



# PM Formalisation of Micro Food Processing Enterprises Scheme

## DETAILED PROJECT REPORT FOR PROCESSING OF COCONUT OIL



**AATMANIRBHAR BHARAT**

**National Institute of Food Technology, Entrepreneurship and  
Management (NIFTEM) - Thanjavur**

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanajvur – 613005

<https://niftem-t.ac.in/>

Ph : 04362-228155, Fax:04632-227971

## TABLE OF CONTENTS

---

<b>Model Detailed Project Report</b> .....	<b>1</b>
<b>1 Executive Summary</b> .....	<b>4</b>
<b>2 Objective Of The Project</b> .....	<b>6</b>
<b>3 Project Profile</b> .....	<b>7</b>
<b>4 General overview of Coconut production, clusters, phm and value addition in India</b> .....	<b>8</b>
4.1 Introduction.....	8
4.2 Origin, Distribution and Production Of Coconut .....	8
4.3 Health Benefits And Nutritional Importance .....	9
4.4 Cultivation, Bearing And Post-Harvest Managements .....	10
4.5 Processing And Value Addition In India .....	11
<b>5 Model Coconut Oil Processing Under FME Scheme</b> .....	<b>12</b>
5.1 Location Of Proposed Project And Land .....	12
5.2 Installed Capacity Of Coconut Oil Processing Plant.....	12
5.3 Raw Material Requirements For The Unit.....	12
5.4 Manufacturing Process.....	12
5.5 Market Demand And Supply For Coconut Oil.....	15
5.6 Marketing Strategy For Coconut Products .....	15
5.7 Detail Project Assumptions .....	16
5.8 Machinery Suppliers.....	16
5.1 Machinery suppliers .....	24
<b>6 Limitations of Model DPR and guidelines for entrepreneurs</b> .....	<b>25</b>
6.1 Limitations Of Model DPR .....	25
6.2 Guidelines For Entrepreneurs .....	25

## LIST OF TABLES

---

TABLE 1	Project at Glance .....	5
TABLE 2	Project Description.....	7
TABLE 3	ALL INDIA AREA PRODUCTION AND PRODUCTIVITY OF COCONUT.....	9
TABLE 4	Nutritional composition Of coconut (45 gm edible portion) .....	9
TABLE 5	Project Summary .....	16
TABLE 6	Fixed Capital Investment.....	17
TABLE 7	Working Capital Requirements .....	18
TABLE 8	Total Project Cost .....	18
TABLE 9	Means Of Finances .....	19
TABLE 10	Expenditure, Revenue And Profitability.....	19
TABLE 11	Repayment Schedule.....	20
TABLE 12	Assets Depreciation.....	21
TABLE 13	Financial Assessment Of Project.....	22
TABLE 14	Break Even Analysis .....	22

## LIST OF FIGURES

---

FIGURE 1	Coconut Oil Prcoess Flowchart.....	13
FIGURE 1	Pia chart for Better Understanding Of Expences Of Each Head.....	23
FIGURE 2	Plant Layout.....	24

## 1 EXECUTIVE SUMMARY

---

Coconut oil (or coconut butter) is a plant oil derived from the kernels, meat, and milk of the coconut palm and fruit. It is used as a food oil, and in industrial applications. It has high levels of saturated fat, causing some health authorities to recommend limiting consumption of coconut oil as a food.

Coconut oil is high in certain saturated fats. These fats have different effects in the body compared with most other dietary fats.

The fatty acids in coconut oil can encourage your body to burn fat, and they provide quick energy to your body and brain. They also raise HDL (good) cholesterol in your blood, which may help reduce heart disease risk.

Edible oils have become a hot topic in the consumer goods industry. Coconut oil, one of the well-known oils, is known globally thanks to its inclusion in fragrances and other industries. They are available in two major formats - refined and virgin. The coconut oil market is headed for a meteoric growth thanks to the leaning of consumers towards health and wellness.

Coconut oil is used in household cooking in states like Kerala and Goa. It is also used in the bakery, hair oil and soap manufacturing industry. Out of the total production, only 35% is utilised for copra and coconut oil production. India is the world's biggest buyer of vegetable oil, importing nearly 60 % of its 16-17 million tonne annual consumption.

**TABLE 1 PROJECT AT GLANCE**

1	Name of the proposed project	Coconut Oil Unit
2	Name of the entrepreneur/FPO/SHG/ Cooperative	
3	Nature of proposed project	
4	Registered office	
5	Project site/location	
6	Names of Partner (if partnership)	
7	No of shareholders (if company/FPC)	
8	Technical advisor	
9	Marketing advisor/partners	
10	Proposed project capacity	0.4Tonn/day (60, 70 & 80% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11	Raw materials	Copra
12	Major product outputs	Coconut Oil
13	Total project cost :	Rs. 27.95 Lakhs
	· Land development, building & civil : construction	Rs. 3.75 Lakhs
	· Machinery and equipment's : (Lakhs)	Rs. 18.19 Lakhs
	· Utilities (Power & water facilities) : (Lakhs)	Rs. 1.00 Lakhs
	· Miscellaneous fixed assets : (Lakhs)	Rs. 0.40 Lakhs
	· Pre-operative expenses : (Lakhs)	Rs. 0.80 Lakhs
	· Contingencies : (Lakhs)	Rs. 1.50 Lakhs
	· Working capital margin : (Lakhs)	Rs. 2.31 Lakhs
14	Working capital requirement	
	· 2nd year (Lakhs)	Rs. 6.93 Lakhs
	· 3rd year (Lakhs)	Rs. 8.25 Lakhs
	· 4th year (Lakhs)	Rs. 9.52 Lakhs
15	Means of Finance	
	· Subsidy grant by MoFPI (max 10 lakhs) : :	Rs. 10.00 Lakhs
	· Promoter's contribution (min 20%)	Rs. 5.59 Lakhs
	· Term loan (45%) :	Rs. 12.36 Lakhs
16	Debt-equity ratio	0.66
17	Profit after Depreciation, Interest & Tax	
	· 2nd year (Lakhs)	Rs. 14.44 Lakhs
	· 3rd year (Lakhs)	Rs. 8.88 Lakhs
	· 4th year (Lakhs)	Rs. 11.23 Lakhs
18	Average DSCR	2.84
19	Benefit-Cost Ratio	1.09
20	Term loan repayment	7 Years with 1year grace period
21	Payback period for investment	3 years 6 month

## 2 OBJECTIVE OF THE PROJECT

---

The Prime Objective of the Report is to present a Viable Bankable Model of “**Coconut Oil Manufacturing Unit**” through adoption of appropriate technology, utilization of resources, quality production and suitable market strategy.

