



PM Formalisation of Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR KINNOW DRINK



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1 EXECUTIVE SUMMARY

The 'Kinnow' is a high yield mandarin hybrid cultivated extensively in the wider Punjab region of India and Pakistan. It is a hybrid of two citrus cultivars — 'King' (Citrus nobilis) × 'Willow Leaf' (Citrus × deliciosa) — first developed by Howard B. Frost, at the University of California Citrus Experiment Station.

Citrus is originated in South East Asia. It comprises Kinnow, Oranges, Lime and Lemon; these are major fruit crops of Punjab. Kinnow is cultivated throughout North India. In India, Citrus is third largest fruit crop after Banana and Mango. Citrus fruits are important source of Vitamin C. Punjab, Rajasthan, Haryana, Himachal Pradesh, Jammu and Kashmir and Uttar Pradesh are major Kinnow growing states.

Kinnow juice is known to enhance the metabolic rate of the body. A good metabolism means quick weight loss. Also, kinnow juice is so filling, it keeps you full for long and prevents you from overeating or having cravings in between the meals. Drinking kinnow juice has numerous benefits and you must have it daily.

Most of the target export markets of Indian and Pakistani 'Kinnow' are those of developing countries. Only 2.6 percent of Kinnow exports target the markets of developed countries, which is due to the emerging demand for seedless Kinnow by the developed countries. About 61 percent of total world exports of oranges and mandarins are of seedless varieties. Some important export markets for 'Kinnow' are: Iran, Bahrain, United Arab Emirates, Kuwait, Oman, Qatar, Saudi Arabia, Indonesia, Malaysia, Afghanistan, Netherlands, Philippines, Singapore, the United Kingdom, Russia and Vietnam. Indonesia has also offered market access to Kinnow, from Pakistan at zero per cent. Over 40% of the Pakistani exports of Kinnows went to Russia in 2015. Internally, the prices of Kinnow in Pakistan dropped more than 50% between 2016 to 2020.

TABLE 1
PROJECT AT GLANCE

1	Name of the proposed project	Kinnow Juice 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 share holders (if company/FPC)	
8	Technical advisor	
9	Marketing advisor/partners	

10	Proposed project capacity	560 Kg/day (60, 70 & 80% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11	Raw materials	Coconut
12	Major product outputs	Desiccated Coconut
13	Total project cost :	Rs. 31.53 Lakhs
	· Land development, building & civil : construction	Rs. 5.00 Lakhs
	· Machinery and Equipment's : (Lakhs)	Rs. 20.20 Lakhs
	· Utilities (Power & water facilities) : (Lakhs)	Rs. 1 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. 1.53 Lakhs
14	Working capital requirement	
	· 2nd year (Lakhs)	Rs. 3.82 Lakhs
	· 3rd year (Lakhs)	Rs. 4.54 Lakhs
	· 4th year (Lakhs)	Rs. 5.24 Lakhs
15	Means of Finance	
	· Subsidy grant by MoFPI (max 10 lakhs) : :	Rs. 10.00 Lakhs
	· Promoter's contribution (min 20%)	Rs. 6.31 Lakhs
	· Term loan (45%) :	Rs. 15.22 Lakhs
16	Debt-equity ratio	1.29
17	Profit after Depreciation, Interest & Tax	
	· 2nd year (Lakhs)	Rs. 8.31 Lakhs
	· 3rd year (Lakhs)	Rs. 6.45 Lakhs
	· 4th year (Lakhs)	Rs. 8.83 Lakhs
18	Average DSCR	2.18
19	Benefit-Cost Ratio	1.08
20	Term loan repayment	7 Years with 1year grace period
21	Payback period for investment	3 years 6 months

2 OBJECTIVE OF THE PROJECT

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

Some important objectives behind setup of “Kinnow Juice 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

PARTICULARS	DESCRIPTION
Project Name	“SET UP OF KINNOW JUICE PROCESSING UNIT”
Project Location	
Project Area	5000 Sq Ft
Project Proposed Economic Activities	Setup of Kinnow Juice Processing Unit
Project Capacity/Annum	Kinnow Juice Processing Unit ✓ 560 kg / Day Capacity

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

4.1 INTRODUCTION

India ranks second for fruits and vegetables producer in the world followed by China. India, during 2017-18 has produced about 97358 thousand MT fruits and 184394 thousand MT vegetables in about 6506 Thousand Ha and 10259 Thousand Ha respectively (Horticulture statistics At a glance, 2018, MoA & FW Gol). In spite of this, the per capita availability of fruit in India is 107 gm/day which is below the recommended 120 gm/day. India's share of global exports of fresh fruits and processed fruit products is also quite meager compared to other major fruit producers of the world (Bung, 2012). Unfortunately, fruits and vegetables being perishable in nature get wasted to the tune of 20-30 % in the supply chain due to improper handling, transportation and poor post-harvest management; and only 2 % of them are processed in to value added products and the rest is consumed fresh. In India, citrus fruits rank third in production.

