



PM Formalisation of Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR PROCESSING OF ARECANUT



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

Model Detailed Project Report	1
1 Executive Summary	4
2 Objective Of The Project	7
3 Project Profile	8
4 General overview of Arecanut PRODUCTION, clusters, phm and value addition in India	9
4.1 Introduction.....	9
4.2 Origin, Distribution And Production Of Arecanut.....	9
4.3 varieties.....	10
4.4 Composition & Nutritive Value Of Arecanut	11
4.5 Health Benefits And Nutritional Importance.....	12
4.6 Cultivation, Bearing And Post-Harvest Managements	12
5 Processing Of Arecanut	14
Separating the fruits from the bunches.....	14
Dehusking	15
Manual dehusking	15
Mechanical dehusking.....	15
Peeling 15	
Splitting of kernel	16
Boiling the kernel	16
Coating 16	
Drying 16	
Packaging of Arecanut.....	17
5.1 Market demand and supply for Arecanut.....	17
5.2 Detail project assumptions	17
5.3 Machinery suppliers.....	26
6 Limitations of Model dpr and guidelines for entrepreneurs	28
6.1 limitations of model dpr	28
6.2 Guidelines for entrepreneurs	28

LIST OF TABLES

TABLE 1	Project at Glance	5
TABLE 2	Project Description	8
TABLE 3	Popular varieties Of Arecanut	10
TABLE 4	Nutritive Value Of Arecanut	11
TABLE 5	Processing Of Arecanut	14
TABLE 6	Project Summary	18
TABLE 7	Fixed Capital Investment.....	18
TABLE 8	Working Capital Requirements	19
TABLE 9	total project cost.....	20
TABLE 10	means of finances.....	20
TABLE 11	Expenditure, Revenue And Profitability.....	20
TABLE 12	Repayment Schedule.....	22
TABLE 13	Assets Depreciation	23
TABLE 14	Financial Assessment Of Project	24
TABLE 15	Break Even Analysis	25

LIST OF FIGURES

FIGURE 1	Betel Nuts	13
FIGURE 2	Pia chart for Better Understanding Of Expenses Of EACH Head	26
FIGURE 3	Plant Layout.....	27

1 EXECUTIVE SUMMARY

India is the major producer and consumer of arecanut in the world and ranks first in terms of both area (58%) and production (53%) of arecanut. Arecanut production in the country crossed 7 lakh tonnes during 2013-14. As per the revised estimates area under arecanut during 2013-14 was 445,000 ha and production was 729,810 tonnes. Total consumption in India is estimated to be 330,000 tonnes per year. It is estimated that more than 10 million people depending on this crop for their livelihood.

Arecanut is the major plantation crop of coastal and southern districts of the country under assured irrigation facility. Karnataka is the largest arecanut producing state in the country with a production of 457,560 tonnes from an area of 218,010 ha. Kerala, Assam, Meghalaya, Tamil Nadu, West Bengal etc., are the other major arecanut growing states in the country. Mumbai, Ahmedabad, Indore, Jaipur, Delhi, Nagpur, Patna, Calcutta, Cuttack, Mangalore, Bangalore, Rajkot, and Chennai are the important marketing centers of arecanut in India. India also exports limited quantity mainly in the form of 'Pan Masala' and 'Gutka'.

TABLE 1 PROJECT AT GLANCE

1	Name of the proposed project	Arecanut Processing 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	200 Kg/day (60, 70 & 80% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11	Raw materials	Arecanut Processing Unit
12	Major product outputs	Arecanut
13	Total project cost :	Rs. 23.83 Lakhs
	· Land development, building & civil : construction	Rs. 3.50 Lakhs
	· Machinery and Equipment's : (Lakhs)	Rs. 14.21 Lakhs
	· Utilities (Power & water facilities) : (Lakhs)	Rs. 0.8 Lakhs
	· Miscellaneous fixed assets : (Lakhs)	Rs. 0.8 Lakhs
	· Pre-operative expenses : (Lakhs)	Rs. 1.00 Lakhs
	· Contingencies : (Lakhs)	Rs. 2.00 Lakhs
	· Working capital margin : (Lakhs)	Rs.1.52 Lakhs
14	Working capital requirement	
	· 2nd year (Lakhs)	Rs. 3.81 Lakhs
	· 3rd year (Lakhs)	Rs. 4.53 Lakhs
	· 4th year (Lakhs)	Rs. 5.23 Lakhs
15	Means of Finance	
	· Subsidy grant by MoFPI (max 10 lakhs) : :	Rs. 10.00 Lakhs
	· Promoter's contribution (min 20%)	Rs. 4.77 Lakhs
	· Term loan (45%) :	Rs. 9.06 Lakhs
16	Debt-equity ratio	Rs. 0.74 Lakhs
17	Profit after Depreciation, Interest & Tax	
	· 2nd year (Lakhs)	Rs. 9.54 Lakhs
	· 3rd year (Lakhs)	Rs. 6.13 Lakhs
	· 4th year (Lakhs)	Rs. 7.96 Lakhs
18	Average DSCR	2.38
19	Benefit-Cost Ratio	1.10

20	Term loan repayment	7 Years with 1year grace period
21	Payback period for investment	2 years 9 month

2 OBJECTIVE OF THE PROJECT

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

Some important objectives behind setup of “**Arecanut Processing 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, labour & other resources for better plant economics.
- ✓ Employment generation for youth and women in surrounding areas.

