

**Project Profiles**  
**FOOD**  
**Processing Industry**

**Fruits & Vegetables Processing**



Department of Food Processing Industries  
& Horticulture  
Govt. of West Bengal

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# মহঃ গোলাম রব্বানী

ভারপ্রাপ্ত মন্ত্রী  
খাদ্য প্রক্রিয়াকরণ শিল্প ও উদ্যানপালন দপ্তর, পশ্চিমবঙ্গ সরকার

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## Foreword

West Bengal has the natural advantage of fertile soil, adequate water, and varied climatic conditions to produce a wide variety of food commodities. Farmer communities, private companies and processors of food products can be benefitted immensely from a vibrant food processing sector in West Bengal.

Entrepreneurs interested in investing in the food processing sector need good bankable projects to start their ventures, but the preparation of DPRs for such projects are both time-consuming and expensive. Besides, there is unavailability of good consultants for the same. The Directorate of Food Processing Industries recognizing this as a gap that needs to be filled up, has come up with this set of 21 DPRs of potential projects.

The aim of this set of project profiles is to further develop the food processing sector in West Bengal that meets its aspirations to become a leading state in food processing sector. Our goal remains to minimize post-harvest losses, stimulating employment and building a thriving entrepreneurship ecosystem which would benefit the state's economy and improve the quality of life. It is intended through these project profile documents to create a transparent, time-bound, responsive and positively inclined ecosystem to encourage food processing ventures in the state.

It is expected that these project profiles will help prospective entrepreneurs in the matter of ready DPRs, which may be edited easily to accommodate projects of varying scales. This would also result in savings of time and resources for the entrepreneur.

My department is committed to being by the side of entrepreneurs. This set of publications has been developed after considerable inputs from across the state to take ahead the food processing sector in the state.

Mohammad Ghulam Rabbani



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# Model Project Report on **Guava Jam Processing**

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# Guava Jam Processing

## 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 hectares 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. Unfortunately, fruits and vegetables being perishable in nature get around 25% is wasted 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. Guava is the fourth most important fruit produced in India and and as per the 2017-18 data West Bengal is the fifth largest producer of the fruit. Nearly 20-25% of the guava fruits are wasted for the above reasons. Thus value addition in Guava should be a good forward integration both for the farmers and the market.

## Promoters - Some specific requirements

The details of the promoters will have to be obtained along with other information. The Proforma for promoter detail is given in Annexure – 1.

## History of the company

The project has been prepared as if a new set up is being made for the purpose of guava jam processing. The same could be part of another company or a new company all together. The details of the existing company or the proposed company have to be obtained/presented in the project report. Proforma for company report is given in Annexure-2.

## Finished product and its utility

Guava is very rich source of soluble dietary fiber and antioxidant Vitamin-C. The fruit is a very good source of Vitamin-A, and flavonoids that are known to have antioxidant properties. It is low in calories and fats but has several vital vitamins, minerals, and antioxidants and flavonoid compounds that play a pivotal role to prevent cancers, aging, infections, etc. Higher potassium in guava is important component of cell and body fluids that helps controlling heart rate and blood pressure. Guava jam is tasty, healthy and loved by one and all specially children.

## Market, Demand and Major Competitors

There are jam manufacturers like Kissan, Dukes and a few others but the coverage by the big private players is not enough to satiate the market demand. In fact homemade jams is very common across the country and with changes in lifestyle specially with both men and women going for work, the processed jam market will only increase. In fact the best way to position the product in the market would be to say that it is as good as home made jam. Given the fact that the process of jam manufacturing for all fruits are same, one can with the same set of equipment, one can change over to another fruit jam with minor adjustments. One may also consider a product mix of two or three different fruit jams for the market based on the local needs.

*Note: In addition details of localized competition, has to be mentioned while preparing the final DPR based on where the unit is going to be set up.*

## Raw Material Requirement

Guava is the fourth most important fruit produced in India and as per the 2017-18 data West Bengal is the fifth largest producer of the fruit with the neighbouring state Bihar being the third largest producer of the fruit. Hence supply of raw material should not be a problem. Other material required are sugar, citric acid, sodium benzoate, permitted colour which are easily available in the market.

## Manufacturing Process

The process of manufacture jam processing is well-established. In fact all jams are produced in the same manner. The general process which is followed is explained here.

- Fruits have to be procured and stored in a cool place
- Fruits need to be sorted based on how ripe it is. The fruits which are yet to fully ripen can be stored for a few more days
- The sorted fruits are washed and cleaned.
- The two ends are manually cut and removed. This part is generally done manually
- They are then cut into slices and boiled in water and the pulp is extracted using pulp extractor.
- After taking out the extract pectin test is done to find the quantum of sugar needed. Putting excess sugar could harden the jam and make it look more like a jelly.
- Sugar is added based on requirement and mixed and the extract along with sugar is boiled again.
- The end point of boiling is judged based on the consistency.
- The foam part which comes up during boiling is removed
- Permitted color, citric acid and permitted preservative like sodium benzoate is added at this stage.



## Financial Aspects of the Project

### Infrastructure requirement

Any project preparation is based on a set of assumptions made which are close to the market reality. In this project the land used is assumed to be own land. The major component of a processing unit is land, building, plant and machinery and civil works. List of all the assumptions made is given in Annexure 4. Raw material storage would be for about 7 days and for that there would be need for having cold room for the same. Ensuring proper tie-up with FPOs would reduce the amount of raw material stored finished goods inventory would be for 15 days. The building would have a raw material storage room, one finished goods storage room, and the main processing room along with an office room and toilet. Space required would be of around 7000 sq ft. taking into account the future expansion

### Land and its development

A plot of approximately 10000 sq.ft would be necessary for setting up a juice making unit of this scale. The land should be free from any encumbrance and shall be mortgageable. The land should be classified as non-agriculture. Permission for non-agriculture use, wherever applicable, shall be obtained for the land.

### Size of the unit

The capacity has been restricted to 1 tonne of guava per day which approximately should produce 600000 bottles (500 ml) of guava jam. Evaluating at lower capacity utilization would be better because of two reasons. First of all raw material tie-ups if it doesn't work out and there is a failure in supply would create problem. Second reason is marketing of end product. The market of fruit jam is competitive and one of the biggest competitor for guava jam is homemade jam because of the simple process. Based on estimates this would be adequate to cater to the market surrounding the production area. As one has to go in for direct marketing, it would be necessary to have a brand which needs to be established in quick time in the last phase of the first year and beginning of second year. And then the same will get settled in a year or two and earn a good name if quality is maintained. Along with this one can branch into digital/net based marketing channels. It is because of all this the maximum capacity utilisation has been kept at a very conservative level with a room for nearly doubling the production from third year if the demand comes up. Moreover, the advantage of a jam processing unit is the fact that since the process of jam making is more or less similar for all fruit crops, one can switch over to a different fruit jam or even mixed fruit jam if the guava jam reaches a point of saturation or idf there is a problem in raw material supply.

### Machineries and Equipment

Various machineries and equipments will be required for setting up the plant The list of such equipment and number of such units required for setting up a Ready to drink juice making unit along with Miscellaneous fixed assets for which investment has to be made is given below. This would have a maximum capacity 1000 kg or 1 tonne per day @ rate of 8 hours per day. For 300 days in a year this would mean 300 tonnes per annum. Capacity utilization has been restricted to 55% for the sake of evaluation while doing the financial analysis

Processing Equipment cost				
Sl no.	Machine	Unit	Unit Cost	Amt in Rs.
1	Fruit washer 3 HP	1	245000	245000
2	Fruit pulper/extractor 3 HP	1	300000	300000
3	Boiler 10 HP	1	300000	300000
4	Steam Kettle (5*2 i.e., 10 HP)	2	135000	270000
5	Vacuum Pan 5 HP	1	500000	500000
6	Cooling Tank 5 HP	1	280000	280000
7	Bottle sterilizer 5 HP	1	285000	285000
8	Bottling unit including capping and labelling 5 HP	1	650000	650000
9	35 KVA Genset	1	325000	325000
10	Effluent Treatment Plant	1	750000	750000
11	Misc items (1 set) and testing lab	1	200000	200000
12	Total cost of equipment			4105000
13	Addl charges for GST, transportation, etc		30%	1231500
14	Total cost of equipment incl GST, etc.			5336500

1. Prices quoted on Indiamart or companies are generally excluding GST, Transportation charges and installation charges as well as any other taxes applicable. Accordingly, an additional 30% has been taken on the ex-factory equipment cost. They are also indicative prices.
2. Based on the searches on Indiamart, it is observed that there are companies supplying all the equipments giving a single window solution. It is suggested that it would be better for an entrepreneur to buy all equipments from a single vendor because the following reasons.
  - a. There will not be any mismatch between equipments and automation would be smoother.
  - b. Single point of contact would not allow any blame game between vendors in case something goes wrong.
  - c. Power assessment would be better and line can be drawn accordingly
  - d. A single unit set up by any of these can be visited to get a clear overview.
  - e. Training would be much easier as it would from one agency

The packaging machine would depend on what volume we want to pack. As we are targeting direct marketing in this case, packaging would be for say 500 ml in bottles. The cost of packaging in this case is higher simply because glass bottles are being used. Plastic bottles can be used which would reduce the cost substantially but as jam is poured hot in the bottle, same is generally not used.

Effluent treatment is an important aspect in any industrial activity. Food Processing industry is no different. Most of the food and dairy processing industries produce huge amount of wastewater also known as effluent, it is a bi-product of their production process. The effluent/wastewater generated consists of several contaminants/pollutants. These contaminants/pollutants can be removed with the help of an effluent treatment plant (ETP).

Food and dairy processing unit needs greater amount of water for processing of food product. Wastewater discharged from dairy, food and beverage industries have variety of pollutants in it. Effluent or waste water from food/dairy industry consists of high concentrations of suspended solids, total solids, BOD (Biological Oxygen Demand), COD (Chemical Oxygen Demand), dissolved oxygen, oil and grease, fats, sugar, color, preservatives, and usually nutrients such as nitrogen, ammonia and phosphate etc. ETP for food and dairy industry is developed and integrated with an advanced technology without which water-borne pathogens can spread out in to the environment and results in diseases and degradation of water bodies. It would cost around 7.5 lakh to have a proper effluent treatment plant. Solid waste can also be converted to organic manure.

Miscellaneous fixed assets				
Sl. No.	Particulars	Units	Unit cost	Amount in Rs.
1	Electrical and water Connection	1	500000	500000
2	Chairs	11	2000	22000
3	Table	2	5000	10000
4	Computer	2	50000	100000
5	Printer	1	15000	15000
	<b>Total</b>			<b>647000</b>

Given the fact that the raw material would be procured from local wholesalers/FPOs/Farmers, we need not stock raw material for more than 7 days @ 100% capacity for which size of room has been evaluated. A separate room of 2000 sq.ft., adjacent to the processing room would be made to store the raw material. Similarly finished goods inventory would not be more than 15 days. The production would be managed accordingly. The finished goods will also be stored in a room adjacent to the production area and you will need another at least 1000 sq.ft. for this purpose. . A production area of 3500 sq ft and 500 sq ft for office room and toilet should be sufficient to set up a unit of this size. The total covered sq. ft. area would be around 7000 sq.ft. The project could thus be done on an 10000 sq ft plot keeping room for loading and unloading. A land of around 0.25 acre would be sufficient for this project which is equivalent to 10890 sq.ft. The total building cost is given in table below:

Land and Building			
Particulars	Area reqd	Rate/sqft in Rs.	Amt in Rs
Land cost	Own land -0.25		0
Building cost @ 1430/-- per sq ft	7000	1430	10010000
<b>Total cost</b>			<b>10010000</b>

There would also be a requirement for having an exclusive arrangement for transportation of finished goods. Depending on hired vehicles always may not be a good idea. Accordingly some trucks/transport vehicles need to be procured as part of the project

Vehicles for Transportation of goods	Units	Price/unit	Amt in Rs.
Small transport vehicle (1 tonne)	4	800000	3200000
<b>Total Cost</b>			<b>3200000</b>

The total bank loan component based on the assumptions made and unit costs taken would be as follows:

Project Summary			
Project Cost excluding land			<b>19193500</b>
Pre-operative expenses			<b>191935</b>
Total Project Cost excluding land			<b>19385435</b>
Own Contribution			<b>7754174</b>
Estimated Bank loan			<b>11631261</b>
Own Contribution in Rs. Lakh			<b>77.54</b>
<b>Bank Loan in Rs. Lakh</b>			<b>116.31</b>

In addition interest cost of the first year will be capitalized as the project would need a moratorium for 12 months. This would increase the outstanding at the end of the first year.

### Project Timeline

The project to start off production would need around one year for implementation to be completed.

The breakup for the same is given in table below:

Activity	
Arrangement of finance	3 months
Building of premises/Acquisition of premises	6 months
Procurement of equipments	2 months
Recruitment of manpower	1 month
Training	1 month

As recruitment of manpower can be done along with procurement of equipment and the activity would not be part of the critical path, the total time taken would be 12 months for setting up the project and to reach a position to start production. Hence, one year moratorium has been taken. If “ready to move in” premises suitable for the project is acquired, then the timeline would come down by around 3 months. However, in this project it has been assumed that the unit will be set up in own land and costing has been done assuming the same with a one year moratorium.

### Price of finished goods

The price for a 500 ml bottle of guava jam has been taken at Rs.120/- per bottle. It is a reasonable price. The market for jam is throughout the year. It’s a good healthy product. If quality is maintained, the price fixed is reasonable for getting a foothold in the market.

## Working Capital requirement

Working capital requirement has been assessed keeping in view the banking requirements. Own contribution has been taken at 25%. However, before calculating the working capital requirement it is necessary to find out the overall raw material requirement, production and details of stock based on the assumptions stated above from which working capital requirement is generated. In the following tables details of working capital requirement is assessed

Capacity utilisation in the second year has been kept at a very modest level of 55% as the market linkages has to be set up and brand has to establish itself in the surrounding locality. Guava jam production in the first five years of the project is expected to be as follows:

Guava jam Production for 5 years					
Production Period	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	55%	60%	65%	70%
Raw material requirement per day	0	0.55	0.6	0.65	0.7
Raw material required in tonnes	0	165	180	195	210
Rate per tonne in Rs.	0	70000	73500	77175	81034
Cost of packaging material per 500 ml bottles	0	20	21	22.05	23.15
Total Cost in Rs. Lakh	0	181.5	207.9	236.49	267.4
<b>Calculation of Sales</b>					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Production of Guava Jam</b>	Units				
Opening Stock	0	0	8250	9000	9750
Production in litres	0	165000	180000	195000	210000
Closing Sock in litres	0.00	8250	9000.00	9750.00	10500.00
Net Sales in litres	0	156750	179250	194250	209250
Sales price per packet of 500 ml incl packaging	0	120.00	122.40	124.85	127.35
<b>Sales value in Rs. Lakh</b>	<b>0.00</b>	<b>376.20</b>	<b>438.80</b>	<b>485.04</b>	<b>532.96</b>

Working capital requirement has to be evaluated based on the above mentioned details. The same is given in the table below:

Working Capital Assessment					
Computation of value of closing stock and working capital requirement					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Finished goods inventory in ltrs	0	8250	9000	9750	10500
Price of finished good/500 ml in Rs. including packaging material	0	120	122.4	124.85	127.35
Total finished goods stock price in Rs.	0	1980000	2203200	2434575	2674350
Raw material inventory in tonne	0	3.85	4.2	4.55	4.9
Price of Raw Material/tonne in Rs.	0	70000	73500	77175	81034
Packaging Material per 500 ml	0	20	21	22.05	23.15
Total packaging Raw Material Stock Price	0	549500	396900	451474	510502
Total value of stock	0	2529500	2600100	2886049	3184852
Amount in Lakh	0	25.3	26	28.86	31.85
Less Creditors in lakh	0	6.33	6.5	7.22	7.96
Paid Stock in lakh	0	18.97	19.5	21.64	23.89
Add sundry debtors in lakh	0	12.65	13	14.43	15.93
<b>Total in Rs. Lakh</b>	<b>0</b>	<b>31.62</b>	<b>32.5</b>	<b>36.07</b>	<b>39.82</b>
<b>Own contribution @ 25% in Rs. Lakh</b>	<b>0</b>	<b>7.91</b>	<b>8.13</b>	<b>9.02</b>	<b>9.96</b>
<b>Working Capital requirement in Rs. Lakh*</b>	<b>0</b>	<b>23.71</b>	<b>24.37</b>	<b>27.05</b>	<b>29.86</b>
<b>* WC requirement has been taken based on the requirement of the second year as the first year would be treated as moratorium period for setting up the project.</b>					

The project is expected to generate sufficient cash and working capital limit is pegged at the requirement of the second year, first year being the moratorium for setting up the factory.

### Other Expenses

There are other expenses which may be also termed as running cost. They are mainly salary, and electricity charges packaging cost, and admin & marketing expenses. The details of these expenses are given below:

Labour and Staff Salary/wages				
Particulars	Wages/ Salary per month	No. of employees	Total Salary per month	Annual Salary
Manager	30000	1	30000	360000
Accountant	25000	1	25000	300000
Helper	10000	1	10000	120000
Plant Operator	20000	1	20000	240000
Skilled labour	15000	1	15000	180000
Unskilled labour	10000	6	60000	720000
<b>Total Salary</b>			<b>160000</b>	<b>1920000</b>

Projected Salary Expenses					
<b>Salary expenses Projection</b>	1st year	2nd year	3rd year	4th year	5th year
<b>Annual Salary expenses</b>	0	1920000	2112000	2323200	2555520
<b>Salary expenses rounded off to lakhs</b>	<b>0</b>	<b>19.2</b>	<b>21.12</b>	<b>23.23</b>	<b>25.56</b>
<b>Electricity Charges</b>					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	<b>0%</b>	<b>55%</b>	<b>60%</b>	<b>65%</b>	<b>70%</b>
Consumption of power per day in units	0	165	180	195	210
Rate per unit in Rs.	9.00	9.00	9.00	9.00	9.00
Power bill per month in Rs.	0	37125	40500	43875	47250
<b>Total power bill per year</b>	<b>0</b>	<b>445500</b>	<b>486000</b>	<b>526500</b>	<b>567000</b>
<b>Power bill in Rs. Lakh</b>	<b>0</b>	<b>4.455</b>	<b>4.86</b>	<b>5.265</b>	<b>5.67</b>
<b>Packaging Cost</b>					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Cost of Packaging per unit (500 ml)	0	20	21	22.05	23.15
Total Production in litres	0	165000	180000	195000	210000
<b>Packaging cost in Rs. Lakh</b>	<b>0.00</b>	<b>165.00</b>	<b>189.00</b>	<b>214.99</b>	<b>243.08</b>
<b>Selling, transportation and administrative expenses</b>					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Sales and branding expenses per annum	0	2000000	2000000	2000000	2000000
Admin Expenses	0	480000	480000	480000	480000
Transportation charges	0	960000	960000	960000	960000
<b>Total Expenditure on Sales, Admin &amp; Transportation</b>	<b>0</b>	<b>3440000</b>	<b>3440000</b>	<b>3440000</b>	<b>3440000</b>

All these costs will be factored in later in the report while evaluating the financial benefits of the project

## Depreciation

The depreciation calculation is as follows:

Depreciation Calculation					
<b>Particulars</b>	<b>1st year</b>	<b>2nd year</b>	<b>3rd year</b>	<b>4th year</b>	<b>5th year</b>
Total value of equipments	0	9183500	7805975	6635079	5639817
Depreciation @15%	<b>0</b>	<b>1377525</b>	<b>1170896</b>	<b>995262</b>	<b>845973</b>
Value at the end of the year to be carried forward	0	7805975	6635079	5639817	4793844
Total Value of building	0	10010000	9009000	8108100	7297290
Depreciation of building@10%	<b>0</b>	<b>1001000</b>	<b>900900</b>	<b>810810</b>	<b>729729</b>
Value at the end of the year to be carried forward	0	9009000	8108100	7297290	6567561
<b>Total depreciation</b>	<b>0</b>	<b>2378525</b>	<b>2071796</b>	<b>1806072</b>	<b>1575702</b>
Total depn in Rs. Lakh	0	23.79	20.72	18.06	15.76

## Repairs and maintenance

In case of new equipments including computers, generally they give a warranty for one year. Thus the maintenance cost would be starting from the second year onwards. The same in general is given at a service charge of 15% per annum. In case there are any major spares to be replaced the cost of that has to be borne by the customers. Given these general terms, it can be taken at 20% of the equipment cost per annum. The same would then be as follows:

Cost of Maintenance	
Particulars	Amount
Total fixed cost	9183500
Maintenance cost in percentage	20%
Cost of Maintenance	1836700
Maintenance cost in Rs. Lakh	18.37

## Cost of Project and Means of Finance

Based on the data presented above on cost of plant and machinery, working capital requirement, etc., the cost of the project and means of finance required can be summarized as follows:

Cost of The Project	
(in Rs. Lakh)	
Particulars	Amount
Land & Building*	100.1
Plant & Machinery	53.36
Misc. Items, transportation & pre-op exp.	40.39
Working Capital	31.62
Total	225.47
*Land is assumed as own land and hence cost taken is 0	

Means of Finance	
(in Rs. Lakh)	
Particulars	Amount
Own Contribution	77.54
Term Loan from Bank	116.31
Working Capital Own contribution	7.91
Working Capital	23.71
total	225.47

The detailed repayment schedule of the term loan is indicated in Annexure 4. The interest for the first year is capitalized and loan outstanding accordingly increased in the end of the first year. It is assumed that the working capital limit given will be renewed every year for the next five years. Any increase in the working

capital may not be necessary as the project should be able to generate sufficient profits and the internal accruals should be able to take care of additional working capital requirements. The summary of interest payment for working capital and term loan and principal repayment is given in the table below:

Year-wise Interest on Bank Loan					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Interest on Term Loan in Rs.*	0	1257420	902384	547348	192312
Interest on Term Loan in Rs. Lakh	0.00	12.57	9.02	5.47	1.92
Interest on working Capital	0	2.61	2.61	2.61	2.61
Principal Repayment in Rs.	0	3227604	3227604	3227604	3227604
Principal Repayment in Rs. Lakh	0.00	32.28	32.28	32.28	32.28
Balance outstanding - end of the year	129.10	96.82	64.54	32.26	0.00
* Interest on term loan has been capitalised for 12 months leading to increase in the capital outlay. This has been done to account for the 12 month moratorium.					

## Financial Statements

The profitability of the project can be judged based on the financial statements generated based on the data presented above in the series of tables. Accordingly the projected profit and loss account, balance sheet, and cash flow statement along with breakeven analysis is presented in the tables below. During the moratorium period the interest is charged by the bank which has to be capitalized to ensure that the same is repaid over a period of time. Capitalisation thus leads to increase in the loan quantum at the end of the first year which can be seen in the balance sheet.

Projected P&L Statement					
(in Rs. Lakh)					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation%	0%	55%	60%	65%	70%
Gross Sale of Guava jam	0	376.2	438.8	485.04	532.96
<b>Total</b>	<b>0</b>	<b>376.2</b>	<b>438.8</b>	<b>485.04</b>	<b>532.96</b>
Cost of Production					
Raw Material Consumed	0	115.5	132.3	150.49	170.17
Electricity Charges	0	4.46	4.86	5.27	5.67
Depreciation	0	23.79	20.72	18.06	15.76
Salary and wages	0	19.2	21.12	23.23	25.56
Repair and Maintenance	0	18.37	18.37	18.37	18.37
Packaging	0	66	75.6	86	97.23
Selling & Admn Expenses	0	34.40	34.40	34.40	34.40
<b>Total Cost of Production</b>	<b>0</b>	<b>281.72</b>	<b>307.37</b>	<b>335.82</b>	<b>367.16</b>

<b>Profit before interest and taxes</b>	<b>0</b>	<b>94.48</b>	<b>131.43</b>	<b>149.22</b>	<b>165.8</b>
Interest on Term Loan*	0.00	12.57	9.02	5.47	1.92
Interest on Working Capital	0	2.61	2.61	2.61	2.61
<b>Total Interest Payment</b>	<b>0.00</b>	<b>15.18</b>	<b>11.63</b>	<b>8.08</b>	<b>4.53</b>
Profit before Tax	0.00	79.30	119.80	141.14	161.27
Income Tax	0	19.83	29.95	35.29	40.32
<b>Net profit after tax</b>	<b>0.00</b>	<b>59.47</b>	<b>89.85</b>	<b>105.85</b>	<b>120.95</b>
<b>Term loan interest for first year capitalised to account for the moratorium</b>					

As can be seen, the unit would be in profits after tax from second year onwards. The project has enough margin at 55% capacity utilization.

<b>Projected Balance Sheet</b>					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Liabilities</b>					
Capital					
Opening Balance	0	77.54	144.92	234.77	340.62
Own Capital Contribution	77.54	7.91			
Retained Earnings	0.00	59.47	89.85	105.85	120.95
<b>Total-Closing Balance</b>	<b>77.54</b>	<b>144.92</b>	<b>234.77</b>	<b>340.62</b>	<b>461.57</b>
Term Loan	129.10	96.82	64.54	32.26	0.00
Working Capital Limit	0.00	23.71	23.71	23.71	23.71
Sundry Creditors	0	6.33	6.5	7.22	7.96
<b>Total Liabilities</b>	<b>206.64</b>	<b>271.78</b>	<b>329.52</b>	<b>403.81</b>	<b>493.24</b>
<b>Assets</b>					
Fixed Assets	193.85	193.85	193.85	193.85	193.85
Gross Depreciation	0	23.79	44.51	62.57	78.33
<b>Net Fixed Assets</b>	<b>193.85</b>	<b>170.06</b>	<b>149.34</b>	<b>131.28</b>	<b>115.52</b>
Sundry Debtors	0	12.65	13	14.43	15.93
Stock in Hand	0	25.3	26	28.86	31.85
Interest capitalised	12.79	0	0	0	0
Cash and Bank Balance	0	63.77	141.18	229.24	329.94
<b>Total Assets</b>	<b>206.64</b>	<b>271.78</b>	<b>329.52</b>	<b>403.81</b>	<b>493.24</b>

The project is generating healthy profit from second year with the first year being moratorium as presented above. The breakeven analysis indicates the level of operation at which the operations will breakeven and not have any loss. It becomes important to identify the fixed and the variable costs. Even within variable

component there is always a part which is fixed. For example, even if the plant is not running there will be lights and fans which will be used for administrative work, people will have to be paid salary for those days as well, etc. Accordingly, a portion of the variable expenses have been taken as fixed cost to arrive at the contribution and the total fixed cost. Total fixed cost divided by the contribution (fixed cost÷Contribution) gives us the breakeven point. In this case the breakeven capacity utilization in year 2 comes at 26% capacity utilisation.