Sweet orange/Kinnow (*Citrus sinensis* L.) is one of the most important subtropical fruits of India and belongs to the family Rutaceae. It is widely consumed fruit JUICE by normal as well as sick people and is well known for its instant energy, pectins, vitamin C and potassium content. Kinnow juice is refreshing after any hectic activity or on a dry, hot day to quench thirst.

4.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF KINNOW

Citrus plants are native to subtropical and tropical regions of Asia and the Malay Archipelago and they were first domesticated in these areas. Some citrus species have been present in the Mediterranean basin for centuries. This group of species has reached great importance in some of the Mediterranean countries and, in the case of orange, mandarin and lemon trees, they found here soil and climatic conditions which allows them to achieve a high level of fruit quality, even better than in the regions where they came from.

Commercially, Kinnow mandarin is grown in Punjab, Haryana, Himachal Pradesh, northwest part of Rajasthan and Uttar Pradesh; Khasi mandarin in north eastern region; Darjeeling mandarin in Darjeeling; Nagpur mandarin in Vidarbha region of Maharashtra and adjoining areas of Madhya Pradesh; Coorg mandarin in Coorg area of Karnataka. The states of NEH region, M.P., Maharashtra, Karnataka and Punjab together contribute more than 90% towards total production of mandarins. The indigenous species are commonly grown in homesteads and introduced species/cultivars, which have adapted in different geographical regions are the basis of commercial plantations.

TABLE 3
STATE WISE PRODUCTION & PRODUCTIVITY OF KINNOW

Sr. No	States	AREA (In HA)	Production (MT)	Productivity (T/ha)
2	Madhya Pradesh	63.76	1093.47	17.30
3	Panjab	49.36	1036	20.70
4	Maharashtra	106.90	768.99	6.45
5	Rajasthan	12.48	267.37	18
6	Assam	17.36	231.64	10.20
7	Arunachal Pradesh	38.52	194.68	5.11
8	Karnataka	4.05	93.33	21.90
9	Nagaland	6.31	53.28	8.80
10	Meghalaya	8.96	4369	5.38
11	Manipur	4.82	42.42	8.50

4.3 HEALTH BENEFITS AND NUTRITIONAL IMPORTANCE

- Regulate blood pressure
- Prevent cancer
- Helps in blood circulation
- Balance cholesterol
- Helps for glowing skin
- Helps in weight loss

**TABLE 4 NUTRITIONAL COMPOSITION OF KINNOW
JUICE PER 100 ML**

Sr.No	Nutrient	Amount
1	Energy	42 Kcal
2	Carbohydrate	0.7 mg
3	Potassium	176 mg
4	Hesperidin	52 mg
5	Fiber	33.4 mg
6	Sugar	9 g
7	Vitamin C	45 mg

4.4 CULTIVATION, BEARING AND POST-HARVEST MANAGERMENTS

Citrus fruits in India are cultivated under varied agro-ecological conditions right from arid and semiarid areas of southwest region to humid tropical climate of northeast India. Citrus trees are evergreen, grown in truly subtropical climates of the world although in tropical regions of the world they tend to produce cyclic growth flushes and hence regulating cropping in tropical areas for forcing them into concentrated bloom needs judicious management of water deficit stress according to soil type and growing season. Citrus fruits grow best between a temperature range of 13°C to 37°C. Temperatures below – 4°C are harmful for the young plants. Soil temperature around 25°C seems

to be optimum for root growth. High humidity favours spread of many diseases. Frost is highly injurious. Hot wind during summer results in desiccation and drop of flowers and developing fruits. Barring these limitations citrus is grown in all subtropical and tropical areas of the world. The subtropical climate is best suited for citrus growth and development. Khasi and Darjeeling mandarins are grown in high altitudes upto 2000 m as it is adapted to a cooler climate.

Citrus plants are grown in a wide range of soils ranging from sandy loam or alluvial soils of north India to clay loam or deep clay loam or lateritic/acidic soils in the Deccan plateau and north-eastern hills. Citrus orchards flourish well in light soils with good drainage properties. Deep soils with pH range of 5.5 to 7.5 are considered ideal. However, they can also be grown in a pH range of 4.0 to 9.0. High calcium carbonate concentration in feeder root zone may adversely affect the growth.

