# DETAILED PROJECT REPORT

# JAMUN CANDY MANUFACTURING UNIT.

## INDIAN INSTITUTE OF FOOD PROCESSING TECHNOLOGY

## Ministry of Food Processing Industries, Govt. of India

## Thanjavur

## 2020

## Contents

The Project at a Glance

| | | |
|---|---|---|
| 1 | Name of the Project | Jamun Candy |
| 2 | Name of the entrepreneur/FPO/SHG/Cooperative | |
| 3 | Nature of proposed project | Proprietorship/Company/ Partnership |
| 4 | Registered office | |
| 5 | Project site/location | |
| 6 | Names of Partner (if partnership) | |
| 7 | No of share holders (if company/FPC) | |
| 8 | Technical advisor | |
| 9 | Marketing advisor/partners | |
| 10 | Proposed project capacity | 150 MT/annum (55, 65, 75,90 and 100% capacity utilization in the 2nd, 3rd, 4th year, 5th year and 6th year onwards respectively |
| 11 | Raw materials | Jamun Fruit |
| 12 | Major product outputs | Jamun Candy |
| 13 | Total project cost (Lakhs) | 38.62 |
| | Land development, building & civil construction | 5.18 |
| | Machinery and equipments | 17.56 |
| | Utilities (Power & water facilities) | 0.8 |
| | Miscellaneous fixed assets | 0.9 |
| | Pre-operative expenses | 0.90 |
| | Contingencies | 1.20 |
| | Working capital margin | 12.08 |
| 14 | Working capital Management (In Lakhs) | |
| | Second Year | 36.23 |
| | Third Year | 42.82 |
| | Fourth Year | 58.38 |
| 15 | Means of Finance | |
| | Subsidy grant by MoFPI (max 10 lakhs) | 9.847088453 |
| | Promoter's contribution (min 20%) | 10.61940912 |
| | Term loan (45%) | 18.14953558 |
| 16 | Debt-equity ratio | 1.70 : 1 |
| 17 | Profit after Depreciation, Interest & Tax | |
| | 2nd year | 50.65 |
| | 3rd year | 57.70 |
| | 4th year | 68.21 |

| | | |
|---|---|---|
| 18 | Average DSCR | 2.16 |
| | Benefit Cost Ratio | 1.570250812 |
| | Term Loan Payment | 7 Years with 1 year grace period |
| | Pay Back Period for investment | 2 Years |

Note: All the data/contents of this DPR are taken from the available information on IIFPT site.

# 1 GENERAL OVERVIEW OF JAMUN PRODUCTION, CLUSTERS, POST-HARVEST MANAGEMENT AND VALUE ADDITION IN INDIA

## 1.1 INTRODUCTION

The jamun is an important indigenous minor fruit of commercial value. It is also known as black plum, Indian black cherry, Ram jamun etc. in different parts of India. The tree is tall and handsome, evergreen, generally grown for shade and windbreak on roads and avenues. Syzygium cumini belongs to family Myrtaceae and is also known as Syzygium jabunum is evergreen tropical and subtropical plant native to Indian subcontinent. It is commonly known as Jambul, Black Plum, Java Plum, Indian Blackberry, Jamblang, Jamun etc. The tree fruits once in a year and berries are purple during early stage, later they become black and taste bitter sweet. Being a tropical and subtropical plant but it also performs very well in lower ranges of Himalaya's upto an altitude of 1300 meter from mean sea level. It is distributed throughout India, Sri Lanka, Malaya, and Australia. Annually the trees produce oblong or ellipsoid fruits (berries). They are green when raw and purplish black when fully ripe. The ripe fruits are sweetish sour to taste.

It is commonly known as 'naaval' in Tamil and Black plum, Indian black berry, Java Plum in English. Leaves are opposite, simple, entire and elliptic to broadly oblong. Flowers are white, 7.5-13 mm across, in branched clusters at stem tips. Fruits are variable in size, up to 2.5 cm long, ellipsoid or oblong, black with juicy pulp. It is an animal dispersed species. It is found throughout India, from sea level to an altitude of 1,800m, usually along streams and often gregarious in Sal (Shorea robusta) and evergreen forests.

India is the second largest producer of the fruit in the world. World production of Jamun is estimated at 13.5 million tonnes out of which 15.4% is contributed by India. India ranks second in production of Jamun in the world. Maharashtra State is the largest Jamun producer followed by Uttar Pradesh, Tamil Nadu, Gujarat, Assam and others. The mainly "Konkan bahadoli" variety are famous. This variety cultivated especially in Konkan region.

## 1.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF JAMUN

The original home of jamun is India or the East Indies. It is also found in Thailand, Philippines, Madagascar and some other countries. The jamun has successfully been introduced into many other subtropical regions including Florida, California, Algeria, Israel, etc.

In India, the maximum number of jamun trees are found scattered throughout the tropical and subtropical regions. It also occurs in the lower range of the Himalayas up to an elevation of 1,300 meters and in the Kumaon hills up to 1,600 meters. It is widely grown in the larger parts of India from the Indo-Gangetic plains in the North to Tamil Nadu in the South. The data about its total acreage in India are not available.

It is believed that this exotic fruit has its origins in Neolithic times when man consumed wild berries, wild plums, and nuts as staple food. In India, Jamun is referred to as the 'Fruit of Gods'. The fruit is also of significant importance in Hindu mythology. During his 14-year exile from Ayodhya, Lord Rama is believed to have eaten several berries and plums including Jamun. Jamun trees require partial rainfall and thrive in dry weather. Jamun that comes from various parts of the world differs in size, this is because of varied soil and weather conditions.

It is an evergreen tropical tree in the flowering plant family Myrtaceae, native to India, Pakistan, Indonesia and Sri Lanka. It is also grown in other areas of

southern Asia including Myanmar, Nepal and Afghanistan. The tree was also introduced to Florida, USA in 1911 by the USDA, and is also now commonly planted in Suriname. In Brazil, where it was introduced from India during Portuguese colonisation, it has spread out in the wild in some places, as many native birds such as thrushes, tanagers and the Great Kiskadee want their fruits. The various names for this fruit are (in Java) plum, jambul, jamun, jaman, black plum, faux pistachier, Indian blueberry , jambol, doowet, jambolan and jambolão. Scientific synonyms include *Syzygium jambolanum, Eugenia cumini* and *Eugenia jambolana*.

## 1.3 VARIETIES

The common types of jamun in India are: 1) Ram Jamun, with large, oblong fruits, dark-purple or bluish, with pink, sweet pulp and small seeds; 2) Kaatha, with small, acid fruits. Among named cultivars are, mainly, 'Early Wild', 'Late Wild', 'Pharenda'; and, secondarily, 'Small Jaman' and 'Dabka' ('Dubaka'). In Java, the small form is called Djoowetkreekil; a seedless form is Djoowetbooten. In southern Malaya, the trees are small-leaved with small flower clusters. Farther north, the variety called 'KrianDuat' has larger, thicker leaves and red inner bark. Fruits with purple flesh are more astringent than the white-fleshed types.

There are no standard varieties of this fruit under cultivation. The common variety grown under North Indian conditions is "Ram Jarnun". It produces big sized, oblong fruits, deep purple or bluish-black in colour at full ripe stage. The pulp of the ripe fruit is purple pink and the fruit is juicy and sweet. The stone is small in size. The variety ripens in the month of June- July and it is very common both in rural as well as in urban markets.