Some important objectives behind setup of “Coconut OIL Manufacturing Unit” are:

- ✓ The prime objective is to setup this unit is to produce & make available quality product in most hygienic conditions with good packaging, untouched & with very less human interference during entire operations till market.
- ✓ To produce & market safe, quality-assured products with highest nutrient value than existing one.
- ✓ Improve customer’s nutrition by allowing them to consume quality processed product.
- ✓ Empowering the lifestyle of promoter by adopting proper techniques in production and marketing of final product.
- ✓ Proper utilization of land, water, labor & other resources for better plant economics.
- ✓ Employment generation for youth and women in surrounding areas.

### 3 PROJECT PROFILE

---

**TABLE 2**  
**PROJECT DESCRIPTION**

<b>PARTICULARS</b>	<b>DESCRIPTION</b>
Project Name	<b>“SET UP OF COCONUT OIL MANUFACTURING UNIT”</b>
Project Location	Tamilnadu, India.
Project Area	3000 Sq.MTr
Project Proposed Economic Activities	✓ Setup of Coconut Oil Manufacturing Unit with optimum capacity
Project Capacity/Annum	<b>Coconut Oil Manufacturing Unit</b> ✓ 500 Kg Per Day – 25 working days per month

## **4 GENERAL OVERVIEW OF COCONUT PRODUCTION, CLUSTERS, PHM AND VALUE ADDITION IN INDIA**

---

### **4.1 INTRODUCTION**

The coconut palm (*Cocos nucifera*) serves a multifunctional role in the Caribbean region where it is commonly grown. Small-scale production of products from the coconut palm makes an important contribution to food security. At the industrial level, the coconut industry is an important source of employment and income in rural communities. The coconut produces a variety of products which are consumed in the region and internationally. These include fresh green and dry nuts, copra, coconut oil and coconut water among others. Coconut oil is consumed as food while a significant amount goes into the oleo-chemical industry. It is also used in food preparation. Additionally, the shell is used for various fibres, charcoal, and other products not yet fully commercialized. There is potential for supplies to both the regional and export markets in the USA, Canada, and European Union markets which are major destinations for coconut oil and coconut products. Principal among these is the suspected adverse health and nutrition effects on humans but studies, such as that conducted by Spade and Dietchy (1988), have shown that coconut oil prevents the formation of hepatic cholesterol esters. In addition to this, the lauric acid found in coconut oil provides the disease-fighting fatty acid monolaurin which boosts the immune system. The bottling and storage of coconut water for extended shelf life and improved marketability is still posing a serious challenge to packers. Research & Development could also improve the yield and profitability of coconut intended for the bottled water market or coconut intended for other uses such as oils or fibres.

### **4.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF COCONUT**

The origin of coconut palm is the subject of controversy. Indian mythology credits the creation of palm with its crown of leafy fronds to the sage Vishwamitra, to prop up his friend King Trishanku when the latter was literally thrown out of heaven by Indra for his misdeeds. In Vadakurungaduthurai, Lord Kulavanangeesar is believed to have taken the form of a coconut tree to help quench the thirst of a pregnant woman. In Kerala, Goddess Bhagavati is believed to be the soul of the coconut tree. One of the Goddess's common epithets is Kurumba which means 'tender coconut'. Folktales of all other areas narrate that coconut originated from head of a dead man or from a dead eel.

Coconut is grown in a large area in India in an area of more than 21 Lakh Hectares. Tamil Nadu, Kerala, Karnataka and Andhra Pradesh are the leading coconut producing states in India and these states account for more than 90 per cent of the total coconut produced in the country. Productivity increased to 11516 fruits per hectare in 2017-18 as compared to 10122 in 2013-14. Between 2014 and 2018, 13,117 hectares were brought under new plantation as compared to 9,561 hectares during 2010-2014. Due to this increase in production of coconut, India has been exporting coconut oil to Malaysia, Indonesia and Sri Lanka since April 2017. Till March 2017, India was importing Coconut oil.

**TABLE 3  
ALL INDIA AREA PRODUCTION AND PRODUCTIVITY OF  
COCONUT**

<b>Sr. No</b>	<b>States</b>	<b>AREA (In HA)</b>	<b>Production (Million nuts)</b>	<b>Productivity (Nuts/ha)</b>
1	Kerala	770.62	7429.39	9641
2	Tamil Nadu	459.74	6171.06	13423
3	Karnataka	526.38	5128.84	9744
4	Andhra Pradesh	103.95	1427.46	13732
5	West Bengal	29.51	373.58	12658
6	Odisha	50.91	328.38	6451
7	Gujrat	22.81	312.68	13706
8	Maharashtra	22.75	271.24	9775
9	Bihar	14.9	141.38	9489
10	Assam	19.73	132.59	6720
11	Chhattisgarh	1.85	30.54	16508
12	Tripura	7.2	29.51	4097
13	Nagaland	0.33	2.67	8091
14	Other	52.8	388.13	7351
	<b>ALL INDIA</b>	<b>2083.48</b>	<b>22167.45</b>	<b>141386</b>

#### **4.3 HEALTH BENEFITS AND NUTRITIONAL IMPORTANCE**

- Coconut kernel is nutritious and rich in fiber, vitamins and minerals.
- Coconut is a natural anti-bacterial and anti-viral food.
- You can get the benefit of coconut fibre by eating fresh or dried coconut and adding coconut to recipes.
- A multitude of studies have demonstrated that dietary fibre protects against heart attacks and strokes.
- Diet rich in coconut kernel prevent digestive disorders and it regulates bowel activity.
- It restores thyroid functions and increases the metabolic rate.

