

PM Formalization of Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR DEHYDRATED APPLE SLICES PROCESSING



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Project At a Glance

| | | |
|----|---|---|
| 1 | Name of the Project | Dehydrated apple slices |
| 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 | 75 MT/annum (55, 65, 75 & 90 % capacity utilization in the 2nd, 3 rd , 4 th & 5 th years' onwards respectively |
| 11 | Raw materials | Apple |
| 12 | Major product outputs | Dehydrated apple slices |
| 13 | Total project cost (Lakhs) | 40.18 |
| | Land development, building & civil construction | 5.3 |
| | Machinery and equipments | 22.43 |
| | Utilities (Power & water facilities) | 0.8 |
| | Miscellaneous fixed assets | 0.9 |
| | Pre-operative expenses | 0.90 |
| | Contingencies | 1.20 |
| | Working capital margin | 8.65 |
| 14 | Working capital Management (In Lakhs) | |
| | Second Year | 25.96 |
| | Third Year | 30.68 |
| | Fourth Year | 41.83 |
| 15 | Means of Finance | |
| | Subsidy grant by MoFPI (max 10 lakhs) | 10.00 |
| | Promoter's contribution (min 20%) | 10.44 |
| | Term loan (49%) | 19.72 |
| 16 | Debt-equity ratio | 1.89 : 1 |
| 17 | Profit after Depreciation, Interest & Tax | |
| | 2nd year | 87.34 |
| | 3rd year | 105.11 |
| | 4th year | 122.87 |
| 18 | Average DSCR | 2.31 |
| | Benefit Cost Ratio | 1.92 |
| | 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 APPLE PRODUCTION, CLUSTERS, POST-HARVEST MANAGEMENT AND VALUE ADDITION IN INDIA

1.1 INTRODUCTION

Apple (*Malus domestica*) is one of the most consumed fruit crops in the world. The major production areas are the temperate regions, however, because of its excellent storage capacity it is transported to distant markets covering the four corners of the earth. India is known as the second largest fruits and vegetables producer in the world followed by China. India, during 2017-18 has produced about 97358 Thousand MT fruits and 184394 Thousand MT vegetables in about 6506 Thousand Ha and 10259 Thousand Ha areas, respectively (Horticultural Statistics At a Glance, 2018, MoA&FW, GoI). In spite of this, the per capita availability of fruit in India is 107 gm/day which is below the recommended 120 gm/day. India's share of global exports of fresh fruits and processed fruit products is also quite meager compared with other major fruit producers of the world (Bung, 2012). Unfortunately, fruits and vegetables being perishable in nature get wasted to the tune of 20-30 per cent in the supply chain due to improper handling, transportation and poor post-harvest management; and only 2 per cent are processed in to value added products and the rest is consumed as fresh. Therefore, processing of fruits and vegetables offers immense scope for wastage minimization and value addition; thus can generate significant income and employment in Indian agrarian economy.

In India, apple is one of the important fruit crops cultivated in temperate areas and has huge potential for value addition and entrepreneurship development. In India, 20-30% of apple fruits are spoiled due to improper handling, transportation and processing and therefore, processing and value addition is extremely needed. There has been an increasing appreciation and understanding of the link between dietary fruit intake and

improved health in humans. The widespread and growing intake of apples and apple juice/jam products and their rich phytochemical profile suggest their important potential to affect the health of the populations.

1.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF APPLE

An **apple** is an edible fruit produced by an **apple tree** (*Malus domestica*). Apple trees are cultivated worldwide and are the most widely grown species in the genus *Malus*. The tree originated in Central Asia, where its wild ancestor, *Malus sieversii*, is still found today. Apples have been grown for thousands of years in Asia and Europe and were brought to North America by European colonists. Apples have religious and mythological significance in many cultures, including Norse, Greek, and European Christian tradition.

