MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

PMFME
सूक्ष्म उद्यमों का संबल

NIFTEM
THANJAVUR

PM Formalisation of
Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT
FOR
GUAVA JUICE

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

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1. The Project at a Glance

1. Name of the proposed project	:	Guava RTS Beverage Unit
2. Name of the entrepreneur/FPO/SHG/Cooperative	:	
3. Nature of proposed project	:	Proprietorship/Company/Partnership
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	:	100 MT/annum (70, 80 & 90% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11. Raw materials	:	Guava fruits
12. Major product outputs	:	Guava RTS beverage (25% pulp)
13. Total project cost	:	Rs. 30 Lakhs
• *Land development, building & civil construction*	:	*Rs. 2.00 Lakhs (only for expansion of existing built-up area)*
• *Machinery and equipments*	:	*Rs. 18 Lakhs*
• *Utilities (Power & water facilities)*	:	*Rs. 2 Lakhs*
• *Miscellaneous fixed assets*	:	*Rs. 1 Lakh*
• *Pre-operative expenses*	:	*Rs. 0.23Lakhs*
• *Contingencies*	:	*Rs. 0.50 Lakhs*
• *Working capital margin*	:	*Rs. 6.27 Lakhs*
14. Working capital requirement		
• *2nd year*		*Rs. 18.80 Lakhs*
• *3rd year*		*Rs. 21.48 Lakhs*
• *4th year*		*Rs. 24.17 Lakhs*
15. Means of Finance		
• *Subsidy grant by MoFPI (max 10 lakhs)*	:	*Rs. 10.00 Lakhs*
• *Promoter's contribution (min 20%)*	:	*Rs. 6.00 Lakhs*
• *Term loan (45%)*	:	*Rs. 14.00 Lakhs*
16. Debt-equity ratio	:	2.33:1
17. Profit after Depreciation, Interest & Tax		
• *2nd year*	:	*Rs. 54.20 Lakhs*
• *3rd year*	:	*Rs. 63.93 Lakhs*
• *4th year*	:	*Rs. 73.64 Lakhs*
18. Average DSCR	:	21.94
19. Benefit-Cost Ratio	:	2.09
20. Term loan repayment	:	7 Years with 1 year grace period
21. Payback period for investment	:	2 Years

2. General Overview of Guava Production, Clusters, Post Harvest Management and Value Addition in India

2.1. Introduction

India is known as the second largest 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 areas, respectively (Horticultural Statistics At a Glance, 2018, MoA&FW, GoI). 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 with 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 per cent in the supply chain due to improper handling, transportation and poor post harvest management; and only 2 per cent are processed in to value added products and the rest is consumed as fresh. Therefore, processing of fruits and vegetables offers immense scope for wastage minimization and value addition; thus can generate significant income and employment in Indian agrarian economy. In India, guava is one of the important fruit crops cultivated in tropical and sub-tropical areas and has huge potential for value addition and entrepreneurship development. Guava is the fourth important crop after mango, banana and citrus. In India, 20-25% of guava fruits are spoiled due to improper handling, transportation and processing (Nida et al., 2016) and therefore, processing and value addition is extremely needed.

2.2. Origin, Distribution and Production of Guava

Guava (*Psidium guajava)* is originated from an extended area of Mexico, Central America or North-South America throughout the Caribbean region. Guava is cultivated in many tropical and subtropical countries across Asia, the southern United States, tropical Africa, South Asia, Southeast Asia, and Oceania. India with the production 4054 Thousand MT Guava in about 265 Thousand Ha areas during 2017-18 (Horticultural Statistics At a Glance, 2018, MoA&FW, GoI) had occupied the first position in the world (41% of the World's production). Its adaptability to varied environments makes it one of the favorite commercial crops.

2.3. State-wise Guava Production, Area and Clusters in India

In India (Table 1), the ten major Guava producing states during 2017-18 (Horticultural Statistics At a Glance, 2018, MoA&FW, GoI) were Uttar Pradesh (928.44 Thousand MT), Madhya Pradesh (686.70 Thousand MT), Bihar (427.61 Thousand MT), Andhra Pradesh (229.78 Thousand MT), West Bengal (215.20 Thousand MT), Chhatisgarh (197.18 Thousand MT), Punjab (195.60 Thousand MT), Gujarat (169.57 Thousand MT), Tamil Nadu (155.06 Thousand MT) and Karnataka (140.23 Thousand MT). The major growing clusters in these states are given

Table 1: State-wise Area and Production of Guava in India (Area in '000 Ha, Production in '000 MT)

