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
TOMATO KETCHUP

AATMANIRBHAR BHARAT

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Contents

1. The Project at a Glance

1. Name of the proposed project	:	Tomato Processing 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	:	150 MT/annum (70, 80 & 90% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11. Raw materials	:	Tomato
12. Major product outputs	:	Tomato Ketchup
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. 2.00 Lakhs*
• *Miscellaneous fixed assets*	:	*Rs. 1 Lakh*
• *Pre-operative expenses*	:	*Rs. 0.67 Lakhs*
• *Contingencies*	:	*Rs. 2.00 Lakhs*
• *Working capital margin*	:	*Rs. 4.33 Lakhs*
14. Working capital requirement		
• *2nd year*		*Rs. 13.00 Lakhs*
• *3rd year*		*Rs. 14.85 Lakhs*
• *4th year*		*Rs. 16.72 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. 26.62 Lakhs*
• *3rd year*	:	*Rs. 32.39 Lakhs*
• *4th year*	:	*Rs. 38.16 Lakhs*
18. Average DSCR	:	11.58
19. Benefit-Cost Ratio	:	1.95
20. Term loan repayment	:	7 Years with 1 year grace period
21. Payback period for investment	:	3 Years

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

2.1. Introduction

Tomato, though botanically a fruit for the purpose of trade, is generally considered a vegetable because of the way in which it is consumed. Tomatoes are widely grown in all parts of the world. Tomatoes are produced and processed during the two main seasons across much of India – August to October (kharif) and December to April (rabi). Tomatoes are also grown during the off-season (May to July) where conditions suit and also under protected cultivation. Tomato fits easily into different cropping systems, has high economic value and fruits can be processed, dried, canned and bottled. Moreover, tomatoes contribute to a healthy, well balanced diet. Tomatoes are rich in potassium, magnesium, phosphorus and small amounts of calcium. Tomatoes contain a lot of vitamin A, vitamin C and vitamin B3. They have small amounts of other B vitamins, and vitamin E. Tomatoes are mostly grown by a large number of smallholder farmers with holdings of between 1-3 acres of land. The southern and central states constitute much of India's production including the states of Andhra Pradesh, Telangana, Karnataka and Maharashtra. Tomato production is growing worldwide because consumers demanding a wider range of innovative, value-added products. Tomatoes are an important crop for both the farmer and the consumer in India. It grows in almost every state of the country. Due to increasing standards of living in the cities and the rapid urbanization taking place in the rural areas, consumption of tomato based products is expected to go up steadily. The major institutional customers of tomato paste are restaurants. At present, the market of ketchup/puree, especially in the urban areas, is dominated by brands likes MEGGI and KISSAN. Some medium and small companies are also engaged in its production. However, because of poor post harvest infrastructure and value addition, a huge quantity of tomato get wasted in the supply chain. Therefore, processing of tomato can not only minimize wastage but also offers huge scope for entrepreneurship development at micro or small scale level through government schemes such as PM-Formalization of Micro Food Processing Enterprises Scheme of MoFPI, Government of India.

2.2. Origin and Distribution of Tomato

Tomato is originated in Peru of South America. It is important commercial vegetable crop of India. It is the second most important crop of world after potato. Fruits are eaten raw or in cooked form. It is rich source of vitamin A, C, potassium and minerals. It is used in soup, juice and ketch up, powder. The major tomato producing states are Bihar, Karnataka, Uttar Pradesh, Orissa, Maharashtra, Andhra Pradesh, Madhya Pradesh and West Bengal.

2.3. Production of Tomato in India

Table 1: Tomato production in India during 2017-18 **('000 Tonnes)**

Sl. No.	State	Production	Share (%)
1	Andhra Pradesh	2,744.32	13.90
2	Madhya Pradesh	2,419.28	12.25
3	Karnataka	2,081.59	10.54
4	Gujarat	1,357.52	6.88
5	Orissa	1,312.07	6.64
6	West Bengal	1,265.25	6.41
7	Telangana	1,171.50	5.93
8	Chattisgarh	1,087.33	5.51
9	Maharashtra	1,086.56	5.50
10	Bihar	941.56	4.77
11	Tamil Nadu	887.08	4.49
12	Uttar Pradesh	841.61	4.26
13	Haryana	753.72	3.82
14	Himachal Pradesh	481.94	2.44
15	Assam	396.24	2.01
16	Jharkhand	265.26	1.34
17	Punjab	224.26	1.14
18	Uttarakhand	103.85	0.53
19	Rajasthan	88.73	0.45
20	Tripura	56.5	0.29
21	Jammu & Kashmir	52.96	0.27
22	Meghalaya	35.51	0.18
23	Manipur	33.72	0.17
24	Nagaland	22.47	0.11
25	Kerala	12.61	0.06
26	Mizoram	11.87	0.06
27	Sikkim	8.03	0.04
28	Arunachal Pradesh	2.15	0.01