The 'Kinnow' mandarin cultivar is a strong alternate bearer and this phenomenon may influence the nutrient content and the trees nutrient consumption in an alternating cycle similar to other fruit tree species, such as pistachio (Baninasab et al., 2007; Brown et al., 1995; Vemmos, 1999) and olive (Fernandez-Escobar et al., 1999).

Post-Harvest Management: -

On attaining proper size, shape along with attractive color having TSS to Acid ratio of 12:1, kinnow fruits is ready for harvest. Depending upon variety fruits are generally ready for harvesting in Mid-January to Mid- February. Do harvesting at proper time as too early or too late harvesting will give poor quality. After harvesting, wash fruits with clean water then dip fruits in Chlorinated water@2.5 ml per litre water and then partially dried them. To improve appearance along with to maintain good quality, do Citra Shine wax coating along with foam. Then these fruits are dried under shade and then packing is done. Fruits are packed in boxes.

Postharvest handling techniques for Kinnow fruits such as maturity indices, harvesting, grade specification and various packaging materials were studied during the past decade in the Department of Horticulture, Punjab Agriculture University. Brix°-acid ratio is the good index for judging maturity. The fruits from the periphery should be picked by mid-January when they attain Brix°-acid ratio of 12:1 whereas the fruits from the interior of the tree can be harvest when attaining 14:1 Brix°-acid ratio. Fruit stalk should be cut as short as possible, otherwise it will puncture the other fruits in the pack and become a source of infection. Kinnow fruits can be conveniently graded into 4 grades i.e. extra-large, large, medium and A grade. Large and medium grades had higher juice percentage, Brix° and acidity. Among the various packages tried, wooden crate had the lowest losses and also maintained desirable quality of the fruits.

4.5 PROCESSING AND VALUE ADDITION IN INDIA

Significant amount of pre-harvest losses, limited shelf life at ambient condition, poor postharvest management practices urged the farmers to explore various aspects of kinnow processing. Appropriate processing may help in minimizing the market glut and also extend its availability period. The desired characteristics for processing of kinnow include, fruit being slightly soft to firm, deep orange to red in colour, smooth-skinned with no deep grooves. From the processing perspective, the fruit is mainly processed in the form of juice related products like squash, nectar, ready to serve (RTS), fermented products, juice powder, etc. (Figure 3a). Such types of citrus beverages are

possibly the most high-flying and unanimously recognized fruit drinks (Alam et al. 2019). Significant population around the globe prefers haze-less and sweet taste of the citrus juices. However, it is well-established fact that kinnow juice undergoes the process of delayed bitterness due to the existence and activation of bitter flavanone molecules during processing. This has significantly affected its consumer acceptability and processing on commercial scale. Therefore to overcome this hindrance, debittering of juice by various approaches as well as blending with suitable fruit/vegetable juices for making nutritive RTS beverages was considered as a convenient and economical alternative for effective utilization (Bhardwaj and Mukherjee 2011). Detailed narration about the prospects of juice bitterness and the efforts executed to reduce bitterness are briefly explained in the following section.

Fruit beverages and drinks are one of the popular categories of beverages that are consumed across the globe. The fruit beverages and drinks are easily digestible, highly refreshing, thirst quenching, appetizing and nutritionally far superior to most of the synthetic and aerated drinks. In recent past the consumption of fruit based beverages and drinks has increased at a fast rate. Fruit Beverages or pulp used for the preparation of these products are subjected to minimal processing operations like filtration, clarification and pasteurization. The fruit Beverages or pulp, are mixed with ingredients like sugar, acid, stabilizers, micronutrients and preservative to develop beverages and drinks.

5 MODEL KINNOW JUICE 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 KINNOW JUICE PROCESSING PLANT

The maximum installed capacity of the manufacturing unit in the present model project is proposed as 168 tons/annum or 560 kg/day Kinnow Juice. 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