Sl.	States/UTs	2015-16		2016-17		2017-18	
		Area	**Prod.**	**Area**	**Prod.**	**Area**	**Prod.**
1	Andhra Pradesh	6.04	109.03	7.43	288.02	9.53	229.78
2	Arunachal Pradesh	0.46	0.65	0.13	0.27	0.12	0.22
3	Assam	4.36	95.62	4.38	96.14	4.43	96.69
4	Bihar	29.34	370.00	29.38	370.37	27.61	427.61
5	Chhatisgarh	20.63	179.59	20.30	180.21	21.89	197.18
6	Gujarat	11.64	153.0	12.09	160.81	12.67	169.57
7	Haryana	11.21	152.18	11.73	163.22	12.09	137.02
8	Himachal Pradesh	2.27	2.61	2.29	2.66	2.32	2.61
9	Jammu & Kashmir	2.46	8.65	2.48	9.15	2.34	7.77
10	Jharkhan	8.10	80.05	8.17	88.84	8.32	89.31
11	Karnataka	6.61	128.11	6.87	134.31	7.18	140.23
12	Kerala	0.22	1.37	0.43	0.62	0.16	1.42
13	Madhya Pradesh	28.44	990.00	32.07	613.05	35.08	686.70
14	Maharashtra	11.74	130.71	11.12	124.31	9.07	122.83
15	Mizoram	0.43	2.47	0.42	2.55	0.42	2.55
16	Nagaland	0.53	4.29	0.58	4.74	0.58	4.75
17	Odisha	14.21	103.79	14.22	104.00	14.27	105.04
18	Punjab	8.12	182.27	8.10	182.09	8.69	195.60
19	Rajasthan	3.85	41.35	4.17	27.18	4.33	55.13
20	Sikkim	1.22	0.12	1.29	0.13	1.21	17.60
21	Tamil Nadu	9.00	71.97	10.79	105.43	9.69	155.06
22	Telengana	5.38	101.11	2.23	13.86	2.56	38.74
23	Tripura	1.01	5.08	0.88	4.56	0.70	3.40
24	Uttar Pradesh	48.70	914.36	49.28	926.25	49.53	928.44
25	Uttarakhand	3.37	19.09	3.43	19.34	3.62	20.37
26	West Bengal	15.37	198.79	15.67	202.95	16.25	215.20
	Others States	0.17	1.50	0.14	1.35	0.20	2.73
	Total	**254.87**	**4047.79**	**260.07**	**3826.40**	**264.85**	**4053.51**

Source: Horticultural Statistics At a Glance, 2018, MoA&FW, GoI

Table 2: Major Guava Clusters in Important Guava Growing States in India	
State	**Guava Production Clusters**
Uttar Pradesh	Allahabad, Farukhabad, Aligarh, Badaun
Madhya Pradesh	Jabalpur, Ujjain, Hoshangabad, Khargone, Badwani, Indore, Shivpuri
Bihar	Mujaffarpur, Begusarai, Katihar, Siwan, Madhubani, Kishanganj, Purnia
Andhra Pradesh	East Godavari, West Godavari, Guntur, Krishna, Ananthapur, Medak, Ranga Reddy, Mahaboob nagar, Prakasham, Khammam
West Bengal	South 24 Parganas, North 24 Parganas, Hooghly
Chhatisgarh	Raipur, Durg
Punjab	Ludhiana, Gurudaspur, Amritsar, Taran Taran, Jalandhar
Gujarat	Bhavnagar, Ahmedabad
Tamil Nadu	Madurai, Dindigul, Salem
Karnataka	Kolar, Shimoga, Dharwar, Raichur, Bangalore (R & U), Belgaum
Source: http://nhb.gov.in	

in table 2. The guava production clusters in these important states therefore, possess good scope for development of processing and value addition units.

2.4. Guava Varieties

State-wise important guava varieties grown are given in the table 3 below:

Table 3: Guava Varieties in Producing Major States	
State	**Guava Varieties**
Uttar Pradesh	L-49, Allahabad Safeda, Lucknow Safeda, Apple Colour, Chittidar, Red Fleshed, Allahabad Surkha, Sardar, Mirzapuri Seedless, CISH-G-1, CISH-G-2, CISH-G-3
Madhya Pradesh	L-49, Allahabad safeda, Gwalior-27, Hafshi, Seedless Chittidar
Bihar	Allahabad Safeda, Apple Colour, Chittidar, Hafshi, Harijha, Sardar, Selection-8
Andhra Pradesh	Allahabad safeda, Lucknow 49, Anakapalli, Banarasi, Chittidar, Hafshi, Sardar, Smooth Green, Safed Jam, Arka Mridula
West Bengal	L-49, Allahabad Safeda, Dudhe Khaja, Gole Khaja, Kabli, Baruipur, Chittidar, Harijha, Sardar
Chhatisgarh	L-49, Allahabad safeda, Lucknow Safeda,
Punjab	Allahabad safeda, L-49, Seedless Chittidar
Gujarat	Nagpur seedless, Dharwar, Dholka, Kothrud, L-24, L-49, Nasik, Sindh
Tamil Nadu	Anakapalli, Banarasi, Bangalore, Chittidar, Hafshi, Nagpur Seedless, Smooth Green
Karnataka	Allahabad Safeda, L-49, Araka Mridula, Araka Amulya, Bangalore, Dharwar
Source: http://nhb.gov.in	

2.5. Health Benefits and Nutritional Value of Guava

Guava is low in calories and fats but has several vital vitamins, minerals, and antioxidant polyphenolic and flavonoid compounds (Table 4) that play a pivotal role to prevent cancers, aging, infections etc. It is very rich source of soluble dietary fiber and antioxidant Vitamin-C. The fruit is a very good source of Vitamin-A, and flavonoids like beta-carotene, lycopene, lutein and cryptoxanthin that are known to have antioxidant properties. Higher potassium in guava is important component of cell and body fluids that helps controlling heart rate and blood pressure.

