

**BVFP 365S Preparation of Food Processing Plant Proposal (Skill based)**

**Medium Fruit and Vegetable Processing Unit (Mini Factory)**





**BVFP 365S Preparation of Food Processing Plant Proposal (Skill  
based)  
report on,**

**Medium Fruit and Vegetable Processing Unit (Mini Factory)**

*Submitted by,*

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**ROLL NUMBER 01**

*Submitted to,*

**M.V.P. Samaj's**

**Arts, Science & Commerce College, Uttam Nagar CIDCO, Nashik 08**

**(Affiliated to SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE**

*Under the guidance of*

**Asst.Prof.M.R.Gawale**

**Academic Year**

**2021- 22**



**Arts, Science & Commerce College, Uttam Nagar CIDCO, Nashik 08**

**(Affiliated to SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE)**

**CERTIFICATE**

This is to certify that,

**MS. Aher Jagruti Harishchandra Roll No. 01** of VI semester, of B. Voc. (**Food Processing Technology**) has completed the necessary work for the requirement of Course No. **BVFP 365S** Course Title: **Preparation of Food Processing Plant Proposal (Skill based)** in the year 2021-22. he has undergone fair exposure to start new industry on food processing and agro based includes present market position and expected future demand, market size, statistics, trends, SWOT analysis and forecast

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**Mrs.Dr.J.D. Sonkhaskar**

Date:

Place: Nashik

# DECLARATION

I am hereby declare that this report is record authentic work carried out by us during the VI<sup>th</sup> semester and has not been submitted to any other university or institute.

**Aher Jagruti Harishchandra**  
**Regn number**

## **ACKNOWLEDGEMENT**

I have great pleasure in presenting Preparation of Food Processing Plant Proposal report that I convey my sincere thanks to Course coordinator for their valuable guidance & motivation throughout Preparation of Food Processing Plant Proposal report. I pay my deep sense of gratitude to Miss.Tejas.S.Muthal(HOD Department of Food Processing Technology ), for the valuable guidance. Without their valuable suggestions & support this project would not have been a success.

Finally, I immense pleasure in expressing my deep sense of gratitude & sincere thanks to Prof. Asst.Prof.M.R.Gawale Course teacher providing me help to undergo Food Processing Plant Proposal report.

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## 1.0 Introduction

India is the second largest producer of fruits and vegetables in the world after China. It accounts for about 15 per cent of the world's production of vegetables. The area and production of horticultural produce is given in **Table 1**.

**Table 1. Area and production of fruits and vegetables**

Produce	Fruits	Vegetables	Spices
Production (Lakh MT)	812.85	1621.9	57.86
Area (Lakh ha)	69.82	91.0	31.0

(Source: National Horticultural Board 2012-13)

As per the latest estimates, by Central Institute of Post Harvest Engineering and Technology (CIPHET), Ludhiana, the wastage of fresh horticultural produce is upto 18 per cent due to poor postharvest management practices. Hardly 2 per cent of perishable horticultural produce is processed to value added products. Hence, there is huge scope for processing of fruits and vegetables. This wastage can be easily prevented by adopting various methods of preservations. At the same time, there is market glut during harvesting season and farmers are forced to sell their produce at throw away prices. Therefore, food processing industries can help farmers to get sure income for their produce and also avoid market glut.

There are various methods of preservation of food including thermal processing, fermentation, pickling, dehydration, freezing etc. The technology for preservation also varies with type of products and targeted market. Some of fast growing segments of food processing industries are given as under:

- Mango and other fruit pulps
- Pickles, chutney, sauces etc.
- Tomato products like paste, puree and ketchup • Fruit jam, marmalade, crush, squashes, juices etc.
- Canned fruits and vegetables etc.
- Frozen products like frozen peas, cauliflower etc.
- Ready to cook (RTC), Ready to Eat (RTE) and Ready to Serve (RTS) products

The above list is broad and illustrative. There are many other growing segments of food industry. The entrepreneurs shall study to sector thoroughly before investing in food industry. The size and outlay of the project depends upon the market size, type of technology and degree of automation. In the present model, a fruit and vegetable processing unit for manufacture of

multiple products is considered. The entrepreneurs may decide upon the type of products based on raw material availability and also market demand in the project area.

## 2 Type of Concern

New entrepreneurs may start their business as an individual, proprietary concern, partnership firm or a joint stock company. Individual & proprietary concern should have their PAN number and should preferably have a bank account. Partnership firms should execute a partnership deed as per Indian Partnership Act 1932 on a Non Judicial Stamp Paper as per the Stamp Act of the State Government and register the partnership firm with the Ministry of Corporate affairs. Details of procedure to be followed are available at: [http://www.mca.gov.in/Ministry/actsbills/pdf/Partnership\\_Act\\_1932.pdf](http://www.mca.gov.in/Ministry/actsbills/pdf/Partnership_Act_1932.pdf). The joint stock company can be formed as private limited, public limited or producers company as per The Company Act 2013, the details of which are given on the website of Ministry as link <http://www.mca.gov.in/MinistryV2/companiesact.html>.

## 3.0 Products

### 3.1 Canned fruit pulp and vegetables

Canning a method of preservation in which a cooked or uncooked food is sealed in tin plated and lacquered steel cans. The sealed cans are sterilized by heat treatment under high pressure in retort. The temperature required for effective sterilization varies with the pH of the product and is generally higher than boiling point of water (100°C or 212°F).

Fruit pulp is prepared from selected varieties of fruits. Fully matured fruit are harvested and quickly transported to the fruit processing plant. The fruits are ripened in controlled ripening chambers or natural ripening in open yard. Fully ripened fruits are washed, pulped, deseeded, centrifuged, homogenized, thermally processed and filled hot to maintain sterility. The preparation process includes cutting, de-stoning, refining packing, processing and cooling.