**TABLE 4 NUTRITIONAL COMPOSITION OF  
COCONUT (45 GM EDIBLE PORTION)**

<b>Sr.No</b>	<b>Nutrient</b>	<b>Amount</b>
1	Calories	160
2	Carbohydrate	6.8 g
3	Protein	1.5 g
4	Fat	1.5 g
5	Fiber	4 g
6	Sugar	2.8g
7	Sodium	9 mg

#### **4.4 CULTIVATION, BEARING AND POST-HARVEST MANagements**

Coconut is a tropical crop and is grown where temperature is 25° to 30°C and a fairly well distributed annual rainfall of 125 to 130 cm. In a few places, especially in Orissa, coconut is grown with as little as 100 cm annual rainfall.

Frost and drought are very harmful to coconut. It is predominantly grown under rainfed condition in Kerala and parts of coastal Karnataka and Tamil Nadu. In rest of the country it is mainly grown under irrigated conditions. Well drained rich loamy soils are best suited for its cultivation. It grows well on sandy loams along sea-coasts and in adjoining river valleys

Saplings of coconut palm are first raised in nurseries and after one year these are transplanted in the garden. The tree starts bearing fruits after 6-7 years and continues to yield harvest for 60-80 years. For better yield the land has to be ploughed or hoed once or twice in a year. Tender nuts are plucked up for juice after 6 or 7 months while ripen nuts are harvested after 11 months for copra and oil. Generally one thousand nuts produce about 150 kg of copra.

The coconut palm is found to grow under varying climatic and soil conditions. It is essentially a tropical plant, growing mostly between 20° N and 20° S latitudes. The ideal temperature for coconut growth and yield is  $27 \pm 5^\circ \text{C}$  and humidity > 60 per cent. The coconut palm grows well upto an elevation of 600 m above MSL. However, near the equator, productive coconut plantations can be established up to an elevation of about 1000 m above MSL. The palms tolerate wide range in intensity and distribution of rainfall. However, a well distributed rainfall of about 200 cm per year is the best for proper growth and higher yield. In areas of inadequate rainfall with uneven distribution, irrigation is required.

##### **Post-harvest management:-**

Coconuts are harvested at different stages of maturity for specific uses. For tender nut purpose, harvesting is done when the nuts are six to eight months old. For snowball tender nut and coconut chips purpose, eight to nine and nine to ten month old nuts are harvested respectively. For the production of copra and other kernel based products, only fully mature coconuts are harvested. The nuts reach full maturity in 11 to 12 months after the inflorescence is opened. At this stage, the output of copra and oil as well as brown fibre would be the maximum. In a study in India, it was found that compared to 12 month old nuts, the copra yield was less to the extent of six percent in 11 month old nuts, 16 percent in 10 month old nuts and 33 percent in nine month old nuts. The corresponding reduction in the percentage of oil was found to be five, 15 and 33 percent respectively. In places where green husks are in demand for the production of white fibre, the usual practice is to harvest 11 month old nuts. The slightly low copra output at this stage would, however, be compensated by the additional income derived from the fibre and its products.

Though the coconut palm produces an average of 12 inflorescences in one year, some of the inflorescences are likely to abort or may fail to develop into fruit bunches due to environmental

factors. Consequently, the number of bunches available for harvest is less than 12 in many areas. Similarly, the frequency of harvest also varies from country to country and also within the countries. In many areas, six to twelve harvests per year are the usual practice. In the properly managed gardens, harvest at monthly intervals is usually adopted. In the neglected gardens, bunches are not produced regularly and, as such, not more than six harvests are possible in a year. In most of the coconut growing countries, harvesting is done at bimonthly intervals and only fully mature nuts of 12 months or above are harvested.

#### **4.5 PROCESSING AND VALUE ADDITION IN INDIA**

There exists a huge scope for coconut based agri-business in India in order to increase the present 8% level of value addition to 25%, thereby value added products becoming a deciding factor in the price movement of coconut to ensure fair, reasonable and steady price to coconut farmers. Foreseeing the imperativeness of high value coconut sector, ICAR CPCRI has developed complete package of practices for the production of virgin coconut oil (hot and fermentation process), coconut chips, coconut honey, jaggery and sugar. The Institute has also developed a technology for collecting coconut inflorescence sap by using a device. The sap thus collected is called Kalparasa. Kalparasa can be preserved up to 45 days under cold condition (in refrigerator) without adding any preservatives and additives with the bottling technology. It has been demonstrated that a farmer tapping 15 coconut palms for Kalparasa could earn on an average Rs. 45,000 a month, while a tapper can earn about Rs. 20,000 per month. For sustaining the value added coconut sector, Women Self Help Groups were formed and equipped with technical know-how and smooth functioning of the coconut value chain was ensured through continuous supply of value added products to the downstream part of the chain. An activated carbon plant was designed for the production of pollution free coconut shell charcoal for community level processing at small scale level. With regard to the commercialization of technologies Institute had successfully developed market for the value added products through well established link with the retail distributor. Moreover, the marketing functionary was made a part of the value chain through appropriate integration techniques adopted and there by ensured the efficient functioning of the chain.

## **5 MODEL COCONUT OIL PROCESSING UNDER FME SCHEME**

---

### **5.1 LOCATION OF PROPOSED PROJECT AND LAND**

The entrepreneur must provide description of the proposed location, site of the project, distance from the targeted local and distant markets; and the reasons/advantages thereof i.e. in terms of raw materials availability, market accessibility, logistics support, basic infrastructure availability etc.

The ideal locations for establishment of exclusive Puffed/ Flaked Rice processing unit are in the production clusters of Rice growing states/Areas such as Bihar, Tripura, West Bengal, Uttar Pradesh, Punjab, Haryana and Uttarakhand where adequate quantities of surplus raw materials can be available for processing.

### **5.2 INSTALLED CAPACITY OF COCONUT OIL PROCESSING PLANT**

The maximum installed capacity of the manufacturing unit in the present model project is proposed as 150 tonnes /annum or 500 kg/day Coconut Oil . The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1st year is assumed to be construction/expansion period of the project; and in the 2nd year 60 percent capacity, 3rd year 70 percent capacity and 4th year onwards 80 percent capacity utilization is assumed in this model project.

### **5.3 RAW MATERIAL REQUIREMENT FOR THE UNIT**

A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled.