Apple trees are large if grown from seed. Generally, apple cultivars are propagated by grafting onto rootstocks, which control the size of the resulting tree. There are more than 7,500 known cultivars of apples, resulting in a range of desired characteristics. Different cultivars are bred for various tastes and use, including cooking, eating raw and cider production. Trees and fruit are prone to a number of fungal, bacterial and pest problems, which can be controlled by a number of organic and non-organic means. In 2010, the fruit's genome was sequenced as part of research on disease control and selective breeding in apple production.

Worldwide production of apples in 2018 was 86 million tonnes. The leading apple growing country is China, producing about 41 percent of the world's apples, followed by the United States. In India total apple production was 2326.91 thousand metric tons in 301.00 thousand ha areas during 2017-18 (Horticultural Statistics at A Glance 2017-18).

Apple was introduced into the country by the British in the Kullu Valley of the Himalayan State of H.P. as far back as 1865, while the colored 'Delicious' cultivars of apple were introduced to Shimla hills of the same State in 1917. The apple

cultivar ‘Ambri’, is considered to be indigenous to Kashmir and had been grown long before Western introductions.

Out of all the deciduous fruits, apple is the most important in terms of production and extent. Although there has been 5-6 fold increase in apple production during the last 50 years, the productivity level is still very low (5.56 t/ha). Apple cultivation received greater attention by the growers.

About 99 percent of India’s apple area falls under the North Western Hills region, covering 6 districts of J&K (Srinagar, Budgam, Pulwama, Anantanag, Baramullah, Kupwara), 6 districts of H.P. (Shimla, Kullu, Sirmour, Mandi, Chamba, Kinnaur) and 8 districts of U.P. (Almora, Nainital, Pithauragarh, Tehri, Pauri, Chamoli, Uttarkashi, Dehradun). In the North-eastern Hills region, good quality apple is grown in a small area in Tawang belt of Kameng district in Arunachal Pradesh. The Tawang area is basically a rainshadow belt and therefore, permits a longer period of sunshine and freedom from heavy rains, making it ideal for apple. Apple is also grown in Sikkim and Nagaland but the production is not a major success. Presently, a small quantity of apple produced in India is exported, mainly to Bangladesh and Sri Lanka.

India with its wide range of soil and climate conditions is ideal for growing large varieties of fruits, both indigenous and the ones introduced from abroad. Today India is the largest producer of fruits. In India, apple is mostly grown in Jammu & Kashmir, Himachal Pradesh and Uttarakhand. Apple cultivation also extended to Arunachal Pradesh, Nagaland, Sikkim. Apples are mostly consumed as fresh fruit but a small part of the production is processed into jellies, juices, canned slices, candies. The state wise apple production in India is given below:

| Major Apple Producing States in India (2017-18) | | |
|--|-------------|-------------------|
| States/UTs | Area | Production |
| 1. Jammu & Kashmir | 158.15 | 1808.33 |
| 2. Himachal Pradesh | 112.63 | 446.57 |
| 3. Uttarakhand | 25.32 | 58.66 |

| | | |
|---|---------------|----------------|
| 4. Arunachal Pradesh | 4.66 | 7.35 |
| 5. Others | 0.28 | 6.00 |
| Total India | 301.04 | 2326.91 |
| Source: Horticultural Statistics at A Glance 2017-18, GoI | | |

1.3 VARIETIES

Almost all apple varieties need to be cross pollinated, although some varieties, such as Liberty, Empire, Jonathan, Jonagold, Gala, Golden Delicious, Rome and Granny Smith are selffruitful, but they still set more fruit through cross pollination. Therefore the grower should plant different apple cultivars together in the same orchard. Also there are some cultivars which produce sterile pollen and cannot be used as pollinizers (Mutsu, Jonagold). Usually, in an apple orchard, every four rows is a pollinizer variety or within a row, every fifth semi-dwarf tree is a pollinizer. The maximum allowed distance between the tree and its pollinizer is 25 meters.