Source: National Horticulture Board (NHB)

2.4. Popular Tomato Varieties in India

Table 2: Popular Tomato Varieties	
Punjab Ratta	Ready for first picking in 125 days from transplanting. Gives average yield of 225qtl/acre. This variety is suitable for processing.
Punjab Chhuhara	Fruits are seedless, pear shape, red and firm with thick wall or skin. Marketable quality remains for 7 days after harvesting and thus suitable for long distance transportation and processing. It gives average yield of 325qtl/acre.
Punjab Tropic	Plant height is about 100 cm. Ready to harvest in 141days. Fruits are of large size and round shape, they borne in cluster. Gives average yield of 90-95qtl/acre.
Punjab Upma	Suitable for cultivation in rainy season. Fruits are oval shape, medium size and of firm deep red color. Gives average yield of 220qtl/acre.
Punjab NR -7	Dwarf variety having medium size juicy fruits. It is highly resistant to fusarium wilt and root knot nematodes. Gives average yield of 175-180qtl/acre.
Punjab Red cherry	These cherry tomatoes are used in salads. These are of deep red color. Sowing is done in August or September and plant is ready to harvest in February and gives yield up to July. Its early yield is 150 qtl/acre and total yield is 430-440 qtl per acre.
Punjab Varkha Bahar 2	Ready to harvest in 100days after transplanting. It is resistant to leaf curl virus. Gives average yield of 215 qtl/acre.
Punjab Varkha Bahar 1	After transplanting, ready to harvest in 90days. It is suitable for sowing in rainy season. It gives resistance to leaf curl virus. Gives average yield of 215qtl/acre.
Punjab Swarna	Matures after 120 days of transplanting. It gives an average yield of 166qtl/acre till end-March and gives total yield of 1087qtl/acre. The variety is suitable for table purpose.
Punjab Sona Cherry	It gives an average yield of 425qtl/acre. The fruits are yellow in color and bears in bunches. The average weight of the fruit is approximately 11gm. It contains 7.5% sucrose content.
Punjab Kesari Cherry	It gives an average yield of 405qtl/acre. The average weight of the fruit is approximately 11gm. It contains 7.6% sucrose content.
Punjab Kesar Cherry	It gives an average yield of 405qtl/acre. The average weight of the fruit is approximately 11gm. It contains 7.6% sucrose content.
Punjab Varkha Bahar-4:	It gives an average yield of 245qtl/acre. It contains 3.8% sucrose content.
Punjab Gaurav	It gives an average yield of 934qtl/acre. It contains 5.5% sucrose content.
Punjab Sartaj	It has round shape fruit, moderate and hard. Suitable for rainy season. It gives an average yield of 898qtl/acre.
HS 101	Suitable for growing in north India during winter condition. Plants are dwarf. Fruits are round and medium size and juicy. Fruits are borne in cluster. It is resistant to Tomato Leaf Curl Virus.
HS 102	Early maturing variety. Fruits are small to medium in size, round and juicy.
Swarna Baibhav Hybrid	Recommended for cultivation in Punjab, Uttarakhand, Jharkhand, Bihar and Uttar Pradesh. It is sown in September- October. Fruits keeping quality is good so suitable for long distance transport and processing. Gives yield of 360-400qtl/acre.
Swarna Sampada Hybrid	Recommended for cultivation in Punjab, Uttarakhand, Jharkhand, Bihar and Uttar Pradesh. Suitable for sowing in Aug-Sept and Feb-May. Yield is 400-420qtl/acre.
Keekruth	Plant height is about 100 cm. Ready to harvest in 136days. Fruits are medium to large size, round shape, deep red color.
Keekruth Ageti	Plant height is about 100cm. Fruits are medium to large size, round shape having green shoulder which disappears on ripening.