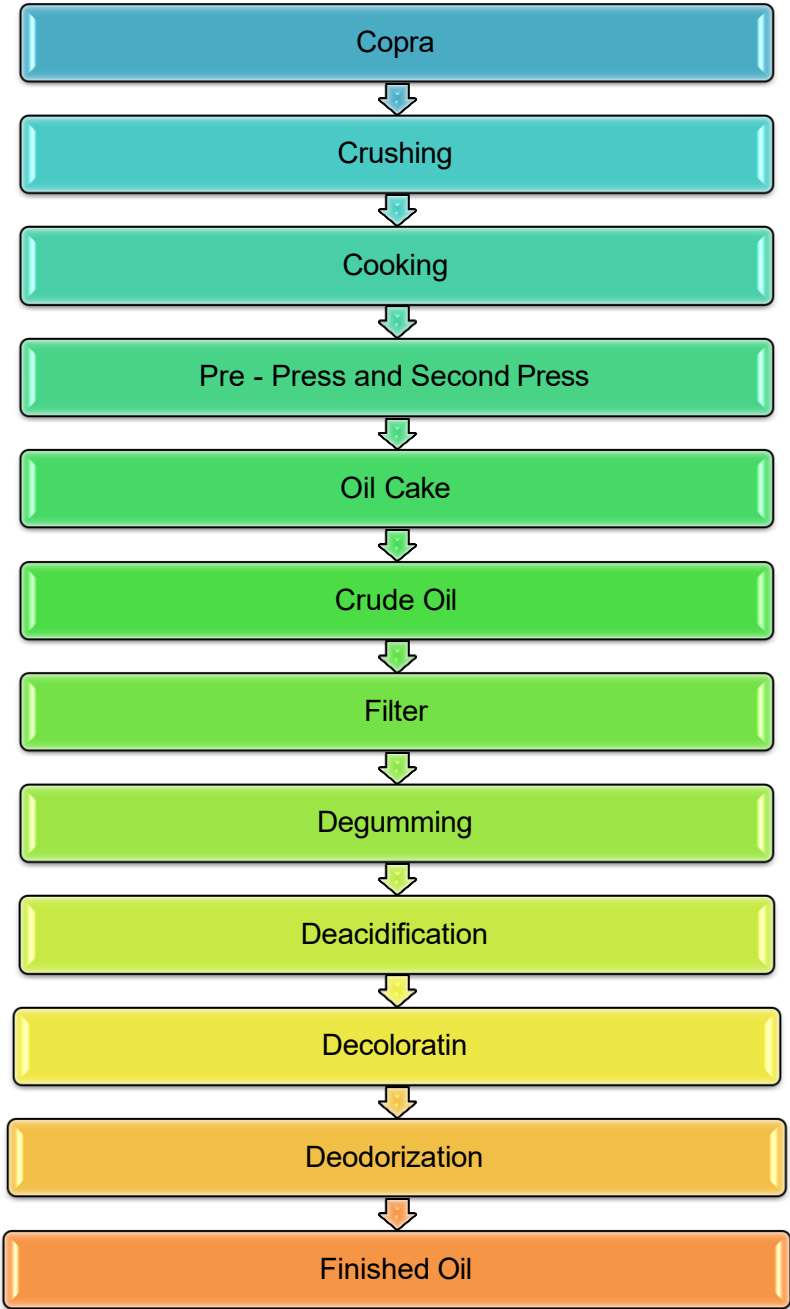
### **5.4 MANUFACTURING PROCESS**

#### **Coconut Oil**

Coconut oil is derived from copra, which is the dried kernel or 'meat' of coconut. Coconuts are fruit of the coconut palm (*Cocos nucifera* L), which is cultivated in tropical coastal areas. The usual tall variety of coconut tree reaches a height of over 30m. Typically, fresh coconut kernel contains (by % of weight), moisture (50%), oil (34%), carbohydrate (7.3%), protein (3.5%), fiber (3.0%) and ash (2.2%) (Canopied al 2005). World production of coconut oil (CNO) or copra oil is about 3.4M tonnes, about half of which is traded internationally. The main producing countries are India, Indonesia, Papua New Guinea, the Philippines, Solomon Islands, Sri Lanka, Thailand and West Malaysia. The Philippines and Indonesia are major exporters, while the EU countries and USA are major importers. CNO is a lauric oil (about 50% lauric acid) similar in composition to palm kernel and babassu oils. In addition to triacylglycerols and free

fatty acids, crude CNO also contains 0.5- 1.5% unsaponifiable matter (Codex, 2009). This material consists mainly of sterols, tocopherols, squalene, pigments and odour compounds (such as lactones). The pleasant odour and taste of CNO when extracted from fresh material is mainly due to  $\gamma$ - and  $\delta$ -lactones, present in trace amounts.  $\gamma$ -Valerolactone is considered to be responsible for the characteristic taste of coconut oil.

**FIGURE 1 COCONUT OIL PROCOESS FLOWCHART**



The processes and operations involved in modern mechanical expression of coconut is given below;

- The coconut shells are cracked and the coconut meat is separated.
- The fresh coconut meat is chopped and sliced into thin flakes of the desired size. The thin flakes of coconut meat are cooked in a cooker by heating them at an elevated temperature for 90 mins.
- The oil is expelled from the heat treated cooked coconut meat (at a temperature of about 70°C) in an oil expeller.
- The oil is stored in an air tight container in a dark cool and dry place for a long storage.
- The deoiled cake obtained from this process is suitable for human consumption.

### **Separation of Nuts:**

Broke the shell of the coconut and keep it in sun to dry, and then separate the nut from husk on next day.

### **Copra Making:**

Keep the nut in sun for more than three days to make copra of required moisture contain.

### **Reheating:**

Dry copra is again heated in the dryer before chopping into pieces, to obtain copra of 6% moisture contain.

### **Chopping:**

Dried coconut (copra) cut into small pieces with the help of a copra cutter.

### **Roasting:**

Feed the copra pieces into steam-jacketed kettles and cooked around 70oC temperature for 30 minutes.

### **Crushing:**

After cooking, feed the cooked copra into the expeller continuously and press twice. Collect the combined oil from the first pressing method and the second pressing takes place in the separate tank.

### **Separation of Cake:**

Filter the oil with the help of the filter press; you will get the oil cake as a byproduct. Oil cake is used as ready-made cattle feed

**Double Filtration:**

Extracted oil filters twice to get the fine filter quality oil. Extraction of the remaining oil is taking place by the solvent extraction method.