Table 4: Nutritive Value of Guava (*Psidium guajava)* per 100 gm

Principle	**Nutrient Value**	**Percentage to RDA**
Energy	68 Kcal	3.50%
Carbohydrates	14.3 g	11.50%
Protein	2.55 g	5%
Total Fat	0.95 g	3%
Cholesterol	0 mg	0%
Dietary fiber	5.4 g	14%
Vitamins & Minerals		
Folates	49µg	12.50%
Niacin	1.084 mg	7%
Pantothenic Acid	0.451 mg	9%
Pyridoxine	0.110 mg	8.50%
Riboflavin	0.040 mg	3%
Thiamin	0.067 mg	5.50%
Vitamin A	624 IU	21%
Vitamin C	228 mg	396%
Vitamin E	0.73 mg	5%
Vitamin K	2.6 µg	2%
Sodium	2 mg	0%
Potassium	417 mg	9%
Calcium	18 mg	2%
Copper	0.230 mg	2.50%
Iron	0.26 mg	3%
Magnesium	22 mg	5.50%
Manganese	0.150 mg	6.50%
Phosphorus	11 mg	2%
Selenium	0.6 mcg	1%
Zinc	0.23 mg	2%
Phyto-Nutrients		
Carotene β	374 µg	-
Crypto-xanthin β	0 µg	-
Lycopene	5204 µg	-
Source: USDA National Nutrient data base		

2.6. Cultivation, Bearing, Post Harvest Management and Storage of Guava

Guava can grow from the sea level to an altitude of about 1500 meter with annual rainfall of below 1000 mm. June and September is the best time for the growth of guava plants. Young plants are susceptible to drought and cold conditions. Guava being perennial fruit plant can live up to 40 years without being replanted and the fruits are readily available year around in tropical region. Guava plants are vegetatively propagated by budding, inarching or air layering. Planting is done during the rainy season i.e. June-July through layers and seedling. Plants start bearing fruits at 2 years and become heavy bearers by 8 years. A Guava plant can be ready for harvesting twice in a year under proper agronomic practices. The fruits are usually let ripened on the tree to experience their intense, natural flavor. However for longer storage, these must be picked while green and mature; and later allowed for ripening. The ripe guava fruit is soft with sweet musky aroma, varied colours and creamy texture. The fresh ripe fruit has a short shelf life; however, mature and green fruits can be stored up to five weeks between 46°F and 55°F temperature and 85- 95% relative humidity and then value addition can be done at later stage.

2.7. Processing and Value Addition of Guava

The fresh fruits have limited shelf life; therefore, it is necessary to process fresh fruits in to different value added products to increase its availability over an extended period and to stabilize the price during the glut season. The processed products have good potential for internal as well as external trade. Seasonal losses in surplus guava fruits can be avoided by processing into different value added products that make them more attractive to the buyer and/or more readily usable to the consumer. Guava being rich in pectin can be used for preparation of natural jam and jelly. Processed guava pulp is an excellent raw material for preparation of juice, RTS beverages, wine, nectar, powder, candy and preserve. Guava pulp or juice can also be used as additive in other fruit juice or pulp. In view of changing consumer attitude, demand and emergence of new market, it has become imperative to develop products that have nutritional as well as health benefits. In this context, guava has excellent digestive and nutritive value, pleasant flavour, high palatability and availability in abundance at moderate price. Guava is a very popular fruit in India and it is available throughout the year except summer season. The nutritive value of the fruit is very high and thus it is an ideal crop for processing and value addition.

3. Model Guava Based Beverage Processing Unit under FME Scheme

3.1. Introduction

The juice market in India is divided into three different segments: fruit drinks (with maximum 30% fruit content) holds about 50-60% market share, fruit juices (with almost 100% fruit content) holds about 30-35% market share and nectar drinks (with almost 30- 90% fruit content) holds just about 10% market share of entire juice industry. Therefore, Ready to Serve (RTS) fruit based beverages have huge potential across India.

The Central Sector scheme for Formalization of Micro Enterprises in food processing sector under Ministry of Food Processing Industries is an important scheme useful for formalization and mainstreaming the unorganized home based or micro food processing units. The scheme is useful for expansion of the existing units in terms of capacity and technology through installation of new machineries and additional civil infrastructures.

Establishment or expansion in terms of guava based Ready to Serve (RTS) fruit beverage unit is an attractive option in potential guava growing states in India as guava is a highly nutritious crop. A model generalized DPR is therefore, prepared for expansion of existing un-formalized beverages units that can include guava based Ready to Serve (RTS) beverage with 25% pulp content as product line. A detailed account of the model DPR prepared on the basis of certain generalized assumptions is discussed in the sequent sections. ***An entrepreneur can use this model DPR template and modify according to his/her need in terms of capacity, location, raw materials availability etc. If there are shortages in per day/annual guava availability, then the entrepreneur can use pulp of other seasonal fruits for beverage to achieve maximum capacity utilization for higher economic efficiency.***

3.2. Form of the Business Enterprise

The entrepreneur concerned must specify about the form of his/her business organization i.e. whether Sole Proprietorship, Cooperative, FPO/FPC, SHG Federation, Partnership Firm or Company and accordingly attach all the required documents. The documents may be registration

certificate, share holding pattern, loan approval certificate etc as specified in the FME scheme guidelines.