2.5. Nutritional Value of Tomato

Tomato is rich in nutrition and per 100 gram

Calories: 16
Fat: 0.2g
Sodium: 5mg
Carbohydrates: 3.5g
Fiber: 1.1g
Sugars: 2.4g
Protein: 0.8g

2.6. Cultivation, Post Harvest Management and Storage of Tomato

Land preparation

Tomato plantation is done in well pulverized and leveled soil. Land is ploughed for 4-5times to bring soil to fine tilth, then planking is done to make soil level. At time of last ploughing well decomposed cow dung and Carbofuron@5kg or Neem cake@8kg per acre should be applied. Transplantation of tomato is done on raised bed of 80-90cm width. To destroy harmful soil borne pathogen, pest and organism, soil solarization is carried out. It can be done by using transparent plastic film as mulch. This sheet absorbs radiation and thus increases soil temperature and kills pathogen.

Nursery Management and Transplanting

Solarization for one month before sowing is done. Tomato seeds are sown on raised beds of 80-90 cm width and of convenient length. After sowing, bed covered with mulch and irrigation of bed must be done with Rose-Can daily in morning. To protect crop from virus attack nursery bed is covered with fine nylon net. To make plants healthier and stronger and to harden seedling against transplanting sock, spray of Lihocin@1ml/Ltr water at 20 days after sowing is good. Damping off damages crop to great extent, to prevent crop from it, overcrowding of seedlings is avoided and soil is kept wet. If wilting is observed, ddrenching of Metalaxyl@2.5gm/Ltr water is done 2-3 times till plants are ready for transplantation. Seedling is ready for transplantation 25 to 30 days after sowing with 3-4 leaves. In case if seedlings age is more than 30 days

transplantation must be done after de-toping. Watering of seedling beds is done 24 hours before transplanting so that seedlings can be easily uprooted and be turgid at transplanting time. To protect crop from bacterial wilt, seedlings are dip in 100 ppm Streptocycline solution for 5 minutes before transplanting.

Transplanting and Spacing

For northern state, tomato cultivation for spring season is done in late November and transplanted in second fortnight of January. For autumn crop, sowing is done in July - August and transplanted in August - September. In hilly areas sowing is done in March- April and transplantation is done in April -May. Depending upon variety and its growth habit, spacing of 60x30cm or 75x60cm or 75x75cm is good.

Harvesting

Plant starts yielding generally by 70 days after transplantation. Harvesting is done depending upon purpose like for fresh market, long distance transport etc. Mature green tomatoes, 1/4th fruits portion gives pink color are harvested for long distance markets. Almost all fruits turn into pink or red color but having firm flesh are harvested for local markets. For processing and seed extraction purpose, fully ripe fruits with soft flesh are used.

Post-harvest Management

After harvesting, grading is done. Then fruits are packed in bamboo baskets or crates or wooden boxes. To increase self-life of tomato during long distance transport pre-cooling is carried out. From ripe tomatoes several products like puree, syrup, juice and ketch up are made after processing.

Storage and Food Safety

Full ripe tomatoes are stored at a temperature of 55°F for up to several days. Temperature cooler than this, will cause chilling injury, producing poor colors and off flavors. Due to improper

storage, there is a loss in fresh weight of about 10-15%. This causes them to appear shriveled and stale, thus considerably lowering their market value and consumer acceptability. Proper storage facilities are important in stabilizing the supplies by carrying over the produce from periods of high production to periods of low production.

Vegetables	**Temp ^{0}C**	**RH (%)**	**Storage life (weeks)**
Tomato, unripe	8.0-10.0	85-90	4.5
Tomato, ripe	7.2	90	1

Following are the methods of storage of tomatoes

Low temperature storage

This is a time tested reliable method used for retention of freshness and extending shelf life of fresh produce as it reduces rate of respiration and thermal decomposition. Chilling injury may erode the quality of fruits if storage temperature is less than 12.5^{0}C.

Ethylene treatment

By treating ethylene either as a dip treatment or gaseous exposure using etherl as a source of ethylene, uniform accelerated ripening can be obtained. Further, by removing the ethylene produced by fruit with the use of ethylene absorbent either prepared indigenously or by use of 'purafil' (commercial form of ethylene absorbent), significant extension of shelf life.

Evaporative cooling of tomato

Evaporation of moisture from tomatoes causes wilting and shriveling, resulting in weight loss. The process of evaporative cooling is an adiabatic exchange of heat when ambient air is passed through a saturated surface to obtain low temperature and high humidity, which are desirable for extending the storage life of tomato.