Fruits are also canned in slices, rings and cubes etc. along with sugar syrup of desired brix.

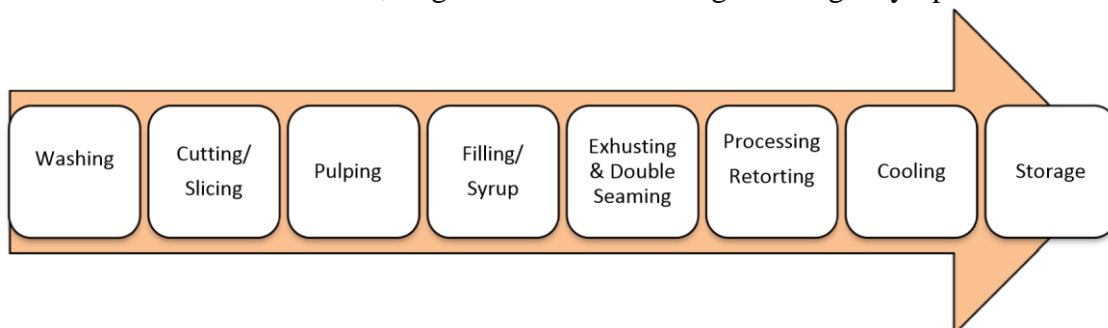


Figure 1 Process flow for fruit canning



The vegetable canning is similar to fruit canning except that the filling materials in case of vegetables is brine solution. The vegetables require thorough cleaning and slicing before passing through canning line. Since vegetables are low in acid it does not require lacquered cans.

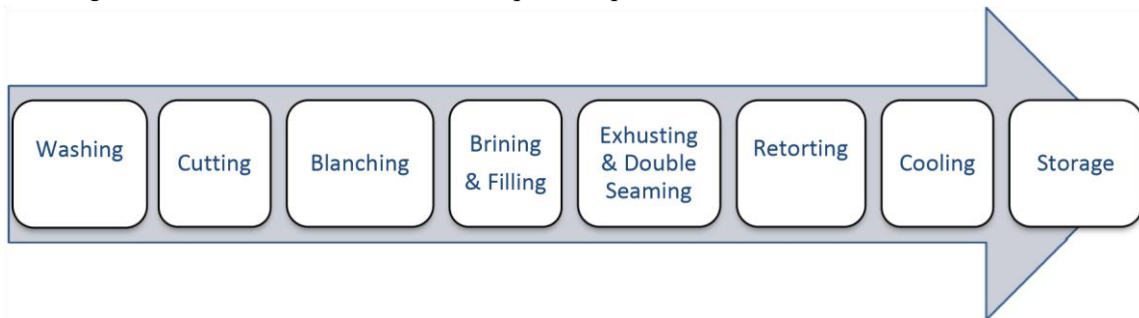


Figure 2 Process flow for vegetable canning









### 3.2 Pickle

Pickling is a process of preservation by fermentation. The fruits and vegetables are immersed in 5–10 per cent salt solution (brine) leading to lactic acid fermentation. Salt prevents growth of undesirable organisms and allow lactic acid bacteria to grow. The natural sugars present in fruits and vegetables are converted to lactic acid at 25°C. The fermentation process takes a few weeks finishing at about 1 per cent acidity of final product. In India, spices and edible oils are used in pickle making. The spices and edible oil inhibit growth of undesirable micro flora in the product and also gives a desirable flavour. The process flow of pickle making is depicted in Figure 3.

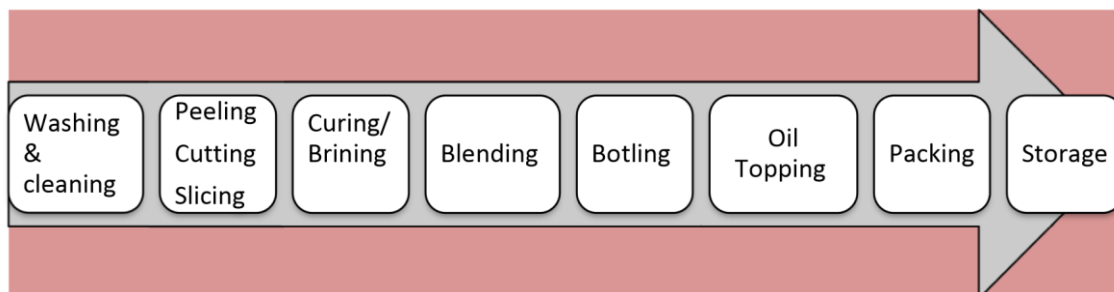


Figure 3 Process flow for pickle making









### 3.3 Jam& jelly

Fresh fruits contain more than 80 per cent water and 10 to 15 per cent sugars. Therefore, fruits are good food for microorganisms. The fruits spoil very fast, if not preserved in time. One of the traditional methods of preservation is conversion of fruit pulp to jam and jelly. The preservation of fruit by addition of sugar helps in reducing water content required by spoilage microorganisms. Jam, jelly and marmalade are based on preservation by high sugar concentration. All fruits can be converted to jam by mashing or slicing it fine, adding an approximately equal amount of sugar, and simmering until it reaches proper concentration or gel at 218° to 222°F (103°–105°C). A process flow chart for jam making is given in Figure 4.