**Stores in Tanks:**

Store the filtered pure coconut oil in storage tanks.

**Packaging:**

The packing is done using multilayered films, bottles, cans, and tins; you can pack the coconut oil into the small packets to sell directly to the customers

**5.5 MAEKRT DEMAND AND SUPPLY FOR COCONUT OIL**

Coconut plays a very significant role in the economy of India. India is the leading coconut producer in the world (31%) with a production of 20440 million nuts from an area of 1975 thousand hectares. The productivity of India is the highest (10614 nuts/ha) among major coconut producing countries in the world. The present production of arecanut in the world is about 1.13 million tonnes from an area of 0.91 million ha. India ranks first in both area and production of the crop. The overall average yield per hectare has improved from 843 kg/ha during 1971 to 1558 kg/ha by the year 2016. Average yield of newly released coconut varieties is around 120 nuts/ palm/ year which is double the national average of 60 nuts/ palm/ year. By adopting the new varieties, the existing crop productivity levels can be enhanced to the tune of 100% in terms of nut/copra yield. In terms of Gross Value Output, coconut contributes Rs. 95000 million to the national income. Coconut industry provides livelihood to about twelve million people in India. Coconut tree is called as "Kalpa Vriksha" which essentially means that all parts of a coconut tree is useful in one way or the other. Coconut palms have many uses; their leaves are used for thatching traditional houses, making sheds, baskets, and the husk for making coir and other coir products. The shell is used for making charcoal and activated carbon, ladles and spoons, and fruits for making copra and coconut oil and other value added products. Coconut is a staple ingredient in traditional cuisines of many states. Technology for collection of fresh, hygienic and unfermented coconut inflorescence sap (Kalparasa) has been developed. Other value added products like coconut sugar, virgin coconut oil, coconut chips, dark chocolate, drinking chocolate, frozen delicacy etc. and their adoption has improved the income of farmers and also generated employment in coconut sector.

**5.6 MARKETING STRATEGY FOR COCONUT PRODUCTS**

The increasing urbanization and income offers huge scope for marketing of Coconut based products. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded Rice based products.

## 5.7 DETAIL PROJECT ASSUMPTIONS

This model DPR for Coconut Oil unit is basically prepared as a template based on certain assumptions that may vary with capacity, location, raw materials availability etc. An entrepreneur can use this model DPR format and modify as per requirement and suitability. The assumptions made in preparation of this particular DPR are given in This DPR assumes expansion of existing Coconut processing unit by adding Coconut Oil manufacturing line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneurs.

Herewith in this DPR, we have considered the assumptions as listed below in the tables of different costs, which may vary as per region, seasons and machinery designs and supplier.

1. Copra cost considered @ Rs.80/-per kg.
2. 1 kg Copra will produce 80% recovery.
3. 1 Batch size is approximately 500 kg.
4. No. of hours per day are approximately 8-10 hours.
5. Batch yield is 95%

## 5.8 MACHINERY SUPPLIERS

j

**TABLE 5  
PROJECT SUMMARY**

<b>Detailed Project Assumptions</b>		
	<b>Parameter</b>	<b>Value</b>
1	Capacity of the processing unit	500 Kg/Day Copra
2	Utilization of capacity	1st year implementation, 60% in 2nd year, 70% in 3rd year and 80% in 4th year onwards.
3	Working days per year	300 days
4	Working hours per day	8 hrs.
5	Interest on term and working capital loan	12%
6	Repayment Period	Seven years with one year grace period is considered.
7	Average prices of Raw Material	80
8	Final Product	Coconut Oil
9	Recovery rate	80%
10	Average Prices of Final Product	140

**TABLE 6  
FIXED CAPITAL INVESTMENT**

Sr. No	Particulars	Size/ Dimension s / Specificati on	Quantit y (No)	Unit Cost (Rs)	Amount (Rs)	Amou nt (Lakh)
<b>A</b>	<b>Capital Investment</b>		<b>1 Plot</b>		3,75,000	3.75
	<b>Capital Investment</b>				<b>3,75,000</b>	<b>3.75</b>
<b>B</b>	<b>Machinery &amp; Equipment's</b>					
1	Paring Unit		2	50,000	1,00,000	1.00
2	Coconut Disintegrater		1	165000	1,65,000	1.65
3	Tabular Bowl Centrifuge		1	700000	7,00,000	7.00
4	Hydraulic Press Screw Press		1	350000	3,50,000	3.50
5	Filter Press		1	175000	1,75,000	1.75
6	Mixing Vessel		1	80000	80,000	0.80
7	Spare Bowl For Centrifuge		1	1,75,000	1,75,000	1.75
8	Oil Tanks	300 lit	2	12,000	24,000	0.24
9	Manual Cap Filling Machine		1	25,000	25,000	0.25
10	Miscellaneous Equipment's (Trolley, Trays)				25,000	0.25
	<b>Machinery &amp; Equipment's</b>				<b>18,19,000</b>	<b>18.19</b>
<b>C</b>	<b>Other Costs</b>					
<b>C1</b>	<b>Utilities &amp; Fittings</b>					
1	Water & Plumbing work				1,00,000	1.00
2	Power & Electric Fittings					
	<b>Total</b>				<b>1,00,000</b>	<b>1.00</b>
<b>C2</b>	<b>Other Fixed Assets</b>					
1	Furniture & Fixtures				40,000	0.40
	<b>Total</b>				<b>40,000</b>	<b>0.40</b>
<b>C3</b>	<b>Pre-operative Expenses</b>					
1	Legal Expenses, Start - up Expenses, Establishment Cost, Consultancy fees, Trials and others				80,000	0.80
	<b>Total</b>				<b>80,000</b>	<b>0.80</b>

<b>C4</b>	<b>Contingency</b>				<b>1,50,000</b>	<b>1.50</b>
	<b>Total</b>				<b>1,50,000</b>	<b>1.50</b>
<b>C</b>	<b>Total Cost (C1+C2+C3+C4)</b>				<b>3,70,000</b>	<b>3.70</b>
<b>II</b>	<b>Total Cost (I+F+G)</b>				<b>25,64,000</b>	<b>25.64</b>