3 PROJECT PROFILE

Project profile is as below.

TABLE 2
PROJECT DESCRIPTION

PARTICULARS	DESCRIPTION
Project Name	“SET UP OF ARECANUT PROCESSING UNIT”
Project Location	NA
Project Location Distance From District	NA
Project Area	5000 Sq. ft.
Project Proposed Economic Activities	✓ Setup of Areca Nut Processing Unit
Project Capacity/Annum	Arecanut Processing Unit ✓ 1000 Kg/Day Input Capacity ✓ 200Kg/Day Final output

4 GENERAL OVERVIEW OF ARECANUT PRODUCTION, CLUSTERS, PHM AND VALUE ADDITION IN INDIA

4.1 INTRODUCTION

'Arecanut', botanically known as *Areca catechu*, is a tropical plant found all over South East Asia. This tree belongs to the palm tree species and is from the *Arecaceae* family. The fruit (nut) of this tree is popularly known as the betel nut or supari in India. The arecanut is an important commercial plantation crop. The fruit has a fibrous mesocarp, and seeds are with a truncate base, endosperm deeply ruminates with a basalar embryo. It is also known as "betel nut" which is the kernel obtained from the fruit of arecanut palm. It is mostly used by the people as masticatory and is an essential requisite during several religious, social and cultural functions of India. The presence of the betel nut is a must in the ceremonial plate, as betel nuts are believed to increase prosperity. The nut is offered to guests, along with a betel leaf, as a mark of respect. It is also used by the local population in native systems as human and veterinary medicine.

India is the major producer and consumer of arecanut in the world and ranks first in terms of both area (58%) and production (53%) of arecanut. Arecanut production in the country crossed 7 lakh tonnes during 2013-14. As per the revised estimates area under arecanut during 2013-14 was 445,000 ha and production was 729,810 tonnes. Total consumption in India is estimated to be 330,000 tonnes per year. It is estimated that more than 10 million people depending on this crop for their livelihood.

Arecanut is the major plantation crop of coastal and southern districts of the country under assured irrigation facility. Karnataka is the largest arecanut producing state in the country with a production of 457,560 tonnes from an area of 218,010 ha. Kerala, Assam, Meghalaya, Tamil Nadu, West Bengal etc., are the other major arecanut growing states in the country. Mumbai, Ahmedabad, Indore, Jaipur, Delhi, Nagpur, Patna, Calcutta, Cuttack, Mangalore, Bangalore, Rajkot, and Chennai are the important marketing centers of arecanut in India. India also exports limited quantity mainly in the form of 'Pan Masala' and 'Gutka'.

4.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF ARECANUT

World:

India, Sri Lanka, Malaysia, Philippines, Thailand, Burma and Bangladesh. In South East Asian countries it is a stray crop. Only in India it is under scientific cultivation. India is the world's largest producer of arecanut contributing nearly 74 % towards world production.

India:

As per 2013–14 statistics.

Area: 445,000 ha

Production: 729,810 tonnes.

As per FAO statistics for 2017.

India is the world's largest consumer of arecanut (accounting to 54.07 %of world production)

4.3 VARITIES

**TABLE 3
POPULAR VARITIES OF ARECANUT**

Variety	Growth Habit	Shape and Size of nut	Chali yield (Kg/palm)	Recommended for
South local	Tall	Round, Bold	2.00	Coastal Karnataka
MangalaSaemi	Tall	Round, Small	3.00	Coastal Karnataka
Sumangala	Tall	Oval, Medium	3.20	Karnataka, Kerala
Sreemangala	Tall	Round, Small	3.18	Karnataka, Kerala
Mohitnagar	Tall	Oval to round Medium	3.67	West Bengal, Karnataka and Kerala
SAS-I	Tall	Round, Medium	4.60	Uttara Kannada
Thirthahalli	Tall	Oblong, Small	3.62	Malnad areas of Karnataka
Sreevardhana	Tall	Round, Medium	2.00	Coastal areas

4.4 COMPOSITION & NUTRITIVE VALUE OF ARECANUT

The main constituents of arecanut are polyphenols, fat, polysaccharides, fiber and protein. It also contains minerals like calcium (0.05%), phosphorus (0.13%), and iron (1.5 mg/100 g) and vitamins (vitamin B6 and vitamin C). Tannins are the main polyphenols present in the arecanut. The other polyphenols mostly of flavonols include about 10% of catechin, 2.5% epicatechin, 12% of leucocyanidin, and 1.3% of another isomer of leucocyanidin, out of the total polyphenols. Among the alkaloids present in arecanut, arecoline is the main and physiologically most active one, varying from 0.1 to 0.67%. Other alkaloids present in trace amounts are arecaidine, guvacoline and guvacine.