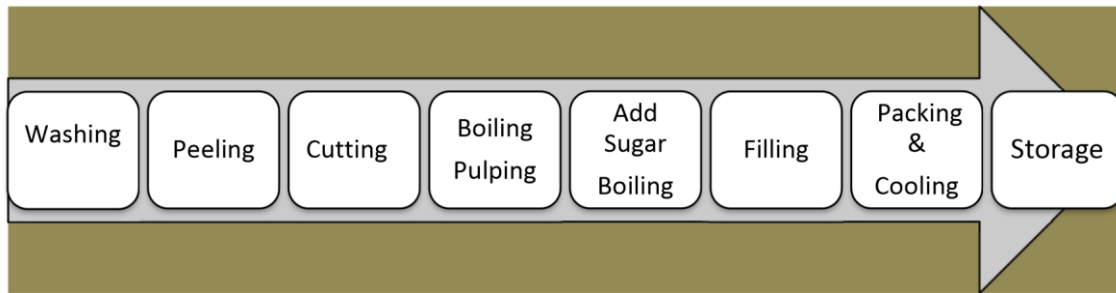


Figure 4 Process flow for jam making

The process of jelly making is also similar except that only fruit extract is used for making of jelly and pectin is added for gel formation after boiling.









### 3.3 Squash

Squashes are sweetened juice of fruits containing minimum prescribed quantity of pulp. As per Indian Standards, squash should contain at least 25 per cent (by volume) of fruit juice.

The squashes are consumed after dilution by drinking water in 1:3 ratio. These beverages contain added flavours and permitted class II preservatives. Since preservatives are added in adequate quantities, the shelf life of squashes is fairly longer at room temperature. The process flow diagram is given in Figure 5.