**TABLE 7  
WORKING CAPITAL REQUIRMENTS**

<b>Sr. No.</b>	<b>Description</b>	<b>Period Days</b>	<b>Quantity</b>	<b>Unit Rate/ Kg</b>	<b>Total Cost (Rs) /Day</b>	<b>Total Cost (Rs) / Month</b>	<b>Total Cost (Rs) / Year</b>
1	Copra (Dry Coconut)		500	80	40,000	10.00	120.00
2	Packaging Material (1 lit)		400	3.5	1,400	0.35	4.20
3	Labour		10	300/day	3,000	0.75	9.00
4	Supervisor / Manager		1	500/day	500	0.15	1.80
5	Electricity				500	0.13	1.50
6	Transportation				500	0.13	1.50
7	Miscellaneous				200	0.05	0.60
	<b>Total Cost</b>				<b>46,100.00</b>	<b>11.55</b>	<b>138.60</b>
	<b>Margin For Working Capital 20%</b>				<b>0.09</b>	<b>2.31</b>	<b>28</b>

**TABLE 8 TOTAL PROJECT COST**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Amount In Lakhs</b>
i	Land Development & Building Structure	3.75
ii	Plant & Machinery	18.19
iii	Utilities (Power & water facilities)	1.00
iv	Miscellaneous fixed assets	0.40
v	Pre-operative expenses	0.80
vi	Contingencies	1.50
	<b>Total Project Cost</b>	<b>27.95</b>

**TABLE 9 MEANS OF FINANCES**

Sr. No.	Particulars	Amount In Lakhs
i	Subsidy	10.00
ii	Promoters Contribution	5.59
iii	Term Loan	12.36
	Total Means of Finance (1 to 3)	27.95

**TABLE 10 EXPENDITURE, REVENUE AND PROFITABILITY**

PARTICULARS	YEAR					
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr
Capacity %	0	60	70	80	90	100
<b>A. INCOME</b>						
Sales of Coconut Oil	-	101.81	119.96	138.47	157.34	176.57
<b>Total</b>	-	<b>101.81</b>	<b>119.96</b>	<b>138.47</b>	<b>157.34</b>	<b>176.57</b>
<b>B. EXPENSES</b>						
Raw Material	-	72.00	85.68	98.88	112.32	126.00
Consumables	-	-	-	-	-	-
Packing cost	-	2.52	3.00	3.46	3.93	4.41
Transportation cost	-	0.90	1.07	1.24	1.40	1.58
Direct employee cost	-	6.48	7.71	8.90	10.11	11.34
Depreciation	-	3.47	2.99	2.57	2.22	1.91
Office Rent	-					
Plant Electricity Cost	-	0.90	1.07	1.24	1.40	1.58
Miscellaneous	-	0.36	0.43	0.49	0.56	0.63
Office Expenses	-	0.66	0.73	0.80	0.88	0.97
Telephonic Expences	-	0.06	0.60	0.66	0.73	0.80
Indirect Employee	-	0.50	0.50	0.50	0.50	0.50
Repair & Maintenance	-	0.50	1.50	1.65	1.82	2.00
Audit, Accounts & Compliance	-	0.44	0.44	0.48	0.53	0.59
Insurance		0.5	2	2	2	3
<b>Total Cost</b>	-	<b>89.29</b>	<b>107.72</b>	<b>123.07</b>	<b>138.82</b>	<b>154.95</b>
<b>Add :- Opening Stock</b>		-	9.66	11.43	13.20	14.99
<b>Less :- Closing Stock</b>	-	9.66	11.43	13.20	14.99	16.82
<b>Cost of Sales</b>	-	<b>79.63</b>	<b>105.95</b>	<b>121.31</b>	<b>137.02</b>	<b>153.12</b>

GROSS PROFIT	-	<b>22.18</b>	<b>14.02</b>	<b>17.16</b>	<b>20.32</b>	<b>23.45</b>
	#DIV/0!	21.78%	11.69%	12.39%	12.91%	13.28%
<b>FINANCE EXPENSES</b>						
Interest on Term Loan	1.48	1.37	1.16	0.94	0.73	0.52
Interest On CC		0.18	0.18	0.18	0.18	0.18
Total Interest	<b>1.48</b>	<b>1.54</b>	<b>1.33</b>	<b>1.12</b>	<b>0.91</b>	<b>0.70</b>
PROFIT BEFORE TAX	<b>-1.48</b>	<b>20.63</b>	<b>12.69</b>	<b>16.04</b>	<b>19.41</b>	<b>22.75</b>
INCOME TAX (30%)	-0.44	6.19	3.81	4.81	5.82	6.83
PROFIT AFTER TAX	<b>-1.04</b>	<b>14.44</b>	<b>8.88</b>	<b>11.23</b>	<b>13.58</b>	<b>15.93</b>

**TABLE 11 REPAYMENT SCHEDULE**

Year	Outstanding loan at start of yr.	Disbursement	Total outstanding Loan	Surplu s for repayment	Interest payment	Repayment of principal	Total outgo	o/s Loan at the end of the yr.	Balance left
1	0.00	12.36	12.36	1.27	1.48	0	1.48	12.36	-0.21
2	12.36		12.36	2.17	1.37	1.77	3.13	10.59	-0.96
3	10.59		10.59	4.78	1.16	1.77	2.92	8.83	1.86
4	8.83		8.83	6.70	0.94	1.77	2.71	7.06	3.99
5	7.06		7.06	8.98	0.73	1.77	2.50	5.30	6.48
6	5.30		5.30	10.69	0.52	1.77	2.29	3.53	8.40
7	3.53		3.53	12.16	0.31	1.77	2.07	1.77	10.08
8	1.77		1.77	15.33	0.10	1.77	1.86	-	13.47