Rie Jamun is one of the dominantly cultivated varieties of Jamun in northern India. The color of fruits goes from dark violet to black blue. These fruits are juicy and have a

sweet taste, which comes with a small drupe at the center. Other Jamun varieties like Badama, Bhado, Jethi, Ra -Jamun, Ashada, Kaatha,

Improved/ Hybrid varieties developed by the SAUs, KVKs and ICAR Institution

| Varieties | Institution developed |
|---|---|
| Narendra Jamun 6 Narendra | Dev University of Agriculture and Technology, Faizabad, U.P. |
| Rajendra Jamun | Bihar Agricultural College, Bhagalpur, Bihar. KonkanBahadoli Regional Fruit Research Station, Vengurla, Maharashtra. |
| Goma Priyanka | Central Horticultural Experiment Station (CHES), Godhra, Gujarat. |
| CISH J-42 (Seedless type) | Central Institute for Subtropical Horticulture (CISH), Lucknow,U.P. |
| CISH J-37 | Central Institute for Subtropical Horticulture (CISH), Lucknow,U.P |

## 1.4 HEALTH BENEFITS AND NUTRITIONAL INFORMATION

**Nutritional value:**

The Fruit contains 83.70 - 85.80 g moisture, 0.70 - 0.13 g protein, 0.15 - 0.30 g fat,0.30 - 0.90g crude fiber, 14.00 g carbohydrate, 0.32 - 0.40 g ash, 8.30 - 15.00 mg

calcium, 35.00 mg magnesium, 15.00-16.20 mg phosphorus, 1.20-1.62 mg iron, 26.20 mg sodium, 55.00 mg potassium, 0.23 mg copper, 13.00 mg sulfur, 8 I.U vitamin A, 0.01-0.03 mg thiamine, 0.009- 0.01 mg riboflavin, 0.20 - 0.29 mg niacin, 5.70 - 18.00 mg ascorbic acid, 7.00 mg chlorine and 3.00 mg folic acid per 100 g of edible portion.

| **Sr no.** | **Nutrient** | **Percentage** |
|---|---|---|
| **1** | Moisture | 28.2 |
| **2** | Protein | 0.7 |
| **3** | Fat | 0.1 |
| **4** | Mineral | **0.4** |
| **5** | Fibre | **0.9** |
| **6** | Carbohydrate | **19.7** |
| **7** | Calcium | **0.02** |
| **8** | Phosphorus | **0.01** |
| **9** | Iron | **1.0** |
| **10** | Calorific value | **83/100 g** |

## CONSTITUENTS AND HEALTH BENEFITS OF JAMUNS

**Health benefits:**

**1. Improves hemoglobin count**

Loaded with vitamin C and iron, jamun increases hemoglobin. With the increased number of hemoglobin, blood will carry more oxygen to the organs and keep you healthy. The iron present in the fruit also purifies your blood.

**2. Astringent property**

Jamun has astringent property, which keeps your skin acne free. You should consume jamun if you have oily skin as it will help you keep your skin fresh and clear.

**3. Improves health of skin and eyes**

Jamun or the black plum improves the number of hemoglobin and the iron present in the fruit acts as a blood purifying agent. This helps in improving the health of your skin and eyes. The fruit is also rich in several minerals and vitamin C and A.

**4. Keeps your heart healthy**

Loaded with potassium, jamun is extremely beneficial for your heart. Around 55 mg of potassium is present per 100 grams of jamun. The fruit is beneficial in keeping diseases like high blood pressure, heart diseases and stroke at bay. It also keeps your arteries healthy and prevents its hardening.

**5. Strengthens your gums and teeth**

Jamun is beneficial for your gums and teeth. The leaves of the black plum have antibacterial properties and can be used to prevent bleeding of gums. You can dry the leave and then powder it to be used as a tooth powder. This will help in preventing gum bleeding and infection. The bark of the tree has astringent properties and you can use a decoction prepared with the bark to rinse your mouth to treat mouth ulcers.

**6. Prevents infection**

Jamun has antibacterial, anti-infective and anti-malaria properties. The fruit also contains malic acid, tannins, gallic acid, oxalic acid and betulic acid. The fruit is effective preventing common infections.

**7. Treats diabetes**

Black plums can cure the symptoms of diabetes including excess urination and thirst. It has low glycemic index, which keeps the blood sugar levels normal. Seeds, bark and leaves of the tree can be used for the treatment of diabetes.

## Food uses:

- Good quality jamun juice is excellent for sherbet, syrup and "squash". In India the latter is a bottled drink prepared by cooking the crushed fruits for 5 to 10 minutes at 140°F, pressing out the juice, combining it with sugar and water and adding citric acid and sodium benzoate as a preservative.
- Jamuns of good size and quality, having a sweet or sub acid flavor and a minimum of astringency, are enjoyable raw and may be made into tarts sauces and jam.
- Astringent fruits are improved in palatability by soaking them in salt water pricking them, rubbing them with a little salt, and letting them stand for an hour.
- All but decidedly inferior fruits can be utilized for juice which is often com-parable to grape juice.
- When extracting juice from cooked jamuns, it is recommended that it be allowed to drain out without squeezing the fruit and it will thus be less astringent.
- The white-fleshed jamun has adequate pectin and makes a very stiff jelly unless cooking is brief (Miller et al.1955).
- The more common purple fleshed yields richly colored jelly but are deficient in pectin and require the addition of a commercial jelling agent or must be combined with pectin-rich fruits such as unripe or sour guavas.
- In Goa jamun are an important source of wine, resembling Port.
- Brandy and distilled liquor called "jambava" have also been made from the fermented fruit.

- Jamun vinegar, extensively made throughout India, is an attractive, clear purple, with a pleasant aroma and mild flavor.

## Uses in Traditional Medicine

- Traditionally the jambul fruits, leaves, seeds, and bark are all used in ayurvedic medicine.
- The bark contains tannins and carbohydrates, accounting for its long-term use as an astringent to combat ailments like dysentery
- A glycoside in the seed, jamun is considered to have anti diabetic properties.
- The seeds have also shown anti-inflammatory effects in rats and antioxidant properties in diabetes.
- Jamun fruit seeds and pulp have been reported to serve various purposes in diabetic patients, such as lowering blood glucose levels and delaying diabetic complications including neuropathy and cataracts.
- Jamun is most often recognized as an adjuvant therapy in type-2 diabetes.
- Jamun fruit reduces the sugar in the blood and is very good in the control of diabetes. Its seeds contain Glucoside, Jamboline and Ellagic acid, which are reported to have the ability to check the conversion of starch into sugar in case of excess production of glucose.
- All parts of the jamun can be used medicinally and it has a long tradition in alternative medicine. The plant has been viewed as an antidiabetic plant since it became commercially available several decades ago.

## Uses in Ayurveda

- Grahi – Absorbent, useful in malabsorption syndrome and diarrhea
- Vatakara – Increases Vata

- Shramahara – Relieves tiredness
- Pittahara, Dahahara – Balances Pitta and its symptoms like burning sensation.
- Kantartihara – Relieves throat pain
- Shosha – Emaciation ϖ Krimi – Worm infestation, infection
- Shwasa – Asthma, COPD (chronic obstructive pulmonary disease), wheezing, breathing difficulty
- Atisara – Diarrhoea, dysentery
- Kasa – Cough, cold
- Vishtambhini – Causes constipation, useful in diarrhea and dysentery
- Rochana – Improves taste, useful in anorexia
- Pachani – Improves digestion

According to Ayurveda, its bark is acrid, sweet, digestive, astringent to the bowels, anthelmintic and in good for sore throat, bronchitis, asthma, thirst, biliousness, dysentery, blood impurities and to cure ulcers Syrup or vinegar prepared from the ripe fruit is useful in spleen enlargement and efficient astringent in chronic diarrhea. Hot water extract of dried fruits is used for stomach ulcers, reduce acidity and for diabetes. The ethanolic extract of Syzygium cumini seeds decreased blood sugar level in alloxan induced diabetic rats also having antibacterial activity.