Kinnow Juice

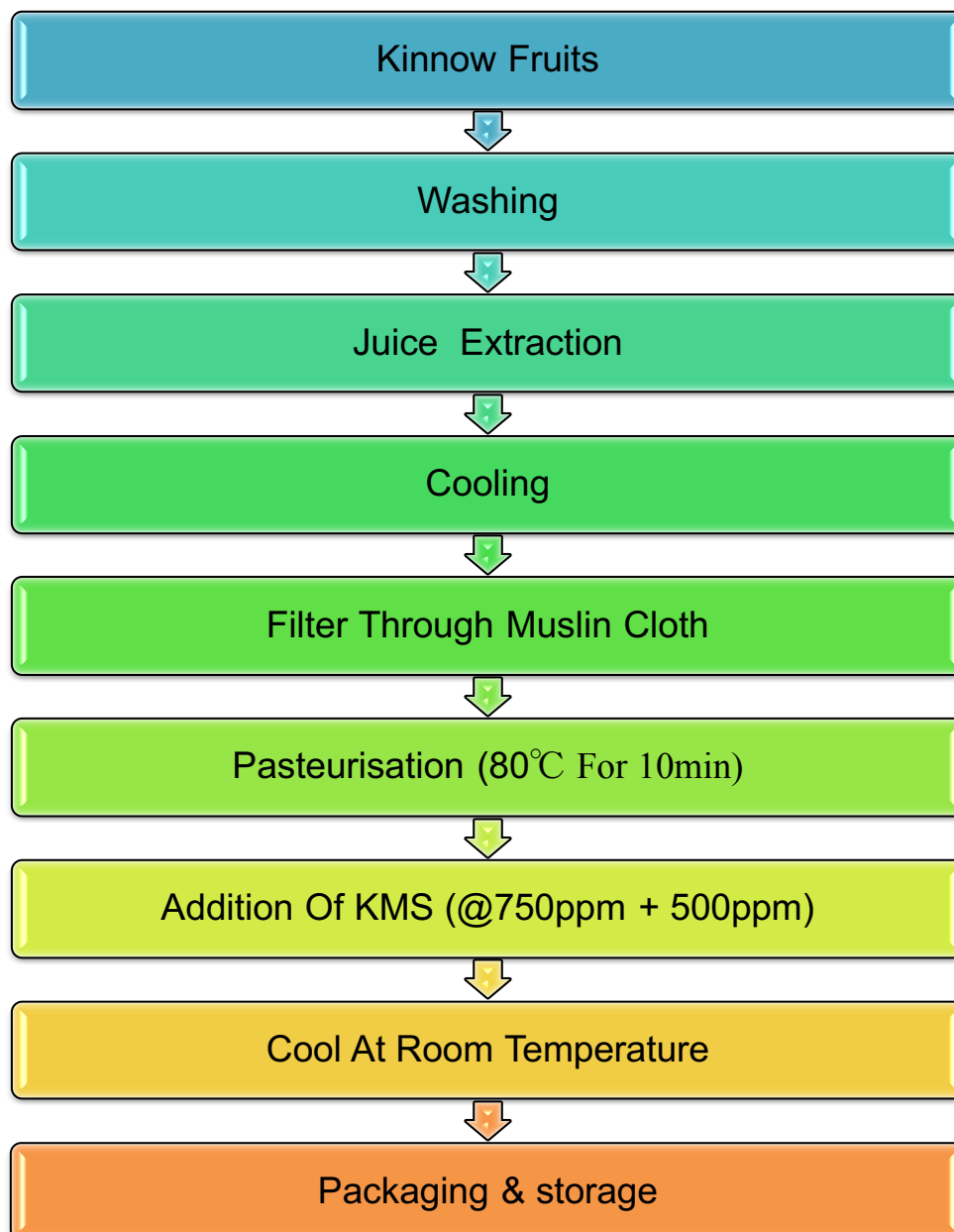
Juice products represent a very important segment of the total processed fruit industry. Juice are being marketed as refrigerated, shelf-stable, and frozen, in a variety of packages with increased emphasis on functionality, health attributes, new flavours or blends, and in some cases fortified with vitamins and minerals. High-quality Juice operations are dependent upon a source of high-quality raw material. Most fruit Juices are excellent sources of vitamin C, several are good sources of carotene and many contain moderate amounts of pyridoxine, inositol, folic acid and biotin. Fruit juice is regarded as source of energy due to their rich carbohydrate content. The organic acids present in the fruit JUICE plays a significant role in the maintenance of the acid-base balance in the body.

The process juice with sound fruit, freshly harvested from the field or taken from refrigerated or frozen storage. Thorough washing is usually necessary to remove dirt and foreign objects and may be followed by a sanitation step to decrease the load of contaminants. Sorting to remove decayed and mold contaminated fruit is necessary to make sure that the final Juice will not have a high microbial load, undesirable flavours, or mycotoxin contamination. For most fruits, preparation steps such as pitting and grinding is required prior to Juice extraction. Heating and addition of enzymes

might also be included before the mash is transferred to the extraction stage. Juice extraction can be performed by pressing or by enzymatic treatment followed by decanting. The extracted Juice will then be treated according to the characteristics of the final product. For clear Juices, complete depectinization by addition of enzymes, fine filtration, or high speed centrifugation is required to achieve visual clarity. The next step is usually a heat treatment or equivalent non-thermal process to achieve a safe and stable Juice and final packaging if single-strength Juice is being produced.