Chemical characteristics of the nuts changes with maturity of different varieties and it is observed that two months old tender arecanut offers no resistance while cutting. About four to five months, the outer skin is dark green and inside it is translucent and jelly-like, with the pale coloured streaks making their appearance. Six to seven months old green nut is comparatively hard, but can be cut easily. It has more or less a white core and light brown veins from periphery to core. This stage is ideal for making the

processed kalipak or kaliadeke of South India. At about nine months maturity, the ripe fruit has a yellow to orange red colour; the enclosed hard nut has distinct brown polyphenol veins enmeshing white fat, polysaccharides and the white core. Such nuts are used in raw form or after drying as chalisupari.

TABLE 4
NUTRITIVE VALUE OF ARECANUT

Nutrients	Quantity per 100g
Energy	249(Kcal)
Moisture	31.3(g)
Protein	4.9 (g)
Fat	4.4 (g)
Ash	1.0(g)
Crude fibre	11.2(g)
Carbohydrate	47.2 (g)
Calcium	50 (mg)
Phosphorous	130 (mg)
Iron	1.5(mg)

4.5 HEALTH BENEFITS AND NUTRITIONAL IMPORTANCE

Arecanut has been found to possess the following properties.

- Prevents oral cavities, dry mouth, gum infection
- Reduce swelling in gums
- Improve digestion
- Analgesic
- Anti-inflammatory
- Wound healing property
- In the metabolic system as a digestive and carminative
- Anti-diabetic
- Used against certain skin diseases
- Used as aphrodisiac
- Improves eyesight when used as Thamboolaseva
- Helps in relieving asthma

In Ayurveda, arecanut was long considered as having medicinal properties. Vagbhata's (4th Century AD) reference to arecanut describes its use in the treatment of leucoderma, leprosy, cough, fits, worms, anaemia and obesity.

Arecanut has pharmacological actions such as antioxidant activity, antimicrobial activity, cholinergic activity, anti-ovulatory activity, hepato-protective activity, anti-migraine activity, anti-inflammatory activity, fungicidal activity, etc.

Arecanut is reported to have pharmacological properties which may be attributed to its biochemical components such as polyphenols, alkaloids, polysaccharides, fat and proteins. Arecanut extract possess potential anti-oxidative activity and inhibition of free radicals and reactive oxygen species

4.6 CULTIVATION, BEARING AND POST-HARVEST MANAGERMENTS

Seedlings of 1 to 2 years of age should be planted in pits of about 90 x 90 x 90 cm at a spacing of 2.75 to 3.0 meter either way and covered with soil to the collar level of the plants and press the soil around. It is essential to provide shade during summer months. Growing Banana or other crops well in advance may also provide some shade.

Post-harvest Processing of Arecanut:

Harvesting:-

It is crucial to harvest the arecanut at specific stages to obtain the best quality produce. Minimum two people with required skills are necessary to accomplish this. One professional tree climber with experience of plucking the fruits and another person who uses gunny bag to catch it when the fruits are falling down are essential. Before the tree climber decides to pluck all the fruits, first he plucks only one/two fruits and indicates the other person to check it. The catcher tastes the fruit and indicates the climber whether to go ahead or not.

The fruits are harvested annually, dried and dehusked. The harvested nuts have to be sun dried for 45 days. It is essential to spread the nuts uniformly in a single layer and turning should be done once a week. This would prevent fungal infection of the nuts.

The post-harvest operations begin soon after the harvest, preferably simultaneously with the harvest.

Stages of Harvest:-

The stage of harvesting depends on the type of produce to be prepared for the market.

1. Dried ripe nuts/ Chali/ Kottapak: Fully ripe, nine months old fruits having yellow to orange red colour is the best suited for the above purpose.
2. Kalipak: Nuts of 6 to 7 months' maturity with dark green colour are used
3. Scented suparis: Both the above types are used.