## Therapeutic properties of Jamun

The phytochemicals like oxalic acid, gallic acid, malic acid, tannins, oleanolic acid, cyanidin, flavonoids, betulinic acid, essential oils have been reported for significant saponins, terpenoids and quinines are confirmed by qualitative analysis. The bioactive compounds from different solvent extracts suspected of anti-diabetic properties. The leaves

of Syzygium cumini is considered as an antibacterial and also used to strengthen the teeth and gums in folklore medicine.

(i) Anti- Diarrhoea and Dysentry

The whole plant of Jamun such as seeds, fruit, leaves, flower, bark used in traditional medicine. Charaka used seeds and leaves decoctions for diarrhoea and the bark as an astringent. The fruit is treated for internally in obesity, in vaginal discharges and menstrual disorders, cold infusion in intrinsic haemorrhage. The bark is astringent; its juice is given doses in chronic diarrhoea, dysentery, and menorrhagia. Decoction of the bark is an efficacious mouth-wash and gargle for treating spongy gums, stomatitis, relaxed throat and other diseases of mouth. Bark also used for inflammation of skin.

(ii) Antimicrobial Effect

The antibacterial activity against E. coli, B. subtilis, P. aeruginosa and S. aureus and inhibitory effect on glucoamylase of ethanolic extracts from seeds of Jamun.

(iii) Antidiabetic

Jamun seeds are prescribed widely in many medicine systems for controlling diabetes. Antidiabetic effect of jamun seed has also been substantiated by many pharmacological studies. Considerable reduction in blood glucose level is observed when treated with jamun seed.

(iv) Hepatoprotective

Effectuality of jamun peel extract as hepatoprotective agent against carbon tetrachloride ($CCl_4$) induced oxidative damage on hepatocytes.

(v) Immunomodulatory

It is now being recognized that immunomodulatory therapy could be practiced as an alternative to conventional chemotherapy towards variety of diseased conditions. The methanolic extract of jamun seeds possesses promising immunomodulatory activity.

(vi) Hypolipidemic

Alteration in lipid profile is one of the most common complications in diabetic mellitus and in that context hypolipidemicis effectively treated with jamun seed. Ethanolic extract of seeds is able to reduce the level of total serum cholesterol/high density lipoprotein cholesterol ratio, low density lipoproteins (LDL) and triglycerides. Elevated levels of cholesterol, phospholipids, triglycerides and free fatty acids in the plasma, liver and kidney tissues of streptozotocin induced diabetic were reverted back to normalcy on oral administration of Handbook of Processing of Jamun Candy 8 ethanolic extract of jamun kernel. According to them, the lowering effect was comparable to that of the treatment with standard drug (glibenclamide).

(vii) Chemopreventive

Hydro-alcoholic extract of jamun seed possesses chemopreventive properties in the DMBAinduced and croton oil promoted skin carcinogenesis. Croton oil treatment reduced the cumulative numbers of papillomas, the tumour incidence and increased the average latency period (carcinogen alone). Jamun seed has the potential to modulate biochemical and histopathological status during skin carcinogenesis. Researchers have identified antioxidant capacity of jamun seed as the probable mechanism of chemopreventive effect.

(viii) Anticancerous

Anticancerous effect of jamun pulp on human cervical carcinoma cell lines i.e. HeLa and SiHa using crude methanolic extract and breast cancer cells using hexane: acetone: methanolic extract. The extracts induced apoptosis in tumorous cells and the anti-

proliferative effect was proportional to dose and exposure time. The extract exerted no apoptotic effect on non-tumorous breast cells.

(ix)Anti-allergic

Allergy is an abnormal reaction of the body to the allergen introduced by ingestion, injection, inhalation or skin contact. A novel, safe and effective remedy is required for this ailment. In an investigation, the aqueous extract of Jamun leaves (25-100mg/ kg, p.o.) inhibited the rat paw edema induced by 48/80 (allergenic compound), histamine and 5-HT. However, the extract could not produce any beneficial effects against the platelet aggregating factorinduced paw edema.

(x) Cardioprotective

Beneficial effects of methanolic extract of jamun seeds on cardioprotection against isoproterenol-induced myocardial infarction have been observed. The effect was probably related to strengthening of the myocardial membrane, induced by the phytochemicals like alkaloids, amino acids, flavonoids, glycosides, phytosterols, saponins, steroids, tannins and triterpenoids in the extract.

## 1.5 CULTIVATION, BEARING & POST HARVEST MANAGEMENT:-

In India, the maximum numbers of jamun trees are found scattered throughout the tropical and subtropical regions. It also occurs in the lower range of the Himalayas up to an elevation of 1,300 meters and in the Kumaon hills up to 1,600 meters. It is widely grown in the larger parts of India from the Indo-Gangetic plains in the North to Tamil Nadu in the South. The data about its total acreage in India are not available.

The jamun tree can be grown on a wide range of soils. However, for high yield potential and good plant growth, deep loam and a well-drained soil are needed.

Jamun prefers to grow under tropical and subtropical climate. It is also found growing in lower ranges of the Himalayas up to an altitude of 1300 meters.

Jamun is prolific and regular bearer tree. It starts flowering from March-April followed by fruiting (berry), which appears in May-June. Fruits ripen in June-July or on the onset of rains and takes about 3-4 months to ripen after full bloom. Fruit color change from green to deep-red or bluish-black at full ripening stage. Berry appears oblong, ovoid and crimson black in color when fully ripe. Fruits from grafted tree are large and deliciously sweet but slightly sour in taste. This fruit is mostly considered as a minor dry land fruit crop but, because of its high nutritional value and excellent processing qualities, it is now gaining popularity in sub-tropics and arid region of the country.

## Harvesting

The seedling jamun plants start bearing after 8 to 10 years of planting, while grafted ones bear after 6 to 7 years. However, commercial bearing starts after 8 to 10 years of planting and continues till the tree becomes 50 to 60 years old. The fruit ripens in the month of June -July. The main characteristic of ripe fruit at full size is deep purple or black colour. The fruit should be picked immediately when it is ripe, because it cannot be retained on the tree in ripe stage.

## Harvesting method

The ripe fruits are handpicked singly by climbing the tree with bags slung on the shoulder. Care should be taken to avoid all possible damage to fruits. Jamun Fruit harvester has been developed for safe harvesting of Jamun. The collecting nylon net is fixed in a revolving frame for collecting fruits without damage. The height of collecting net is 5 feet and collection area is 25 sq.m. Two pipes are fixed in concentric to reduce the size of machine

during transportation. Two trees can be harvested per hour without any damage. The gadget costs around Rs. 7000.

## Yield

The average yield of fruits from a full grown seedling tree is about 80 to 100 kg and from a grafted one 60 to 70 kg per year.