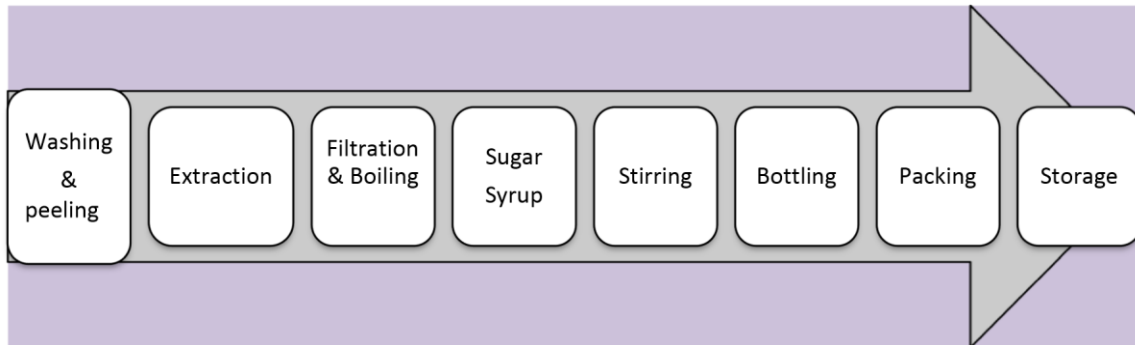


Figure 5 Process flow for manufacture of squash



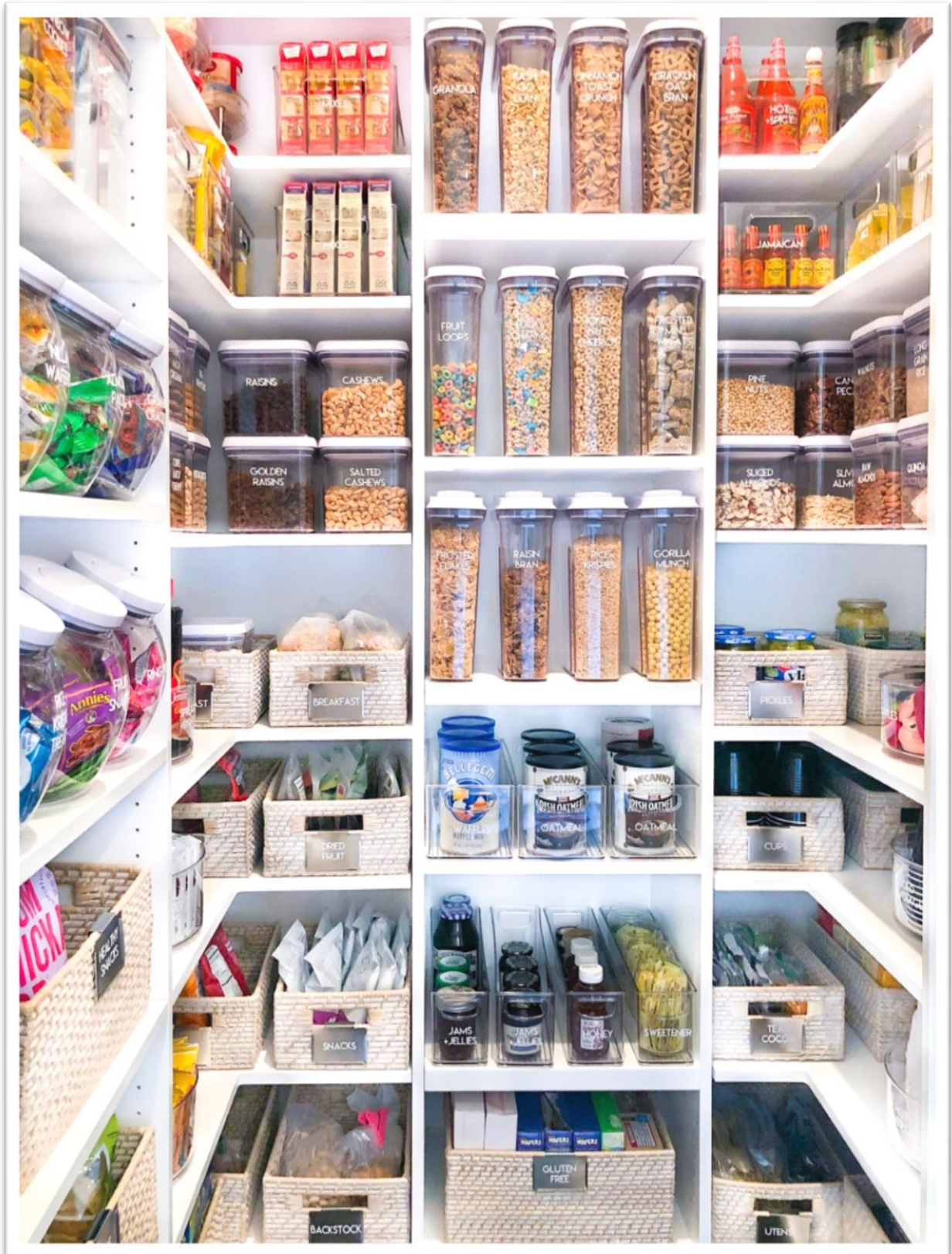


#### 4.0 Storage and packing

The entire product range manufactured should follow the Weight and Measurement Act and packed accordingly in different standard keeping units (SKU). The product should be stored as per batch number allocated to particular product. The product has to be separately stored in storage area. One can follow either “First In First Out (FIFO)” or “First Expiry First Out (FEFO)” method in dispatch process. The entire products can be stored at ambient temperature in dry place. Pickle, chutney and sauces need proper curing before marketing, therefore are stored for a specific period before dispatch









## 5.0 Marketing

Marketing of fruit and vegetable product is the biggest challenge. There are several popular brands in the market, which act as an entry barrier for new food products. Indian market is also flooded by imported products. Therefore, new comers need to give maximum importance to marketing of its products. It is always better to engage a professional agency for product branding and marketing. The units shall also allocate reasonable budget for advertisement and promotion. The details of the product marketing are discussed in this section.

### 5.1 Domestic market

Indians are fond of table enrichers, which are regularly used along with main course of meals as well as snacks. Apart from individual households, restaurants, roadside eateries, clubs, hostels, caterers etc. are bulk consumers of fruit and vegetable products. Branded products available in the market are costly. Therefore, new comers need to work on competitive pricing. The real competition would be from age-old practice of making pulps, jam, jelly, pickles or chutneys at home by the housewives. Many Indian households make these items during season and store them



for remaining part of the year. But this practice is gradually disappearing due to changing lifestyles, hassles of making these items and their availability throughout the year from market. There are many variants of these products. New comers may introduce new flavour with certain change in the ingredients to alter taste of the products. It is imperative to cater to regional palate and ethos e.g. products targeted to areas populated by Jain community needs to be prepared with “no onion and no garlic” tag.

## **5.2 Export market**

Apart from domestic market, there is good demand for processed products in export market. Nowadays Indian products are widely accepted throughout the world for commercial as well as household consumption. Currently, more than 50 countries import processed fruit and vegetable products from India. Of late large numbers of Indian have migrated to various countries and higher numbers of Indian visit other countries. Therefore, the demand for Indian food products is on the rise in many countries. New entrants may initially join hands with existing merchant exporters to get entry into such markets. Thereafter, vast export potential for such products can be tapped slowly.

## **6.0 Quality control and quality assurance**

The processed products 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 & labelling norms. The new units need to take a license called FSSAI number from Food Safety and Standards Authority of India. The licensing procedure is given at FSSAI website link <http://foodlicensing.fssai.gov.in/UserLogin/Login.aspx?ReqID=99887766>.

## **7.0 Project Cost**

The major component of a small-scale fruit processing unit are land, building and civil works. A project cost of **Rs.74.78 Lakh** has been estimated. The details of project cost are given in **Table 2** and the individual components are discussed in this section.

### **7.1 Land and land development**

For a small scale fruit and vegetable processing unit, a plot of land measuring 0.5 acre, with built-up area of 3850 sqft is considered sufficient. 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. The cost of land up to a maximum of 10 per cent of project cost can be reckoned towards margin if purchased by the promoters for the project. The land can also be taken on lease and the lease period should be sufficiently more than the repayment period of loan. The lease land should be with an enabling clause for mortgage of land to banks or financial institutions. The land cost varies considerably from place to place. Land cost of Rs.2.50 lakh has been considered for this profile. Similarly cost of land development also varies from place to place and should be considered on actual basis. Land development cost of Rs.5.0 Lakh rupees has been considered in the model.

## 7.2 Building and civil structures

The processing hall and other utilities would require construction of around 3850 sqft. of building at a total cost of **Rs.23.10 Lakh**. The construction cost is assumed as Rs. 600 per sqft. The building consists of 1000 square feet of processing hall, 1000 square feet of finished product storage area, 1000 square feet of raw material storage area, 500 square feet of washing area, 250 square feet of toilets, and 100 square feet of guard room. The remaining land is kept for future expansion of project. The processing buildings should be constructed as per the guidelines of FSSAI. The height of the building should be such that sufficient breathing space is available. All windows and doors should be provided with insect proof wire mesh. Slope as per standard guidelines should be provided in floor. Glazed tiled flooring shall be preferable to ensure easy cleaning of floor in evening.