For a concentrate, the Juice is fed to an evaporator to remove water until the desired concentration level is obtained. Other processes used for water removal include reverse osmosis and freeze concentration, which are best suited for heat-sensitive Juices. The concentrate is then ready for final processing, packaging, and storage.

FIGURE 1 KINNOW JUICE PROCOESS FLOWCHART



5.5 MAEKRT DEMAND AND SUPPLY FOR KINNOW JUICE

In India, traditional cuisine includes drinks, which were primarily developed to provide aesthetic appeal, but they also contained certain components having nutritional and therapeutic values as well. However, with course of time these traditional health drinks diminished. According to an estimate Indian consumers drink 120 billion litre of marketed beverages out of which only 4 percent is ready-to-drink packaged once. The current value of Indian beverage industry is around 1,049 million US\$. In fact the soft drinks form the third-largest packaged food sector after packaged tea and packaged biscuits. However, the penetration of soft drinks in Indian market is still low. For a long period the Indian beverage industry was dominated by aerated synthetic drinks. However, the situation has changed dramatically, the aerated soft drinks, which had registered a whopping 20% growth during late 90's, could manage its present share in market against possible slide. In contrary to this last few years have witnessed a significant development in fruit based beverages newly introduced fruit beverages fall into the category of functional foods or nutraceuticals. Fruit beverages have gained popularity in recent years. The market size for the bottled water in India had an estimated value of US\$ 570 million in 2008. With annual growth rate of 14.5 percent, the market of bottled water is expected to increase rapidly in coming years. Future of Indian beverage market is quite promising and sectors that may attract processors and consumers alike include the functional dairy drinks, fruit beverages and wine. Advancement in processing and packaging technology in the form of UHT/Aseptic processes and tetra pack packaging offers newer opportunity to deliver nutritious beverages in log-life version.

5.6 MARKETING STRATEGY FOR KINNOW PRODUCTS

The increasing urbanization and income offers huge scope for marketing of Kinnow 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 Kinnow Juice 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 Fruit processing unit by adding Kinnow Juice 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 5
PROJECT DETAILS

Detailed Project Assumptions		
Sr.No	Parameter	Value
1	Capacity of the processing unit	700Kg/Day Kinnow fruit

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	Rs. 20/Kg.
8	Average sale prices (Rs.)	Rs. 70/Kg
9	Recovery rate	80%

TABLE 6
FIXED CAPITAL INVESTMENT

Sr. No.	Particulars	Size/ Dimensions / Specification	Quantity (No)	Total Area (Sq ft)	Unit Cost (Rs)	Amount (Rs)	Amount (Lakh)
A	Capital Investment		1 Plot			5,00,000	5.00
	Capital Investment					5,00,000	5.00
B	Machinery & Equipment's						
1	Cold Storage	1500 Kg Capacity	1		410000	4,10,000	4.10
2	Fruit Washer	100 kg/hr	1		150000	1,50,000	1.50
3	Peeling Machine	100 kg/hr	1		1,00,000	1,00,000	1.00
4	Juice Extractor	100 kg/hr	1		150000	1,50,000	1.50
5	Pasteurizer	100 kg/hr	1		200000	2,00,000	2.00
5	Homogenizer	100 kg/hr	1		250000	2,50,000	2.50
6	Packaging Machinery	2000 pack/hr	1		650000	6,50,000	6.50
7	Sugar Syrup Tank	100 lit/hr	1		1,00,000	1,00,000	1.00
8	Miscellaneous		1		10000	10,000	0.10
	Machinery & Equipment's					20,20,000	20.20
C	Other Costs						
C1	Utilities & Fittings						
1	Water					1,00,000	1.00
2	Power						
	Total					1,00,000	1.00
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	Plastic Tray Capacity						
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)					4,80,000	4.80
II	Total Cost					30,00,000	30.00