**TABLE 12 ASSETS DEPRECIATION**

PARTICULARS	YEAR					
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr
Building Structure						
Opening Bal.		3.75	3.38	3.04	2.73	2.46
Additions	3.75					
Less :- Depreciation @ 10%		0.38	0.34	0.30	0.27	0.25
Closing Bal.	3.75	3.38	3.04	2.73	2.46	2.21
<b>PARTICULARS</b>	<b>YEAR</b>					
	<b>1st yr</b>	<b>2nd yr</b>	<b>3rd yr</b>	<b>4th yr</b>	<b>5th yr</b>	<b>6th yr</b>
Plant Machinery						
Opening Bal.		18.19	15.46	13.14	11.17	9.50
Additions	18.19					
Less :- Depreciation @ 15%		2.73	2.32	1.97	1.68	1.42
Closing Bal.	18.19	15.46	13.14	11.17	9.50	8.07
<b>PARTICULARS</b>	<b>YEAR</b>					
	<b>1st yr</b>	<b>2nd yr</b>	<b>3rd yr</b>	<b>4th yr</b>	<b>5th yr</b>	<b>6th yr</b>
Other Required Material & Accessories						
Opening Bal.		3.70	3.33	3.00	2.70	2.43
Additions	3.70					
Less :- Depreciation @ 10%		0.37	0.33	0.30	0.27	0.24
Closing Bal.	3.70	3.33	3.00	2.70	2.43	2.18
<b>TOTAL DEPRECIATION</b>	-					
<b>PARTICULARS</b>	<b>YEAR</b>					
	<b>1st yr</b>	<b>2nd yr</b>	<b>3rd yr</b>	<b>4th yr</b>	<b>5th yr</b>	<b>6th yr</b>
Building Structure	-	0.38	0.34	0.30	0.27	0.25
Plant Machinery	-	2.73	2.32	1.97	1.68	1.42
Other Required Material & Accessories	-	0.37	0.33	0.30	0.27	0.24
<b>TOTAL DEPRECIATION</b>	-	3.47	2.99	2.57	2.22	1.91

**TABLE 13 FINANCIAL ASSESSMENT OF PROJECT**

	YEAR					
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr
Cost	25.64	89.29	107.72	123.07	138.82	154.95
Benefit	-	101.81	119.96	138.47	157.34	176.57
Discounting Rate	0.91	0.83	0.75	0.68	0.62	0.56
P.V Cost	23.31	73.80	80.93	84.06	86.20	87.47
P.V Benefit	-	84.14	90.13	94.58	97.70	99.67

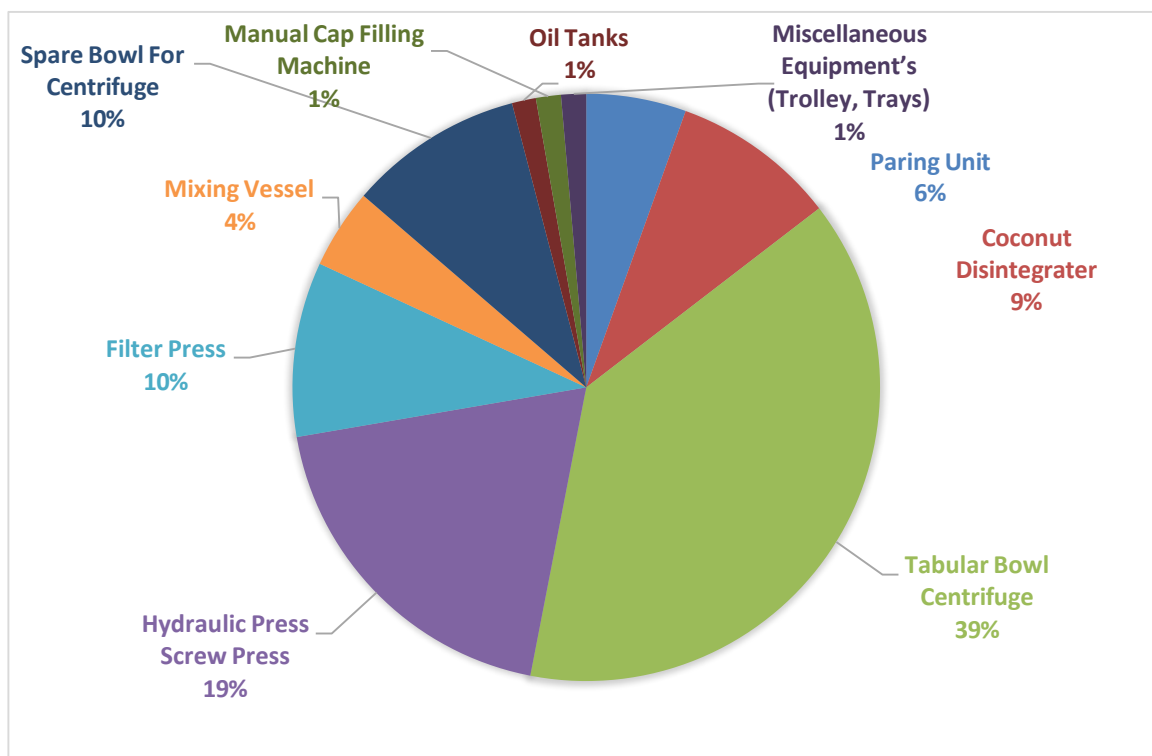
Total P.V Cost	588.69
Total P.V Benefit	641.75
<b>Benefit Cost Ratio</b>	<b>1.09</b>

**TABLE 14 BREAK EVEN ANALYSIS**

PARTICULARS	Year					
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr
Annual Production in Kg	-	72,000	84,000	96,000	1,08,000	1,20,000
Revenue	-	101.81	119.96	138.47	157.34	176.57
Selling Cost Per Kg	-	141.40	142.81	144.24	145.68	147.14
Office & General Expenses	-	1.16	1.77	1.94	2.14	2.35
Depreciation	-	3.47	2.99	2.57	2.22	1.91
Total Fixed Cost	-	4.63	4.76	4.52	4.36	4.26
Total Fixed Cost Per Kg	-	6.44	5.66	4.71	4.03	3.55
Total Variable Cost	-	81.90	97.46	112.48	127.76	143.33

Variable Cost Per Kg	-	113.75	116.03	117.16	118.30	119.44
Contribution	-	19.91	22.50	26.00	29.58	33.24
Contribution per Unit	-	27.65	26.79	27.08	27.38	27.70
Contribution in %	-	20%	19%	19%	19%	19%
Break Even Point kg	-	0	0	0	0	0
Break Even Point Rs	-	3.83	3.94	3.71	3.54	3.45
Break Even In %	-	23.27	21.13	17.38	14.73	12.83
Margin Of Safty	-	97.98	116.02	134.77	153.80	173.12