## 7.3 Plant and machinery

Selection of plant and machinery is the most important decision for setting up a food processing unit. All machinery and equipments used in the processing line should have proper efficiency. The matching the capacities of different machines and equipments in a processing line require an expert guidance. Therefore, a suitable consultant/ food technologist should be appointed to set up a fruit and vegetable processing plant. The estimated cost of plant and machinery is **Rs.40.23 lakh**. All the plant and machinery should be erected in such

\$

a way that the material flow is unidirectional to avoid cross contaminations. The machinery should not occupy more than 1/3<sup>rd</sup> of the total floor area for smooth operation of labour. Various plant and machinery proposed for this model are discussed in this section. **Fruit washing machine** - The fruit washing machine is used for different fruits and vegetables. The purpose of machine is to reduce the initial microbial load by washing raw materials with chlorinated water. Water used for washing has to be replaced at an interval of 3 to 4 hours. The anticipated cost of fruit washing machine having capacity of 1.5 MT per hour is Rs.2.0 Lakh.

**Sorting or inspection conveyer** - This belt conveyor can be used for cutting, inspection and sorting purpose. The anticipated cost of conveyer belt is Rs.1.75 Lakh.

**Screw feeder** - The screw feeder is used for feeding of sorted and cut fruit to fruit mill. The capacity of feeding can vary from fruit to fruit. Therefore, a slightly higher capacity screw feeder of 2MT per hour is proposed. The cost of machine is Rs.3.33 Lakh.

**Twin pulper**- The pulping is major activity in this project. The pulper crushes fruit and fine pulp is extracted. Therefore, a pulper of 3 MT per hour for fruits is required to ensure the regular supply of pulp. The fruit pulp passes through a sieve where stone or waste is removed. The cost of twin pulper is Rs. 2.70 Lakh.

**Steam jacketed kettle** – Steam jacketed kettle is a double walled cooking vessel. Pulp / other products requiring processing are heated in steam jacketed kettle at desirable temperature to reduce microbial load. During process some ingredients like sugar and citric acid are also added to standardize the product. The estimated cost of two steam jacketed kettles of 375 kg each is Rs.3.60 Lakh.



Figure 6 Steam Jacketed Kettle

this  
unit  
MS  
set

**Miscellaneous equipments** - A fruit and vegetable processing will also require some supporting equipment's like retort, crates, electric hoist, rotary flat can body reformer, body blanks (empty cans), washer & sterilizer, working table, steam boiler, trolleys, plastic barrels, knives, weighing scale etc. The entire of miscellaneous equipment's will cost approximately Rs. 20.0 Lakh.

#### 7.4 Miscellaneous fixed asset

In order to run a day to business, some other fixed assets like furniture & fixtures, computers etc. shall also be required for which a provision of Rs.2.0 Lakh is made.

%

**Table 2 Project Cost**

S. No.	Particulars	Unit	Qty.	Rate (Rs.)	Amount (Rs. Lakh)
1	Land	acre	0.5	500000.00	2.50
2	Land Development	Sq ft	20000	LS	5.00
3	Civil Work	Sq ft	3850	600.00	23.10
4	Plant and Machinery				40.23
5	Miscellaneous Fixed Assets				2.00
6	Preliminary and Preoperative Expenses				1.95
	<b>TOTAL</b>				<b>74.78</b>

#### 7.5 Electrical and other items:

Various machines have to be connected to electrical motors of suitable power ratings for supplying power to them. Accordingly AC-3 phase motors of different power ratings, varying from 2.50 Hp to 7.50 Hp will be required for powering various unit operations of the unit. The total cumulative Hp ratings of all these motors will be 55 Hp. The costs of electrical motors have been included along with the cost of plant and machinery.

### 8.0 Water Requirement

The total water requirement of such unit will be 1000 litres per day. Water is mostly required for washing and also in various unit operations during processing. Apart from it, water will also be required for domestic consumption purpose. The water should be clean and treated well for hardness before use. It is preferable to carry out water testing from a reputed testing laboratory



before setting up a plant. Nowadays RO plants are installed to meet water requirement of food processing industry.

## 9.0 Manpower Requirement.

Fruit and vegetable processing is a highly labour intensive operation. Majority of labour is engaged on contract basis during season. These labourers are skilled and mostly women folk. In order to perform day to day work, manpower requirement of a small-scale fruit processing unit is given in **Table 3**.

Table 3. Manpower required of fruit and vegetable processing unit

Salary	Number	Salary (Per Month)	Total (Rs. Lakh)
Plant manager	1.00	15000.00	1.80
Manager – Technical	1.00	10000.00	1.20
Supervisors	3.00	7000.00	2.52
Accountant	1.00	8000.00	0.96
Electrician	2.00	6000.00	1.44
Peon	1.00	5000.00	0.60
Guard	2.00	5000.00	1.20
Total			9.72

In addition, seasonal contract labour during peak processing periods will also be required to be engaged. As a thumb rule an expenditure on wages @ Rs.250/- per MT of raw material is considered adequate.

## 10.0 Working Capital:

Working capital is the most crucial input for viability of any fruit and vegetable processing unit. The raw materials being seasonal in nature, fruit and vegetable processing units need to maintain high inventories. Nowadays, banks are free to finance working capital based on actual need of the borrower. A provision of adequate working capital needs to be considered by the financing banks. The banks provide Cash Credit Limit, commonly known as CC limit to the borrowers for meeting their day to day expenses. The different components of working capital are discussed in this section.

### 10.1 Raw material and packing material

The raw material required would be fruits and vegetables, which are directly procured from the farmers. Other inputs are generally available locally in general stores. As the fruits and vegetables are highly perishable in nature, raw material stock only for 7 days is considered for assessment of working capital.

## 10.2 Work-in-Progress (WIP)

The raw materials need to be converted to semi-finished products and preserved for processing in future. Therefore, the WIP has been considered for 30 days.