Yield :-

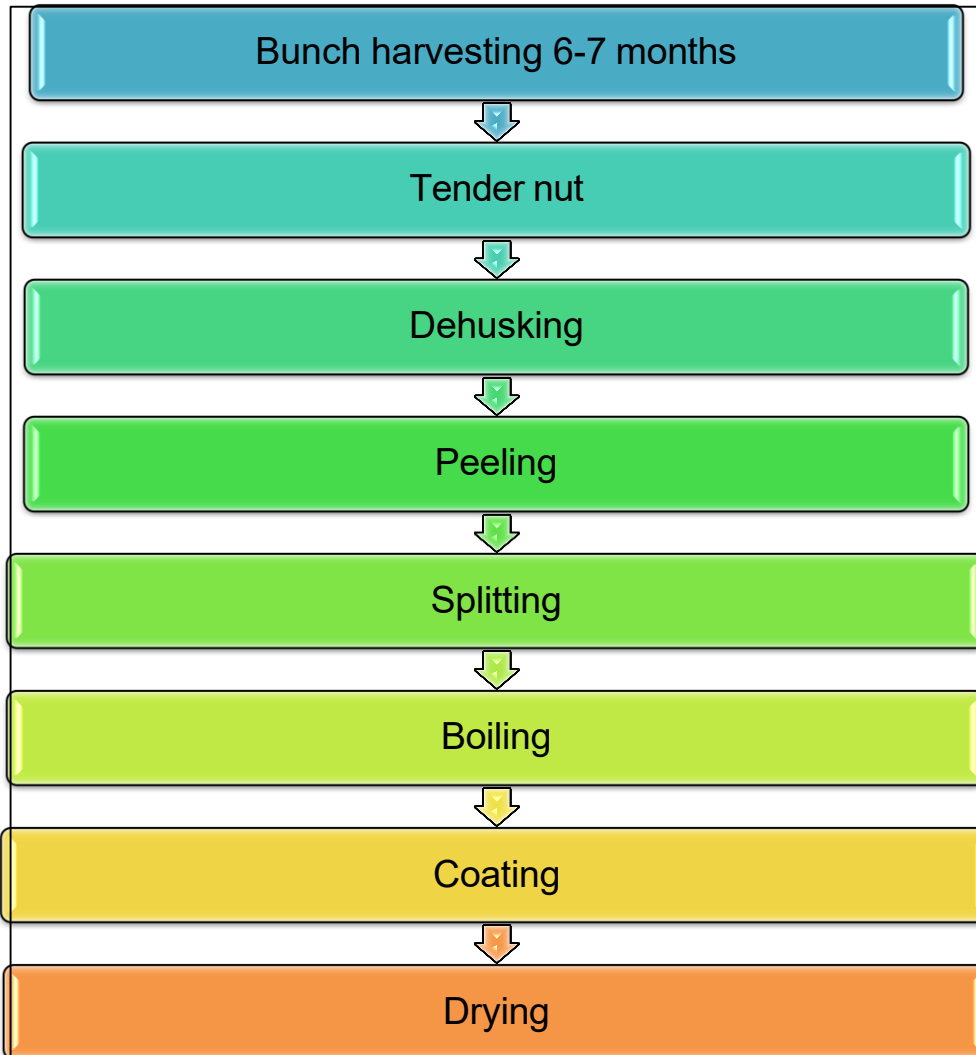
During one full day of harvesting in a typical farm of about 1 acre, an yield of 14-15 gunny bags can be achieved.

FIGURE 1 BETEL NUTS



5 PROCESSING OF ARECANUT

TABLE 5
PROCESSING OF ARECANUT



SEPARATING THE FRUITS FROM THE BUNCHES

Once the fruit bunches are plucked from the tree, it has to be separated to get the individual fruits. This can be done simultaneously w the plucking process is going on. As the farm will be full of trees, unless there is a big enough space it'll be done on a rather flat place.

DEHUSKING

MANUAL DEHUSKING

Dehusking and cutting of the nuts are normally done manually by using a curved knife. These knives are made of mild steel with sharp cutting edge and mounted on a wooden base. It has to be done within two days after harvesting. Otherwise, the cutting will not be easy. After dehusking, the nuts are cut into two types based on the maturity of the fruits. Less matured fruits are cut into longitudinal sections called choor and medium matured fruits are cut into transverse sections called nut or kottai. Fully matured fruits are not cut and are processed as round nuts called urundai. Ripened fruits are segregated and processed separately. Normally one labourer can dehusk and cut about 60-75 kg of fruits in eight hours. Since it is a heavy and intensive manual work, there is a need of minimum of 7-8 labourers for 8 h to peel the raw arecanut fruits of 14-15 gunny bags (800 - 900kg).

MECHANICAL DEHUSKING

Arecanut dehusking work can also be carried out using dehusking machines of different capacity in view of scarcity of skilled labourers. Now-a-days, dehusking machines are available in different models starting from dehusking capacity of 30 to 50 kg/h to 225 to 270 kg/h. Minimum two to three skilled labour are required to operate and work in the dehusking machines.

The mechanical arecanut dehusker consists of a rotary drum having eight numbers of solid rubbers on its periphery. Below this, a concave is placed to aid shelling and to pass the dehusked material down. After dehusking, kernels and husk fall down to the duct and reach the air stream produced by a blower. The husk is thrown out and the kernels/nuts are collected at the outlet. Depending upon the size of the fruits, the spacing between concave and drum has to be changed for minimum breakage and higher efficiency. Grading the dried fruits before dehusking will help to increase the dehusking efficiency and reduce the breakage. One hp electric motor is required to run this machine. Its production capacity is around 30kg/h.

