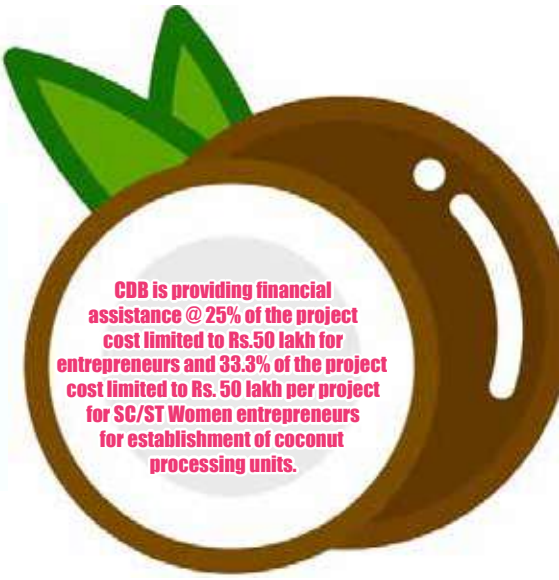
Value Added Products from coconut

Being a zero wastage product, the product basket from coconut is enormous. Some of the value added products from coconut are Desiccated Coconut (DC), Virgin Coconut oil, Coconut chips, Coconut milk, Coconut milk powder, Coconut Vinegar, Coconut oil, Tender Coconut water, Ball copra, Neera and Neera products, Coconut ice cream, Coconut body lotion and so on. As part of the product promotion, commercial production units have been started in various parts of the country under Technology Mission on Coconut (TMoC).



COCONUT INFLORESCENCE Based Food Products

Neera

The vascular sap collected from immature unopened coconut inflorescence is popularly known as Neera in fresh form. It is a sugar containing juice and is a delicious health drink and a rich source of sugars, minerals and vitamins. It is sweet and oyster white in colour and translucent. It is tapped from the coconut inflorescence and is filtered, pasteurized and bio preservatives are added to preserve the product. Treated Neera can be preserved in cans upto two months at room temperature. It can also be packed in tetra packs or glass bottles. Tapping can be done for six months in a year. It is an abundant source of minerals, 17 amino acids, vitamin C, broad spectrum B vitamins and has a nearly neutral pH.

Composition of Neera			
Sl. No	Parameters	Raw Neera	Packed Neera
1	pH	6.2	5.2
2	Brix/TSS	15.13%	15.37%
3	Total sugar	15.00 %	15.00 %
4	Total mineral matter	0.27 %	0.26 %
5	Protein	0.106 %	0.106 %
6	Fat	traces	nil

Installed Capacity - 5000 litres/day

IRR - 28%

Investment - Rs. 2.5 crore

Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs

Coconut Jaggery

Coconut jaggery is prepared by boiling fresh neera to 118-120° C and allowed to cool for solidification. The solid mass is known as coconut jaggery or 'gur'. Coconut jaggery is made in traditional coconut growing tracts in the country on a cottage scale. Calcium and phosphorus are the important minerals contained in coconut jaggery. Treacle is another product manufactured from sweet toddy. It is obtained by boiling down the toddy. Fresh toddy is also a good source of baker's yeast. The fresh neera rapidly ferments and the sugar is replaced by about 5-8 per cent alcohol, which on distillation yields arrack. Fermented neera on acetic fermentation yields vinegar containing 4-7% acetic acid.

Nutritional value of jaggery		
Sl No	Parameters	Amount (%)
1	Moisture	9.1
2	Carbohydrate	87.54
3	Protein	0.72
4	Minerals	1.97
5	Fibre	0.46

Installed Capacity - 200 Kg/day **Investment - Rs. 15 lakhs**

IRR - 18% **Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs**

Coconut Palm Sugar

The coconut palm syrup or jaggery can be crystallized to produce fine granules of sugar. Transition of coconut jaggery into a ground granule sweetener is more accepted by global markets. The recovery of palm sugar from coconut palm jaggery is 15%. The application of this sugar is tremendous and offers huge potential owing to its most important health attributes, the low Glycemic index and the high nutrient content. It can be the most suited alternative sweetener, especially when agave sugar is being rejected owing to the high fructose content. This alternative sugar industry is estimated to be a $1.3 billion industry and hence the market prospects are enormous.

Coconut Flower Syrup

This is a product similar to jaggery with high mineral content and is a rich source of potassium. It has good content of sodium and is free from total fats and cholesterol. It is produced when fresh Neera is heated and concentrated into syrup. The input output ratio is 6:1. The syrup has 50% sucrose content and possess low glycemic index at the levels of 35 GI which indicates that low levels of sugar gets absorbed into the blood thus making it safe for diabetic patients.