## 10.3 Finished goods

Processed fruit and vegetable products can be stored for a period of 12 - 18 months at ambient conditions. However, finished product storage for 15 days has been considered to keep the inventory level under check.

## 10.4 Debtors

The processed fruit and vegetable products are sold to whole sellers/ retailers by the processing units. In general, it takes about one month to recover dues from them. Hence, a period of 30 days debtors has been considered adequate.

## 10.5 Creditors

The fruit and vegetable are purchased from farmers by making cash payments. Therefore, no creditors have been considered.

The estimated working capital for the project is given in Table 4.

Table 4. Working Capital Assessment for F&V processing unit

(Rs. Lakh)

S. No.	Particulars	Period (days)	Yr1	Yr2	Yr3	Remarks
1	Raw materials stock	7	0.71	1.65	2.12	
2	Work in progress	30	4.10	9.57	12.31	
3	Finished goods	15	2.23	5.37	6.74	
4	Debtors	30	4.45	10.75	13.49	
	Total current assets		7.03	16.59	21.16	
5	Creditors (current liabilities)	0	0.00	0.00	0.00	
6	Working capital gap		7.03	16.59	21.16	
7	Margin money for W.C.	25%	1.76	4.15	5.29	
8	Bank loan (CC Limit)		5.28	12.44	15.87	

## **11.0 Means of Finance**

Financing to food processing falls under priority sector lending. The loans to units meeting the criteria of MSME are classified under MSME sector. Such units can be financed by any scheduled commercial banks, Regional Rural Banks and Cooperative Banks. Important terms and conditions of financing such units are discussed in this section.

### **11.1 Margin money**

The promoters of the units need to bring their margin as per the requirement of financing banks and also as per RBI guideline issued from time to time. The margin money varies from minimum 10 per cent to 25 per cent of project cost. We have assumed margin money of 25 per cent in this model scheme.

### **11.2 Bank loan**

The promoters of the units can approach any financing bank for finance. It is compulsory to take bank loan to avail various subsidy schemes of government. Therefore, the promoters should be careful in deciding means of finance.

### **11.3 Grant & subsidy**

There are numbers of incentive from State Government for promotion of food industry. Some of the states have formulated their Agro Industry Policy. The new comers should go through these guidelines. Various incentives are available depending upon location of the unit from District Industry Centres (DIC). Therefore, to take maximum advantage of these incentives, entrepreneurs may contact the District Industry Centres in their state.

Ministry of Food Processing Industry, GoI is implementing a centrally sponsored scheme for known as National Mission on Food Processing (NMFP) jointly with State Governments. The scheme will be operational during 12<sup>th</sup> Five Year Plan. Subsidy is available under this scheme for various purposes under food processing industries. GoI has appointed State Nodal Agencies for implementing this scheme in different states. The details of the scheme are available at <http://www.mofpi.nic.in/SchemeViewPage.aspx?OPsNrN8PJA9sTrxLD7BvfB2hBIJg+pfldJPrxZAJVpDNZljdsLVU2Gbcbo6343MQnflHw3hYt7Q=>. The entrepreneurs should visit State Nodal Agencies in their states to avail this scheme. The details of the State Nodal Officers is given at link [http://www.mofpi.nic.in/H\\_Dwld.aspx?KYEwmOL+HGqHeLIRhVIZUABVfKtILFmuPNWgdG0C70PqfSu+Dkvx1A==](http://www.mofpi.nic.in/H_Dwld.aspx?KYEwmOL+HGqHeLIRhVIZUABVfKtILFmuPNWgdG0C70PqfSu+Dkvx1A==).

## 11.4 Interest rate

The banks are free to charge rate of interest above its base rate within overall RBI guideline issued from time to time. It generally varies from customer to customer based on credit appraisal of the borrower. Base rate of a bank is a minimum lending rate below which bank is not allowed to lend. However, we have considered an interest rate of 12 per cent for working out the bankability of the model project.

## 11.4 Security

As per RBI guidelines, the banks are required to take adequate security for the loans extended by them. The borrowers should plan projects in such a manner that they have enough fixed assets to offer as security against bank loan. Various types of securities considered by the Banks are given here:

### 11.4.1 Primary Security

The land and buildings acquired with by bank loan are mortgaged to financing banks. The mortgage can be registered or equitable in nature. The plant, machinery and other miscellaneous fixed assets acquired by bank loan shall have to be hypothecated to the bank.

The value of all these assets is known as primary security for the bank.

### 11.4.2 Collateral Security

As the value of primary assets, especially buildings and plant and machinery is not enough to cover the bank loan, the banks insists for mortgage of any other property or asset of the company or promoters. This is known as collateral security.

### 11.4.3 Hypothecation of Stocks

All stocks, inventories and debtors are hypothecated to financing banks as security against the bank loan extended by them.

## 12.0 Financial Analysis

In order to test the financial soundness of business, key financial indicators are assessed. Based on historical data on cost and prices, techno-economic assumptions are made for preparation of this model. The key techno-economic assumptions are presented in **Annexure I**. The assumptions made might vary from place to place, hence need to be considered on case-by-case basis.

### 12.1 Financial indicators

Based on the assumptions on input and output parameters, an Income Expenditure statement (Cash Flow Statement) prepared is presented at **Annexure II**. The financial indicators like Net Present Worth (NPW), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR) etc. analysed by discounting cash flow @15% discounting rate are given in **Annexure III** and summary is presented in **Table 5**.