A mechanical dehusker has also been developed by Post Harvest Technology Centre, Gandhi Krishi Vigyan Kendra (GKVK), Bangalore. This machine assembly consists of two sharp edged flaps, one being stationary and the other movable, operated by the pedal through a linkage mechanism. The unit has a hopper to hold about 20 kg of areca nuts. Assembly is made of mild steel, the entire unit is mounted on an angle iron stand and the dehusking mechanism is made of spring steel. This is suitable only for dehusking freshly harvested mature green arecanuts. The dehusking capacity of the unit is 160 kg per day with a running time of eight hours per day. This semi-mechanized dehusker operates at reasonably high output causing less drudgery compared to the traditional method of dehusking which requires a lot of manpower. But it requires skilled labours. Also only half portion of the husk can be removed by using this machine and the rest should be removed by hand.

PEELING

The raw fruit has to be peeled in order to get nut (kernel). Manual peeling of arecanut is the labour intensive process and not safety to the labor. This task is mainly carried out by ladies in the village. Arecanuts are harvested in different methods as well as different maturity conditions of the nut. Green arecanut is harvested after 80 to 90 days of maturity. In one bunch, there will be several nuts, some are over matured and few are under matured. Usually 10 to 15% of the harvest will be over matured. Peeling of the over matured is very difficult by hand. Instead of peeling, they scrap the outer skin by

using sharp knife. This scrapped one is usually called as kettagotu. These scrapped ones are boiled and then dried.

After drying, these are once again scrapped by using knife and then sorted according to the quality. Market rate for this variety is always 40 to 30% of the finest variety of the areca nut. Rains during the harvest season will enhance the quantity of the kettagotu as the processing of the arecanut will be stopped and it will be allowed to over mature and then dried. When these nuts are peeled, they will have white coat on the surface and more often outer skin cannot be cleaned completely. They need further processing before sending it to the market.

In addition to peeling of the green arecanut, peeling of red arecanut also carried out. This task of peeling of red arecanut is very tedious one and complete removal of shell is impossible one. This semi peeled one is further processed in traditional manner and dried. This product is generally called as kettagotu/ gorubulu and goes to the market at nearly 1/4 to 1/6th rate of the normal arecanut. This is mainly due to shape and adherence of the parts of outer shell. These kettagotu/ gorubulu are further processed at market by scrapping individual nut by using knife. This is mainly done by women.

SPLITTING OF KERNEL

A hardened steel blade is used to cut the areca nut. When the areca nut moves into the holder, the blade is used to cut the areca nut

BOILING THE KERNEL

Immediately after the kernel is taken out, it has to be boiled with high temperature for minimum of 12 h. For efficiency purposes, two huge metallic vessels of capacity of 600 litres are being used as seen in the below picture. The arecanut kernel has to be filled in to the vessel mixing with sufficient water. Along with the water, the arecanut precipitate has to be mixed to get good colour.

COATING

During boiling operation, the same water is used for boiling 2-3 batches of arecanut. The extract so obtained is concentrated to get 'Kali'. After boiling the pieces are coated with 'Kali' which imparts a good glossy appearance. Kali coating is repeated to get glossy appearance. Kali contains many polyphenols.

DRYING

Currently drying the nuts after boiling by open sun drying for 8 to 10 days is in practice. The moisture content of processed arecanut is reduced from 40 to 11% during drying operation for safe storage and to maintain food quality. This is the last step of arecanut processing. Recently metallic fabricated trays of 6' x 3' size are used for drying purpose. Artificial drying using the fabricated arecanut dryers are also used for drying of arecanut when adequate sun light is not available. While sundrying is in progress, the nuts are heaped every evening and covered with polythene sheets or arecanut dried leaf sheath and the nuts are again uniformly spread on the bamboo mats next day morning. Once the drying process is over, it can be packed in and kept for any number of days before selling it in the retail market. For every 100 kg of raw arecanut fruits, the expected final dried arecanut is in the range of 13-15 kg.

PACKAGING OF ARECANUT

In order to maintain the quality of the arecanut during handling, transportation, storage and distribution, the packaging material to be used is to be selected with care, keeping in mind the functional as well as the marketing requirements.

The packaging requirements for arecanut, in general, are listed below:

- To protect the product from spillage and spoilage.
- To provide protection against atmospheric factors such as light, heat, humidity and oxygen.

The selected packaging materials should have high water vapour and oxygen barriers.

- Besides the above functional requirements, the packaging material should have good machinability, printability and it should be easily available and disposable.

5.1 MAEKRT DEMAND AND SUPPLY FOR ARECANUT

The global arecanut market is segmented based on the type, product, and region. By type, the market is divided into red arecanut and white arecanut. By product, it is bifurcated into scented supari, tannin, and pan masala. By region, the arecanut market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

5.2 DETAIL PROJECT ASSUMPTIONS

This model DPR for Arecanut processing 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 Arecanut processing unit by adding arecanut 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.