Breakeven Point Analysis		
	Rs. In Lakh	
Total Sale (Sales - opening WIP + closing WIP)	Year 1	Year 2
Net Sales	0.00	376.20
Less: Opening Stock	0.00	0.00
Add: Closing Stock	0.00	19.80
<b>Total Production/Sales</b>	<b>0.00</b>	<b>396.00</b>
<b>Variable Expenses</b>		
Raw Material and Packaging	0.00	181.50
Interest on working Capital	0.00	2.61
Repair and Maintenance	0.00	4.59
Salary expenses	0.00	1.92
Sales & Admin Expenses	0.00	5.16
Energy - Electricity	0.00	4.37
<b>Total</b>	<b>0.00</b>	<b>200.15</b>
<b>Contribution</b>	<b>0.00</b>	<b>195.85</b>
<b>Contribution per unit (per tonne)</b>	<b>NA</b>	<b>124.94</b>
<b>Fixed expenses</b>		
Interest on Term Loan	0.00	12.57
Repair and Maintenance	0.00	13.78
Salary expenses	0.00	17.28
Sales & Admin Expenses	0.00	29.24
Energy - Electricity	0.00	0.09
Depreciation	0.00	23.79
<b>Total</b>	<b>0.00</b>	<b>96.75</b>
Capacity utilisation	0%	55%
<b>Operating Profit</b>	<b>0.00</b>	<b>99.10</b>
<b>Breakeven point in physical units</b>	<b>NA</b>	<b>77435</b>
<b>Breakeven point in capacity utilisation (%)</b>	<b>NA</b>	<b>26%</b>

Cash Flow Statement					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Sources of Fund</b>					
Own margin	77.54	7.91			
Profit Before Interest and Tax	0.00	94.48	131.43	149.22	165.80
Depreciation	0.00	23.79	20.72	18.06	15.76
Working Capital accretion	0.00	23.71	0.00	0.00	0.00
Term Loan accretion	116.31	12.79	0.00	0.00	0.00
Creditors	0.00	6.33	0.17	0.72	0.74
<b>Total</b>	<b>193.85</b>	<b>169.01</b>	<b>152.32</b>	<b>168.00</b>	<b>182.30</b>
<b>Uses of Fund</b>					
Fixed Assets	191.94	0.00	0.00	0.00	0.00
Stock in Trade - Accretion	0.00	25.30	0.70	2.86	2.99
Debtors - Accretion	0.00	12.65	0.35	1.43	1.50
Repayment of term Loan	0.00	32.28	32.28	32.28	32.28
Interest on Term Loan	0.00	12.57	9.02	5.47	1.92
Interest on working capital	0.00	2.61	2.61	2.61	2.61
Income Tax	0.00	19.83	29.95	35.29	40.32
Accretion in cash & bank balance	1.91	63.77	77.41	88.06	100.68
<b>Total</b>	<b>193.85</b>	<b>169.01</b>	<b>152.32</b>	<b>168.00</b>	<b>182.30</b>

The cash flow statement above indicates that chance of any problem with the cash is very little or so to say practically nil in the project. The project generates sufficient cash, and the entrepreneur can maintain a healthy cash balance for any eventuality or a rainy day. There are risks like equipment failure and the repair time required for the same, sudden problem with supply of raw material or shipment not arriving, etc. Now these are unforeseen risk which always cannot be factored in. It is for these kinds of problems that a healthy cash balance is necessary for running a business. This project enables the entrepreneur to have that.

Calculation of DSCR					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Cash Accruals</b>					
Depreciation	0	23.79	20.72	18.06	15.76
Profit before interest and taxes	0	94.48	131.43	149.22	165.8
<b>Total</b>	<b>0</b>	<b>118.27</b>	<b>152.15</b>	<b>167.28</b>	<b>181.56</b>
<b>Repayments</b>					
Interest on Term Loan	0.00	12.57	9.02	5.47	1.92
Term Loan Installments	0.00	32.28	32.28	32.28	32.28
<b>Total</b>	<b>0.00</b>	<b>44.85</b>	<b>41.30</b>	<b>37.75</b>	<b>34.20</b>
<b>Debt Service Coverage Ratio</b>	<b>NA</b>	<b>2.64</b>	<b>3.68</b>	<b>4.43</b>	<b>5.31</b>

The debt service coverage ratio from second year is 2.64 and above indicating that the project should not have any problem in servicing the loan in the structure suggested which is a five-year loan including one year moratorium.

### IRR/NPV and BC Ratio

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is a healthy 1.32 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 441.63 lakh. And the internal rate of return comes to 75% which essentially indicates that at 75% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

BC Ratio, NPV and IRR								(Amt in Rs. Lakh)	
Costs and revenue items	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	
<b>Fixed Costs</b>	191.935								
<b>Variable costs</b>									
Raw material	0	181.5	207.9	236.49	267.4	300.84	336.96	375.94	
Salary	0	19.2	21.12	23.23	25.56	28.11	30.92	34.01	
Electricity	0	4.455	4.86	5.265	5.67	6.075	6.48	6.885	
Maintenance	0	18.37	18.37	18.37	18.37	18.37	18.37	18.37	
Sales and Admin exp	0	34.4	34.4	34.4	34.4	34.4	34.4	34.4	
<b>Total Costs</b>	<b>191.935</b>	<b>257.925</b>	<b>286.65</b>	<b>317.755</b>	<b>351.4</b>	<b>387.795</b>	<b>427.13</b>	<b>469.605</b>	
Rate of discount	15%								
Present value of costs	1388.53								
<b>Revenues</b>									
<b>Sale of finished goods</b>									
500 ml of guava jam		376.20	438.80	485.04	532.96	582.60	634.01	687.24	
<b>Total</b>	<b>0</b>	<b>376.2</b>	<b>438.8</b>	<b>485.04</b>	<b>532.96</b>	<b>582.6</b>	<b>634.01</b>	<b>687.24</b>	
Rate of discount	15%								
Present value of benefits	1830.16								
<b>BC Ratio</b>	<b>1.32</b>								
<b>Net Benefits</b>	<b>-191.94</b>	<b>118.275</b>	<b>152.15</b>	<b>167.285</b>	<b>181.56</b>	<b>194.805</b>	<b>206.88</b>	<b>217.635</b>	
Rate of discount	15%								
<b>NPV</b>	<b>441.63</b>								
<b>IRR</b>	<b>75%</b>								

## Registration/Certification

There are four registrations necessary for MSMEs which are involved in food processing. A brief on the same is given below:

1. **GST:** GST registration in today's environment is a necessity for anyone doing a business. The entrepreneur must get himself registered for the same first. Many of the benefits given by central government is being linked to GST registration. Necessary system should be put in place to file the GST return from time to time as per the rules laid down by GoI.  
(<https://reg.gst.gov.in/registration/>)
2. **FSSAI:** The processing units should follow the Food Safety and Standard Authority of India (FSSAI) act 2006. FSSAI Act is applicable pan India for all food products. It prescribes minimum standards operating procedures, food safety norms, packaging & labeling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India. The registration can be done at FSSAI website. (<https://fssai.gov.in/cms/registration.php>)
3. **UDYAM:** The entrepreneur may consider getting himself registered in UDYAM.  
(<https://udyamregistration.gov.in/Government-India/Ministry-MSME-registration.htm>).
4. **ISO:** ISO certification is a seal of approval from a third party body that a company runs to one of the international standards developed and published by the International Organization for Standardization (ISO). It is absolutely essential if one wants to venture into exports. Even for domestic sales this certification adds value. A person feels comfortable with ISO certification mentioned in the packaging along with FSSAI registration. Various agencies are there doing this job of certification. One such site available is <https://legalwaycertification.com/iso/>. There are many other such agencies who have been authorized to issue ISO certification.

All three viz., GST registration, FSSAI registration and ISO certification has to be mentioned on the packaging. It is also important that these certifications are renewed as and when required. For example, ISO certification is valid for 1 year in many cases. If so, the certification needs to be renewed every year. In addition to the ones stated above, it would be necessary to take fire and pollution clearances. It would also be advisable choose a brand name for the product and secure the name with trademark.

Having a trademark is useful for direct marketing.





# Model Project Report on **Lemon Juice Processing**

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# Lemon Juice Processing

## 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 hectares 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. Unfortunately, fruits and vegetables being perishable in nature get around 25% is wasted 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. Lemon is the third most important citrus fruit following orange and mandarin. Fruits of lemon plants are appreciated for their high content of flavonoids, vitamin C, citric acid and minerals.

## Promoters - Some specific requirements

The details of the promoters will have to be obtained along with other information. The Proforma for promoter detail is given in Annexure – 1.

## History of the company

The project has been prepared as if a new set up is being made for the purpose of lemon juice processing. The same could be part of another company or a new company all together. The details of the existing company or the proposed company have to be obtained/presented in the project report.

Proforma for company report is given in Annexure-2.

## Finished product and its utility

In West Bengal the product has a great demand because of the sultry and hot weather most of the time during the year and there is no drink as refreshing as lemon juice in a hot summer day.

Lemon is a great source of vitamin C and fibre, lemons contain many plant compounds, minerals, and essential oils. Lemons contain very little fat and protein. They consist mainly of carbohydrates (10%) and water (88–89%). The carbohydrates in lemons are primarily composed of fibres and simple sugars, such as glucose, fructose, and sucrose. The main fibre in lemons is pectin. Soluble fibres like pectin can lower blood sugar levels by slowing down the digestion of sugar and starch. Dietary fibres are an important part of a healthy diet and linked to numerous health benefits. It also rich in following vitamins and minerals like Vitamin C, Potassium,

Vitamin B6, Citric acid, Hesperidin, Diosmin, Eriocitrin, D-limonene essential vitamin and antioxidant, vitamin C is important for immune function and skin health. A diet high in potassium can lower blood pressure levels and have positive effects on heart health.

## Market, Demand and Major Competitors

There are fruit juice manufacturers in the country but they mostly manufacture on a large scale. Tropicana and Real and the two most common brands of plain fruit juice while Paper Boat has captured the imagination with flavoured fruit juice. With lemon juice one can have both salty and sugar flavoured juice. It depends on what the market demand is. While consumption of juice in Indian market is comparatively low, the market is widening and that essentially means there is room for other players as well. An entrepreneur could become an important local player and even think of marketing its produce through digital channels like Big Basket, Spencers, etc. However, the first step should be establish itself as a local player in its nearby areas and Kolkata both physically and through the digital marketing channels.

*Note: In addition details of localized competition, has to be mentioned while preparing the final DPR based on where the unit is going to be set up.*

## Raw Material Requirement

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 fortified citrus lemon juice manufacturing project, the unit requires 350 kg/day, 400 kg/day and 450 kg/day raw lemon fruit at 70, 80 and 90 percent capacity utilization, respectively. The Mature lemon must be plucked from plant; and then stored below 6°C temperature.

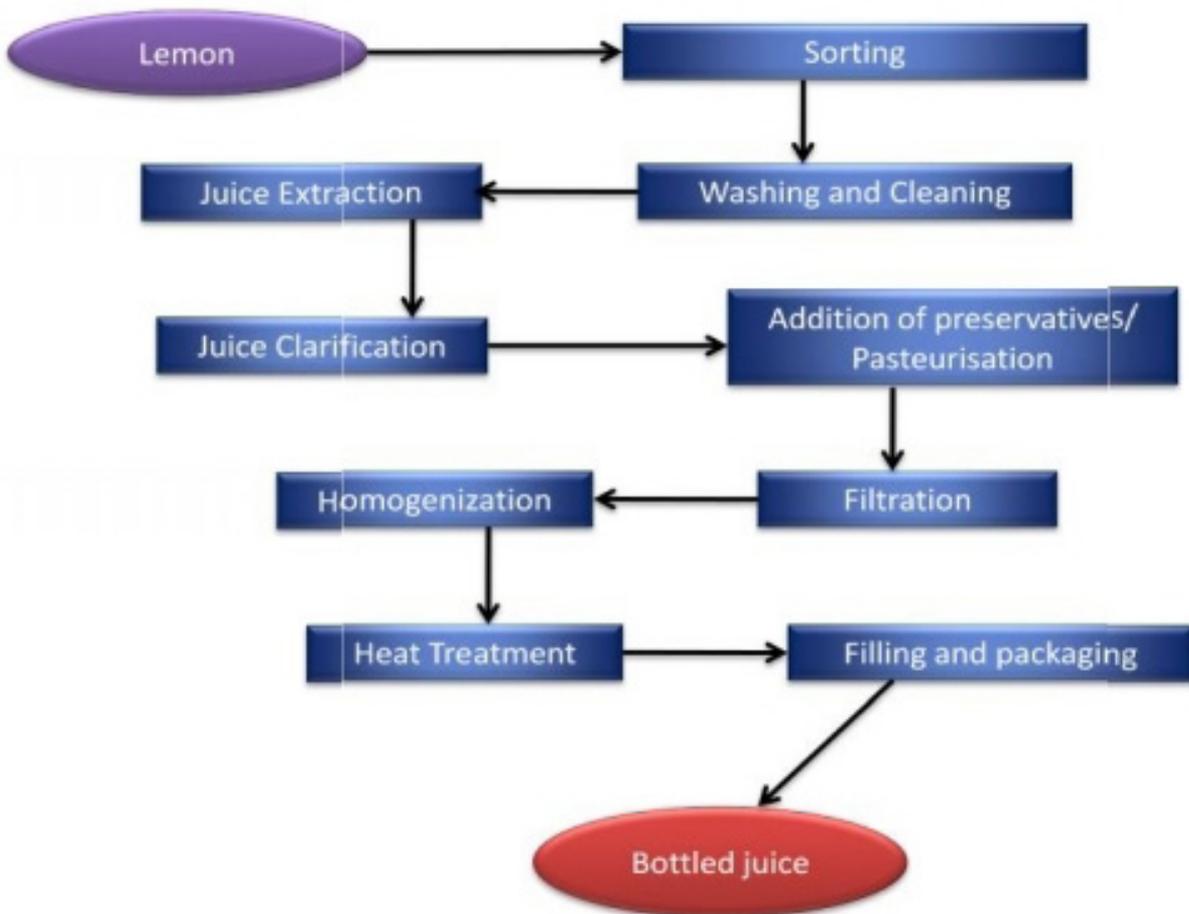
## Manufacturing Process

The process of manufacture for ready to drink lemon juice is well-established. The general process which is followed is explained here.

- Lemon fruits to be purchased from the market and stored at less than 6°C. Mature and ripened fruits with characteristic flavor will have to be used.
- The Lemons have to be sorted and the ones with injury or damage marks have to be removed
- Sorted lemon have to be washed and soaked in water containing chlorine solution (10-20ppm) for 2-5 minutes and the water has to be drained fully with no smell of chlorine left
- Lemons would then be put through for juice extraction

- Juice Clarification - Fruit juices are clarified by using different methods like straining or screening, settling or sedimentation and filtration. The fruit juices are strained or screened by muslin cloth or stainless steel mesh sieves manually to remove coarse particles in a small-scale industry. Automated systems are also available where the process of extraction and clarification are combined together.
- Preservatives are then added or pasteurisation - Potassium metabisulphate at rate of 0.1 % or sodium benzoate at rate of 0.1%. However, nowadays pasteurization is a better alternative as most of the producers make it a point to add a simple line on the bottles stating that no preservatives are added
- It is then put through a filtration process followed by Homogenization
- Heat treatment is then done at 77°C for 30 seconds. In case entrepreneur wants to fortify the juice with calcium and vitamin D as a value addition, the same has to be done at this stage by adding 0.16 % Tricalcium citrate & Vitamin D 4.17 mg/litre. We have however not factored fortification in the project to make it a chemical free juice which is preferred by many.
- It is then sent for bottling and packaging

### Flow Chart for Lemon Juice Making



## SWOT Analysis

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>➤ Increasing Demand due to life style changes and also the climate change. Best on the go drink when a person is thirsty</li> <li>➤ It's a product needed for at least 9 months in a year.</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>➤ Sales do dip during winter months. However, with low breakeven point, the issue should not be a problem.</li> <li>➤ Limited Shelf life of product and hence demand estimation has to be accurate</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>➤ Scope for diversification within the domain bringing out different kinds of fruit juice with some tweaking of the production system.</li> <li>➤ Can switch over even to production of Lemon juice concentrate</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>➤ National and international Level competitors exist. This has to be countered through pricing and marketing efforts</li> </ul>

## Financial Aspects of the Project

### Infrastructure requirement

Any project preparation is based on a set of assumptions made which are close to the market reality. In this project the land used is assumed to be own land. The major component of a fruit juice processing unit is land, building, plant and machinery and civil works. List of all the assumptions made is given in Annexure 3. Raw material storage would be for about 15 days and for that there would be need for having cold room for the same. Ensuring proper tie-up with FPOs would reduce the amount of raw material stored finished goods inventory would be for 15 days. The building would have a raw material storage room, one finished goods storage room, and the main processing room along with an office room and toilet. Space required would be of around 4000 sq ft. taking into account the future expansion plan. This includes a separate room for storage of finished goods. Another 2000 Sq.ft. would go for having a series of cold room. In all there would be 6000 sq.ft. of covered area. The reason for having compartmentalized small cold rooms would be to conserve power consumption based on capacity utilization.

### Land and its development

A plot of approximately 8000 sq.ft would be necessary for setting up a juice making unit of this scale. The land should be free from any encumbrance and shall be mortgageable. The land should be classified as non-agriculture. Permission for non-agriculture use, wherever applicable, shall be obtained for the land.

## Size of the unit

The capacity has been restricted to 2 tonnes of lemon per day which approximately should produce 26000 bottles (250 ml) of ready to drink fruit juice. The machinery chosen is of a higher capacity specially to meet the summer demand which extends for nearly 4-5 months if the product is very successful based on initial marketing efforts. Evaluating at capacity utilization of 40% would be better because of two reasons. First of all raw material tie-ups if it doesn't work out and there is a failure in supply would create big problem. Second reason is marketing of end product. The market of bottled drinks is highly competitive and big brands are also into the lemon flavored drinks. Based on estimates this would be adequate to cater to the market surrounding the production area. As one has to go in for direct marketing, it would be necessary to have a brand which needs to be established in quick time in the last phase of the first year and beginning of second year. And then the same will get settled in a year or two and earn a good name if quality is maintained. It is because of all this that the maximum capacity utilisation has been kept at a very conservative level with a room for even doubling the production from third year if the demand comes up.

## Machineries and Equipment

Various machineries and equipments will be required for setting up the plant. The list of such equipment and number of such units required for setting up a Ready to drink juice making unit along with Miscellaneous fixed assets for which investment has to be made is given below. This would have a maximum capacity 2000 kg or 2 tonnes per day @ rate of 8 hours per day. For 300 days in a year this would mean 600 tonnes per annum. Capacity utilization would be restricted to 40% for the sake of evaluation while doing the financial analysis. While power requirement for each of the equipments were not readily available, based on the assessment made after consulting a few experts, it is felt that a 100 KVA generator set would be sufficient as some of the equipments taken like pet bottle blowing machine can be shut down when the power is not available. The production requirement can be easily covered when the power is available.

Wastewater effluents from fruit juice plants contain high levels of organic material. Major problem in the treatment of raw effluents is pH value, imbalance of nutrients, and fluctuations in the effluent and waste matter produced. Sequencing batch reactor is successfully applied for treatment of strong wastewater with organic carbon and nutrient removal. It is expected that for a wastewater treatment plant the cost would come to around 10 lakhs which has been factored in the project. Solid waste can be converted to sludge and then treated or could even be converted to organic manure by keeping them in pits.

Processing Equipment cost				
Sl no.	Machine	Unit	Unit Cost	Amt in Rs.
1	<b>Reverse Osmosis Plant (With U.V.)</b>			
	a. S.S Based Reverse Osmosis Plant 10 HP			
2	<b>Sugar syrup &amp; final beverage preparation section</b>			
	a. Sugar syrup preparation tank			
	b. Filter press with transfer pump 6 HP			
	c. Sugar Syrup cooling system 8 HP			
	d. Boiler/Hot Water generator for making sugar syrup 12 HP			
	e. Blending/Mixing tank 2 HP			
	f. Transfer Pumps 5 HP			
3	<b>Pasteurizer 3 HP</b>			
4	<b>Homogenizer 3 HP</b>			
5	<b>Lemon Juice Extractor 3 HP</b>			
6	<b>Temperature Holding System. 3 HP</b>			
7	<b>C.I.P. system (Clean in Process) 3 HP</b>			
8	<b>PET Bottle/CAN blow moulding Machine 15 HP</b>			
9	<b>Bottling Section - PET Bottle 2 HP</b>	1 set	900000	900000
	a. Fully Automatic Rotary Based PET Bottle Rinsing, Gravity filling and screw Capping Machine with Cap Feeder, In-feed And Exit Conveyor			
9	<b>Labeling Section 4 HP</b>			
	a. Fully Automatic Shrink Sleeve Applicator for labeling with steam tunnel and steam Generator.			
	b. BOPP Glue labeling Machine with bottle drying system.			
	c. Semi automatic Steam Shrink tunnel and steam generator for Labeling.			
	d. Sticker Labeling Machine			
10	<b>Coding Machine:- Online Ink-Jet Coding Machine</b>			
11	<b>Cap sterilizer/ Tilting Conveyor 5 HP</b>			
12	<b>Cooling tunnel 4 HP</b>			
13	<b>Bottle Drying System 2 HP</b>			
14	<b>Group or Bulk Packaging Machine 3 HP</b>			
15	<b>Interconnecting Pipe Line 5 HP</b>			
16	<b>Cold room equipment and a small testing lab 2 HP</b>			
17	<b>100 KVA Genset</b>	1	900000	900000
18	<b>Effluent Treatment Plant</b>	1	1000000	1000000
	Total cost of equipment			10900000
	Addl charges for GST, transportation, etc		30%	3270000
	Total cost of equipment incl GST, etc.			14170000

1. Prices quoted on Indiamart or companies are generally excluding GST, Transportation charges and installation charges as well as any other taxes applicable. Accordingly, an additional 30% has been taken on the ex-factory equipment cost. They are also indicative prices.
2. Based on the searches on Indiamart, it is observed that there are companies supplying all the equipments giving a single window solution. It is suggested that it would be better for an entrepreneur to buy all equipments from a single vendor because the following reasons.
  - a. There will not be any mismatch between equipments and automation would be smoother.
  - b. Single point of contact would not allow any blame game between vendors in case something goes wrong.
  - c. Power assessment would be better and line can be drawn accordingly
  - d. A single unit set up by any of these can be visited to get a clear overview.
  - e. Training would be much easier as it would from one agency

The packaging machine would depend on what volume we want to pack. As we are targeting direct marketing in this case, packaging would be for say 250 ml to a maximum of 1 litre.

Miscellaneous fixed assets				
Sl. No.	Particulars	Units	Unit cost	Amount in Rs.
1	Electrical and water Connection	1	1000000	1000000
2	Chairs	11	2000	22000
3	Table	2	5000	10000
4	Computer	2	50000	100000
5	Printer	1	15000	15000
	<b>Total</b>			<b>1147000</b>

Given the fact that the raw material would be procured from local wholesalers/FPOs/Farmers, we need not stock raw material for more than 3 days @ 100% capacity for which size of cold room has been evaluated. A separate cold room of 2000 sq.ft., adjacent to the processing room would be made to store the raw material. Similarly finished goods inventory would not be more than 15 days. The production would be managed accordingly. The finished goods will also be stored in a room adjacent to the production area and you will need another at least 1000 sq.ft. for this purpose. A production area of 3500 sq ft and 500 sq ft for office room and toilet should be sufficient to set up a unit of this size. The total covered sq. ft. area would be around 7000 sq.ft. The project could thus be done on an 8000 sq ft plot keeping room for loading and unloading. A land of around 0.25 acre would be sufficient for this project which is equivalent to 10890 sq.ft. Land however has been taken at 0.5 acre to enable sufficient space keeping in mind further expansion. The total building cost is given in table below:

Land and Building			
Particulars	Area reqd	Rate/sqft in Rs.	Amt in Rs
Land cost	Own land - 0.5		0
Building cost @ 1430/-- per sq ft	7000	1430	10010000
<b>Total cost</b>			10010000

There would also be a requirement for having an exclusive arrangement for transportation of finished goods. Depending on hired vehicles always may not be a good idea. Accordingly some trucks/transport vehicles need to be procured as part of the project

Vehicles for Transportation of goods	Units	Price/unit	Amt in Rs.
4-5 tonne truck	2	1500000	3000000
Small transport vehicle (1 tonne)	6	800000	4800000
<b>Total Cost</b>			<b>7800000</b>

The total bank loan component based on the assumptions made and unit costs taken would be as follows:

Project Summary			
Project Cost excluding land			<b>33127000</b>
Pre Operative Expenses			<b>331270</b>
Total Project Cost excluding Land			<b>33458270</b>
Own Contribution			<b>13383308</b>
Estimated Bank loan			<b>20074962</b>
Own Contribution in Rs. Lakh			<b>133.83</b>
<b>Bank Loan in Rs. Lakh</b>			<b>200.75</b>

In addition interest cost of the first year will be capitalized as the project would need a moratorium for 12 months. This would increase the outstanding at the end of the first year.

### Project Timeline

The project to start off production would need around one year for implementation to be completed.

The breakup for the same is given in table below:

Activities	Projected time period
Arrangement of finance	3 months
Building of premises/Acquisition of premises	6 months
Procurement of equipments	2 months
Recruitment of manpower	1 month
Training	1 month

As recruitment of manpower can be done along with procurement of equipment and the activity would not be part of the critical path, the total time taken would be 12 months for setting up the project and to reach a position to start production. Hence, one year moratorium has been taken. If “ready to move in” premises suitable for the project is acquired, then the timeline would come down by around 3 months. However, in this project it has been assumed that the unit will be set up in own land and costing has been done assuming the same with a one year moratorium.

### Price of finished goods

The price for a 250 ml bottle of ready to drink juice has been taken at Rs.15/- per bottle. It is a reasonable price. Bigger packaging could be considered but the main market for such a drink is on the go during the hot summer months. This market is available for nearly 9-10 months in a year. It’s a good healthy drink. The other alternative would be to sell lemon juice concentrate. Costing of that project would however be completely different as many of the things specially with respect to bottling may not be needed as the output in terms of volume would be much less. A detailed market survey may be necessary to decide on this before setting up the market. It is felt that there is a market for ready to drink lemon juice and hence the project has been prepared on those lines.

### Working Capital requirement

Working capital requirement has been assessed keeping in view the banking requirements. Own contribution has been taken at 25%. However, before calculating the working capital requirement it is necessary to find out the overall raw material requirement, production and details of stock based on the assumptions stated above from which working capital requirement is generated. In the following tables details of working capital requirement is assessed.

Capacity utilisation in the second year has been kept at a very modest level of 40% as the market linkages has to be set up and brand has to establish itself in the surrounding locality. Ready to drink lemon juice production in the first five years of the project is expected to be as follows:

Ready to drink lemon juice Production for 5 years					
Production Period	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	40%	45%	50%	55%
Raw material requirement per day	0	0.8	0.9	1	1.1
Raw material required in tonnes	0	240	270	300	330
Rate per tonne in Rs.	0	45000	47250	49613	52094
Cost of packaging material per 250 ml bottles	0	2.5	2.63	2.76	2.9
Total Cost in Rs. Lakh	0	264	312.2	364.12	420.73

Calculation of Sales					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Production of ready to drink lemon Juice</b>					
Opening Stock	0	0	78000	87750	97500
Production in litres	0	1560000	1755000	1950000	2145000
Closing Stock in litres	0.00	78000	87750.00	97500.00	107250.00
Net Sales in litres	0	1482000	1745250	1940250	2135250
Sales price per packet of 250 ml incl packaging	0	15.00	15.30	15.61	15.92
<b>Sales value in Rs. Lakh</b>	<b>0.00</b>	<b>889.20</b>	<b>1068.09</b>	<b>1211.49</b>	<b>1359.73</b>

Working capital requirement has to be evaluated based on the above mentioned details. The same is given in the table below:

Working Capital Assessment					
Computation of value of closing stock and working capital requirement					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Finished goods inventory in ltrs	0	78000	87750	97500	107250
Price of finished good/250 ml in Rs. including packaging material	0	15	15.3	15.61	15.92
Total finished goods stock price in Rs.	0	4680000	5370300	6087900	6829680
Raw material inventory in tonne	0	2.4	2.7	3	3.3
Price of Raw Material/tonne in Rs.	0	45000	47250	49613	52094
Packaging Material per 250 ml	0	2.5	2.63	2.76	2.9
Total packaging Raw Material Stock Price	0	303000	134676	157119	181480
Total value of stock	0	4983000	5504976	6245019	7011160
Amount in Lakh	0	49.83	55.05	62.45	70.11
Less Creditors in lakh	0	12.46	13.76	15.61	17.53
Paid Stock in lakh	0	37.37	41.29	46.84	52.58
Add sundry debtors in lakh	0	7.47	8.26	9.37	10.52
<b>Total in Rs. Lakh</b>	<b>0</b>	<b>44.84</b>	<b>49.55</b>	<b>56.21</b>	<b>63.1</b>
<b>Own contribution @ 25% in Rs. Lakh</b>	<b>0</b>	<b>11.21</b>	<b>12.39</b>	<b>14.05</b>	<b>15.78</b>
<b>Working Capital requirement in Rs. Lakh*</b>	<b>0</b>	<b>33.63</b>	<b>37.16</b>	<b>42.16</b>	<b>47.32</b>
<b>* WC requirement has been taken based on the requirement of the second year as the first year would be treated as moratorium period for setting up the project.</b>					

The project is expected to generate sufficient cash and working capital limit is pegged at the requirement of the second year, first year being the moratorium for setting up the factory.