Table. 5 Estimated Financial Indicators

Financial Indicators	Estimated	Requirement
----------------------	-----------	-------------

NPW @ 15 % DF`	43.96	Should be +ve
IRR	36.73%	> 15%
BCR	1.09	Should be >1.0
DSCR	1.68	Should be >1.5

## 12.2 Repayment period and debt service coverage ratio (DSCR)

The repayment period has been drawn by considering net surplus available for repayment. The bank loan with interest is repayable within 8 years with a grace period of one year. The details are presented in **Annexure IV**. The debt service coverage ratio based on assumed techno economic parameters is found satisfactory.

## 13.0 Depreciation Schedule

There are two different methods for assessment of depreciation on fixed assets namely Written Down Value Method (WDV) and Straight Line Method (SLM). These methods are used invariably to submit the returns to Registrar of Companies & Income Tax Authorities. We have followed WDV method for computation of depreciation in the present model and the schedule of depreciation is presented in **Annexure VI**

## 14.0 Govt. Approvals/ Clearance Required

### 14.1 Prior to establishment

- i. Registration of concern with Registrar of Companies (ROC)
- ii. NOC from Local Bodies like Gram Sabha/ MC etc. - mandatory
- iii. Consent to establish from State Pollution Control Board - mandatory
- iv. Approval of Layout plan for construction - mandatory
- v. Permission to dug bore well from Ground Water Survey and Development Authority (GSDA)
- vi. Registration with District Industry Centre (DIC) for as Small and Medium Enterprise
- vii. Application to State Electricity Board/ Authority for sanction of requisite power load

### 14.2 After establishment

- i. Licence from FSSAI
- ii. Permission to commence production from State Pollution Control Board
- iii. Licence from Boiler Inspector

The list is only illustrative. The entrepreneurs should undertake an exhaustive study of all rules and regulations prior to establishment of any such unit. The new entrepreneurs may take help of suitable consultant to avoid unnecessary expenditure for compliance later on.

*The views expressed in this model project are advisory in nature. NABARD assume no financial liability to anyone using the report for any purpose. The actual cost and returns of projects will have to be taken on a case by case basis considering the specific requirement of projects*

## Annexure I

### Techno Economic Parameters

Assumptions for working out economics of a 300 MT/ Annum capacity fruit and vegetable processing plant Total Installed Capacity 300 MT per annum.

1. The unit will operate in a single shift of 8 hours for 250 days.
2. Share of products considered is 60 per cent, 20per cent, 10per cent and 10 per cent for each canned pulp, pickle, jams and canned vegetables, respectively.
3. Capacity utilization: First year –30 per cent, second year - 70per cent and third year onwards - 90per cent.
4. Sales price will be Rs.62000/MT for pulp, Rs.5000/MT for pickle, Rs.60000/MT for Jam and Rs.62000/MT for canned products.
5. Power cost @ Rs. 6.0 per unit and that for fuel @Rs. 55.0 per litre.
6. Labour charges are considered as Rs.250 per metric ton.
7. Insurance charges for the fixed assets considered as 0.5% of the depreciated cost of the assets.
8. Interest on working capital considered at 14% per annum and interest on term loan considered at 12% per annum.
9. Margin money considered at 25% of the financial outlay.
10. Depreciation rate of 10%, 13.91% and 15% has been considered for civil structures, plant & machineries and miscellaneous fixed assets, respectively.
11. Repayment period of seven years with one year grace period has been considered.

### Profitability Statement

#### i. Installed Capacity (MT)

Installed Capacity	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Mango and other fruit pulps	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0
Pickles, chutney, sauces etc.	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Fruit jam, jelly, squashes etc.	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Canned fruits and vegetables etc.	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
<b>Total</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>	<b>300.0</b>

#### ii. Capacity Utilisation (MT)

Installed capacity	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Capacity utilisation	30%	70%	90%	90%	90%	90%	90%	90%

Mango and other fruit pulps	54	126	162	162	162	162	162	162
Pickles, chutney, sauces etc.	18	42	54	54	54	54	54	54
Fruit jam, jelly, squashes etc.	9	21	27	27	27	27	27	27
Canned fruits and vegetables etc.	9	21	27	27	27	27	27	27
<b>Total</b>	<b>90</b>	<b>210</b>	<b>270</b>	<b>270</b>	<b>270</b>	<b>270</b>	<b>270</b>	<b>270</b>

#### iii. Sales Revenue (Rs. Lakh)

Products	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Mango and other fruit pulps	28.08	65.52	84.24	84.24	84.24	84.24	84.24	84.24
Pickles, chutney, sauces etc.	9.72	22.68	29.16	29.16	29.16	29.16	29.16	29.16
Fruit jam, jelly, squashes etc	4.77	11.13	14.31	14.31	14.31	14.31	14.31	14.31
Canned fruits and vegetables etc	4.95	11.55	14.85	14.85	14.85	14.85	14.85	14.85
<b>Total Income</b>	<b>47.52</b>	<b>110.88</b>	<b>142.56</b>	<b>142.56</b>	<b>142.56</b>	<b>142.56</b>	<b>142.56</b>	<b>142.56</b>

#### iv. Expenditure Calculation (Rs. Lakh)

Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Raw material pulp	14.98	34.94	44.93	44.93	44.93	44.93	44.93	44.93
Raw material pickle	4.14	9.67	12.43	12.43	12.43	12.43	12.43	12.43
Raw material jam RTS squashes	3.23	7.53	9.68	9.68	9.68	9.68	9.68	9.68
Raw material canned F&V	2.873	6.70	8.62	8.62	8.62	8.62	8.62	8.62
Packing material pulp	3.310	7.72	9.93	9.93	9.93	9.93	9.93	9.93