| Category | Varieties |
|----------------------|---|
| 1. Clonal rootstocks | M 9, M 26, M7, MM 106, MM 11 |
| 2. Scab resistant | Prima, Priscilla, Sir Prize, Jonafree, Florina, Macfree, Nova Easy Grow, Coop 12, Coop 13 (Redfree), Nova Mac, Liberty, Freedom, Firdous, Shireen |
| 3. Hybrids | Lal Ambri (Red Delicious x Ambri), Sunehari (Ambri x Golden Delicious), Chaubattia Princess, Chaubattia Anupam (Early Shanburry x Red Delicious), Ambred (Red Delicious x Ambri), Ambrich (Richared x Ambri), Ambroyal (Starking Delicious x Ambri) |

| | |
|-------------------------------------|--|
| 4. Low Chilling | Michal, Schlomit, Anna, Tamma, Vered, Neomi, Tropical Beauty, Parlin's Beauty |
| 5. Pollinizing | Tydeman's Early, Red Gold, Golden Delicious, Mc Intosh, Lord Lambourne, Winter Banana, Granny Smith, Starkspur Golden, Golden Spur |
| Source: National Horticulture Board | |

1.4 HEALTH BENEFITS AND NUTRITIONAL INFORMATION

Nutritional value:

The nutrition facts for apples (100 grams) are:

- Carbohydrates: 13.81 g
- Sugars: 10.39 g
- Dietary fiber: 2.4 g
- Fat: 0.17 g
- Protein: 0.26 g
- Vitamin A equiv.: 3 µg
- Thiamin (Vit. B1): 0.017 mg
- Riboflavin (Vit. B2): 0.026 mg, 2%
- Niacin (Vit. B3): 0.091 mg, 1%
- Pantothenic acid (B5): 0.061 mg, 1%
- Vitamin B6: 0.041 mg, 3%
- Folate (Vit. B9): 3 µg, 1%

- Vitamin C: 4.6 mg, 8%
- Calcium: 6 mg, 1%
- Iron: 0.12 mg, 1%
- Magnesium: 5 mg, 1%
- Phosphorus: 11 mg, 2%

Apples are among the world's most popular fruits. Apples are high in fiber, vitamin C, and various antioxidants. They are also very filling, considering their low calorie count.

- **Carbohydrate:** Apples are mainly composed of carbs and water. They're rich in simple sugars, such as fructose, sucrose, and glucose. Despite their high carb and sugar contents, their glycemic index (GI) is low, ranging 29–44. The GI is a measure of how food affects the rise in blood sugar levels after eating. Low values are associated with various health benefit. Due to their high fiber and polyphenol counts, fruits often have a low GI score.
- **Fiber:** Apples are very rich in fiber. It contains both soluble and insoluble fiber. Soluble fiber is associated with various health benefits. Fibers may also help improve fullness and cause weight loss while lowering blood sugar levels and boosting digestive function.
- **Vitamin C:** Also called ascorbic acid, this vitamin is a common antioxidant in fruits. It's an essential dietary nutrient that has many important functions in your body.
- **Potassium:** The main mineral in apples, potassium may benefit heart health when consumed in high amounts.

Apples are high in various antioxidant plant compounds, which are responsible for many of their health benefits. These include:

- **Quercetin:** nutrient that also occurs in many plant foods, quercetin may have anti-inflammatory, antiviral, anticancer, and antidepressant effects.
- **Catechin:** A natural antioxidant, catechin is also present in large amounts in green tea and has been shown to improve brain and muscle function.
- **Chlorogenic acid:** Also found in coffee, chlorogenic acid has been found to lower blood sugar and cause weight loss.

CONSTITUENTS AND HEALTH BENEFITS OF APPLES

Health benefits:

- i. Apple fruit is notable for its impressive list of phytonutrients, and antioxidants. Studies suggest that its components are essential for optimal growth, development, and overall wellness.
- ii. Apples are low in calories; 100 g of fresh fruit slices provide just 50 calories. They, however, contain no saturated fats or cholesterol. Nonetheless, the fruit is rich in dietary fiber, which helps prevent absorption of dietary-LDL or bad cholesterol in the gut. The fiber also saves the colon mucous membrane from exposure to toxic substances by binding to cancer-causing chemicals inside the colon.
- iii. Apples are rich in antioxidant phytonutrients *flavonoids* and *polyphenolics*. The total measured antioxidant strength (ORAC value) of 100 g apple fruit is 5900 TE. Some of the important flavonoids in apples are quercetin, epicatechin, and procyanidin B2.
- iv. Additionally, they are also good in tartaric acid that gives tart flavor to them. Altogether, these compounds help the body protect from harmful effects of free radicals.
- v. Apple fruit contains good quantities of vitamin-C and β -carotene. Vitamin C is a powerful natural antioxidant. Consumption of foods rich in vitamin-C helps the body