MAS using silicone membrane

It is controlled ventilation system, which regulates the gas levels in the storage environment by recycling on selective gas permeation. The membrane makes use of ability of the polymer to allow the selective passage of gases at different rates according to their physical and chemical properties.

2.7. Processing and Value Addition of Tomato

Tomato production is a growing worldwide as consumers demanding a wider range of innovative, value-added products. This results in high demand on mixing technology for production and processing. Tomato processing industry is huge. A large part of the world tomato crop is processed into tomato paste/puree, which is subsequently used as an ingredient in many food products, mainly soups, sauces and ketchup. India has been exporting processed tomato in the form of tomato paste and ketchup. Tomato sauce is being used with snacks like rolls, cutlets, samosas, chops, soup, chowmin and other continental as well as chinese dishes. Bright mixture made from tomato is used as important items with all modern food/snacks. The only ketchup and sauce market in India is pegged at Rs 1,000 crore and growing at around 20% year-on-year. There is a big market for the processed tomato products. Tomato products are one of the chief ingredients in ready-to-eat or fast food products.

3. Model Tomato Processing Unit under PM-FME Scheme

3.1. Introduction

The Central Sector scheme for Formalization of Micro Food Processing Enterprises under Ministry of Food Processing Industries, Government of India is an important scheme that offers 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. Further, the scheme promotes establishment of new micro units on the principle of ODOP (One District One Product)

Establishment or expansion of **Tomato Processing Unit** is an attractive option in potential tomato growing states in India as tomato offers huge scope for value addition and market demand. A model generalized DPR is therefore, prepared for expansion of existing un- formalized Tomato Processing Unit. 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.***

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 Tomato Processing Units are in the production clusters of the major tomato growing states such as Andhra Pradesh, Madhya Pradesh, Karnataka, Gujarat, Orissa, West Bengal, Telangana, Chattishgarh, Maharashtra and Bihar where adequate quantities of surplus raw materials can be available for processing.***

3.6. Installed Capacity

The maximum installed capacity of the Tomato Processing Unit in the present model project is proposed as150 tonns/annum. 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 tomato processing project, the unit requires 350 kg/day, 400 kg/day and 450 kg/day raw tomato at 70, 80 and 90 percent capacity utilization, respectively.

3.8. Product Profile of the Unit

In the present model tomato processing unit, the targeted product output is **Tomato Ketchup**. Tomato ketchup has huge demand in India and the existing market can still accommodate micro or small scale units on their own or under other's brand.

3.9. Manufacturing Process of Tomato Ketchup

Process flowchart for Tomato Ketchup preparation is given below:

Tomatoes
(Fully ripe, red)
↓
Washing
↓
Sorting and Trimming
↓
Cutting and Chopping
↓

Blanching

@ 70 to 90°C for 3 to 5 minutes (to soften)

↓

Extraction of juice

(Mechanically or by sieving)

↓

Straining Tomato Pulp/Juice

↓

Cooking pulp with one-third quantity of sugar

↓

Putting spice bag in pulp and pressing occasionally

↓

Cooking to one-third of original volume of pulp/juice

↓

Removal of spice bag

(after squeezing in pulp)

↓

Addition of remaining sugar and salt

↓

Cooking

↓

Judging of end-point

(Tomato solids by hand refractometer volume by measuring stick, (ie) one-third of its original volume)

↓

Addition of vinegar / acetic acid and preservative

↓

Filling hot in to bottles at about 88°C

↓

Crown Corking

↓

Pasteurization

(at 85 to 90°C for 30 minutes)

↓

Cooling

↓

Storage at ambient temperature

(in cool and dry place)

3.10. Technology Accessibility

IIFPT and its liaison offices at Guwahati and Bhatinda have all the technical knowhow on fruit and vegetable processing including tomato ketchup. 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 and other institutes also have the technical knowledge and training facilities.