Packing material pickle	2.052	4.79	6.16	6.16	6.16	6.16	6.16	6.16
Packing material jam RTS squashes	1.026	2.39	3.08	3.08	3.08	3.08	3.08	3.08
Packing material canned F&V	0.552	1.29	1.65	1.65	1.65	1.65	1.65	1.65
Fuel	0.41	0.96	1.23	1.23	1.23	1.23	1.23	1.23
Power	1.20	2.79	3.59	3.59	3.59	3.59	3.59	3.59
Salary	0.42	0.98	1.26	1.26	1.26	1.26	1.26	1.26

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Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Wages	2.92	9.72	9.72	9.72	9.72	9.72	9.72	9.72
Repair and maintenance	0.00	0.07	0.18	0.35	0.53	0.53	0.53	0.53
Insurance	0.29	0.25	0.22	0.19	0.17	0.15	0.13	0.11
Promotion and marketing	0.12	0.28	0.36	0.36	0.36	0.36	0.36	0.36
Administrative overheads	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10

<b>Total</b>	<b>37.60</b>	<b>90.18</b>	<b>113.12</b>	<b>113.27</b>	<b>113.42</b>	<b>113.40</b>	<b>113.38</b>	<b>113.36</b>
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#### v. Financials

Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Profit Before Depreciation and Interest (PBDIT)	9.92	20.70	29.44	29.29	29.14	29.16	29.18	29.20
Depreciation	8.21	7.15	6.24	5.44	4.75	4.14	3.62	3.16
Interest on Term Loan	6.73	6.73	5.77	4.81	3.85	3.85	3.85	3.85
Interest on working capital	0.74	1.74	2.22	2.22	2.22	2.22	2.22	2.22
Intangible assets written off	0.00	0.00	0.39	0.39	0.39	0.39	0.39	0.00
Profit After Depreciation and Interest	-5.76	5.08	14.83	16.44	17.94	18.56	19.10	19.97
Tax	0.00	1.83	5.34	5.92	6.46	6.68	6.88	7.19
Profit After Depreciation and Interest and Tax	-5.76	3.25	9.49	10.52	11.48	11.88	12.23	12.78
Surplus available for repayment	9.18	17.13	21.49	20.77	20.07	19.87	19.69	19.79

DSCR	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Coverage Available	9.18	17.13	21.49	20.77	20.07	19.87	19.69	19.79
Debt	6.73	14.74	13.78	12.82	11.86	10.90	9.94	8.97
Value	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DSCR Ratio	1.364	1.162	1.560	1.620	1.693	1.823	1.982	2.205
Average DSCR Ratio	<b>1.68</b>							



Cash Accruals	4.16	23.96	38.93	39.81	40.62	41.04	41.41	41.98
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**Calculation of IRR, BCR and NPW - As per IT Act**

Sr. No	Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	
1	Capital Cost	74.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	Recurring Cost	37.60	90.18	113.12	113.27	113.42	113.42	113.42	113.42	
3	Total Cost	112.38	90.18	113.12	113.27	113.42	113.42	113.42	113.42	Rs. 490.18
4	Benefits	47.52	110.88	142.56	142.56	142.56	142.56	142.56	142.56	
5	Depreciated value of structures									
6	Total Benefits	47.52	110.88	142.56	142.56	142.56	142.56	142.56	145.72	Rs. 534.15
7	Net Benefits	-64.86	20.70	29.44	29.29	29.14	29.14	29.14	32.30	
8	Discounting Factor	15%								
9	NPW @ 15 % DF	43.96								
10	IRR	36.73%								
11	BCR	1.09								

**Repayment Schedule**

O/S Bank Loan at Start of Year	Disb, During the year	Total loan outstanding	Surplus for Repayment	Interest	Interest Payment	Repayment of Principal	Total Outgo	O/S Bank Loan at End of Year	Balance left
0.00	56.09	56.09	9.18	6.73	6.73	0.00	6.73	56.09	2.45
56.09		56.09	17.13	6.73	6.73	8.01	14.74	48.07	2.39
48.07		48.07	21.49	5.77	5.77	8.01	13.78	40.06	7.71
40.06		40.06	20.77	4.81	4.81	8.01	12.82	32.05	7.95
32.05		32.05	20.07	3.85	3.85	8.01	11.86	24.04	8.21
24.04		24.04	19.87	2.88	2.88	8.01	10.90	16.02	8.97
16.02		16.02	19.69	1.92	1.92	8.01	9.94	8.01	9.76
8.01		8.01	19.79	0.96	0.96	8.01	8.97	0.00	10.81

**Depreciation as Per the WDV Method: IT Act**

Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
<b>Civil Works</b>	23.10	20.79	18.71	16.84	15.16	13.64	12.28	11.05
Depreciation	2.31	2.08	1.87	1.68	1.52	1.36	1.23	1.10
Depreciated Cost	20.79	18.71	16.84	15.16	13.64	12.28	11.05	9.94
<b>Plant and Machinery</b>	40.23	34.63	29.82	25.67	22.10	19.02	16.38	14.10
Depreciation	5.60	4.82	4.15	3.57	3.07	2.65	2.28	1.96
Depreciated Cost	34.63	29.82	25.67	22.10	19.02	16.38	14.10	12.14
<b>Miscellaneous Fixed Assets</b>	2.00	1.70	1.45	1.23	1.04	0.89	0.75	0.64
Depreciation	0.30	0.26	0.22	0.18	0.16	0.13	0.11	0.10
Depreciated Cost	1.70	1.45	1.23	1.04	0.89	0.75	0.64	0.54
<b>All Assets</b>	65.33	57.12	49.97	43.74	38.30	33.55	29.41	25.79

Depreciation	8.21	7.15	6.24	5.44	4.75	4.14	3.62	3.16
Depreciated Costs	57.12	49.97	43.74	38.30	33.55	29.41	25.79	22.63