## Other Expenses

There are other expenses which may be also termed as running cost. They are mainly salary, and electricity charges packaging cost, and admin & marketing expenses. The details of these expenses are given below:

Labour and Staff Salary/wages				
Particulars	Wages/ Salary per month	No. of employees	Total Salary per month	Annual Salary
Manager	30000	1	30000	360000
Accountant	25000	1	25000	300000
Helper	10000	1	10000	120000
Plant Operator	20000	3	60000	720000
Skilled labour	15000	5	75000	900000
Unskilled labour	10000	7	70000	840000
<b>Total Salary</b>			<b>270000</b>	<b>3240000</b>

Projected Salary Expenses					
<b>Salary expenses Projection</b>	1st year	2nd year	3rd year	4th year	5th year
<b>Annual Salary expenses</b>	0	3240000	3564000	3920400	4312440
<b>Salary expenses rounded off to lakhs</b>	<b>0</b>	<b>32.4</b>	<b>35.64</b>	<b>39.2</b>	<b>43.12</b>
<b>Electricity Charges</b>					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	<b>0%</b>	<b>40%</b>	<b>45%</b>	<b>50%</b>	<b>55%</b>
Consumption of power per day in units	0	800	900	1000	1100
Rate per unit in Rs.	9.00	9.00	9.00	9.00	9.00
Power bill per month in Rs.	0	180000	202500	225000	247500
<b>Total power bill per year</b>	<b>0</b>	<b>2160000</b>	<b>2430000</b>	<b>2700000</b>	<b>2970000</b>
<b>Power bill in Rs. Lakh</b>	<b>0</b>	<b>21.6</b>	<b>24.3</b>	<b>27</b>	<b>29.7</b>
Packaging Cost					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Cost of Packaging per unit (200 grams)	0	2.5	2.63	2.76	2.9
Total Production in litres	0	1560000	1755000	1950000	2145000
<b>Packaging cost in Rs. Lakh</b>	<b>0.00</b>	<b>195.00</b>	<b>230.78</b>	<b>269.10</b>	<b>311.03</b>
Selling, transportation and administrative expenses					
<b>Particulars</b>	1st year	2nd year	3rd year	4th year	5th year
Sales and branding expenses per annum	0	3000000	3000000	3000000	3000000
Admin Expenses	0	480000	480000	480000	480000
Transportation charges	0	480000	480000	480000	480000
<b>Total Expenditure on Sales, Admin &amp; Transportation</b>	<b>0</b>	<b>3960000</b>	<b>3960000</b>	<b>3960000</b>	<b>3960000</b>

All these costs will be factored in later in the report while evaluating the financial benefits of the project

## Depreciation

The depreciation calculation is as follows:

Depreciation Calculation					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Total value of equipments	0	23117000	19649450	16702032	14196727
Depreciation @15%	0	3467550	2947418	2505305	2129509
Value at the end of the year to be carried forward	0	19649450	16702032	14196727	12067218
Total Value of building	0	10010000	9009000	8108100	7297290
Depreciation of building@10%	0	1001000	900900	810810	729729
Value at the end of the year to be carried forward	0	9009000	8108100	7297290	6567561
<b>Total depreciation</b>	<b>0</b>	<b>4468550</b>	<b>3848318</b>	<b>3316115</b>	<b>2859238</b>
Total depn in Rs. Lakh	0	44.69	38.48	33.16	28.59

## Repairs and maintenance

In case of new equipments including computers, generally they give a warranty for one year. Thus the maintenance cost would be starting from the second year onwards. The same in general is given at a service charge of 15% per annum. In case there are any major spares to be replaced the cost of that has to be borne by the customers. Given these general terms, it can be taken at 20% of the equipment cost per annum. The same would then be as follows:

Cost of Maintenance	
Particulars	Amount
Total fixed cost	23117000
Maintenance cost in percentage	20%
Cost of Maintenance	4623400
Maintenance cost in Rs. Lakh	46.23

## Cost of Project and Means of Finance

Based on the data presented above on cost of plant and machinery, working capital requirement, etc., the cost of the project and means of finance required can be summarized as follows:

Cost of The Project	
(in Rs. Lakh)	
Particulars	Amount
Land & Building*	100.1
Plant & Machinery	141.7
Misc. Items and transportation & Pre-op expenses	92.78
Working Capital	44.84
<b>Total</b>	<b>379.42</b>
*Land is assumed as own land and hence cost taken is 0	

Means of Finance	
	(in Rs. Lakh)
Particulars	Amount
Own Contribution	133.83
Term Loan from Bank	200.75
Working Capital Own contribution	11.21
Working Capital	33.63
total	379.42

The detailed repayment schedule of the term loan is indicated in Annexure 4. The interest for the first year is capitalized and loan outstanding accordingly increased in the end of the first year. It is assumed that the working capital limit given will be renewed every year for the next five years. Any increase in the working capital may not be necessary as the project should be able to generate sufficient profits and the internal accruals should be able to take care of additional working capital requirements. The summary of interest payment for working capital and term loan and principal repayment is given in the table below:

Year-wise Interest on Bank Loan					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Interest on Term Loan in Rs.*	0	2170296	1557504	944715	331926
Interest on Term Loan in Rs. Lakh	0.00	21.70	15.58	9.45	3.32
Interest on working Capital	0	3.7	3.7	3.7	3.7
Principal Repayment in Rs.	0	5570820	5570820	5570820	5570792
Principal Repayment in Rs. Lakh	0.00	55.71	55.71	55.71	55.71
Balance outstanding - end of the year	222.83	167.12	111.41	55.70	0.00
* Interest on term loan has been capitalised for 12 months leading to increase in the capital outlay. This has been done to account for the 12 month moratorium.					

## Financial Statements

The profitability of the project can be judged based on the financial statements generated based on the data presented above in the series of tables. Accordingly the projected Profit and loss account, Balance sheet, and cash flow statement along with breakeven analysis is presented in the tables below. During the moratorium period the interest is charged by the bank which has to be capitalized to ensure that the same is repaid over a period of time. Capitalisation thus leads to increase in the loan quantum at the end of the first year which can be seen in the balance sheet.

Projected P&L Statement					
(in Rs. Lakh)					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation%	0%	40%	45%	50%	55%
Gross Sale of Ready to drink Lemon Juice	0	889.2	1068.09	1211.49	1359.73
<b>Total</b>	<b>0</b>	<b>889.2</b>	<b>1068.09</b>	<b>1211.49</b>	<b>1359.73</b>
Cost of Production					
Raw Material Consumed	0	108	127.58	148.84	171.91
Electricity Charges	0	21.6	24.3	27	29.7
Depreciation	0	44.69	38.48	33.16	28.59
Salary and wages	0	32.4	35.64	39.2	43.12
Repair and Maintenance	0	46.23	46.23	46.23	46.23
Packaging	0	156	184.63	215.28	248.82
Selling & Admn Expenses	0	0.00	39.60	39.60	39.60
<b>Total Cost of Production</b>	<b>0</b>	<b>408.92</b>	<b>496.46</b>	<b>549.31</b>	<b>607.97</b>
<b>Profit before interest and taxes</b>	<b>0</b>	<b>480.28</b>	<b>571.63</b>	<b>662.18</b>	<b>751.76</b>
Interest on Term Loan*	0.00	21.70	15.58	9.45	3.32
Interest on Working Capital	0	3.7	3.7	3.7	3.7
<b>Total Interest Payment</b>	<b>0.00</b>	<b>25.40</b>	<b>19.28</b>	<b>13.15</b>	<b>7.02</b>
Profit before Tax	0.00	454.88	552.35	649.03	744.74
Income Tax	0	113.72	138.09	162.26	186.19
<b>Net profit after tax</b>	<b>0.00</b>	<b>341.16</b>	<b>414.26</b>	<b>486.77</b>	<b>558.55</b>
<b>Term loan interest for first year capitalised to account for the moratorium</b>					

As can be seen, the unit would be in profits after tax from second year onwards. The project has enough margin at 40% capacity utilization.

Projected Balance Sheet					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Liabilities</b>					
Capital					
Opening Balance	0	133.83	486.2	900.46	1387.23
Own Capital Contribution	133.83	11.21			
Retained Earnings	0.00	341.16	414.26	486.77	558.55
<b>Total-Closing Balance</b>	<b>133.83</b>	<b>486.20</b>	<b>900.46</b>	<b>1387.23</b>	<b>1945.78</b>
Term Loan	222.83	167.12	111.41	55.70	0.00
Working Capital Limit	0.00	33.63	33.63	33.63	33.63
Sundry Creditors	0	12.46	13.76	15.61	17.53
<b>Total Liabilities</b>	<b>356.66</b>	<b>699.41</b>	<b>1059.26</b>	<b>1492.17</b>	<b>1996.94</b>
<b>Assets</b>					
Fixed Assets	334.58	331.27	331.27	331.27	331.27
Gross Depreciation	0	44.69	83.17	116.33	144.92
<b>Net Fixed Assets</b>	<b>334.58</b>	<b>286.58</b>	<b>248.1</b>	<b>214.94</b>	<b>186.35</b>
Sundry Debtors	0	7.47	8.26	9.37	10.52
Stock in Hand	0	49.83	55.05	62.45	70.11
Interest capitalised	22.08	0	0	0	0
Cash and Bank Balance	0	355.53	747.85	1205.41	1729.96
<b>Total Assets</b>	<b>356.66</b>	<b>699.41</b>	<b>1059.26</b>	<b>1492.17</b>	<b>1996.94</b>

The project is generating healthy profit from second year with the first year being moratorium as presented above. The breakeven analysis indicates the level of operation at which the operations will breakeven and not have any loss. It becomes important to identify the fixed and the variable costs. Even within variable component there is always a part which is fixed. For example, even if the plant is not running there will be lights and fans which will be used for administrative work, people will have to be paid salary for those days as well, etc. Accordingly, a portion of the variable expenses have been taken as fixed cost to arrive at the contribution and the total fixed cost. Total fixed cost divided by the contribution (fixed cost÷Contribution) gives us the breakeven point. In this case the breakeven capacity utilization in year 2 comes at 10% capacity utilisation.

Breakeven Point Analysis		
	Rs. In Lakh	
<b>Total Sale (Sales - opening WIP + closing WIP)</b>	<b>Year 1</b>	<b>Year 2</b>
Net Sales	0.00	889.20
Less: Opening Stock	0.00	0.00
Add: Closing Stock	0.00	46.80
<b>Total Production/Sales</b>	<b>0.00</b>	<b>936.00</b>
<b>Variable Expenses</b>		
Raw Material and Packaging	0.00	264.00
Interest on working Capital	0.00	3.70
Repair and Maintenance	0.00	11.56
Salary expenses	0.00	3.24
Sales & Admin Expenses	0.00	5.94
Energy - Electricity	0.00	21.17
<b>Total</b>	<b>0.00</b>	<b>309.61</b>
<b>Contribution</b>	<b>0.00</b>	<b>626.39</b>
<b>Contribution per unit (per tonne)</b>	<b>NA</b>	<b>42.27</b>
<b>Fixed expenses</b>		
Interest on Term Loan	0.00	21.70
Repair and Maintenance	0.00	34.67
Salary expenses	0.00	29.16
Sales & Admin Expenses	0.00	33.66
Energy - Electricity	0.00	0.43
Depreciation	0.00	44.69
<b>Total</b>	<b>0.00</b>	<b>164.31</b>
Capacity utilisation	0%	40%
<b>Operating Profit</b>	<b>0.00</b>	<b>462.08</b>
<b>Breakeven point in physical units</b>	<b>NA</b>	<b>388747</b>
<b>Breakeven point in capacity utilisation (%)</b>	<b>NA</b>	<b>10%</b>

Cash Flow Statement					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Sources of Fund</b>					
Own margin	133.83	11.21			
Profit Before Interest and Tax	0.00	480.28	571.63	662.18	751.76
Depreciation	0.00	44.69	38.48	33.16	28.59
Working Capital accretion	0.00	33.63	0.00	0.00	0.00
Term Loan accretion	200.75	22.08	0.00	0.00	0.00
Creditors	0.00	12.46	1.30	1.85	1.92
<b>Total</b>	<b>334.58</b>	<b>604.35</b>	<b>611.41</b>	<b>697.19</b>	<b>782.27</b>
<b>Uses of Fund</b>					
Fixed Assets	334.58	0.00	0.00	0.00	0.00
Stock in Trade - Accretion	0.00	49.83	5.22	7.40	7.66
Debtors - Accretion	0.00	7.47	0.79	1.11	1.15
Repayment of term Loan	0.00	55.71	55.71	55.71	55.71
Interest on Term Loan	0.00	21.70	15.58	9.45	3.32
Interest on working capital	0.00	3.70	3.70	3.70	3.70
Income Tax	0.00	113.72	138.09	162.26	186.19
Accretion in cash & bank balance	0.00	352.22	392.32	457.56	524.54
<b>Total</b>	<b>334.58</b>	<b>604.35</b>	<b>611.41</b>	<b>697.19</b>	<b>782.27</b>

The cash flow statement above indicates that chance of any problem with the cash is very little or so to say practically nil in the project. The project generates sufficient cash, and the entrepreneur can maintain a healthy cash balance for any eventuality or a rainy day. There are risks like equipment failure and the repair time required for the same, sudden problem with supply of raw material or shipment not arriving, etc. Now these are unforeseen risk which always cannot be factored in. It is for these kinds of problems that a healthy cash balance is necessary for running a business. This project enables the entrepreneur to have that.

Calculation of DSCR					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Cash Accruals</b>					
Depreciation	0	44.69	38.48	33.16	28.59
Profit before interest and taxes	0	480.28	571.63	662.18	751.76
<b>Total</b>	<b>0</b>	<b>524.97</b>	<b>610.11</b>	<b>695.34</b>	<b>780.35</b>
<b>Repayments</b>					
Interest on Term Loan	0.00	21.70	15.58	9.45	3.32
Term Loan Installments	0.00	55.71	55.71	55.71	55.71
<b>Total</b>	<b>0.00</b>	<b>77.41</b>	<b>71.29</b>	<b>65.16</b>	<b>59.03</b>
<b>Debt Service Coverage Ratio</b>	<b>NA</b>	<b>6.78</b>	<b>8.56</b>	<b>10.67</b>	<b>13.22</b>

The debt service coverage ratio from second year is 6.78 and above indicating that the project should not have any problem in servicing the loan in the structure suggested which is a five-year loan including one year moratorium.

### IRR/NPV and BC Ratio

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is a healthy 2.02 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 2333.44 lakh. And the internal rate of return comes to 165% which essentially indicates that at 165% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

BC Ratio, NPV and IRR								(Amt in Rs. Lakh)
Costs and revenue items	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year
<b>Fixed Costs</b>	334.583							
<b>Variable costs</b>								
Raw material	0	264	312.2	364.12	420.73	482.4	548.47	620.2
Salary	0	32.4	35.64	39.2	43.12	47.44	52.18	57.4
Electricity	0	21.6	24.3	27	29.7	32.4	35.1	37.8
Maintenance	0	46.23	46.23	46.23	46.23	46.23	46.23	46.23
Sales and Admin exp	0	39.6	39.6	39.6	39.6	39.6	39.6	39.6
<b>Total Costs</b>	<b>334.583</b>	<b>403.83</b>	<b>457.97</b>	<b>516.15</b>	<b>579.38</b>	<b>648.07</b>	<b>721.58</b>	<b>801.23</b>
Rate of discount	15%							
Present value of costs	2293.95							
<b>Revenues</b>								
<b>Sale of finished goods</b>								
250 ml pack of Lemon juice		889.20	1068.09	1211.49	1359.73	1513.73	1672.73	1837.80
<b>Total</b>	<b>0</b>	<b>889.2</b>	<b>1068.09</b>	<b>1211.49</b>	<b>1359.73</b>	<b>1513.73</b>	<b>1672.73</b>	<b>1837.8</b>
Rate of discount	15%							
Present value of benefits	4627.40							
<b>BC Ratio</b>	2.02							
<b>Net Benefits</b>	-334.58	485.37	610.12	695.34	780.35	865.66	951.15	1036.57
Rate of discount	15%							
<b>NPV</b>	2333.44							
<b>IRR</b>	165%							

## Registration/Certification

There are four registrations necessary for MSMEs which are involved in food processing. A brief on the same is given below:

1. **GST:** GST registration in today's environment is a necessity for anyone doing a business. The entrepreneur must get himself registered for the same first. Many of the benefits given by central government is being linked to GST registration. Necessary system should be put in place to file the GST return from time to time as per the rules laid down by GoI.  
(<https://reg.gst.gov.in/registration/>)
2. **FSSAI:** The processing units should follow the Food Safety and Standard Authority of India (FSSAI) act 2006. FSSAI Act is applicable pan India for all food products. It prescribes minimum standards operating procedures, food safety norms, packaging & labeling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India. The registration can be done at FSSAI website. (<https://fsai.gov.in/cms/registration.php>)
3. **UDYAM:** The entrepreneur may consider getting himself registered in UDYAM.  
(<https://udyamregistration.gov.in/Government-India/Ministry-MSME-registration.htm>).
4. **ISO:** ISO certification is a seal of approval from a third party body that a company runs to one of the international standards developed and published by the International Organization for Standardization (ISO). It is absolutely essential if one wants to venture into exports. Even for domestic sales this certification adds value. A person feels comfortable with ISO certification mentioned in the packaging along with FSSAI registration. Various agencies are there doing this job of certification. One such site available is <https://legalwaycertification.com/iso/>. There are many other such agencies who have been authorized to issue ISO certification.

All three viz., GST registration, FSSAI registration and ISO certification has to be mentioned on the packaging. It is also important that these certifications are renewed as and when required. For example, ISO certification is valid for 1 year in many cases. If so, the certification needs to be renewed every year. In addition to the ones stated above, it would be necessary to take fire and pollution clearances. It would also be advisable choose a brand name for the product and secure the name with trademark.

Having a trademark is useful for direct marketing.





Model Project Report on  
**Pineapple Candy (Slices)**  
**Processing**

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# Pineapple Candy (dried slices) Processing

## 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 hectares 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. Unfortunately, fruits and vegetables being perishable in nature get around 25% is wasted 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. India is the fifth largest producer of pineapple in the world though its share in the world market is only 0.1%. Pineapple, one of the most popular fruits in the world is actually native to Brazil and Paraguay and was apparently domesticated by the Indians who carried them up through south and central America to Mexico and the caribeans before the arrival of the Europeans. Other than being a tasty fruit, it has a number of health benefits like treats cough and cold (contains bromelain) , strengthens bones and gums (calcium), aids digestion, reduces symptoms of arthritis, prevents hypertension (high potassium and low sodium content) and is rich with anti-oxidants which prevents you from a host of illnesses.

The ten leading exporters of fresh pineapples were (in descending order): Taiwan (39,621 tons), Puerto Rico, Hawaii, Ivory Coast, Brazil, Guinea, Mexico, South Africa, Philippines and Martinique (5,000 tons). The ten leading exporters of processed pineapples were (in descending order): Hawaii, Philippines, Taiwan, South Africa, Malaysia (Singapore), Ivory Coast, Australia, Ryukyu, Mexico, Thailand (10,500,000 tons). The disadvantage of pineapple as a fruit is its short shelf life. As per details given below, it can be seen that pineapples do not survive more than a week with refrigeration

<b>Pineapples Expiration days</b>	<b>Counter</b>	<b>Refrigerator</b>
Pineapple (Whole) lasts for	2-3 Days	4-5 Days
Pineapple (Cut) lasts for	-	3-4 Days

It is because of this reason that processing of pineapple becomes all the more essential so as to enable availability around the year. However, Temperatures of 7 to 12°C (45 to 55°F) are recommended for storage of pineapples for 14 to 20 days, provided fruit are at the color break stage (Paull 1993). A relative humidity of 85 to 95% is recommended; a high relative humidity significantly reduces water loss. .It is used not only as fresh fruit by people but also used in confectioneries for making cakes and cookies. One of the alternatives of preserving pineapple is to make pineapple candies or what is commonly known as sugar coated pineapple

cube or slices. Candies could be stored safely for 2 months under ambient conditions (20-30°C) while at refrigeration temperature, the shelf-life was 4 months.

Temperatures of 7 to 12°C (45 to 55°F) are recommended for storage of pineapples for 14 to 20 days, provided fruit are at the color break stage (Paull 1993). A relative humidity of 85 to 95% is recommended; a high relative humidity significantly reduces water loss.

## Promoters - Some specific requirements

The details of the promoters will have to be obtained along with other information. The Proforma for promoter detail is given in Annexure – 1.

## History of the company

The project has been prepared as if a new set up is being made for the purpose of pineapple processing. The same could be part of another company or a new company all together. The details of the existing company or the proposed company have to be obtained/presented in the project report. Proforma for company report is given in Annexure-2.

## Finished product and its utility

The finished product in the processing unit is pineapple candies. I can be sold in the market directly or the entrepreneur can opt for B2B channel as well. The pineapple candies can be used for

- ❖ Making a fruit cake or any loaf cake containing candied pineapple instead or in addition to raisins or other dried fruit;
- ❖ Making cookies containing small pieces of pineapple candy;
- ❖ As a part of breakfast by chopping some crystallized pineapple very finely and adding it to your müsli or granola in the morning;
- ❖ Adding to fruit salads;
- ❖ Decorating cakes or cupcakes.

## Market, Demand and Major Competitors

As such there are no national players in this product which is an advantage. The marketing of the produce also would have to be through B2B channels for selling the product to the confectionaries where the demand for the product is high. This has two pronged advantages viz., reduced marketing effort is required and you can plan your processing based on the demand which you can know well in advance if the tie-up is a good one.

**Note: In addition details of localized competition, has to be mentioned while preparing the final DPR based on where the unit is going to be set up.**

## Raw Material Requirement

A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 300 days per year more so because of the tie ups one may have in B2B market wherein buyer generally states their requirement in advance and the producer has to meet the same. It is assumed that this would be a plant with a capacity to process 500 Kg of pineapple per day meaning that the total requirement for the year would be 150 tonnes. However, ensuring uninterrupted supply of raw material has to be managed carefully as pineapples have a very short shelf life after they are plucked. Raw material inventory of 4 days can be maintained whereas for finished goods the same could be stocked for say 7 days. There would be work in progress for 7 days. Given the seasonality factor, the entrepreneur needs to develop good tie-up with raw material suppliers. The entrepreneur may also consider developing direct linkages with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw material which otherwise get spoiled. Another advantage for West Bengal is its proximity to north-east where pineapple is grown widely. Entrepreneur needs to look into these factors and take a final call on where to locate the project. According to Ministry of Agriculture 2015-16, West Bengal is the leading producer of pineapple in India produced 330.07 metric tonnes followed by Kerala (305.67) and Assam (285.17). Hence supply of raw material should not be a problem. Based on the district-wise production data, North Bengal would be the ideal location for setting up a pineapple processing plant as the production in the state is concentrated in Darjeeling, Jalpaiguri, Uttar Dinajpur, Dakshin Dinajpur and Coochbehar. This would reduce transportation cost of raw material.

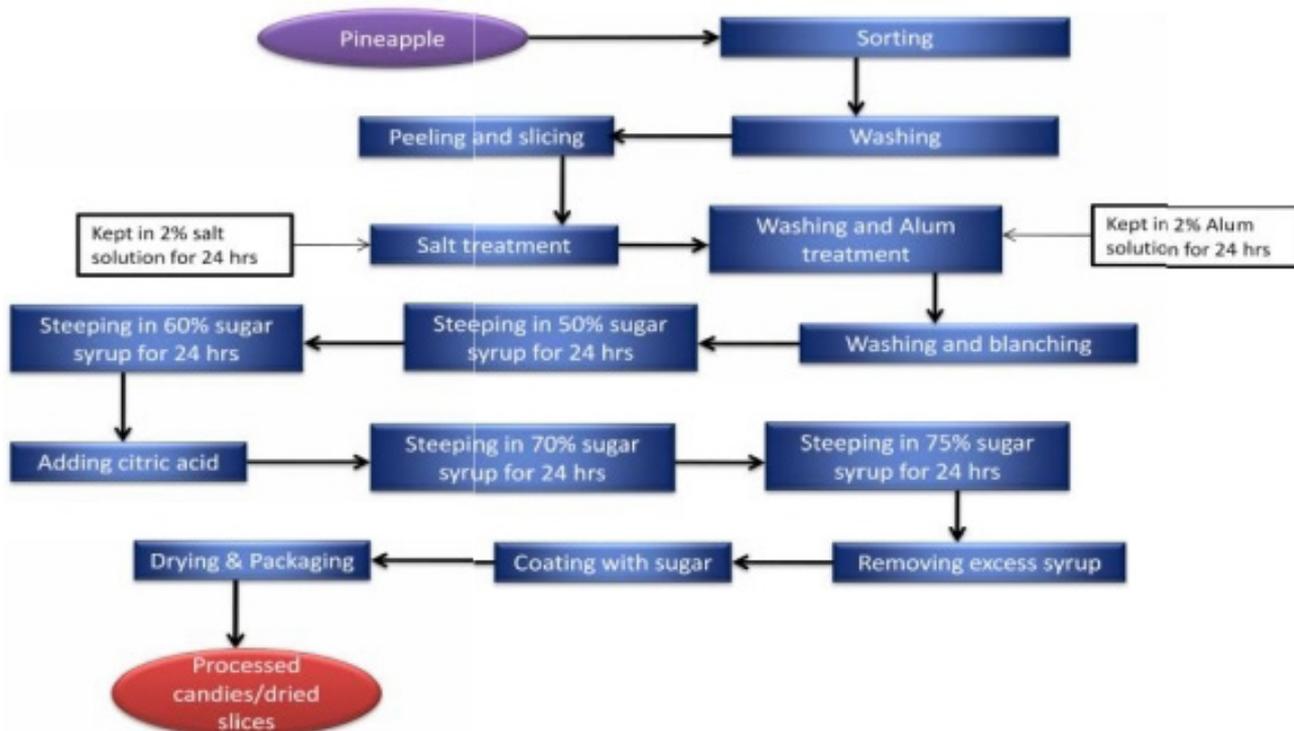
## Manufacturing Process

The process of manufacture for pineapple candies/slices is explained below:

- Purchased fruits are stored in the cold room
- They are sorted and cleaned by washing
- The fruits are then peeled, Core is removed and slices made or cubes made
- The slices are then kept in a 2% salt solution for 24 hours
- Slices are then washed and treated with Alum. For this they are kept in 2% alum solution for 24 hrs
- Slices are then washed and blanched. Blanching stops enzyme actions which can cause loss of flavor, color and texture.
- The slices/cubes are then kept for 24 hrs. in 50% sugar solution followed by another 24 hours in 60% solution
- Citric acid is added at this stage
- It is then again kept in 70% sugar solution for 24 hours followed by another 24 hours in 75% sugar solution
- Excess syrup is then removed

- The slices/cubes are then coated with powdered sugar
- They are then put into a dryer, packaged in bags and dispatched to customers

**Flow Chart for Pineapple candy-dried slices**



**SWOT Analysis**

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>➤ The fruit has lot of medicinal values</li> <li>➤ The product is loved by all age groups</li> <li>➤ It is used by other food processing industries like bakeries as their raw material</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>➤ Limited Shelf life of product and hence demand estimation has to be accurate</li> <li>➤ Lack of availability of skilled manpower</li> <li>➤ Raw material has a very short shelf life</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>➤ Not many players in this product</li> <li>➤ Processing is a must for increasing the life of the agriculture produce unlike foodgrains</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>➤ Local competitors unless analysed properly could be a threat</li> <li>➤ Highly automated plants can become a threat in the long run. To overcome this, technology upgradation is a must from time to time.</li> </ul>

## Financial Aspects of the Project

### Infrastructure requirement

Any project preparation is based on a set of assumptions made which are close to the market reality. In this project the land used is assumed to be own land. The major component of a fruit juice processing unit is land, building, plant and machinery and civil works. List of all the assumptions made is given in Annexure 3. Raw material storage would be for about 4 days and for that there would be need for having cold room for the same. Ensuring proper tie-up with FPOs/suppliers is the key to managing raw material stock properly which otherwise would go waste. The building would have a cold room with a capacity to store 1500-2000 kg raw material storage room, one finished goods storage room where temperature can be maintained at 20-30 °C., the main processing room along with an office room and toilet. Space required would be of around 4000 sq ft. taking into account the future expansion plan.