TABLE 7
WORKING CAPITAL REQUIRMENTS

Sr. No.	Description	Quantity	Unit Rate/ Kg	Total Cost (Rs) /Day	Total Cost (Rs) / Month	Total Cost (Rs) / Year
1	Kinnow	700	20	14,000	3.50	35.00
2	Citric Acid	1	750	750	0.19	1.88
3	preservatives	2	301	602	0.15	1.51
4	Sugar	250	35	8,750	2.19	21.88
5	Packaging Material (1 kg)	500	1.5	750	0.19	1.88
3	Labour	12	300/day	3,600	0.90	9.00
4	Supervisor / Manager	1	500/ day	600.00	0.15	1.50
5	Electricity			600	0.15	1.50
6	Transportation			500	0.13	1.25
7	Miscellaneous			400.00	0.10	1.00
	Total Cost			30,552.00	7.64	76.38
	Margin For Working Capital 20%			0.06	1.53	15

TABLE 8
TOTAL PROJECT COST

Sr. No.	Particulars	Amount In Lakhs
i	Land Development & Building Structure	5.00
ii	Plant & Machinery	20.20
iii	Other Fixed Assets	2.80
iv	Working Capital Margin	1.53
v	Contingency	2.00
vi	Total Project Cost	31.53

TABLE 9
MEANS OF FINANCE

Sr. No.	Particulars	Amount In Lakhs
i	Subsidy	10.00
ii	Promoters Contribution	6.31
iii	Term Loan	15.22
	Total Means of Finance (1 to 3)	31.53

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
A. INCOME						
Sales of Kinnow Juice	-	59.39	69.98	80.78	91.78	103.00
Total	-	59.39	69.98	80.78	91.78	103.00
B. EXPENSES						
Raw Material	-	21.00	24.99	28.84	32.76	36.75
Consumables	-	15.15	15.62	18.03	20.48	22.97
Packing cost	-	1.13	1.34	1.55	1.76	1.97
Transportation cost	-	0.75	0.89	1.03	1.17	1.31
Direct employee cost	-	6.30	7.50	8.65	9.83	11.03

Depreciation	-	4.01	3.46	2.98	2.58	2.22
Office Rent						
Plant Electricity Cost	-	0.90	1.07	1.24	1.40	1.58
Miscellaneous	-	0.60	0.71	0.82	0.94	1.05
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	-	52.50	61.35	69.43	77.78	86.38
Add :- Opening Stock		-	5.30	6.27	7.23	8.22
Less :- Closing Stock	-	5.30	6.27	7.23	8.22	9.22
Cost of Sales	-	47.20	60.38	68.46	76.79	85.38
GROSS PROFIT	-	12.19	9.60	12.31	14.99	17.62
	-	20.52%	13.72%	15.24%	16.33%	17.11%
FINANCE EXPENSES						
Interest on Term Loan	2.05	1.89	1.60	1.30	1.01	0.72
Interest On CC		0.29	0.29	0.29	0.29	0.29
Total Interest	2.05	2.18	1.89	1.59	1.30	1.01
PROFIT BEFORE TAX	-2.05	10.01	7.72	10.72	13.69	16.61
INCOME TAX (30%)	-0.41	2.00	1.54	2.14	2.74	3.32

PROFIT AFTER TAX	-1.64	8.01	6.17	8.58	10.95	13.29
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TABLE 11
REPAYMENT SCHEDULE

Ye ar	Outstan ding loan at start of yr.	Disbur se- ment	Total outstan ding Loan	Surplu s for repaym ent	Intere st paym ent	Repay ment of princip al	Tot al out go	o/s Loan at the end of the yr.	Balan ce left
1	- 0.00	15.22	15.22	0.07	1.83	0	1.83	15.22	-1.76
2	15.22		15.22	1.14	1.69	2.17	3.86	13.05	-2.72
3	13.05		13.05	3.43	1.42	2.17	3.60	10.87	-0.17
4	10.87		10.87	5.32	1.16	2.17	3.34	8.70	1.98
5	8.70		8.70	7.40	0.90	2.17	3.08	6.52	4.32
6	6.52		6.52	9.19	0.64	2.17	2.82	4.35	6.38
7	4.35		4.35	9.69	0.38	2.17	2.56	2.17	7.14
8	2.17		2.17	10.08	0.12	2.17	2.29	-	7.79

TABLE 12
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.		5.00	4.50	4.05	3.65	3.28	2.95	2.66
Additions	5.00							
Less :- Depreciation @ 10%		0.50	0.45	0.41	0.36	0.33	0.30	0.27