3.3. Background of the Promoters/Owners and Required Documents

The detailed bio-data of promoter/promoters inter-alia name, fathers name, age, qualification, business experience, training obtained, contact number, email, office address, permanent address, share holding pattern, definite sources of meeting the commitment of promoters contribution, details of others business along with certified balance sheet and profit loss account for the last 3-4 years, tax registration, PAN number, income tax return etc for 3-4 years and other requirements as specified in the FME guidelines must be provided with the DPR.

3.4. Background of the Proposed Project

The entrepreneur must specify whether it is a new project or expansion of the existing project. If new project is proposed then the reason to go in to the project and if expansion of the existing project, the must specify what kind of expansion is proposed in terms of capacity, product, machines, civil infrastructure etc.

3.5. Location of the 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 entrepreneur must mention whether project is proposed in self owned land or rented/allotted land in any industrial park or private location. Accordingly, he/she must provide ownership document, allotment letter/ lease deed. Land clearance certificate must be from village authority/municipality or any other concerned authority. ***The ideal locations for establishment of exclusive guava beverage processing unit are in the production clusters of the ten major guava growing states such as Uttar Pradesh, Madhya Pradesh, Bihar, Andhra Pradesh, West Bengal, Chhatisgarh, Punjab, Gujarat, Tamil Nadu and Karnataka where adequate quantities of surplus raw materials can be available for processing. However, in other states of India multi fruit based beverage unit with guava as one of the raw materials can be established.***

3.6. Installed Capacity of the Guava Based Beverage Processing Unit

The maximum installed capacity of the guava beverage unit in the present model project is proposed as 100 tonns/annum or 333 kg/day raw guava. 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 70 percent capacity, 3rd year 80 percent capacity and 4th year onwards 90 percent capacity utilization is assumed in this model project.

3.7. Raw Material Requirements for the Unit

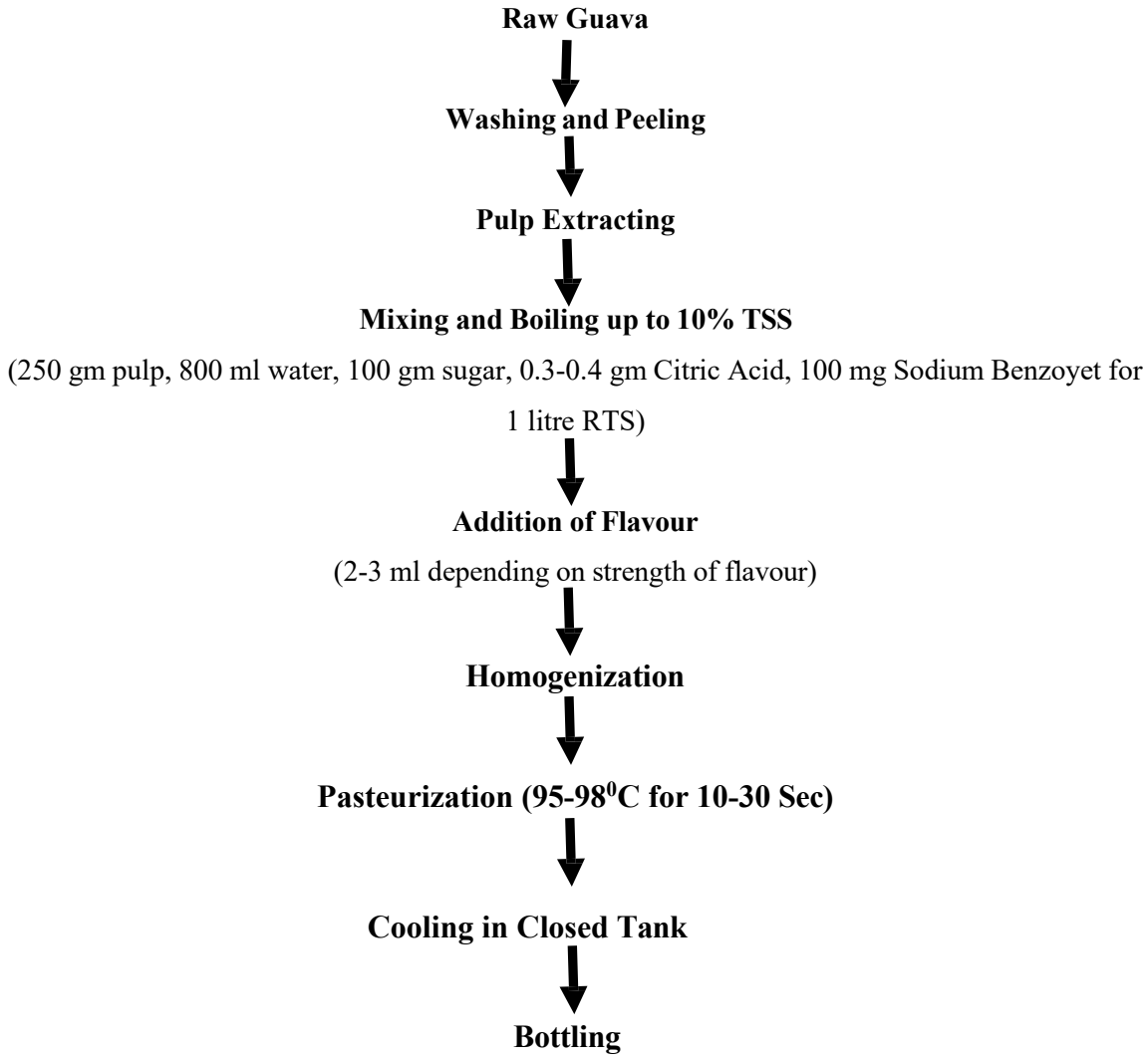
A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled. In the current model guava beverage project, the unit requires 233 kg/day, 266 kg/day and 300 kg/day raw guava at 70, 80 and 90 percent capacity utilization, respectively. If there are shortages in supply, then the entrepreneur can use pulp of other seasonal fruits for beverage to achieve maximum capacity utilization for higher economic efficiency. The guava must be plucked from tree at green and mature stage; and then stored between 46°F and 55°F temperature with 85- 95% relative humidity. However, the guavas should be little soft at the time of processing for easy extraction of pulp.