develop resistance against infectious agents and scavenge harmful, pro-inflammatory free radicals from the body.

vi. Further, apple fruit is an ideal source of B-complex vitamins such as riboflavin, thiamin, and pyridoxine (vitamin B-6). Together, these vitamins help as co-factors for enzymes in metabolism as well as in various synthetic functions inside the human body.

vii. Apples also carry small quantities of minerals like potassium, phosphorus, and calcium. Potassium is an important component of cell and body fluids helps controlling heart rate and blood pressure; thus, counters the bad influences of sodium.

1.5 CULTIVATION, BEARING & POST HARVEST MANAGEMENT:-

Apple, (*Malus domestica*), fruit of the domesticated tree *Malus domestica* (family Rosaceae), one of the most widely cultivated tree fruits. The apple is a pome (fleshy) fruit, in which the ripened ovary and surrounding tissue both become fleshy and edible. The apple flower of most varieties requires cross-pollination for fertilization. When harvested, apples are usually roundish, 5–10 cm (2–4 inches) in diameter, and some shade of red, green, or yellow in colour; they vary in size, shape, and acidity depending on the variety. When planted from a seed, an apple tree can take six to ten years to mature and produce fruit of its own. Apple trees are small to medium sized trees reaching heights of 5–10 m (16.4–32.8 ft), with a central trunk which divides into several branches. The leaves of the tree are oval in shape and can reach up to 13 cm (5.1 in) in length and 7 cm (2.8 in) in width. Apple may also be referred to as mela or appel and the domestic tree is believed to have originated from Western Asia and the Mediterranean from several wild ancestors.

Cultivation and Bearing:-

Growing apples at up to 2500 m from mean sea level is supposed to be beneficial for earning good profit. An apple orchard requires an avg. temp of 20 to 26

°C during the growth period along with 100 to 120 cm annual rainfall. It is notable that fog or heavy rainfall during fruit maturity period is the main cause of improper fruit growth. Also, not that apple farming should be avoided in such area where heavy winds are expected.

Land Selection and its Preparation in Apples Farming

A proper site selection for cultivating apple is an important task. If climate supports, then with good farm management skill, anyone can produce quality apples in high quantities.

Soil Requirement

Apple can be cultivated in all types of soil. However, a loamy soil, rich in all essential organic matter along with well-drainage power is considered as the best soil for apple farming. Also, it should have pH, ranging between 5.5 to 6.8 with proper aeration. It is a good thing to go for at least one soil test to find out the suitability and soil fertility for apple farming. It will also help in determining any deficiency of micronutrients so that proper supplementation at the time of land preparation can be done.

Land Preparation

Commercial apple farming must be done on well-drained soil with decent layout and deep ploughing. Weeds from the preceding crop should be removed, if present.

Propagation Method

Generally, Apples are propagated with the help of tongue grafting and budding methods. It should be from the genuine and registered nurseries in your local. They should be transplanted properly when these nursery grown seedlings become ready or suitable for transplantation in apple orchard. For planting apples, pit is dug having proper size with dimension one meter each. A mixture of rotten cow dung manure, 40 kg along with 50

gm of malathion dust and 500 gm of superphosphate is should be incorporated to each pit for good development of apple tree. An immediate irrigation should be done, just after transplantation of apples on the apple orchards. Also, a planting pollinator must be provided between the main plantations for obtaining decent apple fruit production

Spacing

Spacing in apple orchard is mainly depended on the apple varieties and planting method, used for the cultivation. By planting apple trees keeping a proper distance, it is possible to plant about 300 to 1200 no's of apple plant per hectare land.