3.11. Market Demand and Supply

The tomato based value added products such as puree, paste sauce and ketchup are extensively used in daily consumption pattern both in rural and urban India. Due to increasing standards of living in the cities and the rapid urbanization taking place in the rural areas, consumption of tomato based products is expected to go up steadily. A large part of the world tomato crop is processed into tomato paste/puree, which is subsequently used as an ingredient in many food

products, mainly soups, sauces and ketchup. India has been exporting processed tomato in the form of tomato paste and ketchup. Tomato sauce is being used with snacks like rolls, cutlets, samosas, chops, soup, chowmin and other continental as well as chinese dishes. Bright mixture made from tomato is used as important items with all modern food/snacks. The only ketchup and sauce market in India is pegged at Rs 1,000 crore and growing at around 20% year-on-year. Therefore, there is a big market for the processed tomato products. Tomato products are one of the chief ingredients in ready-to-eat or fast food products. The major institutional customers of tomato paste are restaurants. At present, the market of ketchup/puree, especially in the urban areas, is dominated by brands likes MEGGI and KISSAN. However, the existing market can still accommodate micro or small scale units on their own or under other's brand.

3.12. Marketing Strategy

The increasing urbanization and income offers huge scope for marketing of tomato based value added products. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded tomato ketchup and other products. Processors can also have tie-up with hotels and restaurants for supply.

3.13. Detailed Project Assumptions

This model DPR for tomato processing unit is basically prepared as a template based on certain assumptions (Table 3) 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 3. This DPR assumes expansion of existing unit by adding new tomato ketchup processing line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneur.

Table 3: Detailed Project Assumptions

Parameter		**Value Assumed**
Capacity of the processing unit	:	150 MT/annum raw tomato
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. 20/Kg.
Average sale prices	:	Tomato Ketchup
Recovery rate	:	65% of final ketchup per kg tomato

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 4) as required.

Table 4: 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 5: Machineries and Equipmets					
S..No.	Descriptions	Power required	Area required (Sq.ft)	Qty	Amount (Rs.) in lakhs
1.	Tomatoes Washer Capacity : 100 kg /hr	210V	16	1	1.50
2.	Blancher Capacity : 15 kg /hr	1 KW	10	1	1.50
3.	Fruit Pulper Capacity : 100 kg /hr	2 HP	25	1	2.00
4.	Pasteuriser with Boiler Capacity : 500 lt /hr	2 KW	25	1	5.00
5.	Mixing Tank Capacity : 500 lt /hr	2 HP	25	1	1.00
6.	Vacuum Pan/ Stem Kettle Capacity : 500 lt /hr	5 HP	25	1	5.00
7.	Ketchup Packing Machine Capacity : 500 lt /hr	1 HP	10	1	2.00

3.14.C. Utilities and Fittings

Table 6: Utilities and Fittings		
i.	Power	Rs. 2.00 Lakhs
ii.	Water	

3.14.D. Other Fixed Assets

Table 7: Other Fixed Assets		
i.	Furniture and Fixtures	Rs. 1 Lakh
ii.	Plastic trays capacity	
iii.	Electrical fittings	

3.14.E. Pre-operative Expenses

Table 8: Pre-operative Expenses	
Legal expenses, start-up expenses, establishment cost, consultancy fee, trial runs, & others	Rs.67000
Total Pre-operative Expenses	**Rs.67000**

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+0.67) Lakhs = Rs. 23.67 Lakhs

3.15. Working Capital Requirement

Working capital is critical input in tomato ketchup processing unit as raw materials are seasonal and perishable thus need to maintain high inventories.

Table 9: Working Capital Requirement (Rs. in Lakh)				
Particulars	**Period**	**Year 2 (70%-105 MT)**	**Year 3 (80%-120 MT)**	**Year 4 (90%-135 MT)**
Raw material stock	7 days	0.49	0.56	0.63

Work in progress	15 days	2.21	2.53	2.85
Packing material	15 days	0.34	0.39	0.44
Finished goods' stock	15 days	4.43	5.06	5.70
Receivables	30 days	8.86	10.12	11.40
Working expenses	30 days	1.00	1.14	1.28
Total current assets		17.33	19.8	22.3
Trade creditors		0	0	0
Working capital gap		17.33	19.8	22.3
Margin money (25%)		4.33	4.95	5.58
Bank finance		13.00	14.85	16.72