TABLE 6
PROJECT SUMMARY

Detailed Project Assumptions		
Sr. No.	Parameter	Value
1	Capacity of the processing unit	1000 Kg/Day Raw Betel Nuts
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	9.5-10%
6	Repayment period	Seven years with one year grace period is considered.
7	Average prices of raw material	Rs. 25/Kg.
8	Average sale prices	Rs. 200/Kg.
9	Recovery rate	20%

TABLE 7
FIXED CAPITAL INVESTMENT

Sr. No.	Particulars	Size/ Dimensions / Specification	Quantity (No)	Unit Cost (Rs)	Amount (Rs)	Amount (Lakh)
A	Capital Investment		1 Plot		3,50,000	3.50
	Capital Investment				3,50,000	3.50
B	Machinery & Equipment's					
1	Decorticator / Dehusking machine	200 Kg/hr	1	140000	1,40,000	1.40
2	Sifter Sieves machine	500 kg/hr	1	112000	1,12,000	1.12
3	Digital Weighing Machine	100 kg	2	4,300	8,600	0.09
4	Boiling Tank		2	250000	5,00,000	5.00
5	Packaging Machinery	2000 pack/ hr	1	650000	6,50,000	6.50
						0.00

7	Miscellaneous		1	10000	10,000	0.10
	Machinery & Equipment's				14,20,600	14.21
C	Other Costs					
C1	Utilities & Fittings					
1	Water				80,000	0.80
2	Power					
	Total				80,000	0.80
C2	Other Fixed Assets					
1	Furniture & Fixtures				80,000	0.80
2	Electrical Fittings					
	Total				80,000	0.80
C3	Pre-operative Expenses					
1	Legal Expenses, Start -up Expenses, Establishment Cost, Consultancy fees, Trials and others				1,00,000	1.00
2	Tray					
3	Electrical Fittings					
	Total				1,00,000	1.00
C4	Contingency				2,00,000	2.00
	Total				2,00,000	2.00
C	Total Cost (C1+C2+C3+C4)				4,60,000	4.60
II	Total Cost				22,30,600	22.31

**TABLE 8
WORKING CAPITAL REQUIRMENTS**

Sr. No.	Description	Period Days	Quantity	Unit Rate/ Kg	Total Cost (Rs) /Day	Total Cost (Rs) / Month	Total Cost (Rs) / Year
1	Betel Nuts		1000	25	25,000	6.25	62.50
2	Packaging Material (1 kg)		200	3.5	700	0.18	1.75
3	Labour		10	300/day	3,000	0.75	7.50

4	Supervisor / Manager		1	600/ day	600.00	0.15	1.50
5	Electricity				360	0.09	0.90
6	Transportation				500	0.13	1.25
7	Miscellaneous				300.00	0.08	0.75
	Total Cost				30,460.00	7.62	76.15
	Margin For Working Capital 20%				0.06	1.52	15

TABLE 9 TOTAL PROJECT COST

Sr. No.	Particulars	Amount In Lakhs
i	Land Development & Building Structure	3.50
ii	Plant & Machinery	14.21
iii	Other Fixed Assets	2.60
iv	Working Capital Margin 20%	1.52
v	Contingency	2.00
vi	Total Project Cost	23.83

TABLE 10 MEANS OF FINANCES

Sr. No.	Particulars	Amount In Lakhs
i	Subsidy	10.00
ii	Promoters Contribution	4.77
iii	Term Loan	9.06
	Total Means of Finance (1 to 3)	23.83

TABLE 11 EXPENDITURE, REVENUE AND PROFITABILITY

PARTICULARS	YEAR					
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr
A. INCOME						
Sales of Arecanut	-	60.60	71.41	82.42	93.65	105.10

Total	-	60.60	71.41	82.42	93.65	105.10
B.EXPENSES						
Raw Material	-	37.50	44.63	51.50	58.50	65.63
Consumables	#REF!	-	-	-	-	-
Packing cost	-	1.05	1.25	1.44	1.64	1.84
Transportation cost	-	0.75	0.89	1.03	1.17	1.31
Direct employee cost	-	5.40	6.43	7.42	8.42	9.45
Depreciation	-	2.94	2.54	2.20	1.90	1.64
Office Rent	-					
Plant Electricity Cost	-	0.54	0.64	0.74	0.84	0.95
Miscellaneous		0.45	0.54	0.62	0.70	0.79
Office Expenses	-	0.66	0.73	0.80	0.88	0.97
Telephonic Expenses	-	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
Total Cost	-	51.29	62.68	71.24	80.05	89.11
Add :- Opening Stock		-	5.43	6.43	7.42	8.43
Less :- Closing Stock	-	5.43	6.43	7.42	8.43	9.46
Cost of Sales	-	45.86	61.68	70.24	79.04	88.08
GROSS PROFIT	-	14.74	9.72	12.18	14.62	17.02
	-	24.33%	13.62%	14.78%	15.61%	16.19%

FINANCE EXPENSES						
Interest on Term Loan	1.31	1.21	1.02	0.83	0.65	0.46
Interest On CC		0.29	0.29	0.29	0.29	0.29
Total Interest	1.31	1.50	1.31	1.12	0.94	0.75
PROFIT BEFORE TAX	1.31 -	13.25	8.41	11.06	13.68	16.27
INCOME TAX (30%)	0.39 -	3.97	2.52	3.32	4.10	4.88
PROFIT AFTER TAX	0.91 -	9.27	5.89	7.74	9.58	11.39