## Post-harvest management:-

There are some Fruit handling management after harvesting to avoid post-harvest losses. Following are Post-harvesting handling practices:

- Fruits are graded according to their size and color. All the diseased, deformed, bruised and unripe Fruits are sorted out.
- Do not leave harvested Fruit out in the hot sun;
- Do not pick cold, wet Fruit. When wet turgid Fruit is handled the oil
- Wear cotton gloves when harvesting. This reduces chances of getting injured.
- Use picking bags. This reduces damage as a result of abrasion on Wooden or metal picking bins and allows Fruit to be gently lowered into Bulk harvesting bins;
- Do not leave stems on Fruit or damage buttons by “plugging”;
- Use clean, smooth harvesting bins;
- Make sure packing line equipment is cleaned regularly. This reduces dirt and wax buildup which can cause Fruit abrasion;
- Reduce packing line abrasion by using foam, rubber and smooth belts to Cushion Fruit;
- Remove old and rotten Fruit regularly from the packing shed and surrounds;
- Treat harvested Fruit with a registered fungicide within 24hrs of harvest;

The general practice is to wash the harvested Fruits with chlorine and coat them with a shine wax so that the Fruits look fresh. They are dried at a temperature of 50-55˚C after coating. If the Fruits have to be transported over longer distances, then they are packed in wooden boxes else baskets made of bamboo and mulberry are used for packing jamuns. The boxes or baskets have to be ventilated and the Fruits should be wrapped in tissue paper or newspaper for protection.

## Storage and Marketing

The fruits are highly perishable in nature. They cannot be stored for more than 3 to 4 days under ordinary conditions. However, pre cooled fruits packed in polythene bags can be stored well up to three weeks at low temperatures of 8 to 10°C and 85 to 90% relative humidity. Storage life of fruits can be extended up to three weeks by storing pre-cooled fruits in perforated polythene bags at 8-10°C temperature and 85-90% relative humidity. After harvest fruits are usually packed in bamboo baskets for transportation to local markets. The fruit is packed and needs to be sent to the market almost daily. For marketing, well ripe and healthy fruits are selected. Damaged, diseased and unripe fruits are discarded. These selected fruits are then carefully packed in wooden baskets and sent to the local markets. Practice of prepacking fruits in leaf-cups covered with perforated polythene bags reduces damage in transit and during handling in markets.

## 1.6 PROCESSING & VALUE ADDITION:-

### 1. Jamun juice

The Jamun fruits are washed and grated to separate pulp. After heating the pulp at 60°C, the juice is extracted through basket press. The juice is strained to remove unwanted particles. The juice is pasteurized the juice at 85°C with sodium benzoate as preservative. Then, the juice is bottled in clean and sterile glass bottles and stored at ambient temperature.

**2. Jamun squash**

The Jamun fruits are washed and cut and seeds are removed. Juice is extracted through basket press and straining is done to remove unwanted particles from juice. Sugar syrup is prepared by mixing 1.8 kg sugar, 1 L water and 15 g citric acid for 1 litre of juice. The syrup is strained to remove foreign particles and scum and the syrup is mixed with juice homogeneously. Sodium benzoate at 3.0 g/L squash is added as preservative. The squash is bottled the juice in clean and sterile glass bottles and stored at ambient temperature.

**3. Jamun RTS beverage**

The Jamun fruit pulp is mixed with strained syrup solution (as per requirement). Then, the mixture is homogenized. The RTS is filled in glass bottles and corked tightly. The bottles are pasteurized at 85°C for 20 min, cooled to room temperature and stored at ambient temperature.

**4. Jamun Jam**

Jamun fruit pulp and sugar are taken in a stainless steel kettle and heated to about 1100C under constant stirring and turned low. Pectin is added at 2 g/kg or 0.2% and stirred constantly to prevent the pectin from clotting. When the pectin is dissolved, remaining sugar is added to dissolve completely in the mixture. The jam mixture is heated and stirred constantly till it starts boiling vigorously. Near the finishing point(approximately 221°C or at 68-70% TSS), acidifier (citric acid) is added at 4g kg-1 emulsion to get the expected acidity. Also sodium benzoate is added as preservative at 1 g kg-1 by weight. The jam is hot filled into jars and then the jars are cooled in running cold water until they reached a temperature slightly above room temperature.

**5. Jamun Wine**

The Jamun fruits are washed and then dipped in 5% NaCl salt solution for 72 hour. The seeds are separated from the fruit and the fruit pulp is crushed with water (1:1 ratio). The pulp is pressed to extract the juice and sodium metabisulphite is added. TSS is adjusted to 17 °Brix with cane sugar and the pH to 4.5 using 1N acetic acid. The must is inoculated with wine

yeast starter culture (use 28-48 hour old starter culture at 2% v/v) and kept for Fermentation (at 32 ± 20C for 6 days). Racking and decantation are done (First racking when Brix reaches 2-30. Two to three more racking at 15 days intervals if sedimentation persists). The wine is clarified by chemical method (by adding 0.04% Bentonite). Final racking is done to clear the wine. The wine is filled in bottles and corked. Then the bottles are sealed with bees wax and stored at ambient temperature.

## 2. MODEL JAMUN CANDY PROCESSING UNDER FME SCHEME

### 2.1 LOCATION OF THE PROPOSED PROJECT AND LAND

The entrepreneur must provide description of the proposed location, site of the project, distance from the targeted local and distant markets; and the reasons/advantages thereof i.e. in terms of raw materials availability, market accessibility, logistics support, basic infrastructure availability etc. The major Jamun growing states in India are Maharashtra, Uttar Pradesh, Tamil Nadu, Gujarat, Assam and others.

### 2.2 INSTALLED CAPACITY OF THE JAMUN CANDY PROCESSING UNIT

The maximum installed capacity of the Jamun candy manufacturing unit in the present model project is proposed as150 tonns/annum or 500 kg/day Jamun candy. The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1$^{st}$year is assumed to be construction/expansion period of the project; and in the 2$^{nd}$ year 55 percent capacity, 3$^{rd}$ year 65 percent capacity, 4$^{th}$ year 75 percent capacity utilization, 5$^{th}$ year 90 percent capacity utilization & 6$^{th}$ year 100 percent utilization onwards is assumed in this model project.

### 2.3 RAW MATERIAL REQUIREMENTS FOR THE UNIT

A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled. In the Jamun candy manufacturing project, the unit requires 418 kg/day, 494 kg/day, 570 kg/day, 684 Kg/day & 760 kg/day Jamun fruit at 55, 65, 75, 90 & 100 percent

capacity utilization, respectively. The Jamun must be harvested from plant; and then stored below 6°C temperature.

## 2.4 MANUFACTURING PROCESS OF THE JAMUN CANDY

The typical Procedure for manufacturing of Jamun candy is as below:

**Flow chart for Jamun candy:**

Receiving of Jamun fruits

Washing/ cleaning of Jamun fruits

Pulping (Remove seeds and peel)

Filtering

Addition of ingredients

Mixing

Concentration

Spreading (10 mm thick layer)

Cooling (Room temperature)

Cutting into cubes

## 2.5 MARKET DEMAND AND SUPPLY FOR JAMUN CANDY

Jamun is an underutilized fruit crop, gaining popularity among the consumers due to its high neutroclinical values in rural as well as in urban masses. In addition, the ripe berries are good source of anthocyanins, vitamins, minerals, iron and pectin with fair amount of ascorbic acid. Though, there is maximum availability of raw material or Jamun fruits harvested, it cannot be fully utilized, consumed or processed due to lack of processing techniques and technical know-how. Being highly perishable fruit and its short life, it deteriorates at a faster rate if proper post-harvest handling practices and processing techniques are not adopted. The storage life of Jamun fruits restricted to only 24 hrs at room temperature and 12 days at cool temperature i.e.3 to 4 °C. Jamun falls in underutilized fruit species which are neither cultivated in an organized farming system, nor processed by established commercial processing methods. Jamun has almost an exotic flavor and are known for their nutritional and therapeutic values. Jamun fruits, although produced in considerable quantities and consumed, but seldom processed.