Closing Bal.	5.00	4.50	4.05	3.65	3.28	2.95	2.66	2.39
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Plant & Machinery								
Opening Bal.		20.20	17.17	14.59	12.41	10.54	8.96	7.62
Additions	20.20							
Less :- Depreciation @ 15%		3.03	2.58	2.19	1.86	1.58	1.34	1.14
Closing Bal.	20.20	17.17	14.59	12.41	10.54	8.96	7.62	6.48
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Other Required Material & Accessories								
Opening Bal.		4.80	4.32	3.89	3.50	3.15	2.83	2.55
Additions	4.80							
Less :- Depreciation @ 10%		0.48	0.43	0.39	0.35	0.31	0.28	0.15
Closing Bal.	4.80	4.32	3.89	3.50	3.15	2.83	2.55	2.40
TOTAL DEPRECIATION	-							
PARTICULARS	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Land & Building Structure	-	0.50	0.45	0.41	0.36	0.33	0.30	0.27
Plant & Machinery	-	3.03	2.58	2.19	1.86	1.58	1.34	1.14

-	-							
Other Required Material & Accessories	-	0.48	0.43	0.39	0.35	0.31	0.28	0.15
TOTAL DEPRECIATION	-	4.01	3.46	2.98	2.58	2.22	1.92	1.56

TABLE 13
FINANCIAL ASSESSMENT OF PROJECT

	YEAR							
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
Cost	30.00	52.50	61.35	69.43	77.78	86.38	87.28	87.69
Benefit	-	59.39	69.98	80.78	91.78	103.00	104.03	105.07
Discounting Rate	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47
P.V Cost	27.27	43.39	46.09	47.42	48.29	48.76	44.79	40.91
P.V Benefit	-	49.08	52.58	55.17	56.99	58.14	53.38	49.02

Total P.V Cost	346.92
Total P.V Benefit	374.36
Benefit Cost Ratio	1.08

TABLE 14
BREAK EVEN ANALYSIS

PARTICULARS	Year						
	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr
Annual Production in Kg	-	84,000	98,000	1,12,000	1,26,000	1,40,000	1,40,000
Revenue	-	59.39	69.98	80.78	91.78	103.00	104.03
Selling Cost Per Kg	-	70.70	71.41	72.12	72.84	73.57	74.31

Office & General Expenses	-	1.16	1.77	1.94	2.14	2.35	2.59
Depreciation	-	4.01	3.46	2.98	2.58	2.22	1.92
Total Fixed Cost	-	5.17	5.22	4.93	4.71	4.58	4.51
Total Fixed Cost Per Kg	-	6.15	5.33	4.40	3.74	3.27	3.22
Total Variable Cost	-	44.33	50.34	58.09	65.99	74.03	74.03
Variable Cost Per Kg	-	52.77	51.36	51.87	52.37	52.88	52.88
Contribution	-	15.06	19.64	22.68	25.79	28.97	30.00
Contribution per Unit	-	17.93	20.04	20.25	20.47	20.70	21.43
Contribution in %	-	25%	28%	28%	28%	28%	29%
Break Even Point kg	-	0	0	0	0	0	0
Break Even Point Rs	-	4.42	4.50	4.21	3.99	3.86	3.80
Break Even In %	-	34.33	26.59	21.71	18.27	15.79	15.03
Margin Of Safty	-	54.96	65.47	76.57	87.79	99.14	100.23