3.16. Total Project Cost and Means of Finance

Table 10: 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	0.67
vi. Contingencies	2.00
vii. Working capital margin	4.33
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 11: 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 12: 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**	150 MT/Year Raw Tomato							
	Capacity utilization (%)	Under const. (0%)	105 MT (70 %)	120 MT (80 %)	135 MT (90 %)	135 MT (90 %)	135 MT (90 %)	135 MT (90 %)	135 MT (90 %)
B	**Expenditure (Rs. in Lakh)**								
	Raw tomato(Av. Price @ Rs. 20/Kg)	0.00	21.00	24.00	27.00	27.00	27.00	27.00	27.00
	Other raw materials (Spices, preservatives, sugar & salts)		8.86	10.14	11.40	11.40	11.40	11.40	11.40
	Packaging materials @ Rs. 10/kg glass bottle	0.00	6.82	7.80	8.77	8.77	8.77	8.77	8.77
	Utilities (Electricity, Fuel) @ Rs. 30000/month	0.00	3.60	4.11	4.63	4.63	4.63	4.63	4.63
	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	3.2	51.18	57.02	62.84	62.84	62.84	62.84	62.84
C	**Total Sales Revenue (Rs. in Lakh)**	0.00	88.72	101.40	114.07	114.07	114.07	114.07	114.07
	Sale of tomato ketchup @ Rs. 130/Kg considering 65% output ratio	0.00	88.72	101.40	114.07	114.07	114.07	114.07	114.07
D	**PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows**	**-3.2**	**37.54**	**44.38**	**51.23**	**51.23**	**51.23**	**51.23**	**51.23**
	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	1.56	1.78	2.01	2.01	2.01	2.01	2.01
E	**Profit after depreciation and Interest (Rs. in Lakh)**	**-6.93**	**32.46**	**39.50**	**46.53**	**46.92**	**47.30**	**47.66**	**48.00**
F	Tax (assumed 18%) (Rs. in Lakh)	0	5.84	7.11	8.37	8.44	8.51	8.58	8.64
G	**Profit after depreciation, Interest & Tax (Rs. in Lakh)**	**-6.93**	**26.62**	**32.39**	**38.16**	**38.48**	**38.79**	**39.08**	**39.36**

H	Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh)	-3.20	30.14	35.49	40.85	40.78	40.71	40.64	40.58
I	Coverage available (Rs. in Lakh)	-3.20	30.14	35.49	40.85	40.78	40.71	40.64	40.58
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	8.19	10.32	12.77	13.78	14.97	16.39	18.12
	Average DSCR	**11.58**							
L	**Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh)**	**-4.88**	**28.46**	**34.05**	**39.65**	**39.82**	**39.99**	**40.16**	**40.34**
M	**Payback Period** (on Rs. 30 Lakhs initial investment)	**3 Years**							

3.19. Repayment Schedule

Table 13: 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	-4.88
2	14		14	30.14	1.68	2	3.68	12	26.46
3	12		12	35.49	1.44	2	3.44	10	32.05
4	10		10	40.85	1.20	2	3.20	8	37.65
5	8		8	40.78	0.96	2	2.96	6	37.82
6	6		6	40.71	0.72	2	2.72	4	37.99
7	4		4	40.64	0.48	2	2.48	2	38.16
8	2		2	40.58	0.24	2	2.24	0	38.34

13.20. Assets' Depreciation

Table 14: 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	18.95	17.11	15.45	13.96	12.62	11.42	10.34	9.36