There is a great scope of the processed products not only because of their exotic flavor, but also due to their nutraceutical importance. Thus, processing of Jamun fruit into value-added products result in a wide variety of exotically flavored products with better nutritional and sensory qualities may unveil new market for export. Therefore, development, standardization and popularization of value-added products from Jamun fruit are essential.

## 2.6 MARKETING STRATEGY FOR JAMUN CANDYS

The increasing urbanization and income offers huge scope for marketing of fruit based products. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded Jamun products.

## 2.7 DETAILED PROJECT ASSUMPTIONS

This model DPR for Jamun candy unit is basically prepared as a template based on certain assumptions that may vary with capacity, location, raw materials availability etc. An entrepreneur can use this model DPR format and modify as per requirement and suitability. The assumptions made in preparation of this particular DPR are given in This DPR assumes expansion of existing Fruit processing unit by adding new candies manufacturing line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneurs.

- Herewith in this DPR, we have considered the assumptions as listed below in the tables of different costs, which may vary as per region, seasons and machinery designs and supplier.
    1. Jamun cost considered @ Rs.30/-per kg.
    2. 1 kg Jamun will produce 50% recovery.
    3. 1 Batch size is approximately 100 kg.
    4. No. of hours per day are approximately 8-10 hours.
    5. Batch yield is 95%

| Detailed Project Assumptions | | |
|---|---|---|
| Parameter | Assumption | |
| Capacity of the Jamun Candy Unit | 150 | MT/annum |
| Utilization of capacity | 1st Year Implementation, 55% in second, 65% in third, 75% in fourth year, 90% in fifth years, & 100% in sixth years onwards respectively. | |
| Working days per year | 300 | days |
| Working hours per day | 10 | hours |
| Interest on term and working | 12% | |

| | | |
|---|---|---|
| capital loan | | |
| Repayment period | Seven year with one year grace period is considered. | |
| Average prices of raw material | 30 | |
| Average sale prices per Kg | 240 | Rs/kg |
| Pulp extraction | 50 | |
| JAMUN CANDY | 1.52 Kg Jamun for 1 Jamun candy | |

## 2.8 FIXED CAPITAL INVESTMENT

### 2.8.1 MACHINERY AND EQUIPMENT

| Sr No. | Equipment | Quantity | Capacity | Price (Rs. In Lacs) |
|---|---|---|---|---|
| | | | | |
| 1 | Cold store sq. meter | 1 | 9000 Kg | 6 |
| 2 | Bubble washer | 1 | 100kg/hr | 1.5 |
| 3 | Heating kettle gas operated | 1 | 200 liter | 0.6 |
| 4 | Fruit pulp extractor | 1 | 100 kg/hr | 2.2 |
| 5 | Pulp handling with trolley | 2 | suitable | 1.4 |
| 6 | steam kettle thermic fluid | 1 | 200 Liter | 1.8 |
| 7 | Double twist packaging machine | 1 | 250 candy per min | 3.5 |
| 8 | Weighing balance | 1 | Suitable | 0.06 |
| 9 | Accessories | 1 | Suitable | 0.5 |
| | | | Total | 17.56 |

## 2.8.2 OTHER COSTS:-

**Utilities and Fittings:-**

| Utilities and Fittings | |
|---|---|
| 1.Water | Rs. 0.8 Lacs total |
| 2.Power | |

**Other Fixed Assests:**

| Other Fixed Assets | |
|---|---|
| 1. Furniture & Fixtures | Rs. 0.9 LacS total |
| 2. Plastic tray capacity | |
| 3. Electrical fittings | |

**Pre-operative expenses**

| Pre-operative Expenses | |
|---|---|
| Legal expenses, Start-up expenses, Establishment cost, consultancy fees, trials and others. | 0.9 LAC |
| Total preoperative expenses | 0.9 LAC |

Contingency cost to be added as approx.1.2 Lac.

So total startup cost at own land & Premise may be somewhat similar to 38.62 lacs. This is according to survey done at X location India. This may vary on location, situation and design change over.

## 2.9 WORKING CAPITAL REQUIREMENTS

Working Capital Requirement (Rs. in Lakh)

| | | 55% | 65% | 75% |
|---|---|---|---|---|
| Particulars | Period | Year 2 | Year 3 | Year 4 |
| Raw material stock | 7 days | 4.69 | 5.54 | 7.55 |
| Work in progress | 15 days | 9.37 | 11.08 | 15.10 |
| Packing material | 15 days | 0.45 | 0.53 | 0.73 |
| Finished goods' stock | 15 days | 10.96 | 12.95 | 17.66 |
| Receivables | 30 days | 21.91 | 25.90 | 35.31 |
| Working expenses | 30 days | 0.93 | 1.10 | 1.50 |

| | | | | |
|---|---|---|---|---|
| Total current assets | | 48.30 | 57.09 | 77.85 |
| Trade creditors | | 0.00 | 0.00 | 0.00 |
| Working capital gap | | 48.30 | 57.09 | 77.85 |
| Margin money (25%) | | 12.08 | 14.27 | 19.46 |
| Bank finance | | 36.23 | 42.82 | 58.38 |
| | | | | |

## 2.10TOTAL PROJECT COST AND MEANS OF FINANCES

| Particulars | Amount in Lakhs |
|---|---|
| i. Land and building (20 x 32 x 12 ft - LxBxH) | 5.18 |
| ii. Plant and machinery | 17.56 |
| iii. Utilities & Fittings | 0.8 |
| iv. Other Fixed assets | 0.9 |
| v. Pre-operative expenses | 0.90 |
| vi. Contingencies | 1.20 |
| vii. Working capital margin | 12.08 |
| Total project cost (i to vii) | 38.62 |
| Means Of finance | |
| i. Subsidy | 9.85 |
| ii. Promoters Contribution | 10.62 |
| iii. Term Loan (@10%) | 18.15 |

## 2.11 MANPOWER REQUIREMENTS

| Total Monthly Salary (Rs.) | No | Wages | Total Monthly | Total Annualy |
|---|---|---|---|---|
| Supervisor (can be the owner) | 1 | 18000 | 18000 | 216000 |
| Technician | 1 | 14000 | 14000 | 168000 |
| Semi skilled | 2 | 7600 | 15200 | 182400 |
| Helper | 1 | 5500 | 5500 | 66000 |
| Sales man | 1 | 8000 | 8000 | 96000 |
| | | | 60700 | 728400 |