Nutritional Value of Syrup		
Sl No	Parameters	Amount (%)
1	Total Soluble Solids	81.44
2	Carbohydrate	65.43
3	Protein	0.39
4	Minerals	2.00
5	Acidity	0.04

Installed Capacity - 200 litres/day

Investment - Rs. 15 lakhs

Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs

IRR - 18%

Coconut Convenience Food Products

Coconut Biscuit

Coconut biscuits are ready to eat snack products prepared from maida and coconut powder. It can be prepared in different varieties through addition of cocoa, butter; ginger etc. The product has a shelf life of three months under ambient conditions. It is mainly consumed as a snack item. Coconut biscuits are highly nutritious and delicious with low calories and high fiber content and is one of the healthiest snack items which is quite popular and is in great demand in Asia and Pacific countries, USA, European countries, Middle East and African countries.

Coconut Candy

Coconut candy is prepared from grated coconut mixed with coconut milk. It has high fiber content and helps prevent intestinal sluggishness. It is a newly introduced product mainly produced in Asia and Pacific Countries.

Coconut Chocolate

It is a sweet confectionery item prepared from coconut gratings sugar, milk butter with a coating of chocolate. It is rich in protein, carbohydrate and fiber. It can be made more delicious through addition of cashew, badam and other dry fruits. The product has a shelf life of three months under refrigerated conditions. The product is having extensive demand in Europe, North America, Australia, Middle East and China.

Coconut burfi

It is a snack prepared by roasting coconut gratings. A procedure for preparation of coconut burfi was standardized. Coconut gratings (after extraction of fat) is roasted, followed by addition of fat at the rate of three percent and sugar at ten percent. The product has a good nutritive value with protein (10.23%), Ash (2.1%) and carbohydrates (60.87%).

Coconut Shell Based Products

Coconut Shell Charcoal

Shell Charcoal is obtained by burning the shell of fully matured coconuts with a limited supply of air so that they do not burn away to ash but are only carbonized. The manufacture of shell charcoal shows from the coconut shell has become a very important economic and commercial activity. Furthermore, coconut shell charcoal, which was relatively a minor product in the past, has now developed into a general commercial commodity due to its intrinsic value as a raw material for the manufacture of activated carbon. Coconut shell charcoal are of two types: viz Coconut shell charcoal and granulated shell charcoal.

The quality standards for shell charcoal as per Asian and Pacific Coconut Community (APCC) are as follows:	
Moisture	Less than 10%
Ash	Not more than 2%
Volatile matter	Not more than 15%
Fixed carbon	Not more than 75%
Foreign matter	Not more than 0.5%
Colour	Black
Size	Not more than 5%, shall pass a 0.63 cm mesh sieve.

Type I – Coconut shell charcoal – pieces

Type II – Coconut shell charcoal - granulated

Installed Capacity - 3 tonnes/day

Investment - Rs. 70 lakhs

IRR - 22%

Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs

Coconut Shell Powder

Coconut shells free from contamination of coir pith, etc., are broken into small pieces and fed into a pulveriser. The powder from the pulveriser is fed into a cyclone and the parallel product is collected in bag filters. The shell powder is then fed into a vibrating sieving machine and packed according to mesh size requirements for various end uses. The rejects from the sieving machine can be recycled in the pulverizer for size reduction. The main requirements for consistent good quality of coconut shell powder are proper selection of shell of proper stage of maturity and efficient machinery.

Product Specification	
Appearance	Clear light brown free flowing powder
Moisture	10 per cent max.
Apparent density	0.6 to 0.7 g/cc
Ash content	1.5 max.
Sieve analysis	Retained on 200 mesh BS sieve shall not exceed 0.1%

Installed Capacity - 3 tonnes/day

Investment - Rs. 75 lakhs

IRR - 18%

Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs

Activated Carbon

The process of activation is carried out in two stages. Firstly the coconut shell is converted into shell charcoal by carbonization process which is usually carried out in mud-pits, brick kilns and metallic portable kilns. The coconut shell charcoal is activated by reaction with steam at a temperature of 900°C -1100°C under controlled atmosphere in a rotary kiln. The reaction between steam and charcoal takes place at the internal surface area, creating more sites for adsorption. The temperature factor, in the process of activation is very important. Below 900°C the reaction becomes too slow and is very uneconomical. Above 1100°C, the reaction becomes diffusion controlled and therefore takes place on the outer surface of the charcoal resulting in loss of charcoal.

Products Specifications	
PH Value	6.5 - 7.5
Methylene Value adsorption mgm/gm	190 - 350
Adsorption capacity at % by mass (min)	45
Moisture (max.)	5%
Ash (max)	5%
Hardness	90

Installed Capacity - 6 tonnes/day

Investment - Rs. 5.5 crore

IRR - 28%

Incentive: 25% of the project cost or a maximum of Rs. 50 lakhs