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

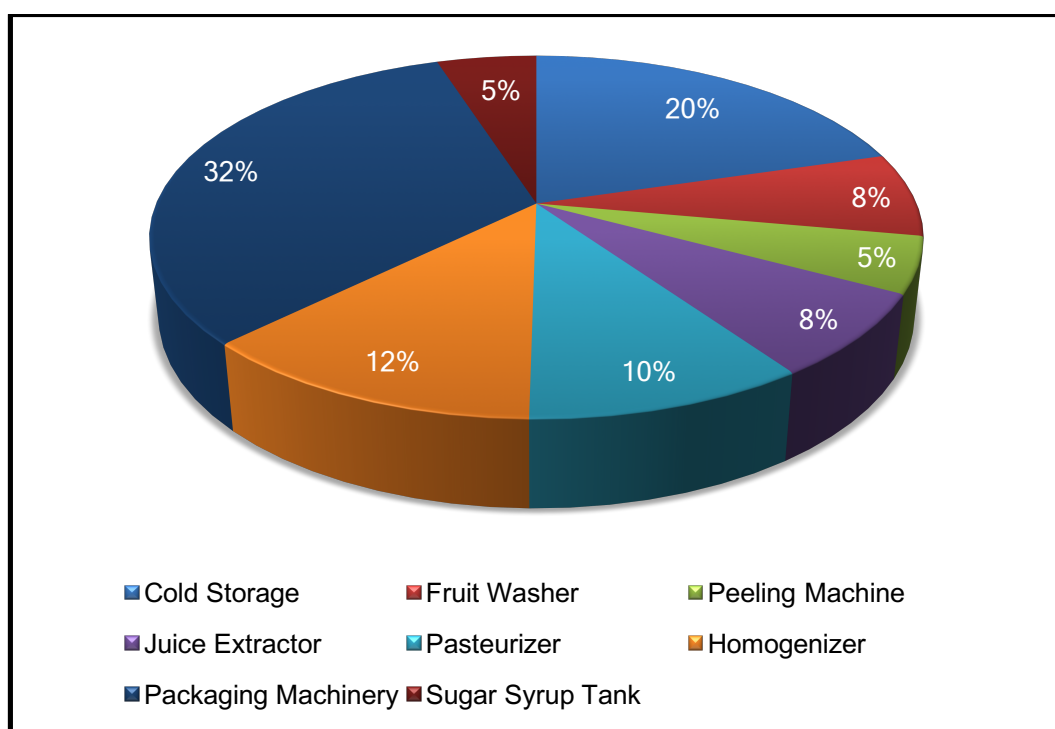
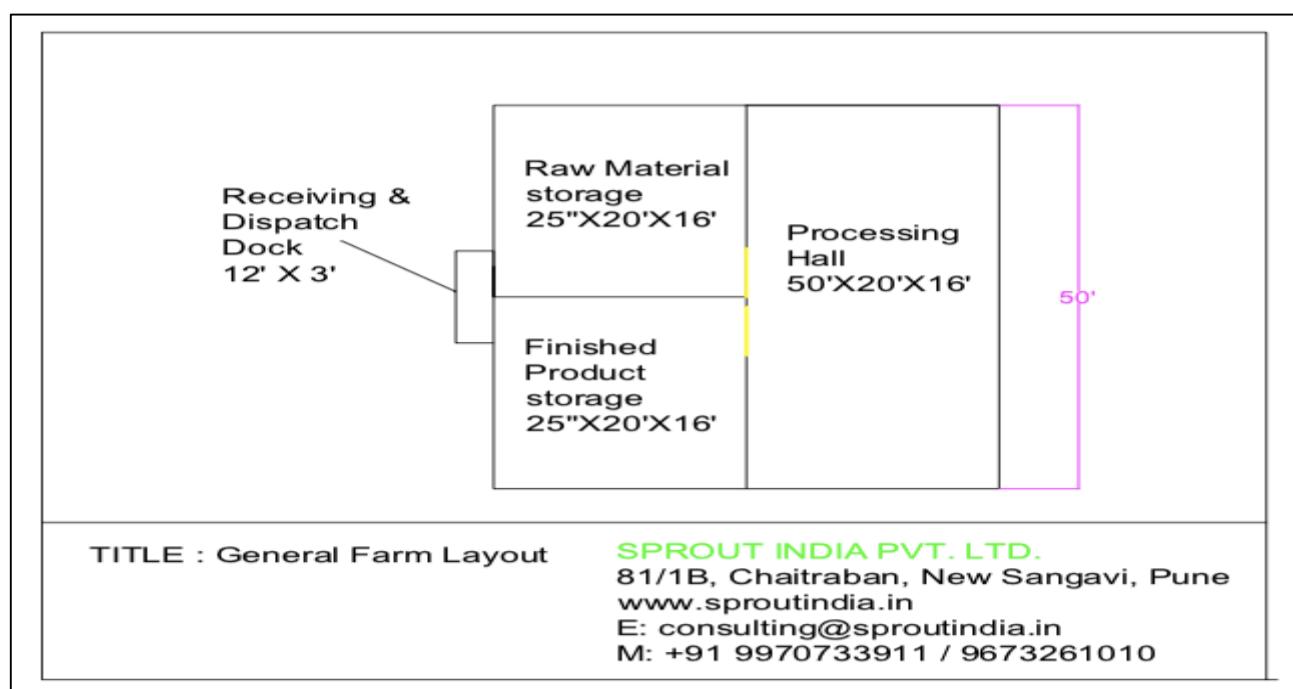


FIGURE 3
PLANT LAYOUT



5.8 MACHINERY SUPPLIERS

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

- Stellar Food Tech. Pune, Maharashtra, India
- Proveg Engineering & Food Processing Private Limited Near Swad Kolhapur Restaurant, Chikhli, Pune
- Lithotech Food & Spice Machinery Vasai East, Mumbai
- Varahi Industries GIDC Vatwa, Ahmedabad
- Srinidhi Industries .Bommasandra, Bengaluru

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 ENTREPRENEURS

- 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.



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