## 2.12 EXPENDITURE, REVENUE AND PROFITABILITY ANALYSIS

| Expenditure, Revenue and Profitability Analysis | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 150 | MT | | | | |
| | | | | | | | |
| | **Particulars** | **1st Year** | **2nd Year** | **3rd Year** | **4 th Year** | **5th year** | **6th year** |
| A | Total Installed Capacity (MT) | 228 MT Jamun/Annum | 82.5 | 97.5 | 112.5 | 135 | 150 |
| | Capacity utilization (%) | Under Const. | 55% | 65% | 75% | 90% | 100% |
| B | **Expenditure (Rs. in Lakh)** | 0 | | | | | |
| | Jamun (Av. Price @ Rs.30/Kg ) | 0.00 | 37.62 | 44.46 | 51.30 | 61.56 | 68.40 |
| | Sugar @ Rs. 35/kg | 0.00 | 12.47 | 14.74 | 17.01 | 20.41 | 22.68 |
| | Glucose @ Rs. 25/kg | 0.00 | 1.55 | 1.83 | 2.11 | 2.53 | 2.81 |
| | Butter @ Rs. 450/Kg | 0.00 | 27.84 | 32.91 | 37.97 | 45.56 | 50.63 |
| | SMP @ Rs. 280/Kg | 0.00 | 25.41 | 30.03 | 34.65 | 41.58 | 46.20 |
| | Other materials (Rs. 3/kg) | 0.00 | 0.21 | 0.24 | 0.28 | 0.34 | 0.38 |
| | Packaging materials (Rs 6 per Kg) | 0.00 | 4.95 | 11.70 | 13.50 | 16.20 | 18.00 |
| | Utilities (Electricity, Fuel) | 0.00 | 1.25 | 1.48 | 1.71 | 2.05 | 2.28 |
| | Salaries (1st yr only manager's salary) | 2.16 | 7.28 | 7.28 | 7.28 | 7.28 | 7.28 |
| | Repair & maintenance | 0.00 | 0.70 | 0.80 | 0.90 | 0.90 | 0.90 |
| | Insurance | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| | Miscellaneous expenses | 0.50 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 |
| | **Total Expenditure** | **2.96** | **121.89** | **148.07** | **169.31** | **201.02** | **222.15** |
| C | **Total Sales Revenue (Rs. in Lakh)** | **0.00** | **198.00** | **234.00** | **270.00** | **324.00** | **360.00** |
| | Sale of Jamun Candy (Av. Sale Price @ Rs.240/kg) | 0.00 | 198.00 | 234.00 | 270.00 | 324.00 | 360.00 |
| D | **PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows** | **-2.96** | **76.11** | **85.93** | **100.69** | **122.98** | **137.85** |
| | Depreciation on civil works @ 5% per annum | 0.26 | 0.25 | 0.23 | 0.22 | 0.21 | 0.20 |
| | Depreciation on machinery @ 10% per annum | 1.76 | 1.58 | 1.42 | 1.28 | 1.15 | 1.04 |
| | Depreciation on other fixed assets @ 15% per annum | 0.12 | 0.10 | 0.09 | 0.07 | 0.06 | 0.05 |
| | Interest on term loan @ 12% | 1.89 | 1.82 | 1.75 | 1.67 | 1.58 | 1.48 |
| | Interest on working capital @ 12% | 0.00 | 4.35 | 4.35 | 4.35 | 4.35 | 4.35 |
| E | Profit after depreciation and Interest (Rs. in Lakh) | **-6.98** | **72.36** | **82.43** | **97.44** | **119.98** | **135.07** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| F | Tax (assumed 30%) (Rs. in Lakh) | **0.00** | **21.71** | **24.73** | **29.23** | **35.99** | **40.52** |
| G | Profit after depreciation, Interest & Tax (Rs. in Lakh) | **-6.98** | **50.65** | **57.70** | **68.21** | **83.98** | **94.55** |
| H | Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh) | 1.89 | 1.82 | 1.75 | 1.67 | 1.58 | 1.48 |
| I | Coverage available (Rs. in Lakh) | 1.89 | 1.82 | 1.75 | 1.67 | 1.58 | 1.48 |
| J | Total Debt Outgo (Rs. in Lakh) | 0.63 | 0.70 | 0.77 | 0.85 | 0.94 | 1.03 |
| K | Debt Service Coverage Ratio (DSCR) | 3.00 | 2.62 | 2.28 | 1.97 | 1.69 | 1.44 |
| | Average DSCR | 2.16 | | | | | |
| L | Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh) | -4.85 | 52.58 | 59.45 | 69.79 | 85.41 | 95.84 |
| M | Payback Period | 2.5 Years | | | | | |
| | (on Rs. 38.62 Lakhs initial investment) | | | | | | |

## 2.13 REPAYMENT SCHEDULE

| Year | Beginning | PMT | Interest | Principal | Ending Balance |
|---|---|---|---|---|---|
| 1 | 18,14,953.56 | 2,51,768.87 | 1,88,755.17 | 63,013.70 | 17,51,939.85 |
| 2 | 17,51,939.85 | 2,51,768.87 | 1,82,201.74 | 69,567.13 | 16,82,372.72 |
| 3 | 16,82,372.72 | 2,51,768.87 | 1,74,966.76 | 76,802.11 | 16,05,570.61 |
| 4 | 16,05,570.61 | 2,51,768.87 | 1,66,979.34 | 84,789.53 | 15,20,781.08 |
| 5 | 15,20,781.08 | 2,51,768.87 | 1,58,161.23 | 93,607.64 | 14,27,173.44 |
| 6 | 14,27,173.44 | 2,51,768.87 | 1,48,426.04 | 1,03,342.84 | 13,23,830.60 |
| 7 | 13,23,830.60 | 2,51,768.87 | 1,37,678.38 | 1,14,090.49 | 12,09,740.11 |
| 8 | 12,09,740.11 | 2,51,768.87 | 1,25,812.97 | 1,25,955.90 | 10,83,784.21 |
| 9 | 10,83,784.21 | 2,51,768.87 | 1,12,713.56 | 1,39,055.32 | 9,44,728.89 |
| 10 | 9,44,728.89 | 2,51,768.87 | 98,251.80 | 1,53,517.07 | 7,91,211.82 |
| 11 | 7,91,211.82 | 2,51,768.87 | 82,286.03 | 1,69,482.84 | 6,21,728.98 |
| 12 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 6,21,728.98 | 2,51,768.87 | 64,659.81 | 1,87,109.06 | 4,34,619.92 |
| 13 | 4,34,619.92 | 2,51,768.87 | 45,200.47 | 2,06,568.40 | 2,28,051.52 |
| 14 | 2,28,051.52 | 2,51,768.87 | 23,717.36 | 2,28,051.52 | (0.00) |
| | | 35,24,764.24 | 17,09,810.68 | 18,14,953.56 | (18,14,953.56) |

## 2.14 ASSET'S DEPRECIATION

| Assets' Depreciation (Down Value Method) | | | | | | | Amounts in Lakhs | |
|---|---|---|---|---|---|---|---|---|
| Particulars | 1st Year | 2nd year | 3 rd year | 4th year | 5th year | 6th year | 7th year | 8th year |
| Civil works | 5.18 | 4.92 | 4.67 | 4.44 | 4.22 | 4.01 | 3.81 | 3.62 |
| Depreciation | 0.26 | 0.25 | 0.23 | 0.22 | 0.21 | 0.20 | 0.19 | 0.18 |
| Depreciated value | 4.92 | 4.67 | 4.44 | 4.22 | 4.01 | 3.81 | 3.62 | 3.44 |
| | | | | | | | | |
| Plant & Machinery | 17.56 | 15.80 | 14.22 | 12.80 | 11.52 | 10.37 | 9.33 | 8.40 |
| Depreciation | 1.76 | 1.58 | 1.42 | 1.28 | 1.15 | 1.04 | 0.93 | 0.84 |
| Depreciated value | 15.80 | 14.22 | 12.80 | 11.52 | 10.37 | 9.33 | 8.40 | 7.56 |
| | | | | | | | | |
| Other Fixed Assets | 0.80 | 0.68 | 0.58 | 0.49 | 0.42 | 0.35 | 0.30 | 0.26 |
| Depreciation | 0.12 | 0.10 | 0.09 | 0.07 | 0.06 | 0.05 | 0.05 | 0.04 |
| Depreciated value | 0.68 | 0.58 | 0.49 | 0.42 | 0.35 | 0.30 | 0.26 | 0.22 |
| | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| All Assets | 23.54 | 21.41 | 19.48 | 17.73 | 16.16 | 14.73 | 13.44 | 12.27 |
| Depreciation | 2.14 | 1.93 | 1.74 | 1.58 | 1.43 | 1.29 | 1.17 | 1.06 |
| Depreciated value | 21.41 | 19.48 | 17.73 | 16.16 | 14.73 | 13.44 | 12.27 | 11.21 |