### Land and its development

A plot of approximately 6000 sq.ft would be necessary for setting up a pineapple processing unit of this scale. The land should be free from any encumbrance and shall be mortgageable. The land should be classified as non-agriculture. Permission for non-agriculture use, wherever applicable, shall be obtained for the land.

### Size of the unit

The capacity has been restricted to 500 kg pineapple per day which approximately should produce 340 kg of pineapple candy/slices. As the marketing tie-ups as well a input supply becomes regular, capacity utilization can be increased and work can even be increased to two shifts thus doubling the capacity. To start with the capacity utilization has been kept at a very conservative level of 50%.

### Machineries and Equipment

Various machineries and equipments will be required for setting up the plant. The list of such equipment and number of such units required for setting up a Ready to drink juice making unit along with Miscellaneous fixed assets for which investment has to be made is given below. This would have a maximum capacity 500 kg or 0.5 tonnes per day @ rate of 8 hours per day. For 300 days in a year this would mean 150 tonnes per annum. Capacity utilization would be restricted to 50% for the sake of conservative evaluation while doing the financial analysis. Given the fact that the work in progress material in this case is for nearly 7 days, it is necessary that there is a proper backup power supply would be a necessity. It is felt that a 35KVA DG set should take care of the requirement.

Tropical and sub-tropical fruits processing have considerably higher ratios of by-products than the temperate fruits. Pineapple by-products are not exceptions and they consist basically of the residual pulp, peels, stem and leaves. The increasing production of pineapple processed items, results in massive waste generations. This is mainly due to selection and elimination of components unsuitable for human consumption. Besides, rough handling of fruits and exposure to adverse environmental conditions during transportation and storage can

cause up to 55% of product waste. These wastes are usually prone to microbial spoilage thus limiting further exploitation. The solid waste thus need to be disposed and could be used for converting into organic manure while the wastewater needs to be treated before allowing the same to be drained out.

Processing Equipment cost				
Sl no.	Machine	Unit	Unit Cost	Amt in Rs.
1	Cold store Room equipment 20 HP	1	600000	600000
2	Fruit washing trough 3 HP	1	250000	250000
3	Automatic Pineapple peeler 3 HP (450 peels per hour)	1	100000	100000
4	Automatic pineapple corer and slicer 4 HP	1	500000	500000
5	Blanching Kettle Gas operated (650 kg)	1	250000	250000
6	Salt and Alum Treatment Tank	2	50000	100000
7	Sugar Syrup Tank 2 HP	4	75000	300000
8	Dryer 5 HP	1	200000	200000
9	Pouch packaging Machine 2 HP	1	450000	450000
10	35 KVA Genset	1	325000	325000
11	Effluent Treatment Plant	1	700000	700000
12	Other equipments like Induction sealer, shrink tunnel, weighing balance, containers etc. (1 set) and testing lab	1	200000	200000
	Total cost of equipment			3975000
	Addl charges for GST, transportation, etc		30%	1192500
	Total cost of equipment incl GST, etc.			5167500

1. Prices quoted on Indiamart or companies are generally excluding GST, Transportation charges and installation charges as well as any other taxes applicable. Accordingly, an additional 30% has been taken on the ex-factory equipment cost. They are also indicative prices.
2. Based on the searches on Indiamart, it is observed that there are companies supplying all the equipments giving a single window solution. It is suggested that it would be better for an entrepreneur to buy all equipments from a single vendor because the following reasons.
  - a. There will not be any mismatch between equipments and automation would be smoother.
  - b. Single point of contact would not allow any blame game between vendors in case something goes wrong.
  - c. Power assessment would be better and line can be drawn accordingly
  - d. A single unit set up by any of these can be visited to get a clear overview.
  - e. Training would be much easier as it would from one agency

The packaging machine would depend on what volume we want to pack. As we are targeting direct marketing in this case, packaging would be for say 250 ml to a maximum of 1 litre.

Miscellaneous fixed assets				
Sl. No.	Particulars	Units	Unit cost	Amount in Rs.
1	Electrical and water Connection	1	1000000	1000000
2	Chairs	11	2000	22000
3	Table	2	5000	10000
4	Computer	2	50000	100000
5	Printer	1	15000	15000
	<b>Total</b>			<b>1147000</b>

Given the fact that the raw material would be procured from local wholesalers/FPOs/Farmers, we need not stock raw material for more than 3 days @ 100% capacity for which size of cold room has been evaluated. Moreover at the most one can keep the pineapples before processing only for 4-5 days. A separate cold room of 1250 sq.ft., adjacent to the processing room would be made to store the raw material. Similarly finished goods inventory including work in progress would not be more than 15 days. The production would be managed accordingly. The finished goods will also be stored in a room adjacent to the production area and you will need another at least 750 sq.ft. for this purpose. . A production area of 1500 sq ft and 500 sq ft for office room and toilet should be sufficient to set up a unit of this size. The total covered sq. ft. area would be around 4000 sq.ft. The project could thus be done on a 6000 sq ft plot keeping room for loading and unloading. The total building cost is given in table below:

Land and Building			
Particulars	Area reqd	Rate/sqft in Rs.	Amt in Rs
Land cost	Own land -6000 sq ft		0
Building cost @ 1430/-- per sq ft	4000	1430	5720000
<b>Total cost</b>			<b>5720000</b>

There would also be a requirement for having an exclusive arrangement for transportation of finished goods. Depending on hired vehicles always may not be a good idea. Accordingly some trucks/transport vehicles need to be procured as part of the project

Vehicles for Transportation of goods	Units	Price/unit	Amt in Rs.
2-3 tonne truck	2	800000	1600000
Small transport vehicle (1 tonne)	2	550000	1100000
<b>Total Cost</b>			<b>2700000</b>

The total bank loan component based on the assumptions made and unit costs taken would be as follows:

Project Summary			
Project Cost excluding land			14734500
Preoperative expenses			147345
<b>Total Project Cost excluding land</b>			<b>14881845</b>
Own Contribution			5952738
Estimated Bank loan			8929107
Own Contribution in Rs. Lakh			<b>59.53</b>
<b>Bank Loan in Rs. Lakh</b>			<b>89.29</b>

In addition interest cost of the first year will be capitalized as the project would need a moratorium for 12 months. This would increase the outstanding at the end of the first year.

### Project Timeline

The project to start off production would need around one year for implementation to be completed.

The breakup for the same is given in table below:

Activities	Projected time period
Arrangement of finance	3 months
Building of premises/Acquisition of premises	6 months
Procurement of equipments	2 months
Recruitment of manpower	1 month
Training	1 month

As recruitment of manpower can be done along with procurement of equipment and the activity would not be part of the critical path, the total time taken would be 12 months for setting up the project and to reach a position to start production. Hence, one year moratorium has been taken. If “ready to move in” premises suitable for the project is acquired, then the timeline would come down by around 3 months. However, in this project it has been assumed that the unit will be set up in own land and costing has been done assuming the same with a one year moratorium.

### Price of finished goods

The sale price for Pineapple candy slices has been kept at Rs.400 per kg. The price set is the lowest based on rates available on Indiamart. Price of smaller packs for retail sale is higher but our target is for a B2B market here. One kg Packs will then be put in cardboard boxes with 10/20 packets per box for selling to bakeries and other wholesale buyers.

### Working Capital requirement

Working capital requirement has been assessed keeping in view the banking requirements. Own contribution has been taken at 25%. However, before calculating the working capital requirement it is necessary to find out the overall raw material requirement, production and details of stock based on the assumptions stated above from which working capital requirement is generated. In the following tables details of working capital requirement is assessed.

Capacity utilisation in the second year has been kept at a very modest level of 50% as the market linkages has to be set up and brand has to establish itself in the surrounding locality. Pineapple candy production in the first five years of the project is expected to be as follows:

Pineapple slice Production for 5 years					
Production Period	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	50%	55%	60%	65%
Raw material requirement per day in tonnes	0	0.25	0.28	0.3	0.33
Raw material required in tonnes	0	75	82.5	90	97.5
Rate per tonne in Rs. Including additives	0	50000	52500	55125	57881
Cost of packaging material per kg	0	10	10.5	11.03	11.58
Total Cost in Rs. Lakh	0	39.38	45.48	52.09	59.26
<b>Calculation of Sales</b>					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Production of pineapple candies/slices</b>					
Opening Stock	0	0	2625	2887.5	3150
Production in kg	0	37500	41250	45000	48750
Closing Stock in kg	0.00	2625	2887.50	3150.00	3412.50
Net Sales in kg	0	34875	40987.5	44737.5	48487.5
Sales price per packet of 1 kg incl packaging	0	400.00	408.00	416.16	424.48
<b>Sales value in Rs. Lakh</b>	<b>0.00</b>	<b>139.50</b>	<b>167.23</b>	<b>186.18</b>	<b>205.82</b>

Working capital requirement has to be evaluated based on the above mentioned details. The same is given in the table below:

Working Capital Assessment					
Computation of value of closing stock and working capital requirement					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Finished goods inventory in kg	0	2625	2888	3150	3413
Price of finished good/kg including packaging material	0	400	408	416.16	424.48
Total finished goods stock price in Rs.	0	1050000	1178100	1310904	1448538
Raw material inventory in tonne	0	0.5	0.56	0.6	0.66
Price of Raw Material/tonne in Rs.	0	50000	52500	55125	57881
Packaging Material per kg	0	10	10.5	11.03	11.58
Total packaging Raw Material Stock Price	0	30000	35280	39693	45844
Total value of stock	0	1080000	1213380	1350597	1494382
Amount in Lakh	0	10.8	12.13	13.51	14.94
Less Creditors in lakh	0	2.7	3.03	3.38	3.74
Paid Stock in lakh	0	8.1	9.1	10.13	11.2
Add sundry debtors in lakh	0	3.78	4.25	4.73	5.23
<b>Total in Rs. Lakh</b>	<b>0</b>	<b>11.88</b>	<b>13.35</b>	<b>14.86</b>	<b>16.43</b>
<b>Own contribution @ 25% in Rs. Lakh</b>	<b>0</b>	<b>2.97</b>	<b>3.34</b>	<b>3.72</b>	<b>4.11</b>
<b>Working Capital requirement in Rs. Lakh*</b>	<b>0</b>	<b>8.91</b>	<b>10.01</b>	<b>11.14</b>	<b>12.32</b>

\* WC requirement has been taken based on the requirement of the second year as the first year would be treated as moratorium period for setting up the project.

The project is expected to generate sufficient cash and working capital limit is pegged at the requirement of the second year, first year being the moratorium for setting up the factory.

## Other Expenses

There are other expenses which may be also termed as running cost. They are mainly salary, and electricity charges packaging cost, and admin n& marketing expenses. The details of these expenses are given below:

Labour and Staff Salary/wages				
Particulars	Wages/ Salary per month	No. of employees	Total Salary per month	Annual Salary
Manager	30000	1	30000	360000
Accountant	25000	1	25000	300000
Helper	10000	1	10000	120000
Plant Operator	20000	1	20000	240000
Skilled labour	15000	6	90000	1080000
Unskilled labour	10000	6	60000	720000
<b>Total Salary</b>			<b>235000</b>	<b>2820000</b>

Projected Salary Expenses					
Salary expenses Projection	1st year	2nd year	3rd year	4th year	5th year
<b>Annual Salary expenses</b>	0	2820000	3102000	3412200	3753420
<b>Salary expenses rounded off to lakhs</b>	<b>0</b>	<b>28.2</b>	<b>31.02</b>	<b>34.12</b>	<b>37.53</b>
Electricity Charges					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	<b>0%</b>	<b>50%</b>	<b>55%</b>	<b>60%</b>	<b>65%</b>
Consumption of power per day in units	0	200	220	240	260
Rate per unit in Rs.	9.00	9.00	9.00	9.00	9.00
Power bill per month in Rs.	0	45000	49500	54000	58500
<b>Total power bill per year</b>	<b>0</b>	<b>540000</b>	<b>594000</b>	<b>648000</b>	<b>702000</b>
<b>Power bill in Rs. Lakh</b>	<b>0</b>	<b>5.4</b>	<b>5.94</b>	<b>6.48</b>	<b>7.02</b>
Packaging Cost					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Cost of Packaging per unit (200 grams)	0	10	10.5	11.03	11.58
Total Production in litres	0	37500	41250	45000	48750
<b>Packaging cost in Rs. Lakh</b>	<b>0.00</b>	<b>18.75</b>	<b>21.66</b>	<b>24.82</b>	<b>28.23</b>
Selling, transportation and administrative expenses					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Sales and branding expenses per annum	0	1000000	1000000	1000000	1000000
Admin Expenses	0	480000	480000	480000	480000
Transportation charges	0	480000	480000	480000	480000
<b>Total Expenditure on Sales, Admin &amp; Transportation</b>	<b>0</b>	<b>1960000</b>	<b>1960000</b>	<b>1960000</b>	<b>1960000</b>

All these costs will be factored in later in the report while evaluating the financial benefits of the project

## Depreciation

The depreciation calculation is as follows:

Depreciation Calculation					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Total value of equipments	0	9014500	7662325	6512976	5536030
Depreciation @15%	0	1352175	1149349	976946	830405
Value at the end of the year to be carried forward	0	7662325	6512976	5536030	4705625
Total Value of building	0	5720000	5148000	4633200	4169880
Depreciation of building@10%	0	572000	514800	463320	416988
Value at the end of the year to be carried forward	0	5148000	4633200	4169880	3752892
<b>Total depreciation</b>	<b>0</b>	<b>1924175</b>	<b>1664149</b>	<b>1440266</b>	<b>1247393</b>
Total depn in Rs. Lakh	0	19.24	16.64	14.4	12.47

## Repairs and maintenance

In case of new equipments including computers, generally they give a warranty for one year. Thus the maintenance cost would be starting from the second year onwards. The same in general is given at a service charge of 15% per annum. In case there are any major spares to be replaced the cost of that has to be borne by the customers. Given these general terms, it can be taken at 20% of the equipment cost per annum. The same would then be as follows:

Cost of Maintenance	
Particulars	Amount
Total fixed cost	9014500
Maintenance cost in percentage	20%
Cost of Maintenance	1802900
Maintenance cost in Rs. Lakh	18.03

## Cost of Project and Means of Finance

Based on the data presented above on cost of plant and machinery, working capital requirement, etc., the cost of the project and means of finance required can be summarized as follows:

Cost of The Project	
(in Rs. Lakh)	
Particulars	Amount
Land & Building*	57.2
Plant & Machinery	51.68
Misc. Items, transportation & Pre op Exp.	39.94
Working Capital	11.88
Total	160.7
*Land is assumed as own land and hence cost taken is 0	

Means of Finance	
	(in Rs. Lakh)
Particulars	Amount
Own Contribution	59.53
Term Loan from Bank	89.29
Working Capital Own contribution	2.97
Working Capital	8.91
total	160.70

The detailed repayment schedule of the term loan is indicated in Annexure 4. The interest for the first year is capitalized and loan outstanding accordingly increased in the end of the first year. It is assumed that the working capital limit given will be renewed every year for the next five years. Any increase in the working capital may not be necessary as the project should be able to generate sufficient profits and the internal accruals should be able to take care of additional working capital requirements. The summary of interest payment for working capital and term loan and principal repayment is given in the table below:

Year-wise Interest on Bank Loan					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Interest on Term Loan in Rs.*	0	965308	692749	420190	147631
Interest on Term Loan in Rs. Lakh	0.00	9.65	6.93	4.20	1.48
Interest on working Capital	0	0.98	0.98	0.98	0.98
Principal Repayment in Rs.	0	2477808	2477808	2477808	2477764
Principal Repayment in Rs. Lakh	0.00	24.78	24.78	24.78	24.78
Balance outstanding - end of the year	99.11	74.33	49.55	24.77	0.00
* Interest on term loan has been capitalised for 12 months leading to increase in the capital outlay. This has been done to account for the 12 month moratorium.					

## Financial Statements

The profitability of the project can be judged based on the financial statements generated based on the data presented above in the series of tables. Accordingly the projected Profit and loss account, Balance sheet, and cash flow statement along with breakeven analysis is presented in the tables below. During the moratorium period the interest is charged by the bank which has to be capitalized to ensure that the same is repaid over a period of time. Capitalisation thus leads to increase in the loan quantum at the end of the first year which can be seen in the balance sheet.

Projected P&L Statement					
(in Rs. Lakh)					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation%	0%	50%	55%	60%	65%
Gross Sale of pineapple candy/slices	0	139.5	167.23	186.18	205.82
<b>Total</b>	<b>0</b>	<b>139.5</b>	<b>167.23</b>	<b>186.18</b>	<b>205.82</b>
Cost of Production					
Raw Material Consumed	0	37.5	43.31	49.61	56.43
Electricity Charges	0	5.4	5.94	6.48	7.02
Depreciation	0	19.24	16.64	14.4	12.47
Salary and wages	0	28.2	31.02	34.12	37.53
Repair and Maintenance	0	18.03	18.03	18.03	18.03
Packaging	0	3.75	4.33	4.96	5.65
Selling & Admn Expenses	0	0.00	19.60	19.60	19.60
<b>Total Cost of Production</b>	<b>0</b>	<b>112.12</b>	<b>138.87</b>	<b>147.2</b>	<b>156.73</b>
<b>Profit before interest and taxes</b>	<b>0</b>	<b>27.38</b>	<b>28.36</b>	<b>38.98</b>	<b>49.09</b>
Interest on Term Loan*	0.00	9.65	6.93	4.20	1.48
Interest on Working Capital	0	0.98	0.98	0.98	0.98
<b>Total Interest Payment</b>	<b>0.00</b>	<b>10.63</b>	<b>7.91</b>	<b>5.18</b>	<b>2.46</b>
Profit before Tax	0.00	16.75	20.45	33.80	46.63
Income Tax	0	4.19	5.11	8.45	11.66
<b>Net profit after tax</b>	<b>0.00</b>	<b>12.56</b>	<b>15.34</b>	<b>25.35</b>	<b>34.97</b>
<b>Term loan interest for first year capitalised to account for the moratorium</b>					

As can be seen, the unit would be in profits after tax from second year onwards. The project has enough margin at 50% capacity utilization.

Projected Balance Sheet					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Liabilities</b>					
Capital					
Opening Balance	0	59.53	75.06	90.4	115.75
Own Capital Contribution	59.53	2.97			
Retained Earnings	0.00	12.56	15.34	25.35	34.97
<b>Total-Closing Balance</b>	<b>59.53</b>	<b>75.06</b>	<b>90.4</b>	<b>115.75</b>	<b>150.72</b>
Term Loan	99.11	74.33	49.55	24.77	0.00
Working Capital Limit	0.00	8.91	8.91	8.91	8.91
Sundry Creditors	0	2.70	3.03	3.38	3.74
<b>Total Liabilities</b>	<b>158.64</b>	<b>161</b>	<b>151.89</b>	<b>152.81</b>	<b>163.37</b>
<b>Assets</b>					
Fixed Assets	148.82	148.82	148.82	148.82	148.82
Gross Depreciation	0	19.24	35.88	50.28	62.75
<b>Net Fixed Assets</b>	<b>148.82</b>	<b>129.58</b>	<b>112.94</b>	<b>98.54</b>	<b>86.07</b>
Sundry Debtors	0	3.78	4.25	4.73	5.23
Stock in Hand	0	10.8	12.13	13.51	14.94
Interest capitalised	9.82	0	0	0	0
Cash and Bank Balance	0	16.84	22.57	36.03	57.13
<b>Total Assets</b>	<b>158.64</b>	<b>161</b>	<b>151.89</b>	<b>152.81</b>	<b>163.37</b>

The project is generating healthy profit from second year with the first year being moratorium as presented above. The breakeven analysis indicates the level of operation at which the operations will breakeven and not have any loss. It becomes important to identify the fixed and the variable costs. Even within variable component there is always a part which is fixed. For example, even if the plant is not running there will be lights and fans which will be used for administrative work, people will have to be paid salary for those days as well, etc. Accordingly, a portion of the variable expenses have been taken as fixed cost to arrive at the contribution and the total fixed cost. Total fixed cost divided by the contribution (fixed cost÷Contribution) gives us the breakeven point. In this case the breakeven capacity utilization in year 2 comes at 41% capacity utilisation.

Breakeven Point Analysis		
Rs. In Lakh		
Total Sale (Sales - opening WIP + closing WIP)	Year 1	Year 2
Net Sales	0.00	139.50
Less: Opening Stock	0.00	0.00
Add: Closing Stock	0.00	10.50
<b>Total Production/Sales</b>	<b>0.00</b>	<b>150.00</b>
Variable Expenses		
Raw Material and Packaging	0.00	39.38
Interest on working Capital	0.00	0.98
Repair and Maintenance	0.00	4.51
Salary expenses	0.00	2.82
Sales & Admin Expenses	0.00	2.94
Energy - Electricity	0.00	5.29
<b>Total</b>	<b>0.00</b>	<b>55.92</b>
<b>Contribution</b>	<b>0.00</b>	<b>94.08</b>
<b>Contribution per unit (per kg)</b>	<b>NA</b>	<b>269.76</b>
Fixed expenses		
Interest on Term Loan	0.00	9.65
Repair and Maintenance	0.00	13.52
Salary expenses	0.00	25.38
Sales & Admin Expenses	0.00	16.66
Energy - Electricity	0.00	0.11
Depreciation	0.00	19.24
<b>Total</b>	<b>0.00</b>	<b>84.56</b>
Capacity utilisation	0%	50%
<b>Operating Profit</b>	<b>0.00</b>	<b>9.52</b>
<b>Breakeven point in units (kg)</b>	<b>NA</b>	<b>31346</b>
<b>Breakeven point in capacity utilisation (%)</b>	<b>NA</b>	<b>84%</b>

Cash Flow Statement					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Sources of Fund</b>					
Own margin	59.53	2.97			
Profit Before Interest and Tax	0.00	27.38	28.36	38.98	49.09

Depreciation	0.00	19.24	16.64	14.40	12.47
Working Capital accretion	0.00	8.91	0.00	0.00	0.00
Term Loan accretion	89.29	9.82	0.00	0.00	0.00
Creditors	0.00	2.70	0.33	0.35	0.36
<b>Total</b>	<b>148.82</b>	<b>71.02</b>	<b>45.33</b>	<b>53.73</b>	<b>61.92</b>
<b>Uses of Fund</b>					
Fixed Assets	148.82	0.00	0.00	0.00	0.00
Stock in Trade - Accretion	0.00	10.80	1.33	1.38	1.43
Debtors - Accretion	0.00	3.78	0.47	0.48	0.50
Repayment of term Loan	0.00	24.78	24.78	24.78	24.78
Interest on Term Loan	0.00	9.65	6.93	4.20	1.48
Interest on working capital	0.00	0.98	0.98	0.98	0.98
Income Tax	0.00	4.19	5.11	8.45	11.66
Accretion in cash & bank balance	0.00	16.84	5.73	13.46	21.09
<b>Total</b>	<b>148.82</b>	<b>71.02</b>	<b>45.33</b>	<b>53.73</b>	<b>61.92</b>

The cash flow statement above indicates that chance of any problem with the cash is very little or so to say practically nil in the project. The project generates sufficient cash, and the entrepreneur can maintain a healthy cash balance for any eventuality. There are risks like equipment failure and the repair time required for the same, sudden problem with supply of raw material or shipment not arriving, etc. Now these are unforeseen risk which always cannot be factored in. It is for these kinds of problems that a healthy cash balance is necessary for running a business. This project enables the entrepreneur to have that.

Calculation of DSCR					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Cash Accruals</b>					
Depreciation	0	19.24	16.64	14.4	12.47
Profit before interest and taxes	0	27.38	28.36	38.98	49.09
<b>Total</b>	<b>0</b>	<b>46.62</b>	<b>45</b>	<b>53.38</b>	<b>61.56</b>
<b>Repayments</b>					
Interest on Term Loan	0.00	9.65	6.93	4.20	1.48
Term Loan Instalments	0.00	24.78	24.78	24.78	24.78
<b>Total</b>	<b>0.00</b>	<b>34.43</b>	<b>31.71</b>	<b>28.98</b>	<b>26.26</b>
<b>Debt Service Coverage Ratio</b>	<b>NA</b>	<b>1.35</b>	<b>1.42</b>	<b>1.84</b>	<b>2.34</b>

The debt service coverage ratio from second year is 4.5 and above indicating that the project should not have any problem in servicing the loan in the structure suggested which is a five-year loan including one year moratorium.

## IRR/NPV and BC Ratio

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is a healthy 1.87 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 526.80 lakh. And the internal rate of return comes to 108% which essentially indicates that at 108% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

BC Ratio, NPV and IRR								(Amt in Rs. Lakh)
Costs and revenue items	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year
<b>Fixed Costs</b>	148.818							
<b>Variable costs</b>								
Raw material	0	39.38	45.48	52.09	59.26	67.01	75.38	84.43
Salary	0	28.2	31.02	34.12	37.53	41.29	45.42	49.96
Electricity	0	5.4	5.94	6.48	7.02	7.56	8.1	8.64
Maintenance	0	18.03	18.03	18.03	18.03	18.03	18.03	18.03
Sales and Admin exp	0	19.6	19.6	19.6	19.6	19.6	19.6	19.6
<b>Total Costs</b>	<b>148.818</b>	<b>110.61</b>	<b>120.07</b>	<b>130.32</b>	<b>141.44</b>	<b>153.49</b>	<b>166.53</b>	<b>180.66</b>
Rate of discount	15%							
Present value of costs	624.84							
<b>Revenues</b>								
<b>Sale of finished goods</b>								
1 kg pack of pineapple candy		139.50	167.23	186.18	205.82	226.17	247.26	269.09
<b>Total</b>	<b>0</b>	<b>139.5</b>	<b>167.23</b>	<b>186.18</b>	<b>205.82</b>	<b>226.17</b>	<b>247.26</b>	<b>269.09</b>
Rate of discount	15%							
Present value of benefits	702.92							
<b>BC Ratio</b>	1.12							
<b>Net Benefits</b>	-148.82	28.89	47.16	55.86	64.38	72.68	80.73	88.43
Rate of discount	15%							
<b>NPV</b>	78.07							
<b>IRR</b>	30%							

## Registration/Certification

There are four registrations necessary for MSMEs which are involved in food processing. A brief on the same is given below:

1. **GST:** GST registration in today's environment is a necessity for anyone doing a business. The entrepreneur must get himself registered for the same first. Many of the benefits given by central government is being linked to GST registration. Necessary system should be put in place to file the GST return from time to time as per the rules laid down by Gol.