3.8. Product Profile of the Unit

In the present model guava beverage processing unit, the targeted product output is Ready to Serve (RTS) Guava beverage with 25 per cent pulp content. If there are shortages in supply of guava, then entrepreneur can use pulp of other seasonal fruits for beverage processing in the same machinery set up to achieve maximum capacity utilization for higher economic efficiency.

3.9. Manufacturing Process of Guava Beverage

FPO specifications for Ready-to-Serve beverage are: (i) minimum percentage of TSS 10, (ii) minimum percentage of fruit pulp is 10%.The permissible limit of food grade preservative and flavor should also be mixed. The process flow of 25% pulp based guava Ready-to-Serve beverage is given below:



3.10. Technology Accessibility

IIFPT and its liaison offices at Guwahati and Bhatinda have all the technical knowhow on fruit based beverage processing. These technologies are available through training, incubation and consultancy. The entrepreneur can first avail training or consultancy and then undergo business incubation before venturing into the business. Other than IIFPT, NIFTEM, CFTRI oand other institutes also have the technical knowledge and training facilities.

3.11. Market Demand and Supply for Guava Beverage

The Fruit based non-alcoholic beverages such as RTS, Squash are part and parcel of consumption pattern both in rural and urban India. The fruit beverages consumption is picking up due to increasing income and changing food habits. Therefore, demand for fruit based beverages are prevalent across length and breadth of the country throughout the year. The juice market in India is divided into mainly three segments: fruit drinks (with maximum 30% fruit content) occupying about 50-60% market share, fruit juices (with almost 100% fruit content) occupying about 30-35% market share and nectar drinks (with almost 30- 90% fruit content) occupying just about 10% market share of entire juice industry. Therefore, any kind of Ready to Serve (RTS) fruit based beverages have huge potential across India. Further, guava being low in calories and fats but rich in vital vitamins (Vitamin-C, Vitamin-A) minerals (Potassium, Calcium, Magnesium, Phosphorus), dietary fiber, and antioxidant polyphenolic and flavonoid compounds (beta-carotene, lycopene, lutein and cryptoxanthin) can play a pivotal role to prevent cancers, aging, infections etc. Therefore, guava beverage if highlighted properly for all these health benefits can occupy significant beverage market.

3.12. Marketing Strategy for Guava Beverage

The increasing urbanization and income offers huge scope for marketing of fruit based RTS beverages. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded guava based RTS beverage. Processors can also have tie-up with hotels and restaurants for supply.

3.13. Detailed Project Assumptions

This model DPR for Guava based RTS beverage unit is basically prepared as a template based on certain assumptions (Table 5) 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 Table 5. This DPR assumes expansion of existing unit by adding new guava based RTS beverage line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneur.

Table 5: Detailed Project Assumptions		
Parameter		**Value Assumed**
Capacity of the Guava RTS Beverage Unit	:	100MT/annum raw guava
Utilization of capacity	:	1st year implementation, 70% in 2nd year, 80% in 3rd year and 90% in 4th year onwards.
Working days per year	:	300 days
Working hours per day	:	8-10 hrs.
Interest on term and working capital loan	:	12%
Repayment period	:	Seven years with one year grace period is considered.
Average prices of raw material	:	Rs. 40/Kg.
Average sale prices of RTS beverage/litre	:	Rs. 60/Litre
Pulp extraction	:	800 gm pulp/kg raw guava
RTS (25% pulp) processing	:	3.2 litres RTS/kg raw guava

3.14. Fixed Capital Investment

3.14.A. Land & Building

The DPR is for FME scheme to upgrade/formalize existing micro enterprises which already has land & built-up area. However, they can invest to expand the built-up area (Table 6) as required.

Table 6: Land and Civil Infrastructures	
i. Land 10000 Sq ft	Assumed land already developed and has 6000 sq m built in area. So additional 1000 sq ft can be built in @ Rs. 200/sq ft Rs. 2.00 Lakhs
ii. Built-up processing area 6000 sq ft	
iii. Storage area 1000 sq ft	
Total	**Rs. 2.00 Lakhs**