However, there are mainly 4 types of density planting, usually followed by the growers.

- i. With the help of Ultra high density (UHD) method of planting, about 1200 apple plants per hectare can be cultivated.
- ii. With the help of high density (HD) method of planting, about 600 to 1200 apple plants per hectare can be cultivated.
- iii. By using moderate density plantation, 300 to 600 apple plants per hectare can be cultivated.
- iv. By following low-density plantation in apple cultivation, 300 apple plants per hectare can be cultivated.

Watering Apple Trees

An apple tree requires about 120 cm rainfall per annum. So, providing this much of water is beneficial for more production of apples. Watering in apple orchard must be on a schedule basis for about 20 irrigation per year. Watering should be done frequently in the

summer season at an interval of a week whereas, in winter, irrigation should be carried out at an intervals of three to four weeks or even more.

Growing Apples/Planting Season

Usually, apples are planted in the winter season, mostly in the month of January and February Since apples thrive their best in the cool region at chilling temp. Apples should be planted in the square or hexagonal planting system. If planting is done in the hilly area or valleys, the counter planting method is good in those sloppy areas.

Apple Harvesting

Generally, apple orchard begins fruit bearing after about 7 to 8 years of plantation. However, it is mainly depended on the variety of apple. Generally, an apple tree gives fruit for about more than 35 years. In the beginning, there is less fruit production; but, after about 8 years of starting fruit bearings, fruit production will increase up to 15 years. Thereafter, this production will remain stable for about 35 years. Presently, there are many types of apple, easily available in the market that can produce fruits for more than 35 years constantly depending on the surroundings atmospheres.

Yield

The yield of apple farming depends on numbers of factors like the agroclimatic conditions of the atmosphere (cooling, sunlight, wind flow, etc), type of soil, variety of apple and farm management skills. However, averagely about 12 to 18 tonnes of apple per hectare can be easily obtained after a good establishment and it can be increased latterly in the following years.

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 fruits are sorted out.
- Do not leave harvested fruit out in the hot sun;
- 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 24 hrs of harvest;

An apple continues to live and respire even after it is picked. Although respiration cannot be halted completely, the objective of postharvest cooling is to slow the process and thus increase storage life. Preferred cooling method are forced air, hydrocooling (room cooling acceptable); optimum temperature is 30-40°F depending on variety; freezing temperature is 29°F; optimum humidity is 90-95% to storage life is up to 12 months.

The general practice is to wash the harvested fruits with chlorine. 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 apple. The boxes or baskets have to be ventilated and the fruits should be wrapped in tissue paper or newspaper for protection.

1.6 PROCESSING & VALUE ADDITION:-

The fresh apple fruits have limited shelf life; therefore, it is necessary to process fresh fruits into different value added products to increase its availability over an extended period and to stabilize the price during the glut season. The processed products have good potential for internal as well as external trade. Seasonal losses in surplus apple fruits can be avoided by processing into different value added products that make them more attractive to the buyer and/or more readily usable to the consumer. Apples can be eaten as raw as well as a vital ingredient in numbers of sweets like apple crisp, apple crumbles, apple cake, and dehydrated slices and apple pie. Apart from this, apples are also processed into beverages and sugar based products like jam jelly.

Processing of fruits results in high amount of waste materials like peels, seeds, stones, oilseed meals etc. It creates problem that is further provoked by legal restrictions. Thus new aspects relating to the use of these wastes as by-products for additional exploitation on the production of food additives with high nutritional value have gained increasing interest since these are high-value products and may be economically attractive.

Various products from apple is processed and popular nowadays:

- Apple Candy
- Apple Jam
- Apple Jelly
- Apple juice
- Apple Pulp
- Apple concentrate
- Dehydrated apple slices
- Canned apple slices
- Apple RTS

Apple Candy:

A candy is a sugar based confectionary made from concentrated sugar solution, to which they generally add the apple flavor, to produce yummy, mouthwatering apple candies, which melts slowly in mouth, with a rich taste of apple, for each and every swallow you do.