## 2.15 FINANCIAL ASSESSMENT OF THE PROJECT

**Benefit Cost Ratio (BCR) and Net Present Worth (NPW)**

| Particulars | 1st Year | 2nd year | 3 rd year | 4th year | 5th year | 6th year | 7th year | 8th year | |
|---|---|---|---|---|---|---|---|---|---|
| Capital cost (Rs. in Lakh) | 38.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Recurring cost (Rs. in Lakh) | 2.96 | 121.89 | 148.07 | 169.31 | 201.02 | 222.15 | 222.15 | 222.15 | |
| Total cost (Rs. in Lakh) | 41.58 | 121.89 | 148.07 | 169.31 | 201.02 | 222.15 | 222.15 | 222.15 | 1348.33 |
| Benefit (Rs. in Lakh) | 0.00 | 198.00 | 234.00 | 270.00 | 324.00 | 360.00 | 360.00 | 360.00 | |
| Total Depreciated value of all assets (Rs. in Lakh) | | | | | | | | 11.21 | |
| Total benefits (Rs. in Lakh) | 0.00 | 198.00 | 234.00 | 270.00 | 324.00 | 360.00 | 360.00 | 371.21 | 2117.21 |
| Benefit-Cost Ratio (BCR): (Highly Profitable project) | **1.570** | | | | | | | | |
| Net Present Worth (NPW): | 768.89 | | | | | | | | |

## 2.16 BREAK EVEN ANALYSIS

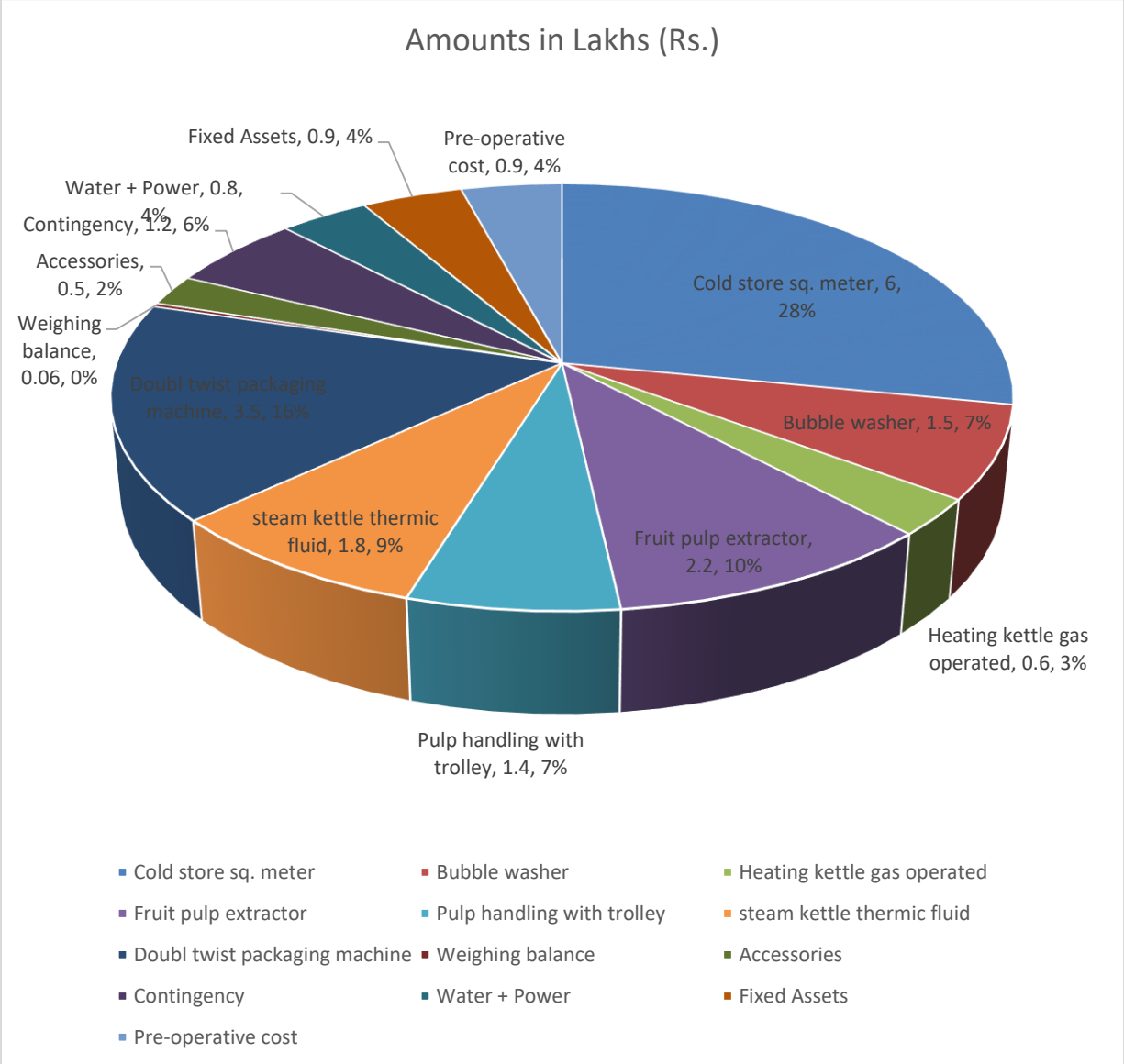
Break even analysis indicates costs-volume profit relations in the short run. This is the level at which, the firm is in no loss no profit situation.