(<https://reg.gst.gov.in/registration/>)

2. **FSSAI:** The processing units should follow the Food Safety and Standard Authority of India (FSSAI) act 2006. FSSAI Act is applicable pan India for all food products. It prescribes minimum standards operating procedures, food safety norms, packaging & labeling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India. The registration can be done at FSSAI website. (<https://fssai.gov.in/cms/registration.php>)
3. **UDYAM:** The entrepreneur may consider getting himself registered in UDYAM. (<https://udyamregistration.gov.in/Government-India/Ministry-MSME-registration.htm>).
4. **ISO:** ISO certification is a seal of approval from a third party body that a company runs to one of the international standards developed and published by the International Organization for Standardization (ISO). It is absolutely essential if one wants to venture into exports. Even for domestic sales this certification adds value. A person feels comfortable with ISO certification mentioned in the packaging along with FSSAI registration. Various agencies are there doing this job of certification. One such site available is <https://legalwaycertification.com/iso/>. There are many other such agencies who have been authorized to issue ISO certification.

All three viz., GST registration, FSSAI registration and ISO certification has to be mentioned on the packaging. It is also important that these certifications are renewed as and when required. For example, ISO certification is valid for 1 year in many cases. If so, the certification needs to be renewed every year. In addition to the ones stated above, it would be necessary to take fire and pollution clearances. It would also be advisable choose a brand name for the product and secure the name with trademark.

Having a trademark is useful for direct marketing.



# Model Project Report on **Potato Chips Processing**

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# Potato Chips Processing

## Introduction

Potato is a staple food and is one of the world's major agricultural crops. Potato, widely known as 'The king of Vegetables', is grown by more than 150 countries in the world and more than a billion peoples diet consist of potato. It is the most important and versatile food around the globe. It is the world's fourth significant food crop after wheat, rice and maize because of its higher yield potential along with high nutritive value. With an annual global production of about 370 million tonnes, potato is an economically important staple crop in both developed and developing countries. Presently China, India, Russia, Ukrain, and U.S.A. contribute to a major share (70%) of the total world production. China is the largest producer of potato followed by India.

Being a cool season vegetable, it is a perishable commodity and cannot be preserved for long in fresh form. For this purpose support of cold room for storing raw material is absolutely essential. The same can then be used for converting to value-added processed products which have a longer shelf life. Further, value-addition and processing of potato will also ensure the availability of wholesome, safe, nutritious, and acceptable food to consumers throughout the year along with simultaneous reduction in post-harvest losses and profit to the farmers for their produce.

## Promoters - Some specific requirements

The details of the promoters will have to be obtained along with other information. The Proforma for promoter detail is given in Annexure – 1.

## History of the company

The project has been prepared as if a new set up is being made for the purpose of potato chips processing. The same could be part of another company or a new company all together. The details of the existing company or the proposed company have to be obtained/presented in the project report.

Proforma for company report is given in Annexure-2.

## Finished product and its utility

Potato chips is generally consumed as a snack food. It is a good source of carbohydrate. It also has phosphorus, calcium, iron and some vitamin A and C.

## Market, Demand and Major Competitors

Till the 90's era, potato processing in India was not in vogue. But in recent years the demand for processed potato products in the country has risen at fast pace due to increased urbanization, rise in per capita income, expanding tourism and with the openings of organized processing by multinationals and indigenous players, potato processing industry has grown manifolds. Presently about 10-15% of potato production is being used for processing and the major part (around 70%) of potato harvest goes to domestic table consumption. In the developed countries, table potato utilization is merely 31%, rest being frozen French fries (30%), chips and shoestrings (12%) and dehydrated products (12%). In India, potato processing industry mainly comprises of four segments: potato chips, French fries, potato flakes/powder and other processed products. However, potato chips still continue to be the most common and popular processed product.

In terms of competitors, Pepsico (lays), Balaji, ITC, Parle, Haldiram, Prataap Snacks are the major players of which Pepsico holds nearly 50% of the market share compared to around 15% share of Balaji and 10% share of ITC. It is interesting to note that small players put together hold about 18% of the market share indicating that there is a room for investment because the market is expanding.

**Note: In addition details of localized competition, has to be mentioned while preparing the final DPR based on where the unit is going to be set up.**

## Raw Material Requirement

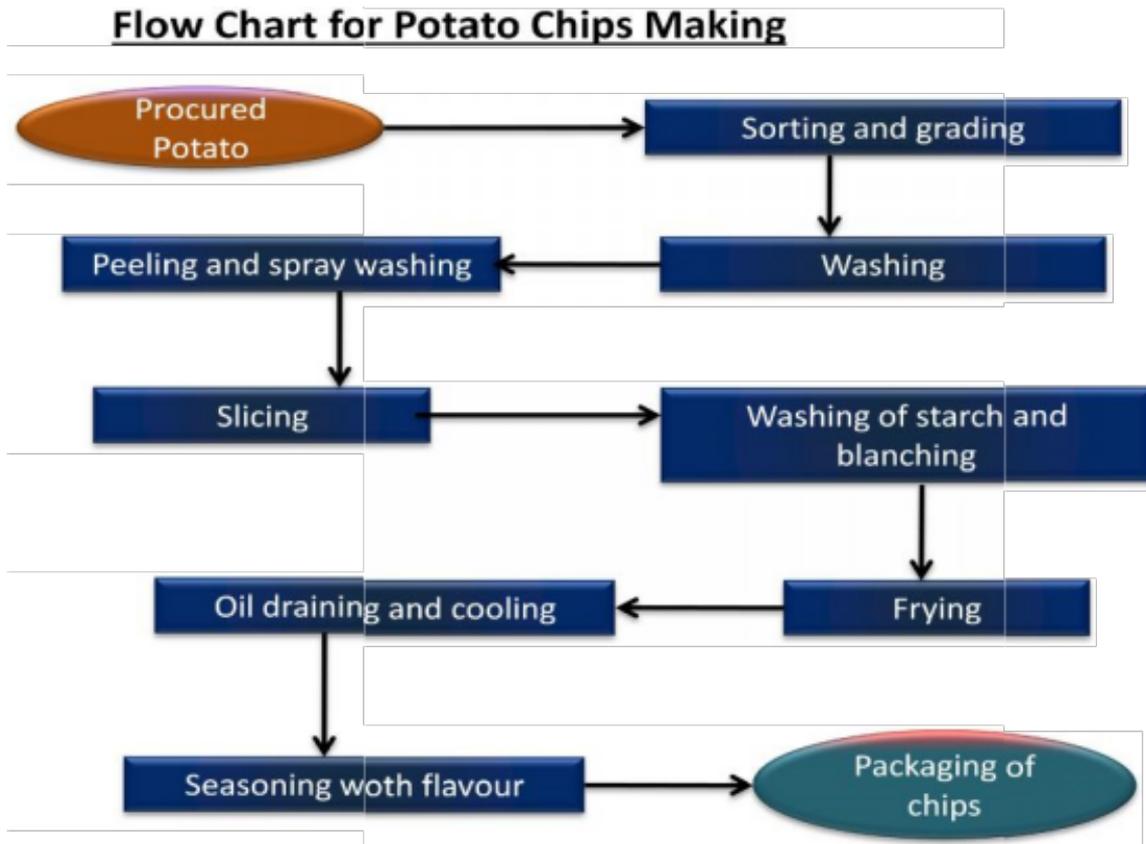
Normally, It takes about 3.5 Kg potatoes to get final 1 Kg potato chips depending upon the solid content of potatoes as there are diff. varieties being used for the same. In traditional fried chips 34-38% is oil content by weight and batch-fried chips have an oil content of about 30%. The additives account for 210% of the weight.

## Manufacturing Process

The process of manufacture for potato chips making is well-established. The general process which is followed is explained here.

- Procured potato is first sorted and graded
- The selected ones are then washed and cleaned
- The potatoes are then peeled in automated peeling machines and spray washed
- Potatoes are then put into slicing machine
- Slices are again washed and blanched to wash out starch
- Slices are given a second speed wash through a system equipped with salt dosing system for controlled dosing of salt water

- It is then taken for frying through a drying/dewatering conveyor system
- The oil is then drained and the chips are cooled
- It is put through the flavouring machine at this stage followed by packaging.
- Nitrogen charged packaging is necessary to ensure longer shelf life.



## SWOT Analysis

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>➤ The most popular snack food across age group.</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>➤ Raw material purely seasonal and hence proper storage facility is a must to overcome price fluctuation</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>➤ Scope for diversification within the domain bringing out different kinds of flavours will increase profitability.</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>➤ Local as well as national/international competitors.</li> </ul>

## Financial Aspects of the Project

### Infrastructure requirement

Any project preparation is based on a set of assumptions made which are close to the market reality. In this project the land used is assumed to be own land. The major component of a potato chips processing unit is land, building, cold storage, plant and machinery and civil works. List of all the assumptions made is given in Annexure 3. Raw material storage would be for about eight months as the product is seasonal and perishable. Accordingly there would be a necessity for having a 1000 tonne cold storage so that raw material is picked up and stored properly during the harvesting season. It is essential to have control over the main raw material as price fluctuation could be heavy. Finished goods inventory would be for 15 days. The building would have one finished goods storage room, and the main processing room along with an office room and toilet. Space required would be of around 4000 sq ft.

### Land and its development

A plot of approximately 8000 sq.ft would be necessary for setting up a potato chips making factory along with cold storage of this scale. In addition space will be required for DG set, Effluent treatment which thus would necessitate a land requirement of 0.5 acre or say 20000 sq ft. The land should be free from any encumbrance and shall be mortgageable. The land should be classified as non-agriculture.

Permission for non-agriculture use, wherever applicable, shall be obtained for the land.

### Size of the unit

The maximum capacity has been restricted to 840 tonnes of potatoes per annum and operations have been taken at 50% capacity to start with. It would be better to restrict the size of operation at this level because of two reasons. The raw material will be sourced from the farmers and FPOs and there is a bit of uncertainty in it. Second reason is marketing of end product. As one has to go in for direct marketing of the product in a market which is highly competitive, it would be necessary to have a brand which needs to be established in quick time in the last phase of the first year and beginning of second year. And then the same will get settled in a year or two and earn a good name if quality is maintained. It is because of all this the maximum capacity utilisation has been kept at a very conservative level with a room for even doubling the production from third year if the demand comes up.

### Machineries and Equipment

Various machineries and equipments will be required for setting up the plant. The list of such equipment and number of such units required for setting up a Potato chips making unit along with Miscellaneous fixed assets for which investment has to be made is given below. This would have a maximum production capacity of 0.8 tonnes per day @ rate of 8 hours per day. For 300 days in a year this would mean 240 tonnes of potato chips per annum.

Given the fact that potato will be procured in peak production season and stored, a cold storage with continuous power support is a necessity. The cost of both DG set and Cold storage has been factored in the project. In the past two decades, the potato industry has experienced rapid growth worldwide, accompanied by a large increase in the amount of wastewater produced. Large volumes of wastewater and organic wastes are generated in potato processing as result of the water used in washing, peeling, and additional processing operations. The potato industry is well known for the vast quantities of organic wastes it generates. Proper treatment of potato processing wastewaters is necessary to minimize their undesirable impact on the environment. Currently, there is an increasing demand for quality improvement of water resources in parallel with the demand for better finished products. These requirements have obliged the potato industry to develop methods for providing effective removal of sedimentable and dissolved solids from potato processing wastewater. It is estimated that around Rs.15 lakh would be required to set up the desired wastewater treatment plant.

Processing Equipment cost				
Sl no.	Machine	Unit	Unit Cost	Amount in Rs.
1	Cleaning equipment 2 HP	1 set	5100000	5100000
2	Sorting conveyer belt 5 HP			
3	Peeler 2 HP			
4	Hopper with Metered Feeder 3 HP			
5	Slicer 3 HP			
6	Washing equipment 3 HP			
7	Water dehydrator 5 HP			
8	Vibro Shaker 3 HP			
9	Frying System 10 HP			
10	Heat Exchanger 10 HP			
11	Oil Tank			
12	Packing machine 2 HP			
13	Other small equipments like bucket, steel containers, etc as a set and a small testing lab			
14	100 KVA Genset	1	900000	900000
15	Effluent Treatment Plant	1	1500000	1500000
	Total cost of equipment			7500000
	Addl charges for GST, transportation, etc		30%	2250000
	<b>Total cost of equipment incl GST, etc.</b>			<b>9750000</b>

- Prices quoted on Indiamart or companies are generally excluding GST, transportation charges and installation charges as well as any other taxes applicable. Accordingly, an additional 30% has been taken on the ex-factory equipment cost.

2. Based on the searches on Indiamart, it is observed that there are companies supplying all the equipments giving a single window solution. It is suggested that it would be better for an entrepreneur to buy all equipments from a single vendor because the following reasons.
  - a. There will not be any mismatch between equipments and automation would be smoother.
  - b. Single point of contact would not allow any blame game between vendors in case something goes wrong.
  - c. Power assessment would be better and line can be drawn accordingly
  - d. A single unit set up by any of these can be visited to get a clear overview.
  - e. Training would be much easier as it would from one agency

The packaging machine would depend on what volume we want to pack. As we are targeting direct marketing in this case, packaging would be for say 50 grams to start with. Later smaller or larger packaging can also be tried out.

Miscellaneous fixed assets				
Sl. No.	Particulars	Units	Unit cost	Amt in Rs.
1	Electrical and water Connection	1	200000	200000
2	Chairs	11	2000	22000
3	Table	2	5000	10000
4	Computer	2	50000	100000
5	Printer	1	15000	15000
	<b>Total</b>			<b>347000</b>

Given the fact that the raw material would be procured from FPOs and farmers, and the crop is a seasonal one. It would be necessary to procure sufficient stock of potato and keep it in a cold storage. It has been assumed that potato requirement for 8 months would be procured and stored. For this it would be necessary to have a separate cold storage adjacent to the processing unit. Other raw material like oil, etc. can be procured for a stock of 1 month. Finished goods inventory would not be more than 15 days. The production would be managed accordingly. The finished goods will also be stored in a room adjacent to the production area. The total space required would be around 4000 sq. ft for the plant and 3000 sq ft for the cold storage. The project could be done on a 9000 sq ft plot. Land however has been taken at 0.5 acre to enable sufficient space for loading and unloading as well as keeping in mind future expansion. The total building cost is given in table below:

Land and Building			
Particulars	Area reqd	Rate/sqft in Rs.	Amount in Rs.
Land cost	Own land - 0.5		0
Building cost @ 1430/-- per sq ft	4000	1430	5720000
Potato Cold storage for 1000 tonnes 70 HP	3000		15000000
<b>Total cost</b>			<b>20720000</b>

Transportation Facility			
Vehicles for Transportation of goods	Units	Price/unit	Amt in Rs.
4-5 tonne truck	2	1500000	3000000
Small transport vehicle (1 tonne)	6	800000	4800000
<b>Total Cost</b>			<b>7800000</b>

The total bank loan component based on the assumptions made and unit costs taken would be as follows:

Project Summary			
Project Cost excluding land			38617000
Preoperative expenses			386170
Total Project Cost excluding land			39003170
Own Contribution			15601268
Estimated Bank loan			23401902
Own Contribution in Rs. Lakh			<b>156.01</b>
<b>Bank Loan in Rs. Lakh</b>			<b>234.02</b>

In addition interest cost of the first year will be capitalized as the project would need a moratorium for 12 months. This would increase the outstanding at the end of the first year.

### Project Timeline

The project to start off production would need around one year for implementation to be completed. The breakup for the same is given in table below:

Activities	Projected time period
Arrangement of finance	3 months
Building of premises/Acquisition of premises	6 months
Procurement of equipments	2 months
Recruitment of manpower	1 month
Training	1 month

As recruitment of manpower can be done along with procurement of equipment and the activity would not be part of the critical path, the total time taken would be 12 months for setting up the project and to reach a position to start production. Hence, one year moratorium has been taken. As a cold storage also has to be set up, it would be necessary that the construction activity is carefully planned to ensure timely implementation

### Price of Finished Goods

The price of finished goods varies in the market widely based on three criteria viz., weight, flavour and quantity purchased in terms of number of packets – the last one probably is to enable sale a flavour which has built up stocks but sales are poor. For example a single piece of uncle chips weighing 52 gms is available on big basket

at 19/- whereas 3 packets of 52 gms each of cream and onion flavour is being sold in the same platform at Rs.48.45 by Bingo which essentially is possible if that specific flavour of that brand is not doing well in the market or as a part of the marketing strategy the same is being priced lower whenever the same is being purchased in bulk. The same strategy can be adopted later but for the time being price has been taken at Rs.19/- for a 50 gram pack.

### Working Capital requirement

Working capital requirement has been assessed keeping in view the banking requirements. Own contribution has been taken at 25%. However, before calculating the working capital requirement it is necessary to find out the overall raw material requirement, production and details of stock based on the assumptions stated above from which working capital requirement is generated. In the following tables details of working capital requirement is assessed.

Capacity utilisation in the second year has been kept at a very modest level of 50% as the market linkages has to be set up and brand has to establish itself in the surrounding locality. Potato chips production in the first five years of the project is expected to be as follows:

Potato chips Production for 5 years					
Production Period	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	50%	55%	60%	65%
Raw material requirement per day	0	1.4	1.54	1.68	1.82
Raw material required in tonnes	0	420	462	504	546
Rate per tonne of potato in Rs.	0	15000	15750	16538	17365
Oil required in litres		36000	39600	43200	46800
Price of oil per litre		140	147	154.35	162.07
Cost of packaging material per 50 grams	0	1.5	1.58	1.66	1.74
Cost of additives	0	1500	1575	1653.8	1736.5
Total Cost in Rs. Lakh	0	155.74	180.01	206.22	234.49

Calculation of Sales					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Production of potato chips</b>					
Opening Stock	0	0	6.01	6.61	7.21
Production of chips in tonnes	0	120.12	132.13	144.14	156.16
Closing Stock in tonnes	0.00	6.01	6.61	7.21	7.81
Net Sales in tonnes	0	114.11	131.53	143.54	155.56
Sales price per packet of 50 gm incl packaging	0	19	20	21	22
<b>Sales value in Rs. Lakh</b>	<b>0.00</b>	<b>433.62</b>	<b>526.12</b>	<b>602.87</b>	<b>684.46</b>

Working capital requirement has to be evaluated based on the above mentioned details. The same is given in the table below:

Working Capital Assessment					
Computation of value of closing stock and working capital requirement					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Finished goods inventory in tonnes	0	6.01	6.61	7.21	7.81
Price of finished good/50 grams in Rs. including packaging material	0	19	20	21	22
Total finished goods stock price in Rs.	0	2283800	2644000	3028200	3436400
Raw material inventory in tonne	0	336	369.6	403.2	436.8
Price of Raw Material/tonne in Rs.	0	15000	15750	16538	17365
Packaging Material per 50 grams	0	1.5	1.58	1.66	1.74
Total Raw Material Stock Price	0	15120000	17500560	20054362	22785672
Total value of stock	0	17403800	20144560	23082562	26222072
Amount in Lakh	0	174.04	201.45	230.83	262.22
Less Creditors in lakh	0	43.51	50.36	57.71	65.56
Paid Stock in lakh	0	130.53	151.09	173.12	196.66
Add sundry debtors in lakh	0	26.11	30.22	34.62	39.33
<b>Total</b>	<b>0</b>	<b>156.64</b>	<b>181.31</b>	<b>207.74</b>	<b>235.99</b>
<b>Own contribution @ 25%</b>	<b>0</b>	<b>39.16</b>	<b>45.33</b>	<b>51.94</b>	<b>59</b>
<b>Working Capital requirement*</b>	<b>0</b>	<b>117.48</b>	<b>135.98</b>	<b>155.8</b>	<b>176.99</b>
* WC requirement has been taken based on the requirement of the second year as the first year would be treated as moratorium period for setting up the project.					

The project is expected to generate sufficient cash and working capital limit is pegged at the requirement of the second year, first year being the moratorium for setting up the factory.

### Other Expenses

There are other expenses which may be also termed as running cost. They are mainly salary, and electricity charges packaging cost, and admin n& marketing expenses. The details of these expenses are given below:

Labour and Staff Salary/wages				
Particulars	Wages/ Salary per month	No. of employees	Total Salary per month	Annual Salary
Manager	30000	1	30000	360000
Accountant	25000	1	25000	300000
Helper	10000	1	10000	120000
Plant Operator	20000	3	60000	720000
Skilled labour	15000	3	45000	540000
Unskilled labour	10000	10	100000	1200000
<b>Total Salary</b>			<b>270000</b>	<b>3240000</b>

Projected Salary Expenses					
Salary expenses Projection	1st year	2nd year	3rd year	4th year	5th year
Annual Salary expenses	0	3240000	3564000	3920400	4312440
Salary expenses rounded off to lakhs	0	32.4	35.64	39.2	43.12

Electricity Charges					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	50%	55%	60%	65%
Consumption of power per day in units	0	2000	2200	2400	2600
Rate per unit in Rs.	9.00	9.00	9.00	9.00	9.00
Power bill per month in Rs.	0	450000	495000	540000	585000
<b>Total power bill per year</b>	<b>0</b>	<b>5400000</b>	<b>5940000</b>	<b>6480000</b>	<b>7020000</b>
<b>Power bill in Rs. Lakh</b>	<b>0</b>	<b>54</b>	<b>59.4</b>	<b>64.8</b>	<b>70.2</b>

Packaging Cost					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Cost of Packaging per unit (50 grams)	0	1.5	1.58	1.66	1.74
Total Production in kg	0	120120	132130	144140	156160
<b>Packaging cost in Rs. Lakh</b>	<b>0.00</b>	<b>36.04</b>	<b>41.75</b>	<b>47.85</b>	<b>54.34</b>

Selling, transportation and administrative expenses					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Sales and branding expenses per annum	0	4000000	4000000	4000000	4000000
Admin Expenses	0	480000	480000	480000	480000
Transportation charges	0	480000	480000	480000	480000
<b>Total Expenditure on Sales, Admin &amp; Transportation</b>	<b>0</b>	<b>4960000</b>	<b>4960000</b>	<b>4960000</b>	<b>4960000</b>

All these costs will be factored in later in the report while evaluating the financial benefits of the project

## Depreciation

The depreciation calculation is as follows:

Depreciation Calculation					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Total value of equipments	0	17897000	15212450	12930582	10990995
Depreciation @15%	0	2684550	2281868	1939587	1648649
Value at the end of the year to be carried forward	0	15212450	12930582	10990995	9342346
Total Value of building	0	20720000	18648000	16783200	15104880
Depreciation of building@10%	0	2072000	1864800	1678320	1510488
Value at the end of the year to be carried forward	0	18648000	16783200	15104880	13594392
<b>Total depreciation</b>	<b>0</b>	<b>4756550</b>	<b>4146668</b>	<b>3617907</b>	<b>3159137</b>
Total depn in Rs. Lakh	0	47.57	41.47	36.18	31.59

## Repairs and maintenance

In case of new equipments including computers, generally they give a warranty for one year. Thus the maintenance cost would be starting from the second year onwards. The same in general is given at a service charge of 15% per annum. In case there are any major spares to be replaced the cost of that has to be borne by the customers. Given these general terms, it can be taken at 20% of the equipment cost per annum. The same would then be as follows:

Cost of Maintenance	
Particulars	Amount
Total fixed cost	17897000
Maintenance cost in percentage	20%
Cost of Maintenance	3579400
Maintenance cost in Rs. Lakh	35.79

## Cost of Project and Means of Finance

Based on the data presented above on cost of plant and machinery, working capital requirement, etc., the cost of the project and means of finance required can be summarized as follows:

Cost of The Project	
(in Rs. Lakh)	
Particulars	Amount
Land & Building*	207.2
Plant & Machinery	97.5
Misc. Items, transport and Pre-op Cost	85.32
Working Capital	156.64
Total	546.66
*Land is assumed as own land and hence taken as 0	

Means of Finance	
(in Rs. Lakh)	
Particulars	Amount
Own Contribution	156.01
Term Loan from Bank	234.02
Working Capital Own contribution	39.16
Working Capital	117.48
total	546.67

The detailed repayment schedule of the term loan is indicated in Annexure 4. The interest for the first year is capitalized and loan outstanding accordingly increased in the end of the first year. It is assumed that the working capital limit given will be renewed every year for the next five years. Any increase in the working capital may not be necessary as the project should be able to generate sufficient profits and the internal accruals should be able to take care of additional working capital requirements. The summary of interest payment for working capital and term loan and principal repayment is given in the table below:

Year-wise Interest on Bank Loan					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Interest on Term Loan in Rs.*	0	2529975	1815627	1101281	386934
Interest on Term Loan in Rs. Lakh	0.00	25.30	18.16	11.01	3.87
Interest on working Capital	0	12.92	12.92	12.92	12.92
Principal Repayment in Rs.	0	6494064	6494064	6494064	6494024
Principal Repayment in Rs. Lakh	0.00	64.94	64.94	64.94	64.94
Balance outstanding - end of the year	259.76	194.82	129.88	64.94	0.00

\* Interest on term loan has been capitalised for 12 months leading to increase in the capital outlay. This has been done to account for the 12 month moratorium.

## Financial Statements

The profitability of the project can be judged based on the financial statements generated based on the data presented above in the series of tables. Accordingly the projected profit and loss account, balance sheet, and cash flow statement along with breakeven analysis is presented in the tables below. During the moratorium period the interest is charged by the bank which has to be capitalized to ensure that the same is repaid over a period of time. Capitalisation thus leads to increase in the loan quantum at the end of the first year which can be seen in the balance sheet.

Projected P&L Statement					
(in Rs. Lakh)					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation%	0%	50%	55%	60%	65%
Gross Sale of potato chips	0	433.62	526.12	602.87	684.46
<b>Total</b>	<b>0</b>	<b>433.62</b>	<b>526.12</b>	<b>602.87</b>	<b>684.46</b>
Cost of Production					
Raw Material Consumed	0	63	72.77	83.35	94.81
Electricity Charges	0	54	59.4	64.8	70.2
Depreciation	0	47.57	41.47	36.18	31.59
Salary and wages	0	32.4	35.64	39.2	43.12
Repair and Maintenance	0	35.79	35.79	35.79	35.79
Packaging	0	9.01	10.44	11.96	13.59
Selling & Admn Expenses	0	49.60	49.60	49.60	49.60
<b>Total Cost of Production</b>	<b>0</b>	<b>291.37</b>	<b>305.11</b>	<b>320.88</b>	<b>338.7</b>
<b>Profit before interest and taxes</b>	<b>0</b>	<b>142.25</b>	<b>221.01</b>	<b>281.99</b>	<b>345.76</b>
Interest on Term Loan*	0.00	25.30	18.16	11.01	3.87
Interest on Working Capital	0	12.92	12.92	12.92	12.92
<b>Total Interest Payment</b>	<b>0.00</b>	<b>38.22</b>	<b>31.08</b>	<b>23.93</b>	<b>16.79</b>
Profit before Tax	0.00	104.03	189.93	258.06	328.97
Income Tax	0	26.01	47.48	64.52	82.24
<b>Net profit after tax</b>	<b>0.00</b>	<b>78.02</b>	<b>142.45</b>	<b>193.54</b>	<b>246.73</b>
<b>Term loan interest for first year capitalised to account for the moratorium</b>					

As can be seen, the unit would be in profits after tax from second year onwards. The project has enough margin even at 50% capacity utilization.