Apple Jam:

A good jam has a soft and even consistency with good fruit flavor, bright color and a semi jellied texture, that is easy to spread over, but has no free liquid. Apple jam has the fresh flavor of ordinary apples. This jam can be relished by spreading a generous amount over a slice of bread with cheese or butter.

Apple Jelly:

Apple jelly is a semi solid food made from fruit juice, sugar and pectin. Generally the pectin present in the fruit should act as a gelling agent, but since it is insufficient to form a proper gel, pectin is added externally the gelling capacity.

Apple juice:

Apple Juice is one of the fruit juice which is manufactured by maceration and pressing of apples. The expelled juice is further processed by centrifugal and enzymatic clarification to remove the pectin and starch.

Apple pulp:

Apple pulp is manufactured by picking fresh fruits, which are clean, sound and properly matured. The fruit and the pulp is processed and packed in accordance with proper manufacturing.

Apple concentrates:

Apple juice concentrate is generally produced by evaporating the fresh apple juice, which is extracted from farm fresh juicy apples. Fresh apple juice has a concentration of around 11 to 13 brix.

Dehydrated Apple slices:

Dehydrated apple slices are a dehydrated version of apple which can be preserved by drying. It can easily be added into the diet or can be consumed as a low-calorie snack, anywhere, anytime. Many commercial brands today add ingredients such as salt, spices and vegetable oils not only to boost its flavour but also to lengthen its shelf life. Apple's suitability for drying is fair to good. Modern research shows that its nutritional content may benefit the health.

Drying or dehydration is one of the most effective means to extend the shelf life of perishable fruits and vegetables. The main purpose of dehydration in preserving fruits and vegetables is to remove moisture so that water activity of the dehydrated products is low enough of a_w less than 0.6 for preventing the spoilage and the growth of pathogenic microorganisms and subsequently to reduce the spoilage reactions. Dehydration is also used in combination with other preservative factors such as initial heating of vegetable in boiling water and salt solution to extend the shelf life of vegetables. Dehydration significantly reduces the cost of transportation and storage due to reduced weight and volume of dehydrated vegetables. Unlike fresh vegetables, dehydrated vegetables do not require refrigeration during storage.

Value addition of apple increases the nutritional profile and helps in proper utilization of crop by reducing wastage. It helps farmers to produce higher shelf-life product with reasonable higher income.

2. MODEL DEHYDRATED APPLE SLICES 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 apple growing areas in India are 6 districts of J&K (Srinagar, Budgam, Pulwama, Anantanag, Baramullah, Kupwara), 6 districts of H.P. (Shimla, Kullu, Sirmour, Mandi, Chamba, Kinnaur) and 8 districts of U.P. (Almora, Nainital, Pithauragarh, Tehri, Pauri, Chamoli, Uttarkashi, Dehradun). In the North-eastern Hills region, good quality apple is grown in a small area in Tawang belt of Kameng district in Arunachal Pradesh.

2.2 INSTALLED CAPACITY OF THE DEHYDRATED APPLE SLICES PROCESSING UNIT

The maximum installed capacity of the Dehydrated apple slices manufacturing unit in the present model project is proposed as 75 tonns/annum or 250 kg/day Dehydrated apple slices. The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1st year is assumed to be construction/expansion period of the project; and in the 2nd year 55 percent capacity, 3rd year 65 percent capacity, 4th year 75 percent capacity and 5th year onwards 90 percent capacity utilization is assumed in this model project.