**Break-Even Analysis**

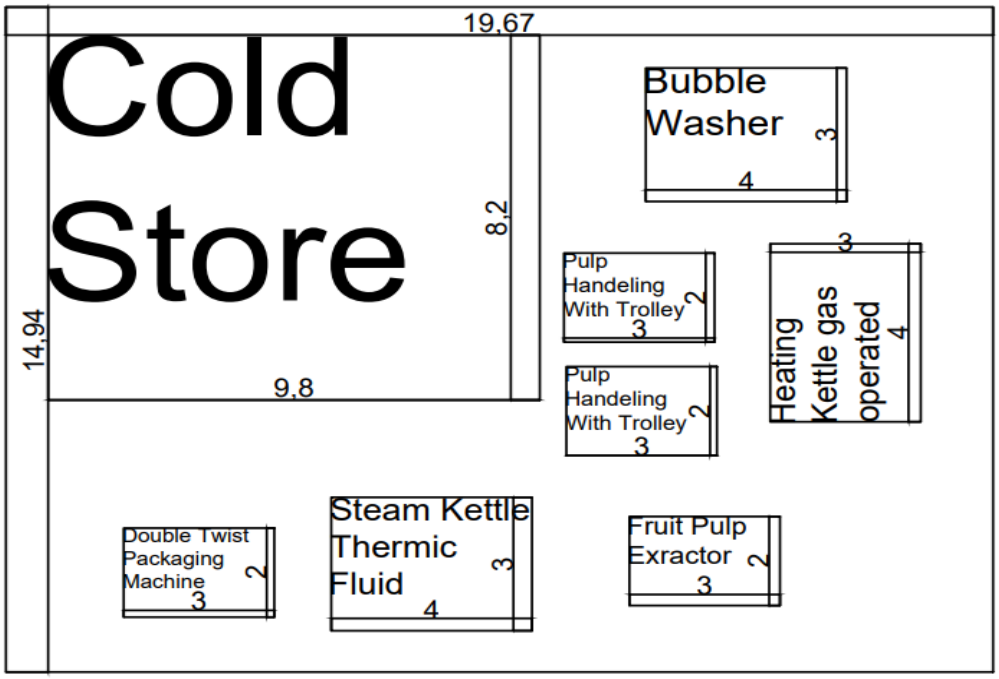
| Particulars | 1st Year | 2nd year | 3 rd year | 4th year | 5th year | 6th year | 7th year | 8th year |
|---|---|---|---|---|---|---|---|---|
| Capacity utilization (%) | Under Const. | 55% | 65% | 75% | 90% | 100% | 100% | 100% |
| Production MT/Annum | | 82.5 | 97.5 | 112.5 | 135 | 150 | 150 | 150 |
| Fixed Cost (Rs. in Lakh) | | | | | | | | |
| Permanent staff salaries | 7.284 | 7.284 | 7.284 | 7.284 | 7.284 | 7.284 | 7.284 | 7.284 |
| Depreciation on building @ 5% per annum | 0.26 | 0.25 | 0.23 | 0.22 | 0.21 | 0.20 | 0.19 | 0.18 |
| Depreciation on machinery @ 10% per annum | 1.76 | 1.58 | 1.42 | 1.28 | 1.15 | 1.04 | 0.93 | 0.84 |
| Depreciation on other fixed assets @ 15% per annum | 0.12 | 0.10 | 0.09 | 0.07 | 0.06 | 0.05 | 0.05 | 0.04 |
| Interest on term loan | 1.89 | 1.82 | 1.75 | 1.67 | 1.58 | 1.48 | 1.38 | 1.26 |
| Insurance | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| **Total Fixed Cost (Rs. in Lakh)** | **11.61** | **11.33** | **11.08** | **10.83** | **10.59** | **10.36** | **10.13** | **9.90** |
| **Sales Revenue (Rs. in Lakh)** | **0** | **198** | **234** | **270** | **324** | **360** | **360** | **360** |
| Variable Cost (Rs. in Lakh) | | | | | | | | |
| Jamun (Av. Price @ Rs. 30/Kg ) | 0.00 | 37.62 | 44.46 | 51.30 | 61.56 | 68.40 | 68.40 | 68.40 |
| Sugar @ 35 per kg | 0.00 | 12.47 | 14.74 | 17.01 | 20.41 | 22.68 | 22.68 | 22.68 |
| Glucose @ 25 per kg | 0.00 | 1.55 | 1.83 | 2.11 | 2.53 | 2.81 | 2.81 | 2.81 |
| Butter @ 150 per kg | 0.00 | 27.84 | 32.91 | 37.97 | 45.56 | 50.63 | 50.63 | 50.63 |
| SMP @ 280 per kg | 0.00 | 25.41 | 30.03 | 34.65 | 41.58 | 46.20 | 46.20 | 46.20 |
| Other ingredients @3/Kg | 0.00 | 0.21 | 0.24 | 0.28 | 0.34 | 0.38 | 0.38 | 0.38 |
| Packaging materials | 0.00 | 4.95 | 5.85 | 6.75 | 8.10 | 9.00 | 9.00 | 9.00 |
| Casual staff salaries | 0.00 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Utilities (Electricity, Fuel) | 0.00 | 1.25 | 1.48 | 1.71 | 2.05 | 2.28 | 2.28 | 2.28 |
| Repair & maintenance | 0.00 | 0.70 | 0.80 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Miscellaneous expenses | 0.50 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Interest on working capital @ 12% | 0.00 | 4.35 | 4.35 | 4.35 | 4.35 | 4.35 | 4.35 | 4.35 |
| **Total Variable Cost (Rs. in Lakh)** | **0.50** | **124.13** | **144.47** | **164.81** | **195.16** | **215.40** | **215.40** | **215.40** |
| Break Even Point (BEP) | | | | | | | | |
| as % of sale | - | 12.00 | 10.00 | 8.00 | 8.00 | 7.00 | 7.00 | 6.00 |
| Break Even Point (BEP) in terms of sales value (Rs. in Lakhs) | - | 23.76 | 23.40 | 21.60 | 25.92 | 25.20 | 25.20 | 21.60 |

## 2.17 PIE CHART FOR BETTER UNDERSTANDING OF EXPENSES OF EACH HEAD:



## 2.18 TYPICAL JAMUN CANDY MANUFACTURING UNIT LAYOUT




## 2.19 MACHINERY SUPPLIERS

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

1. Bajaj Process pack Limited, Noida, India
2. Shriyan Enterprises. Mumbai, India
3. Jwala Technocrats, Boiser, Maharashtra, India

# 3. LIMITATIONS OF MODEL DPR & GUIDELINES FOR ENTREPRENEURS

## 3.1 LIMITATIONS OF THE DPR

i. This DPR has provided only the basic standard components and methodology to be adopted by an entrepreneur while submitting a proposal under the Formalization of Micro Food Processing Enterprises Scheme of MoFPI.

ii. This DPR is made to provide general methodological structure not for specific entrepreneur/crops/location. Therefore, information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of business, background of proposed project, location, raw material base/contract sourcing, entrepreneur's own SWOT analysis, market research, rationale of the project for specific location, community advantage/benefit, employment generation etc are not given in detail.

iii. The present DPR is based on certain assumptions on cost, prices, interest, capacity utilization, output recovery rate and so on. However, these assumptions in reality may vary across places, markets and situations; thus the resultant calculations will also change accordingly.

## 3.2 GUIDELINES FOR THE ENTREPRENEURS

i. The success of any prospective food processing project depends on how closer the assumptions made in the initial stage are with the reality of the targeted market/place/situation. Therefore, the entrepreneurs must do its homework as realistic as possible on the assumed parameters.

ii. This model DPR must be made more comprehensive by the entrepreneur by including information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of entrepreneur's business, project location, raw material costing base/contract sourcing, detailed market research, comprehensive dehydrated product mix

based on demand, rationale of the project for specific location, community advantage/benefit from the project, employment generation, production/availability of the raw materials/crops in the targeted area/clusters and many more relevant aspects for acceptance and approval of the competent authority.

iii. The entrepreneur must be efficient in managing the strategic, financial, operational, material and marketing aspects of a business. In spite of the assumed parameter being closely realistic, a project may become unsustainable if the entrepreneur does not possess the required efficiency in managing different aspects of the business and respond effectively in changing situations.

iv. The machineries should be purchased after thorough market research and satisfactory demonstration.

v. The entrepreneur must ensure uninterrupted quality raw materials' supply and maintain optimum inventory levels for smooth operations management.

vi. The entrepreneur must possess a strategic look to steer the business in upward trajectory.

vii. The entrepreneur must maintain optimum (not more or less) inventory, current assets. Selecting optimum source of finance, not too high debt-equity ratio, proper capital budgeting and judicious utilization of surplus profit for expansion is must.

viii. The entrepreneur must explore prospective markets through extensive research, find innovative marketing strategy, and maintain quality, adjust product mix to demand.

ix. The entrepreneur must provide required documents on land, financial transaction, balance sheet, further project analysis as required by the competent authority for approval.

x. The entrepreneur must be hopeful and remain positive in attitude while all situations.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