Projected Balance Sheet					
					Rs. In Lakh
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Liabilities</b>					
Capital					
Opening Balance	0	156.01	273.19	415.64	609.18
Own Capital Contribution	156.01	39.16			
Retained Earnings	0.00	78.02	142.45	193.54	246.73
<b>Total-Closing Balance</b>	<b>156.01</b>	<b>273.19</b>	<b>415.64</b>	<b>609.18</b>	<b>855.91</b>
Term Loan	259.76	194.82	129.88	64.94	0.00
Working Capital Limit	0.00	117.48	117.48	117.48	117.48
Sundry Creditors	0	43.51	50.36	57.71	65.56
<b>Total Liabilities</b>	<b>415.77</b>	<b>629</b>	<b>713.36</b>	<b>849.31</b>	<b>1038.95</b>
<b>Assets</b>					
Fixed Assets	390.03	390.03	390.03	390.03	390.03
Gross Depreciation	0	47.57	89.04	125.22	156.81
<b>Net Fixed Assets</b>	<b>390.03</b>	<b>342.46</b>	<b>300.99</b>	<b>264.81</b>	<b>233.22</b>
Sundry Debtors	0	26.11	30.22	34.62	39.33
Stock in Hand	0	174.04	201.45	230.83	262.22
Interest capitalised	25.74	0	0	0	0
Cash and Bank Balance	0	86.39	180.7	319.05	504.18
<b>Total Assets</b>	<b>415.77</b>	<b>629</b>	<b>713.36</b>	<b>849.31</b>	<b>1038.95</b>

The project is generating healthy profit from second year with the first year being moratorium as presented above. The breakeven analysis indicates the level of operation at which the operations will breakeven and not have any loss. It becomes important to identify the fixed and the variable costs. Even within variable component there is always a part which is fixed. For example, even if the plant is not running there will be lights and fans which will be used for administrative work, people will have to be paid salary for those days as well, etc. Accordingly, a portion of the variable expenses have been taken as fixed cost to arrive at the contribution and the total fixed cost. Total fixed cost divided by the contribution (fixed cost÷Contribution) gives us the breakeven point. In this case the breakeven capacity utilization in year 2 comes at 41% capacity utilisation.

Breakeven Point Analysis		
	Rs. In Lakh	
Total Sale (Sales - opening WIP + closing WIP)	Year 1	Year 2
Net Sales	0.00	433.62
Less: Opening Stock	0.00	0.00
Add: Closing Stock	0.00	5.71
<b>Total Production/Sales</b>	<b>0.00</b>	<b>439.33</b>
<b>Variable Expenses</b>		
Raw Material and Packaging	0.00	155.74
Interest on working Capital	0.00	12.92
Repair and Maintenance	0.00	8.95
Salary expenses	0.00	3.24
Sales & Admin Expenses	0.00	7.44
Energy - Electricity	0.00	52.92
<b>Total</b>	<b>0.00</b>	<b>241.21</b>
<b>Contribution</b>	<b>0.00</b>	<b>198.12</b>
<b>Contribution per unit (per tonne)</b>	<b>NA</b>	<b>173621.94</b>
<b>Fixed expenses</b>		
Interest on Term Loan	0.00	25.30
Repair and Maintenance	0.00	26.84
Salary expenses	0.00	29.16
Sales & Admin Expenses	0.00	42.16
Energy - Electricity	0.00	1.08
Depreciation	0.00	47.57
<b>Total</b>	<b>0.00</b>	<b>172.11</b>
Capacity utilisation	0%	50%
<b>Operating Profit</b>	<b>0.00</b>	<b>26.01</b>
<b>Breakeven point in physical units</b>	<b>NA</b>	<b>99</b>
<b>Breakeven point in capacity utilisation (%)</b>	<b>NA</b>	<b>41%</b>

Cash Flow Statement					
					Rs. In Lakh
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Sources of Fund</b>					
Own margin	156.01	39.16			
Profit Before Interest and Tax	0.00	142.25	221.01	281.99	345.76
Depreciation	0.00	47.57	41.47	36.18	31.59
Working Capital accretion	0.00	117.48	0.00	0.00	0.00
Term Loan accretion	234.02	25.74	0.00	0.00	0.00
Creditors	0.00	43.51	6.85	7.35	7.85
<b>Total</b>	<b>390.03</b>	<b>415.71</b>	<b>269.33</b>	<b>325.52</b>	<b>385.20</b>
<b>Uses of Fund</b>					
Fixed Assets	390.03	0.00	0.00	0.00	0.00
Stock in Trade - Accretion	0.00	174.04	27.41	29.38	31.39
Debtors - Accretion	0.00	26.11	4.11	4.40	4.71
Repayment of term Loan	0.00	64.94	64.94	64.94	64.94
Interest on Term Loan	0.00	25.30	18.16	11.01	3.87
Interest on working capital	0.00	12.92	12.92	12.92	12.92
Income Tax	0.00	26.01	47.48	64.52	82.24
Accretion in cash & bank balance	0.00	86.39	94.31	138.35	185.13
<b>Total</b>	<b>390.03</b>	<b>415.71</b>	<b>269.33</b>	<b>325.52</b>	<b>385.20</b>

The cash flow statement above indicates that chance of any problem with the cash is very little or so to say practically nil in the project. The project generates sufficient cash, and the entrepreneur can maintain a healthy cash balance for any eventuality or a rainy day. There are risks like equipment failure and the repair time required for the same, sudden problem with supply of raw material or shipment not arriving, etc. Now these are unforeseen risk which always cannot be factored in. It is for these kinds of problems that a healthy cash balance is necessary for running a business. This project enables the entrepreneur to have that.

Calculation of DSCR					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Cash Accruals</b>					
Depreciation	0	47.57	41.47	36.18	31.59
Profit before interest and taxes	0	142.25	221.01	281.99	345.76
<b>Total</b>	<b>0</b>	<b>189.82</b>	<b>262.48</b>	<b>318.17</b>	<b>377.35</b>
<b>Repayments</b>					
Interest on Term Loan	0.00	25.30	18.16	11.01	3.87
Term Loan Instalments	0.00	64.94	64.94	64.94	64.94
<b>Total</b>	<b>0.00</b>	<b>90.24</b>	<b>83.10</b>	<b>75.95</b>	<b>68.81</b>
<b>Debt Service Coverage Ratio</b>	<b>NA</b>	<b>2.1</b>	<b>3.16</b>	<b>4.19</b>	<b>5.48</b>

The debt service coverage ratio from second year is 2.1 and above indicating that the project should not have any problem in servicing the loan in the structure suggested which is a five-year loan including one year moratorium.

## IRR/NPV and BC Ratio

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is a healthy 1.36 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 480.55 lakh. And the internal rate of return comes to 45% which essentially indicates that at 45% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

BC Ratio, NPV and IRR								(Amt in Rs. Lakh)
Costs and revenue items	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year
<b>Fixed Costs</b>	390.032							
<b>Variable costs</b>								
Raw material	0	155.74	180.01	206.22	234.49	265.25	298.35	334.3
Salary	0	32.4	35.64	39.2	43.12	47.44	52.18	57.4
Electricity	0	54	59.4	64.8	70.2	75.6	81	86.4
Maintenance	0	35.79	35.79	35.79	35.79	35.79	35.79	35.79
Sales and Admin exp	0	49.6	49.6	49.6	49.6	49.6	49.6	49.6
<b>Total Costs</b>	<b>390.032</b>	<b>327.53</b>	<b>360.44</b>	<b>395.61</b>	<b>433.2</b>	<b>473.68</b>	<b>516.92</b>	<b>563.49</b>
Rate of discount	15%							
Present value of costs	1848.70							
<b>Revenues</b>								
<b>Sale of finished goods</b>								
50 gram pack potato chips		433.62	526.12	602.87	684.46	770.82	861.98	957.95
<b>Total</b>	<b>0</b>	<b>433.62</b>	<b>526.12</b>	<b>602.87</b>	<b>684.46</b>	<b>770.82</b>	<b>861.98</b>	<b>957.95</b>
Rate of discount	15%							
Present value of benefits	2329.25							
<b>BC Ratio</b>	<b>1.26</b>							
<b>Net Benefits</b>	<b>-390.03</b>	<b>106.09</b>	<b>165.68</b>	<b>207.26</b>	<b>251.26</b>	<b>297.14</b>	<b>345.06</b>	<b>394.46</b>
Rate of discount	15%							
<b>NPV</b>	<b>480.55</b>							
<b>IRR</b>	<b>45%</b>							

## Registration/Certification

There are four registrations necessary for MSMEs which are involved in food processing. A brief on the same is given below:

1. **GST:** GST registration in today's environment is a necessity for anyone doing a business. The entrepreneur must get himself registered for the same first. Many of the benefits given by central government is being linked to GST registration. Necessary system should be put in place to file the GST return from time to time as per the rules laid down by Gol.  
(<https://reg.gst.gov.in/registration/>)
2. **FSSAI:**The processing units should follow the Food Safety and Standard Authority of India (FSSAI) act 2006. FSSAI Act is applicable pan India for all food products. It prescribes minimum standards operating procedures, food safety norms, packaging & labeling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India.  
The registration can be done at FSSAI website. (<https://fssai.gov.in/cms/registration.php>)
3. Accordingly the entrepreneur may consider getting himself registered in UDYAM.  
(<https://udyamregistration.gov.in/Government-India/Ministry-MSME-registration.htm>).
4. **ISO:**ISO certification is a seal of approval from a third party body that a company runs to one of the international standards developed and published by the International Organization for Standardization (ISO). It is absolutely essential if one wants to venture into exports. Even for domestic sales this certification adds value. A person feels comfortable with ISO certification mentioned in the packaging along with FSSAI registration. Various agencies are there doing this job of certification. One such site available is <https://legalwaycertification.com/iso/>. There are many other such agencies who have been authorized to issue ISO certification.

All three viz., GST registration, FSSAI registration and ISO certification has to be mentioned on the packaging. It is also important that these certifications are renewed as and when required. For example, ISO certification is valid for 1 year in many cases. If so, the certification needs to be renewed every year. In addition to the ones stated above, it would be necessary to take fire and pollution clearances. It would also be advisable choose a brand name for the product and secure the name with trademark.

Having a trademark is useful for bulk sale and is necessary for direct marketing as well as exports.





# Model Project Report on **Tomato Processing**

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# Tomato Processing - Ketchup making

## Introduction

Tomato, is generally considered a vegetable because of the way in which it is consumed. However, botanically it is classified as fruit. Tomatoes are produced and processed during the two main seasons across much of India – Kharif and Rabi. Tomatoes are also grown during the off-season (May to July) where conditions suit like in Sikkim and also under protected cultivation (polyhouse). Tomato has high economic value and fruits can be processed, dried, canned and bottled. Moreover, tomatoes contribute to a healthy, well balanced diet. The southern and western states constitute much of India's production including the states of Andhra Pradesh, Telangana, Karnataka and Maharashtra. State-wise data on production for the year 2017-18 of tomato is given in Annexure-1. West Bengal stands 6<sup>th</sup> in the production of tomato. In case of tomato, processing becomes more important because of the short shelf life. For ripe tomatoes the storage temperature is 40 to 45°F and the cold storage life is about 1 to 1½ weeks. For mature (greenish-yellow) tomatoes storage temperature required is about 55 to 60°F and its cold storage life is about 3 to 4 weeks.

## Promoters - Some specific requirements

The details of the promoters will have to be obtained along with other information. The Proforma for promoter detail is given in Annexure – 2.

## History of the company

The project has been prepared as if a new set up is being made for the purpose of tomato ketchup processing. The same could be part of another company or a new company all together. The details of the existing company or the proposed company have to be obtained/presented in the project report.

Proforma for company report is given in Annexure-3.

## Finished product and its utility

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. Tomato ketchup has 5 surprising health benefits. It reduces risk of prostate cancer, increases

sperm count, cuts cholesterol, improves your eyesight and above all makes actually healthy food which otherwise may have very little taste bearable to eat.

## Market, Demand and Major Competitors

Due to increasing standards of living in the cities and the rapid urbanization taking place, consumption of tomato based products is going up steadily and consumers are also demanding innovative, value added products. It is also used in the processing of other products like preparation of potato chips, flavoured oats, etc. The demand for tomato powder in these industries is large. The major institutional customers of tomato paste and tomato ketchup are restaurants. At present, the market of ketchup/puree, especially in the urban areas, is dominated by brands like Maggi, KISSAN, Del Monte, etc. 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 good scope for value added products.

*Note: In addition details of localized competition, has to be mentioned while preparing the final DPR based on where the unit is going to be set up.*

## Raw Material Requirement

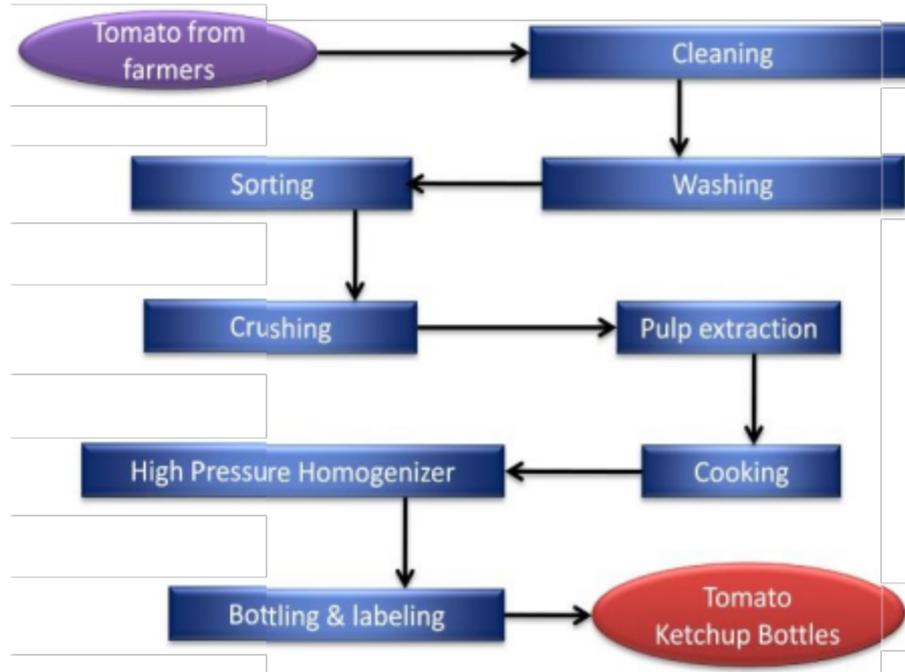
The only raw material required, as mentioned earlier is tomato and additives which are readily available in the market. It may be stated here that tomato has a very short shelf life leading to making use of the same at the earliest after harvest. As a strategy it is advisable under such circumstances to have a good tie up with the local farmers through SHGs, FPOs to procure at the lowest possible price. However, during off-season, dependence on market purchase is eminent as we may have to depend on tomatoes imported from other states. Raw material price also has been taken accordingly for the analysis based on bulk purchase rates available on Indiamart. In fact North Bengal could be a more suitable place to set up Tomato ketchup unit as it would get the advantage of procurement of raw tomato in off season from Sikkim through tieup with the farmers in that state.

## Manufacturing Process

The process of manufacture for tomato ketchup is well-established. The general process which is followed is explained here.

- Procured tomatoes have to be cleaned first.
- The selected ones have to be washed.
- The same would get dried while on the conveyor where it would also be sorted
- Crushing of tomatoes
- Pulp would then be extracted leaving aside seed and skin which would be waste material used for making organic manure or servicing a biogas plant
- The extracted pulp would then be cooked and additives would be given at this stage
- This would then be routed through a high pressure homogenizer to ensure uniformity of taste
- The ketchup after this is ready for bottling and selling in the market.

## Flow Chart for Tomato Ketchup/ Tomato Pure Making



### SWOT Analysis

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>➤ Increasing Demand due to life style changes. It is consumed with all kinds of fast food which are popular.</li> <li>➤ Comparatively long shelf life of finished goods (9 months in general)</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>➤ Highly sensitive to raw material price</li> <li>➤ Highly sensitive to capacity utilization from the point of view of debt servicing under the present assumptions. One way to avoid this problem could be to further increase own contribution and reduce loan burden</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>➤ People keen in looking for variety.in ketchup in terms of flavours</li> <li>➤ Switching over to production of chilli sauce or chili garlic sauce is a common practice to overcome the risk of raw material supply</li> <li>➤ Backward integration by having a separate facility to produce tomato pulp with increased scale of operation can be a big opportunity to overcome the weaknesses of the project</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>➤ National as well as international competitors</li> <li>➤ Highly automated plants can become a threat in the long run. To overcome this, technology upgradation is a must from time to time.</li> </ul>

## Financial Aspects of the Project

### Infrastructure required

Any project preparation is based on a set of assumptions made which are close to the market reality. In this project the land used is assumed to be own land. The major component of a tomato ketchup processing unit is land, building, plant and machinery and civil works. List of all the assumptions made is given in Annexure 4. No major storage facility would be required as raw material and finished goods would not be stored for more than 7 days each. Out of the total space around 1000 sq.ft would be used for storing the raw material and finished goods

### Land and its development

A plot of approximately 4000 sq.ft would be necessary for setting up a Tomato Ketchup making factory of this scale. The land should be free from any encumbrance and shall be mortgageable. The land should be classified as non-agriculture. Permission for non-agriculture use, wherever applicable, shall be obtained for the land.

### Size of the unit

The capacity has been restricted to 1200 tonnes of tomato per annum. It would be better to restrict the size of operation at this level because of two reasons. The raw material will be sourced either from farmers or from the local wholesalers. In the first 2 years, the brand would have to establish itself in the locality. Based on estimates this would be adequate to cater to the market surrounding the production area. Second reason is marketing of end product. As one has to go in for direct marketing, it would be necessary to have a brand which needs to be established in quick time in the last phase of the first year and beginning of second year. And then the same will get settled in a year or two and earn a good name if quality is maintained. It is because of all this the maximum capacity utilisation has been kept at a very conservative level with a room for increase in third year if the demand comes up.

### Machineries and Equipment

Various machineries and equipments will be required for setting up the plant The list of such equipment and number of such units required for setting up a tomato ketchup making unit along with Miscellaneous fixed assets for which investment has to be made is given below. This would have a maximum capacity 4 tonnes per day @ rate of 8 hours per day. For 300 days in a year this would mean 1200 tonnes per annum. In order to ensure continuous power supply, a DG Set of 30 KVA has been provided for the project based on power assessment. There will also be a need for handling the waste generated which in case of tomato ketchup making would be mostly organic waste. The same can be handled in many ways. Waste water however before being released needs to be treated and the solid waste which could be separated and converted to organic manure and sold to the farmers nearby. It is estimated that around 7 lakh would be required for setting up an effluent treatment plant.

Processing Equipment cost				
Sl no.	Machine	Unit	Unit Cost	Amount in Rs.
1	Conveyor fruit and vegetable washer 5 HP	1	230000	230000
2	Tomato sorting machine 2 HP	1	250000	250000
3	Tomato Crushing Machine 2 HP	1	100000	100000
4	Automatic tomato pulp making machine 2 HP	1	130000	130000
5	Steam Jacket kettle for cooking 10 HP	1	100000	100000
6	Homogenizer 3*2 i.e. 6 HP	2	330000	660000
7	Electric automatic aseptic pouch filling machine 2 HP	1	650000	650000
8	Pipelines, escalators, motors, etc. 4 HP	lumpsum	500000	500000
9	Other small equipments and a testing lab	lumpsum	200000	200000
10	30 KVA Genset	1	325000	325000
11	Effluent Treatment Plant	1	700000	700000
	Total cost of equipment incl GST, etc.			3845000

1. Prices quoted on Indiamart or companies are generally excluding GST, Transportation charges and installation charges as well as any other taxes applicable. Accordingly, an additional 30% has been taken on the ex-factory equipment cost.
2. Based on the searches on Indiamart, it is observed that there are companies supplying all the equipment giving a single window solution. It is suggested that it would be better for an entrepreneur to buy all equipments from a single vendor because the following reasons.
  - a. There will not be any mismatch between equipments and automation would be smoother.
  - b. Single point of contact would not allow any blame game between vendors in case something goes wrong.
  - c. Power assessment would be better and line can be drawn accordingly
  - d. A single unit set up by any of these can be visited to get a clear overview.
  - e. Training would be much easier as it would from one agency

The packaging machine would depend on what volume we want to pack. As we are targeting direct marketing in this case, packaging would of 1 kg.

Miscellaneous fixed assets				
Sl. No.	Particulars	Units	Unit cost	Amount in Rs.
1	Electrical and water Connection	1	200000	200000
2	Chairs	11	2000	22000
3	Table	2	5000	10000
4	Computer	2	50000	100000
5	Printer	1	15000	15000
	<b>Total</b>			<b>347000</b>

Given the fact that the raw material would be procured directly from the farmers during season and from wholesalers during off season, we need not stock raw material for more than a week. Only a room adjacent to the processing room would be made to store the raw material. Similarly finished goods inventory would not be more than 7 days. The production would be managed accordingly. The finished goods will also be stored in a room adjacent to the production area. Two room of 750 sq ft each with racks should be sufficient for this purpose. A production area of 2000 sq ft and 500 sq ft for office room and toilet should be sufficient to set up a unit of this size. The project could be done on a 5000 sq ft plot. It is assumed that suitable premises would be taken on rent for setting up the factory.

Land and Building - Rent			
Particulars	Area reqd in sq ft	Rate/sqft in Rs.	Amount in Rs.
Building rent per year	4000	30	1440000
<b>Total cost in Rs. Lakh</b>			<b>14.4</b>

The total bank loan component based on the assumptions made and unit costs taken would be as follows:

Project Summary			
Project Cost			<b>4192000</b>
Preoperative Expenses			<b>41920</b>
Total Project Cost excluding land			<b>4233920</b>
Own Contribution			<b>1693568</b>
Estimated Bank loan			<b>2540352</b>
Own Contribution in Rs. Lakh			<b>16.94</b>
<b>Bank Loan in Rs. Lakh</b>			<b>25.40</b>

In addition interest cost of the first year will be capitalized as the project would need a moratorium for 12 months. This would increase the outstanding at the end of the first year.

## Project Timeline

The project to start off production would need around one year for implementation to be completed. The breakup for the same is given in table below:

Activity	
Arrangement of finance	3 months
Building of premises/Acquisition of premises	6 months
Procurement of equipments	2 months
Recruitment of manpower	1 month
Training	1 month

The first year should also be utilized for creating tie-ups with SHGs and FPOs which in turn would enable supply of raw material at the lowest possible prices when production starts.

## Price of raw material and finished goods

Raw material price of tomato varies widely across the season. While tomato prices do come down in winter drastically and even farmers at times throw off their produce as it doesn't even realize the price of going to the market, it increases heavily in other seasons. In fact this year the rates of tomato has been very high with an average wholesale price nearing 5500/- per quintal which means Rs.55/- per kg. The lowest price of course has been 25/- a kg but the highest has been 70/- per kg. For the purpose of this project the same has been taken at Rs.35/- per kg. The finished product price has been taken at Rs.120/- per kg. A question may come up as to how the raw material price has been kept at Rs.35/when the average price even in the month of December is at Rs.55/-. First of all in the current year wherein large scale damage of crop has led to skyrocketing of price of tomato can be taken as an exceptional year. Nevertheless the same thing can happen in future as well. The only way to mitigate risk is by increasing production in the crop season and have two shifts to produce more during the crop season. Ketchup generally has a shelf life of 9 months. This would help in tiding over the high prices of tomato in the off season as this crop cannot be stored for long and keep the plant operational at a lower level during the off season period. In this manner the average price of raw material will remain low. However, high level of inventory would mean higher cost in terms of storage space, and higher requirement of working capital. The best alternative would be to convert tomato to tomato paste and store it in sealed containers which in the off season can be used for the purpose of making tomato ketchup. In fact Heinz, the largest producer of ketchup in the world uses this method to produce tomato ketchup (<https://www.youtube.com/watch?v=c1LePreHLY0>) across the world. The last alternative would be to motivate local farmers to produce tomatoes and go for a tieup with them so as to avoid huge price fluctuations for them as well as for the unit. They can be motivated to go in for control farming using poly-house. The price part of the project has to be evaluated very carefully before getting into ketchup business. Another alternative would be to diversify as the same set of equipment, with minor adjustments, can also be used to prepare green chili sauce as well as red chili sauce. This would also help in maintaining viability of the unit. The decision regarding the pricing,

product mix, and the strategy to be adopted for production will play a key role in deciding as to whether one can go in for setting up a unit for Tomato ketchup.

### Working Capital requirement

Working capital requirement has been assessed keeping in view the banking requirements. Own contribution has been taken at 25%. However, before calculating the working capital requirement it is necessary to find out the overall raw material requirement, production and details of stock based on the assumptions stated above from which working capital requirement is generated. In the following tables details of working capital requirement is assessed

Capacity utilisation in the second year has been kept at a very modest level of 60% as the market linkages has to be set up and brand has to establish itself in the surrounding locality. Tomato Ketchup production in the first five years of the project is expected to be as follows:

Tomato ketchup Production for 5 years - Raw Material					
Production Period	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	60%	65%	70%	75%
Raw material requirement per day	0	2.4	2.6	2.8	3
Raw material required in tonnes per year	0	720	780	840	900
Rate per tonne in Rs.	0	35000	36750	38588	40517
Cost of Additives		1512000	1719900	1944835	2187918
Cost of packaging material per kg	0	2.5	2.63	2.76	2.9
Total Cost in Rs. Lakh	0	274.32	312.05	352.86	396.97

Calculation of Sales					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Production of Tomato Ketchup</b>					
Opening Stock	0	0	6.72	7.28	7.84
Production in tonnes	0	288	312	336	360
Closing Sock	0.00	6.72	7.28	7.84	8.40
Net Sales in tonnes	0	281.28	311.44	335.44	359.44
Sales price per 1 kg incl packaging	0	120	126	132	139
<b>Sales value in Rs. Lakh</b>	<b>0.00</b>	<b>337.54</b>	<b>392.41</b>	<b>442.78</b>	<b>499.62</b>

Working capital requirement has to be evaluated based on the above mentioned details. The same is given in the table below:

<b>Working Capital Assessment</b>					
<b>Computation of value of closing stock and working capital requirement</b>					
<b>Particulars</b>	<b>1st year</b>	<b>2nd year</b>	<b>3rd year</b>	<b>4th year</b>	<b>5th year</b>
Finished goods inventory in tonnes	0	6.72	7.28	7.84	8.4
Price of finished good/kg in Rs. including packaging material	0	120	126	132	139
Total finished goods stock price in Rs.	0	806400	917280	1034880	1167600
Raw material inventory in tonne	0	16.8	18.2	19.6	21
Price of Raw Material/tonne in Rs.	0	35000	36750	38588	40517
Packaging Material per kg	0	2.5	2.63	2.76	2.9
Total Raw Material Stock Price	0	604800	716716	810421	911757
Total value of stock	0	1411200	1633996	1845301	2079357
Amount in Lakh	0	14.11	16.34	18.45	20.79
Less Creditors in lakh	0	1.41	1.63	1.85	2.08
Paid Stock in lakh	0	12.7	14.71	16.6	18.71
Add sundry debtors in lakh	0	2.12	2.45	2.77	3.12
<b>Total</b>	<b>0</b>	<b>14.82</b>	<b>17.16</b>	<b>19.37</b>	<b>21.83</b>
<b>Own contribution @ 25%</b>	<b>0</b>	<b>3.71</b>	<b>4.29</b>	<b>4.84</b>	<b>5.46</b>
<b>Working Capital requirement*</b>	<b>0</b>	<b>11.11</b>	<b>12.87</b>	<b>14.53</b>	<b>16.37</b>
<b>* WC requirement has been taken based on the requirement of the second year as the first year would be treated as moratorium period for setting up the project.</b>					

The project is expected to generate sufficient cash and working capital limit is pegged at the requirement of the second year, first year being the moratorium for setting up the factory.