3.14.B. Machinery & Equipment: Rs. 18 Lakhs

Table 7: Machinery and Equipments					
Sl. No	**Machinery Descriptions**	**Power required**	**Area required (Sq. ft.)**	**Qty**	**Cost (Rs. in lakhs)**
1.	Washer Capacity 40 kg/hr	3 HP	25	1	1.50
2.	Fruit Pulper/extractor Capacity 40 kg / hr	3 HP	16	1	2.00
3.	Boiler Steam out put 10 kg Working pressure 10 bar maximum	3 HP	100	1	3.00
4.	Steam Kettle Capacity 100 lit/hr	3 HP	25	1	1.50
5.	Homogenizer Capacity 100 lit/hr	8 HP	50	2	2.00
6.	Pasteurizer Capacity 100 liter	2 HP	200	1	3.00
7.	Cooling Tank	-	25	1	0.50
8.	Bottling line (with 3 parts i.e. washing unit with 50-100 bottles/hr,, filling unit 100 litres/hr and capping unit 100 litres/hr)	3HP	75	1	4.5

3.14.C. Utilities and Fittings

Table 8: Utilities and Fittings		
i.	Power	Rs. 2.00 Lakhs
ii.	Water	

3.14.D. Other Fixed Assets

Table 9: Other Fixed Assets		
i.	Furniture and Fixtures	Rs. 1 Lakh
ii.	Plastic trays capacity	
iii.	Electrical fittings	

3.14.E. Pre-operative Expenses

Table 10: Pre-operative Expenses	
Legal expenses, start-up expenses, establishment cost, consultancy fee, trial runs, & others	Rs.23000
Total Pre-operative Expenses	**Rs.23000**

3.14.F. Total Fixed Capital Investment

Total Fixed Capital Investment = (Land & Building + Machinery & Equipment+ Utilities and Fittings + Other Fixed Assets + Pre-operative Expenses) = Rs. (2+18+2+1+0.23) Lakhs = Rs. 23.23 Lakhs

3.15. Working Capital Requirement

Working capital is critical input in guava based RTS beverage unit as raw materials are seasonal and thus need to maintain high inventories.

Table 11: Working Capital Requirement (Rs. in Lakh)				
Particulars	**Period**	**Year 2 (70%-70 MT)**	**Year 3(80%-80MT)**	**Year 4 (90%-90 MT)**
Raw material stock	7 days	0.65	0.75	0.84
Work in progress	15 days	2.69	3.07	3.46
Packing material	15 days	0.56	0.64	0.72
Finished goods' stock	15 days	6.72	7.68	8.64
Receivables	30 days	13.44	15.36	17.28
Working expenses	30 days	1.00	1.14	1.28
Total current assets		25.06	28.64	32.22
Trade creditors		0	0	0
Working capital gap		25.06	28.64	32.22
Margin money (25%)		6.27	7.16	8.06
Bank finance		18.80	21.48	24.17

3.16. Total Project Cost and Means of Finance

Table 12: Total Project Cost and Means of Finance	**(Rs. in Lakhs)**
Particulars	**Amount**
i. Land and building	2.00
ii. Plant and machinery	18.00
iii. Utilities & Fittings	2.00
iv. Other Fixed assets	1.00
v. Pre-operative expenses	0.23
vi. Contingencies	0.50
vii. Working capital margin	6.27
Total project cost (i to vii)	**30**
Means of finance	
i. Subsidy	10
ii. Promoter's contribution	6
iii. Term loan	14

3.17. Manpower Requirement

Table 13: Manpower Requirement		
Particulars	**No. & Wage**	**Total Monthly Salary (Rs.)**
i. Manager (can be the owner)	1 @ Rs. 20000	20000
ii. Skilled worker	2 @ Rs. 10000	20000
iii. Semi skilled	2 @ Rs. 7500	15000
iv. Helper	1 @ Rs. 5000	5000
v. Sales man	1 @ Rs. 7500	7500
Total	**7 persons**	**Rs. 67500/- per month**

Note: Manager, two skilled workers are permanent staffs only (Salary Rs. 40000/month). Others are causal staffs.

3.18. Expenditure, Revenue and Profitability Analysis

Table 14: Expenditure, Revenue and Profitability Analysis									
	Particulars	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**6th Year**	**7th Year**	**8th Year**
A	**Total Installed Capacity**	100 MT/Year Raw Guava							
	Capacity utilization (%)	Under const. (0%)	70 MT (70 %)	80 MT (80 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)
B	**Expenditure (Rs. in Lakh)**								
	Raw guava (Av. Price @ Rs. 40/Kg)	0.00	28.00	32.00	36.00	36.00	36.00	36.00	36.00
	Sugar @ 30/kg	0.00	6.72	7.68	8.64	8.64	8.64	8.64	8.64
	Other ingredients	0.00	1.50	1.71	1.93	1.93	1.93	1.93	1.93
	Packaging materials @ Rs. 5/bottle	0.00	11.20	12.80	14.40	14.40	14.40	14.40	14.40
	Utilities (Electricity, Fuel)	0.00	4.20	4.80	5.40	5.40	5.40	5.40	5.40
	Salaries (1st yr only manager's salary)	2.40	8.10	8.10	8.10	8.10	8.10	8.10	8.10
	Repair & maintenance	0.00	0.50	0.57	0.64	0.64	0.64	0.64	0.64
	Insurance	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Miscellaneous expenses	0.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Total Expenditure	**3.20**	**62.52**	**69.96**	**77.41**	**77.41**	**77.41**	**77.41**	**77.41**
C	**Total Sales Revenue (Rs. in Lakh)**	**0.00**	**134.40**	**153.60**	**172.80**	**172.80**	**172.80**	**172.80**	**172.80**
	Sale of Guava RTS (Av. Sale Price @ Rs. 60/litre)	0.00	134.40	153.60	172.80	172.80	172.80	172.80	172.80
D	**PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows**	**-3.20**	**71.88**	**83.64**	**95.39**	**95.39**	**95.39**	**95.39**	**95.39**
	Depreciation on civil works @ 5% per annum	0.10	0.09	0.09	0.09	0.08	0.07	0.07	0.07
	Depreciation on machinery @ 10% per annum	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86
	Depreciation on other fixed assets @ 15% per annum	0.15	0.13	0.11	0.09	0.08	0.07	0.05	0.05
	Interest on term loan @ 12%	1.68	1.68	1.44	1.20	0.96	0.72	0.48	0.24
	Interest on working capital @ 12%	0.00	2.26	2.58	2.90	2.90	2.90	2.90	2.90
E	**Profit after depreciation and Interest (Rs. in Lakh)**	**-6.93**	**66.1**	**77.96**	**89.8**	**90.19**	**90.57**	**90.93**	**91.27**
F	Tax (assumed 18%) (Rs. in Lakh)	0.00	11.90	14.03	16.16	16.23	16.30	16.37	16.43
G	**Profit after depreciation, Interest & Tax (Rs. in Lakh)**	**-6.93**	**54.20**	**63.93**	**73.64**	**73.96**	**74.27**	**74.56**	**74.84**
H	Surplus available for repayment (PBDIT-Interest on working capital-	-3.20	57.72	67.03	76.33	76.26	76.19	76.12	76.06

