coconut Shell powder unit in Jammu & Kashmir
M/s. S.S Agro Mills, Samba

Project cost – Rs. 136.07 lakhs
Financial assistance – Rs. 15.92 lakhs
Capacity – 6.4 tones per day
Product – Shell Powder
De-husking machine with a speed of 10 coconuts per minute developed under the study.
For further details:

Chairman
Coconut Development Board
Ministry of Agriculture, Govt. of India
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Thankyou