**FIGURE 1**  
**PIA CHART FOR BETTER UNDERSTANDING OF**  
**EXPENCES OF EACH HEAD**

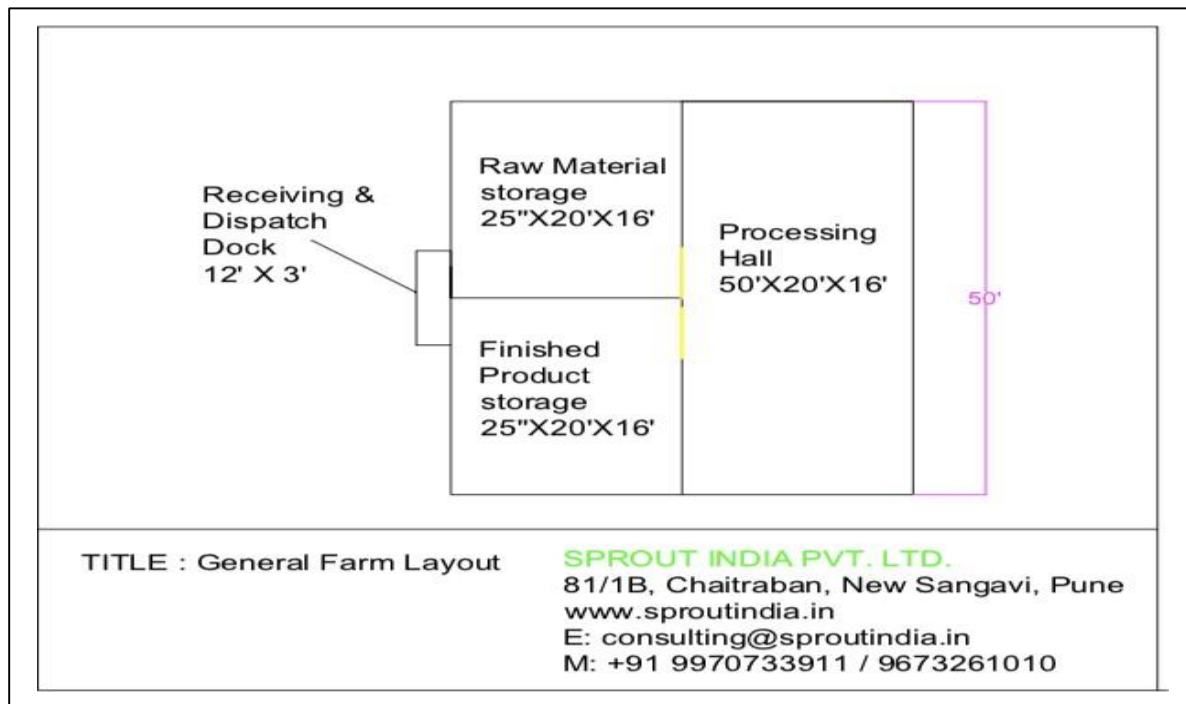


## 5.1 MACHINERY SUPPLIERS

There are many machinery suppliers available within India for processing machineries and equipment. Some of the suppliers are:

1. Spectrum Industries, Karnataka
2. Yeyyadi, Mangalore, Dist. Dakshina Kannada
3. Labh Projects Pvt. Ltd., Ahmedabad
4. Evaporators & Dryers Engineering, Chinchwad, Pune

**FIGURE 2**  
**PLANT LAYOUT**



## **6 LIMITATIONS OF MODEL DPR AND GUIDELINES FOR ENTREPRENEURS**

---

### **6.1 LIMITATIONS OF MODEL DPR**

i. This DPR has provided only the basic standard components and methodology to be adopted by an entrepreneur while submitting a proposal under the Formalization of Micro Food Processing Enterprises Scheme of MoFPI.

ii. This DPR is made to provide general methodological structure not for specific entrepreneur/crops/location. Therefore, information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of business, background of proposed project, location, raw material base/contract sourcing, entrepreneur's own SWOT analysis, market research, rationale of the project for specific location, community advantage/benefit, employment generation etc are not given in detail.

iii. The present DPR is based on certain assumptions on cost, prices, interest, capacity utilization, output recovery rate and so on. However, these assumptions in reality may vary across places, markets and situations; thus the resultant calculations will also change accordingly.

### **6.2 GUIDELINES FOR ENTEPRENURES**

i. The success of any prospective food processing project depends on how closer the assumptions made in the initial stage are with the reality of the targeted market/place/situation. Therefore, the entrepreneurs must do its homework as realistic as possible on the assumed parameters.

ii. This model DPR must be made more comprehensive by the entrepreneur by including information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of entrepreneur's business, project location, raw material costing base/contract sourcing, detailed market research, comprehensive dehydrated product mix based on demand, rationale of the project for specific location, community advantage/benefit from the project, employment generation, production/availability of the raw materials/crops in the targeted area/clusters and many more relevant aspects for acceptance and approval of the competent authority.

iii. The entrepreneur must be efficient in managing the strategic, financial, operational, material and marketing aspects of a business. In spite of the assumed parameter being closely realistic, a project may become unsustainable if the entrepreneur does not possess the required efficiency in managing different aspects of the business and respond effectively in changing situations.

iv. The machineries should be purchased after thorough market research and satisfactory demonstration.

- v. The entrepreneur must ensure uninterrupted quality raw materials' supply and maintain optimum inventory levels for smooth operations management.
- vi. The entrepreneur must possess a strategic look to steer the business in upward trajectory.
  
- vii. The entrepreneur must maintain optimum (not more or less) inventory, current assets. Selecting optimum source of finance, not too high debt-equity ratio, proper capital budgeting and judicious utilization of surplus profit for expansion is must.
  
- viii. The entrepreneur must explore prospective markets through extensive research, find innovative marketing strategy, and maintain quality, adjust product mix to demand.
  
- ix. The entrepreneur must provide required documents on land, financial transaction, balance sheet, further project analysis as required by the competent authority for approval.
  
- x. The entrepreneur must be hopeful and remain positive in attitude while all situations.

**- END OF THE REPORT -**



## Contact Us

### **National Institute of Food Technology, Entrepreneurship and Management (NIFTEM) - Thanjavur**

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanjavur – 613005, Tamil Nadu, India

Ph: 04362-228155, Fax:04362-227971

Email: [director@iifpt.edu.in](mailto:director@iifpt.edu.in) Web: <https://niftem-t.ac.in/>