### Other Expenses

There are other expenses which may be also termed as running cost. They are mainly salary, and electricity charges packaging cost, and admin n& marketing expenses. The details of these expenses are given below:

<b>Labour and Staff Salary/wages</b>				
<b>Particulars</b>	<b>Wages/ Salary per month</b>	<b>No. of employees</b>	<b>Total Salary per month</b>	<b>Annual Salary</b>
Manager	30000	1	30000	360000
Accountant	25000	1	25000	300000
Helper	10000	1	10000	120000
Plant Operator	20000	1	20000	240000
Skilled labour	15000	3	45000	540000
Unskilled labour	10000	3	30000	360000
<b>Total Salary</b>			<b>160000</b>	<b>1920000</b>

Projected Salary Expenses					
Salary expenses Projection	1st year	2nd year	3rd year	4th year	5th year
Annual Salary expenses	0	1920000	2112000	2323200	2555520
Salary expenses rounded off to lakhs	0	19.2	21.12	23.23	25.56

Electricity Charges					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation	0%	60%	65%	70%	75%
Consumption of power per day in units	0	240	260	280	300
Rate per unit in Rs.	9.00	9.00	9.00	9.00	9.00
Power bill per month in Rs.	0	54000	58500	63000	67500
<b>Total power bill per year</b>	<b>0</b>	<b>648000</b>	<b>702000</b>	<b>756000</b>	<b>810000</b>
<b>Power bill in Rs. Lakh</b>	<b>0</b>	<b>6.48</b>	<b>7.02</b>	<b>7.56</b>	<b>8.1</b>

Packaging Cost					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Cost of Packaging per unit 1 kg	0	2.5	2.63	2.76	2.9
Total Production in kg	0	288000	312000	336000	360000
<b>Packaging cost in Rs. Lakh</b>	<b>0.00</b>	<b>7.20</b>	<b>8.21</b>	<b>9.27</b>	<b>10.44</b>

Selling, transportation and administrative expenses					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Sales and branding expenses per annum	0	1000000	1000000	1000000	1000000
Admin Expenses	0	240000	240000	240000	240000
Transportation charges	0	480000	480000	480000	480000
<b>Total Expenditure on Sales, Admin &amp; Transportation</b>	<b>0</b>	<b>1720000</b>	<b>1720000</b>	<b>1720000</b>	<b>1720000</b>

All these costs will be factored in later in the report while evaluating the financial benefits of the project

## Depreciation

The depreciation calculation is as follows:

Depreciation Calculation					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Total value of equipments	0	4192000	3563200	3028720	2574412
Depreciation @15%	0	628800	534480	454308	386162
Value at the end of the year to be carried forward	0	3563200	3028720	2574412	2188250
<b>Total depreciation</b>	<b>0</b>	<b>628800</b>	<b>534480</b>	<b>454308</b>	<b>386162</b>
Total depn in Rs. Lakh	0	6.29	5.34	4.54	3.86

## Repairs and maintenance

In case of new equipments including computers, generally they give a warranty for one year. Thus the maintenance cost would be starting from the second year onwards. The same in general is given at a service charge of 15% per annum. In case there are any major spares to be replaced the cost of that has to be borne by the customers. Given these general terms, it can be taken at 20% of the equipment cost per annum. The same would then be as follows:

Cost of Maintenance	
Particulars	Amount
Total fixed cost	4192000
Maintenance cost in percentage	20%
Cost of Maintenance	838400
Maintenance cost in Rs. Lakh	8.38

## Cost of Project and Means of Finance

Based on the data presented above on cost of plant and machinery, working capital requirement, etc., the cost of the project and means of finance required can be summarized as follows:

Cost of The Project	
(in Rs. Lakh)	
Particulars	Amount
Plant & Machinery	38.45
Misc. Items & Pre op. Expenses	3.89
Working Capital	14.82
Total	57.16

Means of Finance	
(in Rs. Lakh)	
Particulars	Amount
Own Contribution	16.94
Term Loan from Bank	25.40
Working Capital Own contribution	3.71
Working Capital	11.11
total	57.16

The detailed repayment schedule of the term loan is indicated in Annexure 4. The interest for the first year is capitalized and loan outstanding accordingly increased in the end of the first year. It is assumed that the working capital limit given will be renewed every year for the next five years. Any increase in the working

capital may not be necessary as the project should be able to generate sufficient profits and the internal accruals should be able to take care of additional working capital requirements. The summary of interest payment for working capital and term loan and principal repayment is given in the table below:

Year-wise Interest on Bank Loan					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Interest on Term Loan in Rs.*	0	274597	197063	119529	41994
Interest on Term Loan in Rs. Lakh	0.00	2.75	1.97	1.20	0.42
Interest on working Capital	0	1.22	1.22	1.22	1.22
Principal Repayment in Rs.	0	704856	704856	704856	704828
Principal Repayment in Rs. Lakh	0.00	7.05	7.05	7.05	7.05
Balance outstanding - end of the year	28.19	21.14	14.09	7.04	0.00

\* Interest on term loan has been capitalised for 12 months leading to increase in the capital outlay. This has been done to account for the 12 month moratorium.

## Financial Statements

The profitability of the project can be judged based on the financial statements generated based on the data presented above in the series of tables. Accordingly the projected Profit and loss account, Balance sheet, and cash flow statement along with breakeven analysis is presented in the tables below. During the moratorium period the interest is charged by the bank which has to be capitalized to ensure that the same is repaid over a period of time. Capitalisation thus leads to increase in the loan quantum at the end of the first year which can be seen in the balance sheet.

Projected P&L Statement					
(in Rs. Lakh)					
Particulars	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation%	0%	60%	65%	70%	75%
Gross Sale of tomato ketchup	0	337.54	392.41	442.78	499.62
<b>Total</b>	<b>0</b>	<b>337.54</b>	<b>392.41</b>	<b>442.78</b>	<b>499.62</b>
Cost of Production					
Raw Material Consumed	0	252.00	286.65	324.14	364.65
Electricity Charges	0	6.48	7.02	7.56	8.1
Depreciation	0	6.29	5.34	4.54	3.86
Salary and wages	0	19.20	21.12	23.23	25.56
Repair and Maintenance	0	8.38	8.38	8.38	8.38
Packaging	0	7.20	8.21	9.27	10.44
Selling & Admn Expenses	0	17.20	17.20	17.20	17.20
Rent		14.40	14.40	14.40	14.40
<b>Total Cost of Production</b>	<b>0</b>	<b>331.15</b>	<b>353.92</b>	<b>394.32</b>	<b>438.19</b>

Projected P&L Statement					
Profit before interest and taxes	0	6.39	38.49	48.46	61.43
Interest on Term Loan*	0.00	2.75	1.97	1.20	0.42
Interest on Working Capital	0	1.22	1.22	1.22	1.22
<b>Total Interest Payment</b>	<b>0.00</b>	<b>3.97</b>	<b>3.19</b>	<b>2.42</b>	<b>1.64</b>
Profit before Tax	0.00	2.42	35.30	46.04	59.79
Income Tax	0	0.61	8.83	11.51	14.95
<b>Net profit after tax</b>	<b>0.00</b>	<b>1.81</b>	<b>26.47</b>	<b>34.53</b>	<b>44.84</b>
<b>Term loan interest for first year capitalised to account for the moratorium</b>					

As can be seen, the unit would be in profits after tax from second year onwards. The project generates profit at 60% capacity utilization.

Projected Balance Sheet					
Rs. In Lakh					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Liabilities</b>					
Capital					
Opening Balance	0	16.94	22.46	48.93	83.46
Own Capital Contribution	16.94	3.71			
Retained Earnings	0.00	1.81	26.47	34.53	44.84
<b>Total-Closing Balance</b>	<b>16.94</b>	<b>22.46</b>	<b>48.93</b>	<b>83.46</b>	<b>128.3</b>
Term Loan	28.19	21.14	14.09	7.04	0.00
Working Capital Limit	0.00	11.11	11.11	11.11	11.11
Sundry Creditors	0	1.41	1.63	1.85	2.08
<b>Total Liabilities</b>	<b>45.13</b>	<b>56.12</b>	<b>75.76</b>	<b>103.46</b>	<b>141.49</b>
<b>Assets</b>					
Fixed Assets	42.34	42.34	42.34	42.34	42.34
Gross Depreciation	0	6.29	11.63	16.17	20.03
<b>Net Fixed Assets</b>	<b>42.34</b>	<b>36.05</b>	<b>30.71</b>	<b>26.17</b>	<b>22.31</b>
Sundry Debtors	0	2.12	2.45	2.77	3.12
Stock in Hand	0	14.11	16.34	18.45	20.79
Interest capitalised	2.79	0	0	0	0
Cash and Bank Balance	0	3.84	26.26	56.07	95.27
<b>Total Assets</b>	<b>45.13</b>	<b>56.12</b>	<b>75.76</b>	<b>103.46</b>	<b>141.49</b>

The project is generating profit from second year with the first year being moratorium as presented above. The breakeven analysis indicates the level of operation at which the operations will breakeven and not have any loss. It becomes important to identify the fixed and the variable costs. Even within variable component there

is always a part which is fixed. For example, even if the plant is not running there will be lights and fans which will be used for administrative work, people will have to be paid salary for those days as well, etc. Accordingly, a portion of the variable expenses have been taken as fixed cost to arrive at the contribution and the total fixed cost. Total fixed cost divided by the contribution (fixed cost÷Contribution) gives us the breakeven point. In this case the breakeven capacity utilization in year 2 comes at 32% capacity utilisation.

<b>Breakeven Point Analysis</b>		
<b>Rs. In Lakh</b>		
<b>Total Sale (Sales - opening WIP + closing WIP)</b>	<b>Year 1</b>	<b>Year 2</b>
Net Sales	0.00	337.54
Less: Opening Stock	0.00	0.00
Add: Closing Stock	0.00	40.32
<b>Total Production/Sales</b>	<b>0.00</b>	<b>377.86</b>
<b>Variable Expenses</b>		
Raw Material and Packaging	0.00	274.32
Interest on working Capital	0.00	1.22
Repair and Maintenance	0.00	2.10
Salary expenses	0.00	1.92
Sales & Admin Expenses	0.00	2.58
Energy - Electricity	0.00	6.35
<b>Total</b>	<b>0.00</b>	<b>288.49</b>
<b>Contribution</b>	<b>0.00</b>	<b>89.37</b>
<b>Contribution per unit (per tonne)</b>	<b>NA</b>	<b>31772.61</b>
<b>Fixed expenses</b>		
Interest on Term Loan	0.00	2.75
Repair and Maintenance	0.00	6.28
Salary expenses	0.00	17.28
Sales & Admin Expenses	0.00	14.62
Energy - Electricity	0.00	0.13
Depreciation	0.00	6.29
<b>Total</b>	<b>0.00</b>	<b>47.35</b>
Capacity utilisation	0%	60%
<b>Operating Profit</b>	<b>0.00</b>	<b>42.02</b>
<b>Breakeven point in physical units</b>	<b>NA</b>	<b>149</b>
<b>Breakeven point in capacity utilisation (%)</b>	<b>NA</b>	<b>31%</b>

Cash Flow Statement					
					Rs. In Lakh
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Sources of Fund</b>					
Own margin	16.94				
Profit Before Interest and Tax	0.00	6.39	38.49	48.46	61.43
Depreciation	0.00	6.29	5.34	4.54	3.86
Working Capital accretion	0.00	11.11	0.00	0.00	0.00
Term Loan accretion	25.40	2.79	0.00	0.00	0.00
Creditors	0.00	1.41	0.22	0.22	0.23
<b>Total</b>	<b>42.34</b>	<b>27.99</b>	<b>44.05</b>	<b>53.22</b>	<b>65.52</b>
<b>Uses of Fund</b>					
Fixed Assets	42.34	0.00	0.00	0.00	0.00
Stock in Trade - Accretion	0.00	14.11	2.23	2.11	2.34
Debtors - Accretion	0.00	2.12	0.33	0.32	0.35
Repayment of term Loan	0.00	7.05	7.05	7.05	7.05
Interest on Term Loan	0.00	2.75	1.97	1.20	0.42
Interest on working capital	0.00	1.22	1.22	1.22	1.22
Income Tax	0.00	0.61	8.83	11.51	14.95
Accretion in cash & bank balance	0.00	0.13	22.42	29.81	39.19
<b>Total</b>	<b>42.34</b>	<b>27.99</b>	<b>44.05</b>	<b>53.22</b>	<b>65.52</b>

The cash flow statement above indicates that chance of any problem with the cash is very little or so to say practically nil in the project. The project generates sufficient cash, and the entrepreneur can maintain a healthy cash balance for any eventuality or a rainy day. There are risks like equipment failure and the repair time required for the same, sudden problem with supply of raw material or shipment not arriving, etc. Now these are unforeseen risk which always cannot be factored in. It is for these kinds of problems that a healthy cash balance is necessary for running a business. This project enables the entrepreneur to have that.

Calculation of DSCR					
Particulars	1st year	2nd year	3rd year	4th year	5th year
<b>Cash Accruals</b>					
Depreciation	0	6.29	5.34	4.54	3.86
Profit before interest and taxes	0	6.39	38.49	48.46	61.43
<b>Total</b>	<b>0</b>	<b>12.68</b>	<b>43.83</b>	<b>53</b>	<b>65.29</b>
<b>Repayments</b>					
Interest on Term Loan	0.00	2.75	1.97	1.20	0.42
Term Loan Instalments	0.00	7.05	7.05	7.05	7.05
<b>Total</b>	<b>0.00</b>	<b>9.80</b>	<b>9.02</b>	<b>8.25</b>	<b>7.47</b>
<b>Debt Service Coverage Ratio</b>	<b>NA</b>	<b>1.29</b>	<b>4.86</b>	<b>6.42</b>	<b>8.74</b>

The debt service coverage ratio from second year is 1.41 and above indicating that the project should not have any problem in servicing the loan in the structure suggested which is a five-year loan including one year moratorium.

## IRR/NPV and BC Ratio

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is 1.05 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 76.63 lakh. And the internal rate of return comes to 60% which essentially indicates that at 60% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

BC Ratio, NPV and IRR								(Amt in Rs. Lakh)
Costs and revenue items	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year
<b>Fixed Costs</b>	42.3392							
<b>Variable costs</b>								
Raw material	0	274.32	312.05	352.86	396.97	444.63	496.03	551.47
Salary	0	19.2	21.12	23.23	25.56	28.11	30.92	34.01
Electricity	0	6.48	7.02	7.56	8.1	8.64	9.18	9.72
Maintenance	0	8.38	8.38	8.38	8.38	8.38	8.38	8.38
Sales and Admin exp	0	17.2	17.2	17.2	17.2	17.2	17.2	17.2
<b>Total Costs</b>	<b>42.3392</b>	<b>325.58</b>	<b>365.77</b>	<b>409.23</b>	<b>456.21</b>	<b>506.96</b>	<b>561.71</b>	<b>620.78</b>
Rate of discount	15%							
Present value of costs	1617.57							
<b>Revenues</b>								
<b>Sale of finished goods</b>								
1 Kg pack Tomato ketchup		337.54	392.41	442.78	499.62	559.82	623.38	694.62
<b>Total</b>	<b>0</b>	<b>337.54</b>	<b>392.41</b>	<b>442.78</b>	<b>499.62</b>	<b>559.82</b>	<b>623.38</b>	<b>694.62</b>
Rate of discount	15%							
Present value of benefits	1718.25							
<b>BC Ratio</b>	1.06							
<b>Net Benefits</b>	-42.339	11.96	26.64	33.55	43.41	52.86	61.67	73.84
Rate of discount	15%							
<b>NPV</b>	100.68							
<b>IRR</b>	62%							

The calculation for internal rate of return (IRR) a, BC Ratio and net present value (NPV) is given below. The BC ratio is 1.05 considering a discount rate of 15%. The net present value of future benefits at a discount rate of 15% comes to Rs. 76.63 lakh. And the internal rate of return comes to 60% which essentially indicates that at 60% discount rate the net present value of net benefits would be zero. This also acts as an indicator of the risk bearing capacity of the project.

## Registration/Certification

There are four registrations necessary for MSMEs which are involved in food processing. A brief on the same is given below:

1. **GST:** GST registration in today's environment is a necessity for anyone doing a business. The entrepreneur must get himself registered for the same first. Many of the benefits given by central government is being linked to GST registration. Necessary system should be put in place to file the GST return from time to time as per the rules laid down by GoI.  
(<https://reg.gst.gov.in/registration/>)
2. **FSSAI:** The processing units should follow the Food Safety and Standard Authority of India (FSSAI) act 2006. FSSAI Act is applicable pan India for all food products. It prescribes minimum standards operating procedures, food safety norms, packaging & labeling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India. The registration can be done at FSSAI website. (<https://fssai.gov.in/cms/registration.php>)
3. Accordingly the entrepreneur may consider getting himself registered in UDYAM.  
(<https://udyamregistration.gov.in/Government-India/Ministry-MSME-registration.htm>).
4. **ISO:** ISO certification is a seal of approval from a third party body that a company runs to one of the international standards developed and published by the International Organization for Standardization (ISO). It is absolutely essential if one wants to venture into exports. Even for domestic sales this certification adds value. A person feels comfortable with ISO certification mentioned in the packaging along with FSSAI registration. Various agencies are there doing this job of certification. One such site available is <https://legalwaycertification.com/iso/>. There are many other such agencies that have been authorized to issue ISO certification.

All three viz., GST registration, FSSAI registration and ISO certification has to be mentioned on the packaging. It is also important that these certifications are renewed as and when required. For example, ISO certification is valid for 1 year in many cases. If so, the certification needs to be renewed every year. In addition to the ones stated above, it would be necessary to take fire and pollution clearances. It would also be advisable choose a brand name for the product and secure the name with trademark. Having a trademark is useful for bulk sale and is necessary for direct marketing as well as exports.



# Annexure



## Annexure 1: Promoter's Profile

Sl. No.	Particulars	Details				
1	Name of the person					
2	Date of birth and Age					
3	Marital status					
4	Residential Address					
5	Educational Qualification	Item	Name of School/ college	Year of Passing	Subject	Percentage obtained
		Secondary				
		Higher secondary				
		College				
		Post- Graduation				
	Any Other (Pl. Specify)					
6	Training	Specify training programmes attended, if any				
7	Past experience	Work Experience: Business Experience:				
8	Aadhaar Number					
9	PAN Number					
10	Any police complaint against the promoter	Yes/No; If yes please give details				

## Annexure 2: Company Profile

Is it an existing company? : Yes/No (If “Yes” the fill up table 1 and if “No”, go to table 2)

**Table 1 of Annexure 3 (for existing companies)**

Sl. No.	Item	Details			
1.	Name of the company				
2.	Year of establishment				
3.	List of investors/ shareholders	Name	Pan No.	CIBIL Score (enclose CIBIL Report)	Whether filing IT return (Yes/No)
4.	Products of the company				
5.	P&L Account and Balance sheet	Please attach copy of balance sheet and P&L account for maximum of last 3 years. If company is less than 3 years old, then the same may be provided for the years of existence			
6.	Profit after tax	Financial Year			
		Profit/Loss			
		Turnover			
7.	Proposed location of the new unit				
8.	Connectivity and other details	<ol style="list-style-type: none"> <li>1. Whether the site is connected by motorable approach road? Yes/No</li> <li>2. Whether the Road is a metallic road? Yes/No</li> <li>3. Whether the area is a low lying area? Yes/No</li> <li>4. Any incidence of flooding in the last 5 years in the area? Yes/ No – If yes please mention the years</li> <li>5. Whether power connection available? Yes/No</li> <li>6. Whether drinking water supply available? Yes/No</li> <li>7. Whether water supply available for industrial activity? Yes/No</li> <li>8. Name of the nearest town/city</li> <li>9. Distance from the nearest town/city</li> <li>10. Nearest Police station - pl give name and distance</li> <li>11. Any other information – please specify</li> </ol>			

**Table 2 of Annexure 3 (for newly set up/proposed to be set up companies for the project)**

Sl. No.	Item	Details			
1.	Proposed Name of the company				
2.	Expected date of establishment				
3.	Proposed List of investors/ shareholders	Name	Pan No.	CIBIL Score (enclose CIBIL Report)	Whether filing IT return (Yes/No)
4.	Proposed location of the new unit				
5.	Connectivity and other details	<ol style="list-style-type: none"> <li>1. Is it a non-agricultural land? Yes/No</li> <li>2. Whether the site is connected by motorable approach road? Yes/No</li> <li>3. Whether the Road is a metallic road? Yes/No</li> <li>4. Whether the area is a low lying area? Yes/No</li> <li>5. Any incidence of flooding in the last 5 years in the area? Yes/No – If yes please mention the years</li> <li>6. Whether power connection available? Yes/No</li> <li>7. Whether drinking water supply available? Yes/No</li> <li>8. Whether water supply available for industrial activity? Yes/No</li> <li>9. Name of the nearest town/city</li> <li>10. Distance from the nearest town/city</li> <li>11. Nearest Police station – pl give name and distance</li> <li>12. Any other information – please specify</li> </ol>			

## Guava Jam Processing

### Annexure - 3 : Guava Production in India - Statewise

Production		(000 Tonnes)	
		2017-18	
Sr No.	State	Production	Share(%)
1	Uttar Pradesh	928.44	22.93
2	Madhya Pradesh	686.70	16.96
3	Bihar	427.61	10.56
4	Andhra Pradesh	229.78	5.68
5	West Bengal	215.20	5.32
6	Chattisgarh	197.18	4.87
7	Punjab	195.60	4.83
8	Gujarat	169.57	4.19
9	Tamil Nadu	155.06	3.83
10	Karnataka	140.23	3.46
11	Haryana	137.02	3.38
12	Maharashtra	122.83	3.03
13	Orissa	105.04	2.59
14	Assam	96.69	2.39
15	Jharkhand	89.31	2.21
16	Rajasthan	55.13	1.36
17	Telangana	38.74	0.96
18	Uttarakhand	20.37	0.50
19	Sikkim	17.60	0.43
20	Jammu & Kashmir	7.77	0.19
21	Nagaland	4.75	0.12
22	Tripura	3.40	0.08
23	Himachal Pradesh	2.61	0.06
24	Kerala	1.42	0.04
	<b>Total</b>	<b>4048.05</b>	
Source: National Horticulture Board			

## Annexure 4: Assumptions/Basis of the project

Particulars	Value	Unit
Machine capacity for Guava per day in tonne	1	tonne
Capacity Utilisation in the second year	55%	
Increase in capacity utilisation per year	5%	
Working hours	8	Hours
Working days per year	300	Days
Average working days per month	25	days
Final product in litres for the installed capacity/day	1000	litres
Raw material Stock in Days	7	Days
Finished goods stock in days	15	Days
Interest on working capital and term loan	11%	
Power Consumption in units per day @ 100% capacity utilisation	300	Units
Increase in sale price/year	2%	
Rate per 500 gram bottle of guava jam	120	Rupees
Increase in raw material & packaging cost	5.00%	
Average cost of Guava per kg including additives like sugar, citric acid	70	Rupees
Land	Own land	
Guava price per tonne and Other additives like sugar, preservatives if any, etc per tonne of Guava	70000	Rupees
Packaging material (glass bottle) cost per 500 ml including printing cost	20	Rupees
Creditors in percentage of the stock Value	25%	
Debtors in percentage of the stock value	50%	
Power tariff per unit consumed in Rs.	9.00	Rupees
Depreciation of plant and Machinery and office equipments	15%	
Depreciation of building	10%	
Own contribution in Working Capital	25%	
Own contribution in Fixed Cost	40%	
Maintenance cost as Percentage of fixed cost	20%	
Increase in salary expenses every year	10%	
Repayment of term loan in months	60	months
Moratorium in months	12	months
Income Tax	25%	
Variable cost under Repair and maintenance in percentage	25%	
Variable component in salary in percentage	10%	
Variable component in sale & Admin expenses	15%	
Variable component of electricity in percentage	98%	
Sales and branding expenses per annum in Rs.	2000000	Rupees
Misc Admin Expenses per annum @ 40000/- per month in Rs.	480000	Rupees
Transportation expenses per annum @ 20000/- per week in Rs.	960000	Rupees
Pre-operative Expenses as a percentage of project cost	1%	
Packaging Size	500	ml

## Annexure 5: Interest on Bank Loan and Repayment Schedule

Principal Repayment per month		268967					
Year	Particulars	Amount in Rs.	Interest	Repayment of principal	Closing Balance	Annual Interest payment	Projected Principal Repayment
1	1st Month	11631000	106618	0	11631000		
	2nd Month	11631000	106618	0	11631000		
	3rd Month	11631000	106618	0	11631000		
	4th Month	11631000	106618	0	11631000		
	5th Month	11631000	106618	0	11631000		
	6th Month	11631000	106618	0	11631000		
	7th Month	11631000	106618	0	11631000		
	8th Month	11631000	106618	0	11631000		
	9th Month	11631000	106618	0	11631000		
	10th Month	11631000	106618	0	11631000		
	11th Month	11631000	106618	0	11631000		
	12th Month	11631000	106618	0	11631000	1279416	0
2	1st Month	12910416	118345	268967	12641449		
	2nd Month	12641449	115880	268967	12372482		
	3rd Month	12372482	113414	268967	12103515		
	4th Month	12103515	110949	268967	11834548		
	5th Month	11834548	108483	268967	11565581		
	6th Month	11565581	106018	268967	11296614		
	7th Month	11296614	103552	268967	11027647		
	8th Month	11027647	101087	268967	10758680		
	9th Month	10758680	98621	268967	10489713		
	10th Month	10489713	96156	268967	10220746		
	11th Month	10220746	93690	268967	9951779		
	12th Month	9951779	91225	268967	9682812	1257420	3227604
3	1st Month	9682812	88759	268967	9413845		
	2nd Month	9413845	86294	268967	9144878		
	3rd Month	9144878	83828	268967	8875911		
	4th Month	8875911	81363	268967	8606944		
	5th Month	8606944	78897	268967	8337977		
	6th Month	8337977	76431	268967	8069010		
	7th Month	8069010	73966	268967	7800043		
	8th Month	7800043	71500	268967	7531076		
	9th Month	7531076	69035	268967	7262109		
	10th Month	7262109	66569	268967	6993142		
	11th Month	6993142	64104	268967	6724175		
	12th Month	6724175	61638	268967	6455208	902384	3227604