TABLE 12 REPAYMENT SCHEDULE

Year	Outstanding loan at start of yr.	Disbursement	Total outstanding Loan	Surplus for repayment	Interest payment	Repayment of principal	Total outgo	o/s Loan at the end of the yr.	Balance left
1	-	10.89	10.89	2.89	1.31	0	1.31	10.89	1.59
2	10.89		10.89	3.31	1.21	1.56	2.76	9.33	0.55
3	9.33		9.33	2.54	1.02	1.56	2.57	7.78	-0.04
4	7.78		7.78	4.03	0.83	1.56	2.39	6.22	1.64
5	6.22		6.22	5.71	0.65	1.56	2.20	4.67	3.51
6	4.67		4.67	7.10	0.46	1.56	2.01	3.11	5.08
7	3.11		3.11	7.66	0.27	1.56	1.83	1.56	5.83
8	1.56		1.56	9.63	0.08	1.56	1.64	-	7.99

TABLE 13 ASSETS DEPRECIATION

PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Land & Building Structure								
Opening Bal.		3.50	3.15	2.84	2.55	2.30	2.07	1.86
Additions	3.50							
Less :- Depreciation @ 10%		0.35	0.32	0.28	0.26	0.23	0.21	0.19
Closing Bal.	3.50	3.15	2.84	2.55	2.30	2.07	1.86	1.67
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Plant & Machinery								
Opening Bal.		14.21	12.08	10.26	8.72	7.42	6.30	5.36
Additions	14.21							
Less :- Depreciation @ 15%		2.13	1.81	1.54	1.31	1.11	0.95	0.80
Closing Bal.	14.21	12.08	10.26	8.72	7.42	6.30	5.36	4.55
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Other Required Material & Accessories								
Opening Bal.		4.60	4.14	3.73	3.35	3.02	2.72	2.44
Additions	4.60							

Less :- Depreciation @ 10%		0.46	0.41	0.37	0.34	0.30	0.27	0.14
Closing Bal.	4.60	4.14	3.73	3.35	3.02	2.72	2.44	2.30
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Land & Building Structure	-	0.35	0.32	0.28	0.26	0.23	0.21	0.19
Plant & Machinery	-	2.13	1.81	1.54	1.31	1.11	0.95	0.80
-	-							
Other Required Material & Accessories	-	0.46	0.41	0.37	0.34	0.30	0.27	0.14
TOTAL DEPRECIATION	-	2.94	2.54	2.20	1.90	1.64	1.42	1.13

TABLE 14 FINANCIAL ASSESSMENT OF PROJECT

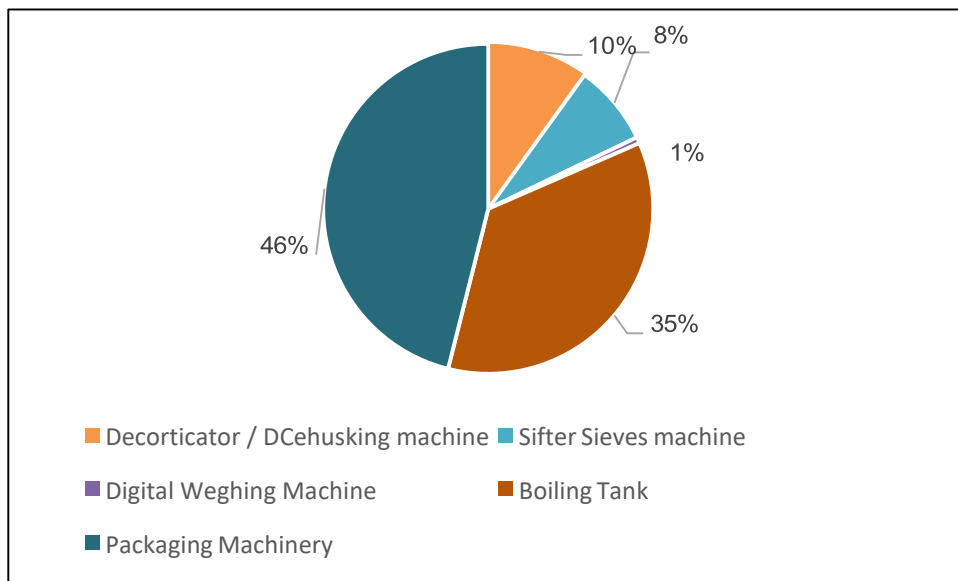
	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Cost	22.31	51.29	62.68	71.24	80.05	89.11	90.09	90.57
Benefit	-	60.60	71.41	82.42	93.65	105.10	106.15	107.21
Discounting Rate	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47
P.V Cost	20.28	42.39	47.09	48.66	49.70	50.30	46.23	42.25
P.V Benefit	-	50.08	53.65	56.30	58.15	59.33	54.47	50.02