	Tax) (Rs. in Lakh)								
I	Coverage available (Rs. in Lakh)	-3.20	57.72	67.03	76.33	76.26	76.19	76.12	76.06
J	Total Debt Outgo (Rs. in Lakh)	1.68	3.68	3.44	3.20	2.96	2.72	2.48	2.24
K	**Debt Service Coverage Ratio (DSCR)**	-1.90	15.68	19.49	23.85	25.76	28.01	30.69	33.96
	Average DSCR	**21.94**							
L	**Cash accruals (PBDIT- Interest- Tax) (Rs. in Lakh)**	**-4.88**	**56.04**	**65.59**	**75.13**	**75.3**	**75.47**	**75.64**	**75.82**
M	**Payback Period** (on Rs. 30 Lakhs initial investment)	**2 Years**							

3.19. Repayment Schedule

Table 15: Repayment Schedule **(Rs. in Lakh)**

Year	Outstanding loan at start of yr.	Disburse-ment	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	0	14	14	-3.20	1.68	0	1.68	14	-04.88
2	14		14	57.72	1.68	2	3.68	12	54.04
3	12		12	67.03	1.44	2	3.44	10	63.59
4	10		10	76.33	1.20	2	3.20	8	73.13
5	8		8	76.26	0.96	2	2.96	6	73.30
6	6		6	76.19	0.72	2	2.72	4	73.47
7	4		4	76.12	0.48	2	2.48	2	73.64
8	2		2	76.06	0.24	2	2.24	0	73.82

13.20. Assets' Depreciation

Table 16: Assets' Depreciation (Down Value Method)								(Rs. in Lakh)
Particulars	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**6th Year**	**7th Year**	**8th Year**
Civil works	2.00	1.90	1.81	1.72	1.63	1.55	1.48	1.41
Depreciation	0.10	0.09	0.09	0.09	0.08	0.07	0.07	0.07
Depreciated value	1.90	1.81	1.72	1.63	1.55	1.48	1.41	1.34
Plant & Machinery	18	16.20	14.58	13.12	11.81	10.63	9.57	8.61
Depreciation	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86
Depreciated value	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
Other Fixed Assets	1.00	0.85	0.72	0.61	0.52	0.44	0.37	0.32
Depreciation	0.15	0.13	0.11	0.09	0.08	0.07	0.05	0.05
Depreciated value	0.85	0.72	0.61	0.52	0.44	0.37	0.32	0.27
All Assets	21	18.95	17.11	15.45	13.96	12.62	11.42	10.34
Depreciation	2.05	1.84	1.66	1.49	1.34	1.2	1.08	0.98
Depreciated value	18.00	16.20	14.59	13.15	11.85	10.68	9.63	8.69

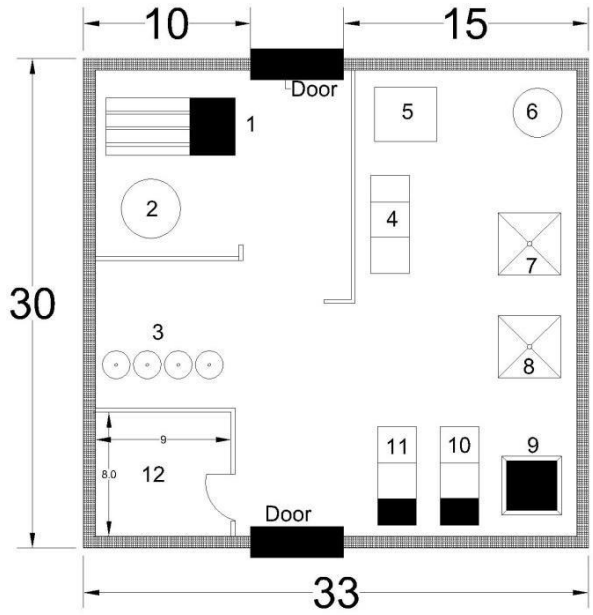
3.21. Financial Assessment of the Project