4	1st Month	6455208	59173	268967	6186241		
	2nd Month	6186241	56707	268967	5917274		
	3rd Month	5917274	54242	268967	5648307		
	4th Month	5648307	51776	268967	5379340		
	5th Month	5379340	49311	268967	5110373		
	6th Month	5110373	46845	268967	4841406		
	7th Month	4841406	44380	268967	4572439		
	8th Month	4572439	41914	268967	4303472		
	9th Month	4303472	39448	268967	4034505		
	10th Month	4034505	36983	268967	3765538		
	11th Month	3765538	34517	268967	3496571		
	12th Month	3496571	32052	268967	3227604	547348	3227604
5	1st Month	3227604	29586	268967	2958637		
	2nd Month	2958637	27121	268967	2689670		
	3rd Month	2689670	24655	268967	2420703		
	4th Month	2420703	22190	268967	2151736		
	5th Month	2151736	19724	268967	1882769		
	6th Month	1882769	17259	268967	1613802		
	7th Month	1613802	14793	268967	1344835		
	8th Month	1344835	12328	268967	1075868		
	9th Month	1075868	9862	268967	806901		
	10th Month	806901	7397	268967	537934		
	11th Month	537934	4931	268967	268967		
	12th Month	268967	2466	268967	0	192312	3227604

## Annexure 6: Illustrative List of Equipment Manufacturers

### Shiva Engineers

Address:

T Block, Plot No. S 33,  
Bhosari MIDC, Pune - 411026,  
Maharashtra, India

Phone: +91 9822499586; 08048765052

Email: shivaengineers1@gmail.com

### B.K. ENGINEERS

Address:

Plot No - B109, Taswade MIDC, Karad Dist: Satara,  
Pincode: 415109, Maharashtra, INDIA

Contact No: +91-2164-258096; (+91) 9689927461

Email: response@bkfoodprocessingmachinery.com

Website: www.bkfoodprocessingmachinery.com

## Lemon Juice Processing

### Annexure 7: Assumptions/Basis of the project

Particulars	Value	Unit
Machine capacity for lemon per day in tonne	2	tonne
Capacity Utilisation in the second year	40%	
Increase in capacity utilisation per year	5%	
Working hours	8	Hours
Working days per year	300	Days
Average working days per month	25	days
Final product in litres for the installed capacity/day	6500	litres
Raw material Stock in Days	3	Days
Finished goods stock in days	15	Days
Interest on working capital and term loan	11%	
Power Consumption in units per day @ 100% capacity utilisation	2000	Units
Increase in sale price/year	2%	
Rate per 250 ml pack of ready to drink lemon juice	15	Rupees
Increase in raw material & packaging cost	5.00%	
Average price of lemon per kg including additives	45	Rupees
Land	Own land	
Lemon price per tonne and Other additives like sugar, preservatives if any, etc per tonne of lemon	45000	Rupees
Packaging material cost per 250 grams including printing cost	2.5	Rupees
Creditors in percentage of the stock Value	25%	
Debtors in percentage of the stock value	15%	
Power tariff per unit consumed in Rs.	9.00	Rupees
Depreciation of plant and Machinery and office equipments	15%	
Depreciation of building	10%	
Own contribution in Working Capital	25%	
Own contribution in Fixed Cost	40%	
Maintenance cost as Percentage of fixed cost	20%	
Increase in salary expenses every year	10%	
Repayment of term loan in months	60	months
Moratorium in months	12	months
Income Tax	25%	
Variable cost under Repair and maintenance in percentage	25%	
Variable component in salary in percentage	10%	
Variable component in sale & Admin expenses	15%	
Variable component of electricity in percentage	98%	
Sales and branding expenses per annum in Rs.	3000000	Rupees
Misc Admin Expenses per annum @ 40000/- per month in Rs.	480000	Rupees
Transportation expenses per annum @ 10000/- per week in Rs.	480000	Rupees
Packaging Size	250	ml
Preoperative Expenses as % age of Project Cost	1%	

## Annexure 8: Interest on Bank Loan and Repayment Schedule

Principal Repayment per month		464235					
Year	Particulars	Amount in Rs.	Interest	Repayment of principal	Closing Balance	Annual Interest payment	Projected Principal Repayment
1	1st Month	20075000	184021	0	20075000		
	2nd Month	20075000	184021	0	20075000		
	3rd Month	20075000	184021	0	20075000		
	4th Month	20075000	184021	0	20075000		
	5th Month	20075000	184021	0	20075000		
	6th Month	20075000	184021	0	20075000		
	7th Month	20075000	184021	0	20075000		
	8th Month	20075000	184021	0	20075000		
	9th Month	20075000	184021	0	20075000		
	10th Month	20075000	184021	0	20075000		
	11th Month	20075000	184021	0	20075000		
	12th Month	20075000	184021	0	20075000	2208252	0
2	1st Month	22283252	204263	464235	21819017		
	2nd Month	21819017	200008	464235	21354782		
	3rd Month	21354782	195752	464235	20890547		
	4th Month	20890547	191497	464235	20426312		
	5th Month	20426312	187241	464235	19962077		
	6th Month	19962077	182986	464235	19497842		
	7th Month	19497842	178730	464235	19033607		
	8th Month	19033607	174475	464235	18569372		
	9th Month	18569372	170219	464235	18105137		
	10th Month	18105137	165964	464235	17640902		
	11th Month	17640902	161708	464235	17176667		
	12th Month	17176667	157453	464235	16712432	2170296	5570820
3	1st Month	16712432	153197	464235	16248197		
	2nd Month	16248197	148942	464235	15783962		
	3rd Month	15783962	144686	464235	15319727		
	4th Month	15319727	140431	464235	14855492		
	5th Month	14855492	136175	464235	14391257		
	6th Month	14391257	131920	464235	13927022		
	7th Month	13927022	127664	464235	13462787		
	8th Month	13462787	123409	464235	12998552		
	9th Month	12998552	119153	464235	12534317		
	10th Month	12534317	114898	464235	12070082		
	11th Month	12070082	110642	464235	11605847		
	12th Month	11605847	106387	464235	11141612	1557504	5570820

4	1st Month	11141612	102131	464235	10677377		
	2nd Month	10677377	97876	464235	10213142		
	3rd Month	10213142	93620	464235	9748907		
	4th Month	9748907	89365	464235	9284672		
	5th Month	9284672	85109	464235	8820437		
	6th Month	8820437	80854	464235	8356202		
	7th Month	8356202	76599	464235	7891967		
	8th Month	7891967	72343	464235	7427732		
	9th Month	7427732	68088	464235	6963497		
	10th Month	6963497	63832	464235	6499262		
	11th Month	6499262	59577	464235	6035027		
	12th Month	6035027	55321	464235	5570792	944715	5570820
5	1st Month	5570792	51066	464235	5106557		
	2nd Month	5106557	46810	464235	4642322		
	3rd Month	4642322	42555	464235	4178087		
	4th Month	4178087	38299	464235	3713852		
	5th Month	3713852	34044	464235	3249617		
	6th Month	3249617	29788	464235	2785382		
	7th Month	2785382	25533	464235	2321147		
	8th Month	2321147	21277	464235	1856912		
	9th Month	1856912	17022	464235	1392677		
	10th Month	1392677	12766	464235	928442		
	11th Month	928442	8511	464235	464207		
	12th Month	464207	4255	464207	0	331926	5570792

## Annexure 9: Illustrative list of Manufacturers

### **Maruti Machines Private Limited**

Plot No. 95, Road No. 8, Opposite Water Tank

kathwada

Ahmedabad - 382430, Gujarat, India

<https://www.marutiprojects.in>

Phone: 08048602186

### **Shreeji Projects**

30, Jaishree Khodiyar Ind Estate, Ramol Road, Nr Subhash Estate

Amraiwadi

Ahmedabad - 380026, Gujarat, India <https://www.shreejiproject.com>

Phone: 08048794652

### **Ysm Dairy & Biotech Private Limited**

Khasra Mustatil No. 39, Tehsil Killa No,9 Village- Gharora Ballabhgarh

Faridabad - 121101, Haryana, India

Phone: 080 48762267

## Pineapple Candy (Slices) Processing

### Annexure 10: Assumptions/Basis of the project

Particulars	Value	Unit
Machine capacity for pineapple per day in tonne	500	kg
Capacity Utilisation in the second year	50%	
Increase in capacity utilisation per year	5%	
Working hours	8	Hours
Working days per year	300	Days
Average working days per month	25	days
Final product in kg for the installed capacity/day	250	kg
Raw material Stock in Days	2	Days
Finished goods stock in days plus work in progress	21	Days
Interest on working capital and term loan	11%	
Power Consumption in units per day @ 100% capacity utilisation	400	Units
Increase in sale price/year	2%	
Price per kg of Candy	400	Rupees
Increase in raw material & packaging cost	5.00%	
Average price of pineapple per kg including additives	50	Rupees
Land	Own land	
Pineapple price per tonne and Other additives like sugar, citric acid, alium etc per tonne of pineapple	50000	Rupees
Packaging material cost per kg including printing cost	10	Rupees
Creditors in percentage of the stock Value	25%	
Debtors in percentage of the stock value	35%	
Power tariff per unit consumed in Rs.	9.00	Rupees
Depreciation of plant and Machinery and office equipments	15%	
Depreciation of building	10%	
Own contribution in Working Capital	25%	
Own contribution in Fixed Cost	40%	
Maintenance cost as Percentage of fixed cost	20%	
Increase in salary expenses every year	10%	
Repayment of term loan in months	60	months
Moratorium in months	12	months
Income Tax	25%	
Variable cost under Repair and maintenance in percentage	25%	
Variable component in salary in percentage	10%	
Variable component in sale & Admin expenses	15%	
Variable component of electricity in percentage	98%	
Sales and branding expenses per annum in Rs.	1000000	Rupees
Misc Admin Expenses per annum @ 40000/- per month in Rs.	480000	Rupees
Transportation expenses per annum @ 10000/- per week in Rs.	480000	Rupees
Pre-operative Expenses as a percentage of project cost	1%	
Packaging Size	1	kg

## Annexure 11: Interest on Bank Loan and Repayment Schedule

Principal Repayment per month		206484					
Year	Particulars	Amount in Rs.	Interest	Repayment of principal	Closing Balance	Annual Interest payment	Projected Principal Repayment
1	1st Month	8929000	81849	0	8929000		
	2nd Month	8929000	81849	0	8929000		
	3rd Month	8929000	81849	0	8929000		
	4th Month	8929000	81849	0	8929000		
	5th Month	8929000	81849	0	8929000		
	6th Month	8929000	81849	0	8929000		
	7th Month	8929000	81849	0	8929000		
	8th Month	8929000	81849	0	8929000		
	9th Month	8929000	81849	0	8929000		
	10th Month	8929000	81849	0	8929000		
	11th Month	8929000	81849	0	8929000		
	12th Month	8929000	81849	0	8929000	982188	0
2	1st Month	9911188	90853	206484	9704704		
	2nd Month	9704704	88960	206484	9498220		
	3rd Month	9498220	87067	206484	9291736		
	4th Month	9291736	85174	206484	9085252		
	5th Month	9085252	83281	206484	8878768		
	6th Month	8878768	81389	206484	8672284		
	7th Month	8672284	79496	206484	8465800		
	8th Month	8465800	77603	206484	8259316		
	9th Month	8259316	75710	206484	8052832		
	10th Month	8052832	73818	206484	7846348		
	11th Month	7846348	71925	206484	7639864		
	12th Month	7639864	70032	206484	7433380	965308	2477808
3	1st Month	7433380	68139	206484	7226896		
	2nd Month	7226896	66247	206484	7020412		
	3rd Month	7020412	64354	206484	6813928		
	4th Month	6813928	62461	206484	6607444		
	5th Month	6607444	60568	206484	6400960		
	6th Month	6400960	58675	206484	6194476		
	7th Month	6194476	56783	206484	5987992		
	8th Month	5987992	54890	206484	5781508		
	9th Month	5781508	52997	206484	5575024		
	10th Month	5575024	51104	206484	5368540		
	11th Month	5368540	49212	206484	5162056		
	12th Month	5162056	47319	206484	4955572	692749	2477808

4	1st Month	4955572	45426	206484	4749088		
	2nd Month	4749088	43533	206484	4542604		
	3rd Month	4542604	41641	206484	4336120		
	4th Month	4336120	39748	206484	4129636		
	5th Month	4129636	37855	206484	3923152		
	6th Month	3923152	35962	206484	3716668		
	7th Month	3716668	34069	206484	3510184		
	8th Month	3510184	32177	206484	3303700		
	9th Month	3303700	30284	206484	3097216		
	10th Month	3097216	28391	206484	2890732		
	11th Month	2890732	26498	206484	2684248		
	12th Month	2684248	24606	206484	2477764	420190	2477808
5	1st Month	2477764	22713	206484	2271280		
	2nd Month	2271280	20820	206484	2064796		
	3rd Month	2064796	18927	206484	1858312		
	4th Month	1858312	17035	206484	1651828		
	5th Month	1651828	15142	206484	1445344		
	6th Month	1445344	13249	206484	1238860		
	7th Month	1238860	11356	206484	1032376		
	8th Month	1032376	9463	206484	825892		
	9th Month	825892	7571	206484	619408		
	10th Month	619408	5678	206484	412924		
	11th Month	412924	3785	206484	206440		
	12th Month	206440	1892	206440	0	147631	2477764

## Annexure 12: Illustrative list of Equipment Manufacturers

### **Shiva Engineers Address:**

T Block, Plot No. S 33, Bhosari MIDC, Pune - 411026, Maharashtra, India

Phone: +91 9822499586

Email: shivaengineers@gmail.com

### **Industrial Fabricators**

Shed No. 2321, 22, J Type, 3rd Phase, Lane Adjacent BOB, GIDC, Vapi, Valsad-396195, Gujarat, India

Phone: 08045337972

### **Sanjivan Industries Pvt. Ltd.**

Square Industrial Park, BLDG. NO. 3, GALA NO. 4, Western Express Highway, Near Tungareshwar Phata, Vasai (East), THANE, Maharashtra, India

Phone: 09820998248 / 9987187747

Website: <https://www.sanjivanindustries.com>

## Potato Chips Processing

### Annexure 13: Assumptions/Basis of the project

Particulars	Value	Unit
Machine capacity for potato per day in tonne	2.8	tonne
Capacity Utilisation in the second year	50%	
Increase in capacity utilisation per year	5%	
Working hours	8	Hours
Working days per year	300	Days
Average working days per month	25	days
Final product in kg per day/tonne	286	kg
Raw material Stock in Days	240	Days
Finished goods stock in days	15	Days
Interest on working capital and term loan	11%	
Power Consumption in units per day @ 100% capacity utilisation	4000	Units
Oil requirement per day in ltrs	240	litres
Increase in sale price/year	5%	
Rate per 50 gram pack of potato chips	19	Rupees
Increase in raw material & packaging cost	5.00%	
Average price of potato per kg during season	15	Rupees
Land	Own land	
Average price of oil per litre	140	Rupees
cost of salt and other additives as percentage of the total potato	10%	
Packaging material cost per 100 grams including printing cost	1.5	Rupees
Creditors in percentage of the stock Value	25%	
Debtors in percentage of the stock value	15%	
Power tariff per unit consumed in Rs.	9.00	Rupees
Depreciation of plant and Machinery and office equipments	15%	
Depreciation of building	10%	
Own contribution in Working Capital	25%	
Own contribution in Fixed Cost	40%	
Maintenance cost as Percentage of fixed cost	20%	
Increase in salary expenses every year	10%	
Repayment of term loan in months	60	months
Moratorium in months	12	months
Income Tax	25%	
Variable cost under Repair and maintenance in percentage	25%	
Variable component in salary in percentage	10%	
Variable component in sale & Admin expenses	15%	
Variable component of electricity in percentage	98%	
Sales and branding expenses per annum in Rs.	4000000	Rupees
Misc Admin Expenses per annum @ 40000/- per month in Rs.	480000	Rupees
Transportation expenses per annum @ 10000/- per week in Rs.	480000	Rupees
Preoperative Expenses as Percentage of project cost	1%	
Packaging Size	50	grams

## Annexure 14: Interest on Bank Loan and Repayment Schedule

Principal Repayment per month		541172					
Year	Particulars	Amount in Rs.	Interest	Repayment of principal	Closing Balance	Annual Interest payment	Projected Principal Repayment
1	1st Month	23402000	214518	0	23402000		
	2nd Month	23402000	214518	0	23402000		
	3rd Month	23402000	214518	0	23402000		
	4th Month	23402000	214518	0	23402000		
	5th Month	23402000	214518	0	23402000		
	6th Month	23402000	214518	0	23402000		
	7th Month	23402000	214518	0	23402000		
	8th Month	23402000	214518	0	23402000		
	9th Month	23402000	214518	0	23402000		
	10th Month	23402000	214518	0	23402000		
	11th Month	23402000	214518	0	23402000		
	12th Month	23402000	214518	0	23402000	2574216	0
2	1st Month	25976216	238115	541172	25435044		
	2nd Month	25435044	233155	541172	24893872		
	3rd Month	24893872	228194	541172	24352700		
	4th Month	24352700	223233	541172	23811528		
	5th Month	23811528	218272	541172	23270356		
	6th Month	23270356	213312	541172	22729184		
	7th Month	22729184	208351	541172	22188012		
	8th Month	22188012	203390	541172	21646840		
	9th Month	21646840	198429	541172	21105668		
	10th Month	21105668	193469	541172	20564496		
	11th Month	20564496	188508	541172	20023324		
	12th Month	20023324	183547	541172	19482152	2529975	6494064
3	1st Month	19482152	178586	541172	18940980		
	2nd Month	18940980	173626	541172	18399808		
	3rd Month	18399808	168665	541172	17858636		
	4th Month	17858636	163704	541172	17317464		
	5th Month	17317464	158743	541172	16776292		
	6th Month	16776292	153783	541172	16235120		
	7th Month	16235120	148822	541172	15693948		
	8th Month	15693948	143861	541172	15152776		
	9th Month	15152776	138900	541172	14611604		
	10th Month	14611604	133940	541172	14070432		
	11th Month	14070432	128979	541172	13529260		
	12th Month	13529260	124018	541172	12988088	1815627	6494064

4	1st Month	12988088	119057	541172	12446916		
	2nd Month	12446916	114097	541172	11905744		
	3rd Month	11905744	109136	541172	11364572		
	4th Month	11364572	104175	541172	10823400		
	5th Month	10823400	99215	541172	10282228		
	6th Month	10282228	94254	541172	9741056		
	7th Month	9741056	89293	541172	9199884		
	8th Month	9199884	84332	541172	8658712		
	9th Month	8658712	79372	541172	8117540		
	10th Month	8117540	74411	541172	7576368		
	11th Month	7576368	69450	541172	7035196		
	12th Month	7035196	64489	541172	6494024	1101281	6494064
5	1st Month	6494024	59529	541172	5952852		
	2nd Month	5952852	54568	541172	5411680		
	3rd Month	5411680	49607	541172	4870508		
	4th Month	4870508	44646	541172	4329336		
	5th Month	4329336	39686	541172	3788164		
	6th Month	3788164	34725	541172	3246992		
	7th Month	3246992	29764	541172	2705820		
	8th Month	2705820	24803	541172	2164648		
	9th Month	2164648	19843	541172	1623476		
	10th Month	1623476	14882	541172	1082304		
	11th Month	1082304	9921	541172	541132		
	12th Month	541132	4960	541132	0	386934	6494024

## Annexure 15: Illustrative List of Equipment Manufacturer

### Maya Food Equipments

Plot No. 28/11 Konark Business Park  
Kalyan Badlapur Road  
Ambarnath Industrial Area  
MIDC Morivali  
Ambarnath West – 421505  
Thane, Maharashtra  
Phone: +91 9028658738; +91 9987971321  
Email: mayafodeequipments@gmail.com  
Website: <https://www.mayafodeequipments.com/>

### Super Engineering Works

B - 36, Sector -10  
Gautam Budh Nagar,  
Noida - 201301,  
Uttar Pradesh, India  
Phone: 08048621170; 08071682143  
Website: <https://www.superengineeringwork.in/>

### Economode Food Equipment ( India ) Private Limited

Kothari Warehouse, No. 3, Unit M, 27 Acre  
Tikuji Ni Wadi Road, Manpada,  
Thane West, Thane - 400607, Maharashtra, India  
Phone: 08048572254  
Website: <https://www.economode.in/>

### Viraj Machinery

E17/C, Sector 8, Gautam Buddha Nagar,  
Noida - 201301,  
Uttar Pradesh, India  
Phone: 07971472994; 07942551856  
Website: [www.virajmachinery.in/](http://www.virajmachinery.in/)

### M/S.Flavourite Foods & Services (P) Ltd.

208,Manas Bhavan, 11,RNT Marg,Indore-452008 Madhya Pradesh  
Ph-0731/2527644/5046509

## Tomato Processing

### Annexure 16: Indian Production of TOMATO

Production(000 Tonnes)			
		2017-18	
Sr No.	State	Production	Share(%)
1	Andhra Pradesh	2,744.32	13.9
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	5.5
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
	<b>Total</b>	<b>19,745.49</b>	

## Annexure 17: Assumptions/Basis of the project

Particulars	Value	Unit
Machine capacity for tomato per day in tonne for 2 shifts	4	tonne
Capacity Utilisation in the second year	60%	
Increase in capacity utilisation per year	5%	
Working hours	8	Hours
Working days per year	300	Days
Average working days per month	25	days
Final product as a percentage of raw material	40%	
Additives - salt, sugar, spices, acetic acid, sodium benzoate as % of base raw material	6.00%	
Raw material Stock in Days	7	Days
Finished goods stock in days	7	Days
Interest on working capital and term loan	11%	
Power Consumption in units per day @ 100% capacity utilisation	400	Units
Increase/decrease in power consumption units for every percentage increase/decrease in capacity utilisation in production per day	10	units
Increase in sale price/year	5%	
Rate per 1kg pack of tomato ketchup	120	Rupees
Increase in raw material & packaging cost	5.00%	
Average price of tomato per kg	35	
Packaging material cost standing pouch per 1 kg including printing cost	2.5	Rupees
Creditors in percentage of the stock Value	10%	
Debtors in percentage of the stock value	15%	
Power tariff per unit consumed in Rs.	9.00	Rupees
Depreciation of plant and Machinery and office equipments	15%	
Own contribution in Working Capital	25%	
Own contribution in Fixed Cost	40%	
Maintenance cost as Percentage of fixed cost	20%	
Increase in salary expenses every year	10%	
Repayment of term loan in months	60	months
Moratorium in months	12	months
Income Tax	25%	
Variable cost under Repair and maintenance in percentage	25%	
Variable component in salary in percentage	10%	
Variable component in sale & Admin expenses	15%	
Variable component of electricity in percentage	98%	
Sales and branding expenses per annum in Rs.	1000000	Rupees
Misc Admin Expenses per annum @ 20000/- per month in Rs.	240000	Rupees
Transportation expenses per annum @ 10000/- per week in Rs.	480000	Rupees
Preoperative Expenses as a percentage of project Cost	1%	
Packaging Size	1	Kg

## Annexure 18: Interest on Bank Loan and Repayment Schedule

Principal Repayment per month		58738					
Year	Particulars	Amount in Rs.	Interest	Repayment of principal	Closing Balance	Annual Interest payment	Projected Principal Repayment
1	1st Month	2540000	23283	0	2540000		
	2nd Month	2540000	23283	0	2540000		
	3rd Month	2540000	23283	0	2540000		
	4th Month	2540000	23283	0	2540000		
	5th Month	2540000	23283	0	2540000		
	6th Month	2540000	23283	0	2540000		
	7th Month	2540000	23283	0	2540000		
	8th Month	2540000	23283	0	2540000		
	9th Month	2540000	23283	0	2540000		
	10th Month	2540000	23283	0	2540000		
	11th Month	2540000	23283	0	2540000		
	12th Month	2540000	23283	0	2540000	279396	0
2	1st Month	2819396	25844	58738	2760658		
	2nd Month	2760658	25306	58738	2701920		
	3rd Month	2701920	24768	58738	2643182		
	4th Month	2643182	24229	58738	2584444		
	5th Month	2584444	23691	58738	2525706		
	6th Month	2525706	23152	58738	2466968		
	7th Month	2466968	22614	58738	2408230		
	8th Month	2408230	22075	58738	2349492		
	9th Month	2349492	21537	58738	2290754		
	10th Month	2290754	20999	58738	2232016		
	11th Month	2232016	20460	58738	2173278		
	12th Month	2173278	19922	58738	2114540	274597	704856
3	1st Month	2114540	19383	58738	2055802		
	2nd Month	2055802	18845	58738	1997064		
	3rd Month	1997064	18306	58738	1938326		
	4th Month	1938326	17768	58738	1879588		
	5th Month	1879588	17230	58738	1820850		
	6th Month	1820850	16691	58738	1762112		
	7th Month	1762112	16153	58738	1703374		
	8th Month	1703374	15614	58738	1644636		
	9th Month	1644636	15076	58738	1585898		
	10th Month	1585898	14537	58738	1527160		
	11th Month	1527160	13999	58738	1468422		
	12th Month	1468422	13461	58738	1409684	197063	704856

4	1st Month	1409684	12922	58738	1350946		
	2nd Month	1350946	12384	58738	1292208		
	3rd Month	1292208	11845	58738	1233470		
	4th Month	1233470	11307	58738	1174732		
	5th Month	1174732	10768	58738	1115994		
	6th Month	1115994	10230	58738	1057256		
	7th Month	1057256	9692	58738	998518		
	8th Month	998518	9153	58738	939780		
	9th Month	939780	8615	58738	881042		
	10th Month	881042	8076	58738	822304		
	11th Month	822304	7538	58738	763566		
	12th Month	763566	6999	58738	704828	119529	704856
5	1st Month	704828	6461	58738	646090		
	2nd Month	646090	5922	58738	587352		
	3rd Month	587352	5384	58738	528614		
	4th Month	528614	4846	58738	469876		
	5th Month	469876	4307	58738	411138		
	6th Month	411138	3769	58738	352400		
	7th Month	352400	3230	58738	293662		
	8th Month	293662	2692	58738	234924		
	9th Month	234924	2153	58738	176186		
	10th Month	176186	1615	58738	117448		
	11th Month	117448	1077	58738	58710		
	12th Month	58710	538	58710	0	41994	704828

## Annexure 19: Illustrative list of Tomato Ketchup Equipment Manufacturer

### Shiva Engineers

T Block, Plot No. S 33,  
Bhosari MIDC Pune - 411026, Maharashtra, India  
Phone: 08048765052; 9822499586  
Email: shivaengineers1@gmail.com  
Website: <https://www.food-processing.net>

### Yashda Engineers

Shop No. J-406, Mega Centre,  
Pune Solapur Road, Hadapsar,  
Pune-411028, Maharashtra, India  
Phone: 08048371931  
Website: <https://www.indiamart.com/yashdaengineers/>

### Nihira Food Engineering LLP

Plot No. 185, Sector No. 07,  
MIDC, PCNTDA, Bhosari,  
Pune-411026, Maharashtra, India  
Phone: 020 66350099  
Mobile: +91 97675 14222  
Email: santoshkarale@yahoo.com; santosh@nihira.in  
Website: <https://nihira.in/>

### Suan Scientific Instruments & Equipments

P – 814 (Ground Floor), Block-A ,Lake Town, Kolkata-700089, Ph :033 2534 2047

### Bajaj Process Pack Maschinen Pvt. Ltd

7/20-27, Jai Lakshmi Industrial Estate, Site IV, Sahibabad Ind. Area, Distt. Gazaibad 201010. U.P  
Ph. (0120)-463 9950 (50 lines)  
[www.bajajmachines.com](http://www.bajajmachines.com)