Total P.V Cost	346.90
Total P.V Benefit	382.00
Benefit Cost Ratio	1.10

TABLE 15 BREAK EVEN ANALYSIS

PARTICULARS	Year						
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr
Annual Production in Kg	-	30,000	35,000	40,000	45,000	50,000	50,000
Revenue	-	60.60	71.41	82.42	93.65	105.10	106.15
Selling Cost Per Kg	#DIV/0!	202.00	204.02	206.06	208.12	210.20	212.30
Office & General Expenses	-	1.16	1.77	1.94	2.14	2.35	2.59
Depreciation	-	2.94	2.54	2.20	1.90	1.64	1.42
Total Fixed Cost	-	4.10	4.31	4.14	4.04	3.99	4.01
Total Fixed Cost Per Kg	-	13.67	12.30	10.35	8.97	7.99	8.02
Total Variable Cost	-	44.70	53.19	61.39	69.73	78.23	78.23
Variable Cost Per Kg	-	149.00	151.98	153.47	154.96	156.45	156.45
Contribution	-	15.90	18.21	21.04	23.92	26.88	27.93
Contribution per Unit	-	53.00	52.04	52.59	53.16	53.75	55.85
Contribution in %	-	26%	26%	26%	26%	26%	26%
Break Even Point kg	-	0	0	0	0	0	0
Break Even Point Rs	-	3.36	3.56	3.39	3.29	3.25	3.27
Break Even In %	-	25.79	23.64	19.67	16.87	14.86	14.36
Margin Of Safty	-	57.24	67.85	79.03	90.36	101.85	102.88

FIGURE 2
PIA CHART FOR BETTER UNDERSTANDING OF EXPENCES OF EACH HEAD

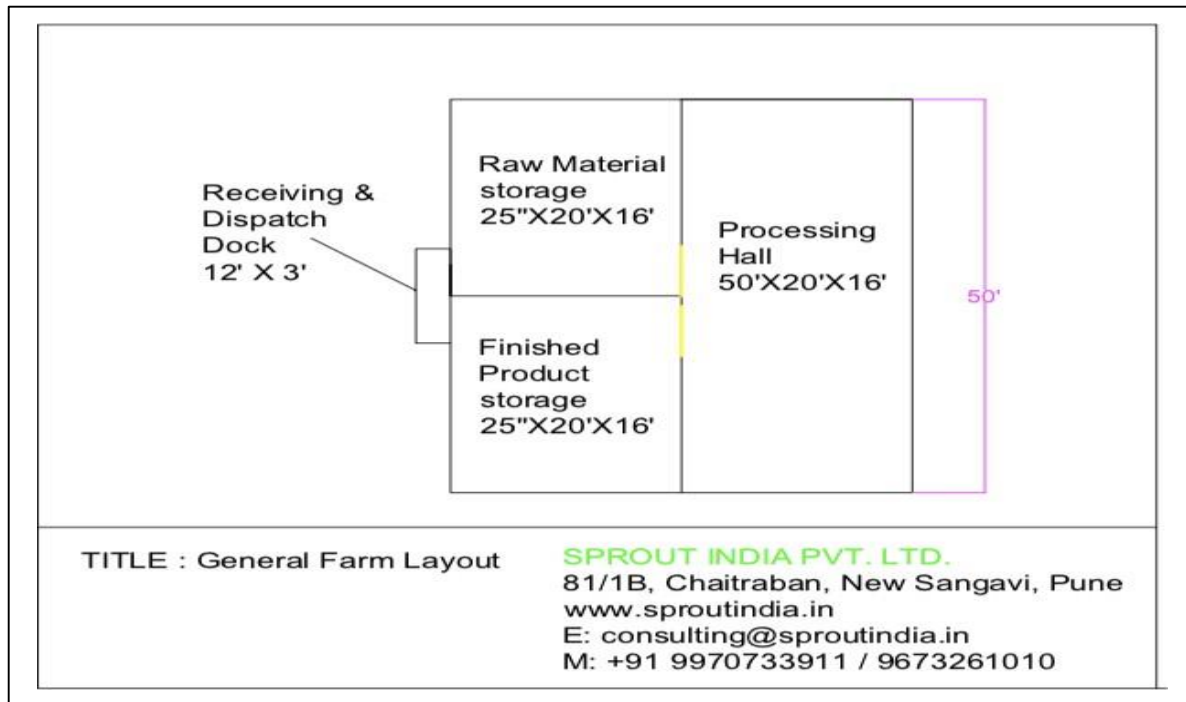


5.3 MACHINERY SAPPLIERS

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

1. Kovai Classic Industries Sowripalayam, Coimbatore , Tamilnadu
2. Unique Manufacturer Atika Industrial Estate, Rajkot
3. Micro Engineering Works, Kanpur Mirpur, Kanpur

FIGURE 3
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 Web: <https://niftem-t.ac.in/>