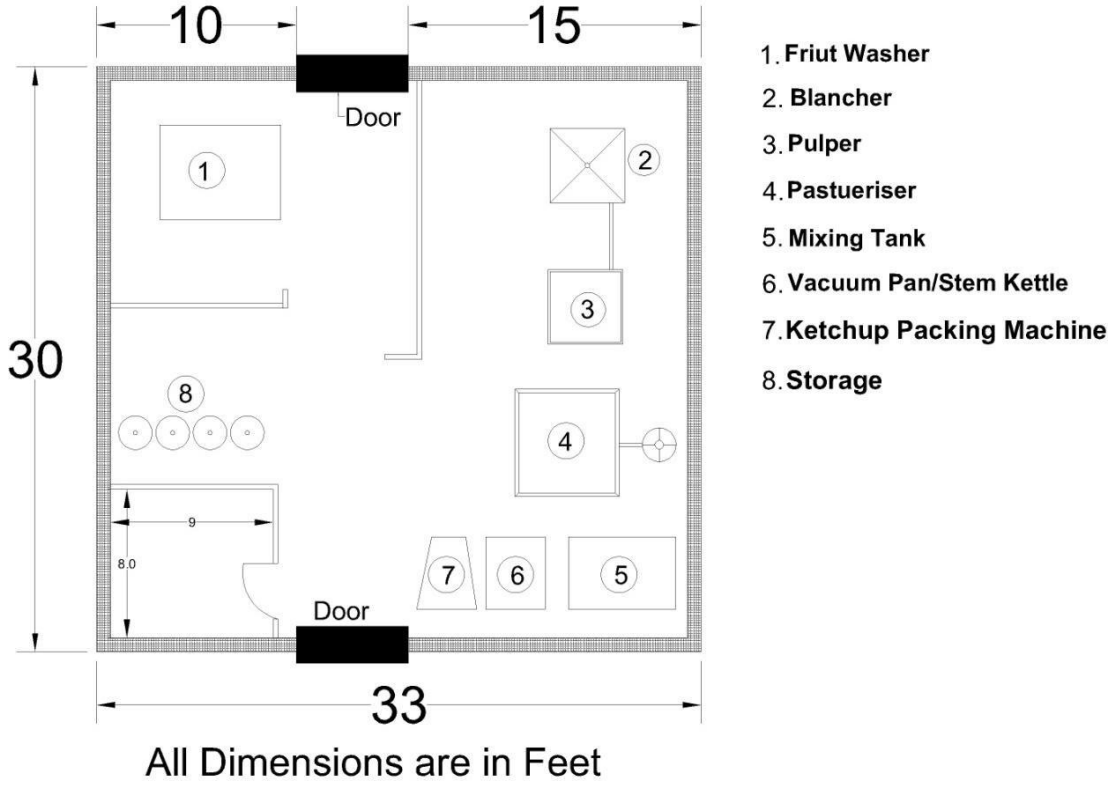
3.21. Financial Assessment of the Project

Table 15: 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	51.18	57.02	62.84	62.84	62.84	62.84	62.84	
iii.	Total cost (Rs. in Lakh)	32.20	3.2	51.18	57.02	62.84	62.84	62.84	62.84	394.96
iv.	Benefit (Rs. in Lakh)	0.00	88.72	101.40	114.07	114.07	114.07	114.07	114.07	
v.	Total Depreciated value of all assets (Rs. in Lakh)								9.36	
vi.	Total benefits (Rs. in Lakh)	0.00	88.72	101.40	114.07	114.07	114.07	114.07	123.43	769.83
	Benefit-Cost Ratio (BCR): 1.95 (Highly Profitable project) Net Present Worth (NPW): 374.87									

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 16: 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%)	105 MT (70 %)	120 MT (80 %)	135 MT (90 %)	135 MT (90 %)	135 MT (90 %)	135 MT (90 %)	135 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 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
	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	88.72	101.40	114.07	114.07	114.07	114.07	114.07
C	**Variable Cost** (Rs. in Lakh)								
	Raw tomato(Av. Price @ Rs. 20/Kg)	0.00	21.00	24.00	27.00	27.00	27.00	27.00	27.00
	Other raw materials (Spices, preservatives, sugar & salts)		8.86	10.14	11.40	11.40	11.40	11.40	11.40
	Packaging materials @ Rs. 10/kg glass bottle	0.00	6.82	7.80	8.77	8.77	8.77	8.77	8.77
	Casual staff salaries	0.00	3.30	3.30	3.30	3.30	3.30	3.30	3.30
	Utilities (Electricity, Fuel) @ Rs. 30000/month	0.00	3.60	4.11	4.63	4.63	4.63	4.63	4.63
	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	1.56	1.78	2.01	2.01	2.01	2.01	2.01
	Total Variable Cost (Rs. in Lakh)	0.5	47.64	53.7	59.75	59.75	59.75	59.75	59.75
D	**Break Even Point (BEP) as % of sale**	-	21.00	17.00	14.00	14.00	13.00	12.00	12.00
	Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)	-	18.63	17.24	15.97	15.97	14.83	13.69	13.69

3.22. Plant Layout



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 tomato processing machineries and equipments. Some of the suppliers are:

i. Shiva Engineers, Pune, Maharashtra
ii. Jwala Techno Engineering Pvt. Ltd. Thane, Maharashtra
iii. Zigma Machinery and Equipments Solutions, Coimbatore, Tamil Nadu
iv. Sagar Engineering Works. Sindhudurga, India
v. Jupiter Scientific Company, Salem, India
vi. M/s Sri Bramha Industries, Trichy,
Vii. India Guru Engineers, Pune, Maharashtra

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 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

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