Table 17: Benefit Cost Ratio (BCR) and Net Present Worth (NPW)										
Sl.	**Particulars**	**1st Yr**	**2nd Yr**	**3rd Yr**	**4th Yr**	**5th Yr**	**6th Yr**	**7th Yr**	**8th Yr**	
i.	Capital cost (Rs. in Lakh)	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ii.	Recurring cost (Rs. in Lakh)	3.20	62.52	69.96	77.41	77.41	77.41	77.41	77.41	
iii.	Total cost (Rs. in Lakh)	33.20	62.52	69.96	77.41	77.41	77.41	77.41	77.41	552.73
iv.	Benefit (Rs. in Lakh)	0.00	134.40	153.60	172.80	172.80	172.80	172.80	172.80	
v.	Total Depreciated value of all assets (Rs. in Lakh)								8.69	
vi.	Total benefits (Rs. in Lakh)	0.00	134.40	153.60	172.80	172.80	172.80	172.80	181.49	1160.69
	Benefit-Cost Ratio (BCR): 2.09 (Highly Profitable project) Net Present Worth (NPW): 607.96									

Break Even analysis indicates costs-volume-profit relations in the short run. This is the level at which, the firm is in no loss no profit situation.

Table 18: Break-Even Analysis									
Sl.	**Particulars**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**6th Year**	**7th Year**	**8th Year**
	Capacity utilization	Under const. (0%)	70 MT (70 %)	80 MT (80 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)	90 MT (90 %)
A	**Fixed Cost** (Rs. in Lakh)								
	Permanent staff salaries	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
	Depreciation on building @ 5% per annum	0.10	0.09	0.09	0.09	0.08	0.07	0.07	0.07
	Depreciation on machinery @ 10% per annum	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86
	Depreciation on other fixed assets @ 15% per annum	0.15	0.13	0.11	0.09	0.08	0.07	0.05	0.05
	Interest on term loan	1.68	1.68	1.44	1.20	0.96	0.72	0.48	0.24
	Insurance	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Total Fixed Cost (Rs. in Lakh)	8.83	8.62	8.2	7.79	7.4	7.02	6.66	6.32
B	**Sales Revenue** (Rs. in Lakh)	**0.00**	**134.40**	**153.60**	**172.80**	**172.80**	**172.80**	**172.80**	**172.80**
C	**Variable Cost** (Rs. in Lakh)								
	Raw guava (Av. Price @ Rs. 40/Kg)	0.00	28.00	32.00	36.00	36.00	36.00	36.00	36.00
	Sugar @ 30/kg	0.00	6.72	7.68	8.64	8.64	8.64	8.64	8.64
	Other ingredients	0.00	1.50	1.71	1.93	1.93	1.93	1.93	1.93
	Packaging materials @ Rs. 5/bottle	0.00	11.20	12.80	14.40	14.40	14.40	14.40	14.40
	Casual staff salaries	0.00	3.30	3.30	3.30	3.30	3.30	3.30	3.30
	Utilities (Electricity, Fuel)	0.00	4.20	4.80	5.40	5.40	5.40	5.40	5.40
	Repair & maintenance	0.00	0.50	0.57	0.64	0.64	0.64	0.64	0.64
	Miscellaneous expenses	0.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Interest on working capital @ 12%	0.00	2.26	2.58	2.90	2.90	2.90	2.90	2.90
	Total Variable Cost (Rs. in Lakh)	0.5	59.68	67.44	75.21	75.21	75.21	75.21	75.21
D	**Break Even Point (BEP) as % of sale**	-	12.00	10.00	08.00	08.00	07.00	07.00	06.00
	Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)	**-**	**16.13**	**15.36**	**13.82**	**13.82**	**12.10**	**12.10**	**10.37**

3.22. Plant Layout



All Dimensions are in Feet

1. Fruit washer
2. Fruit Extractor/pulper
3. Storage Bins
4. Agitator Tank / Filter (Optional)
5. Steam Kettle
6. Steam Boiler
7. Homogenizer
8. Pasteurizer
9. Cooling tank
10. Bottle filling & caping machine
11. Bottle washing unit (Optional)
12. Storage Room

3.23. Machinery Suppliers

The entrepreneur must provide tentative supplier list and quotations with respect to his project However, there are many machinery suppliers available within India for fruits based beverage processing machineries and equipments. Some of the suppliers are:

i. Bajaj Processpack Limited, Noida, India
ii. Annapurna Processing Industries. Kolhapur, India
iii. Sagar Engineering Works. Sindhudurga, India
iv. Jwala Engineering Company. Mumbai, India
v. Shriyan Enterprises. Mumbai, India
vi. Jupiter Scientific Company, Salem, India
vii. M/s Sri Bramha Industries, Trichy, India

4. Limitations of the Model DPR and Guidelines for Entrepreneurs

4.1. Limitations of the Model DPR

i. This model 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 is a model DPR 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.

iv. This particular DPR is made on three components of means of finance i.e. grant, owner's contribution and loan/debt as followed in many central sector schemes.

4.2. Guidelines for the 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

base/contract sourcing, entrepreneurs own SWOT analysis, 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.

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/