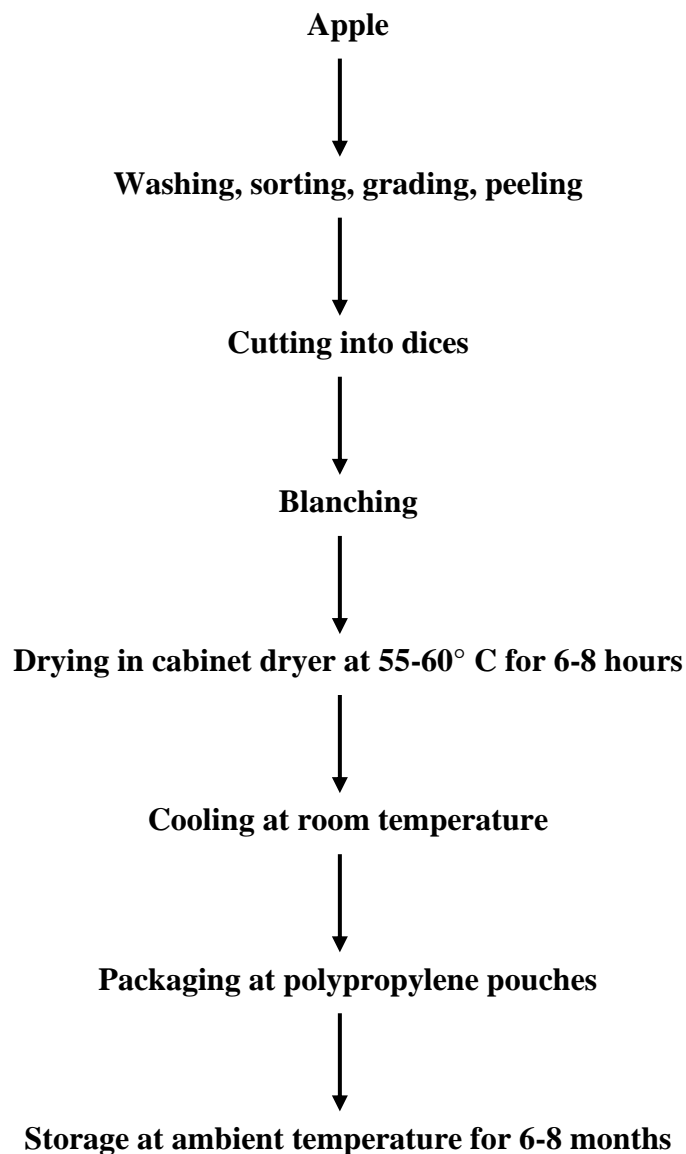
2.3 RAW MATERIAL REQUIREMENTS FOR THE UNIT

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 Dehydrated apple slices manufacturing project, the unit requires 938.18 kg/day, 1108.76 kg/day, 1279.34 kg/day and 1535.21 kg/day Apple fruit at 55, 65, 75, and 90 percent capacity utilization, respectively. The Mature Apple must be plucked from plant; and then stored below 6°C temperature.

2.4 MANUFACTURING PROCESS OF THE DEHYDRATED APPLE SLICES

FLOW CHART OF DEHYDRATED APPLE SLICES



2.5 MARKET DEMAND AND SUPPLY FOR DEHYDRATED APPLE SLICES

The use of dehydration is a time honored way of preserving seasonal fruits and vegetables and has been around for ages. The freeze drying and sun drying methods are the most preferred processes among the manufacturers of dehydrated fruits & vegetables. The drying process renders ingredients and food safe from yeast, bacteria, mold and other forms of microbial contamination. The dehydrated fruits & vegetable market has observed significant improvement in terms of new product launches along with an increase in research & development activities. According to the MRFR analysis, the dehydrated fruits & vegetable market globally is projected to touch USD 38.06 billion in revenues through the forecast period from 2018 to 2023 while registering a CAGR of 7.95 percent approximately.

Dehydration has become highly sought-after as the technology enables in transforming food to a state that is easy to store, package, and transport. Food drying technologies such as heat pump drying, vacuum drying, air drying, and others have been around for some time now. While advent of these technologies continues to aid expansion, the market has been witnessing a spurt of innovations.

The dehydrated fruits & vegetable market is expected to be motivated by a combination of factors. Among these factors is the intensifying demand for seasonal fruits & vegetables which is positively influencing the growth of the market. On the other hand, the progressive growth of sports drinks and supplements also has been a significant factor in increasing the market size of dehydrated fruits & vegetables market. The demand for non-carbonated beverages such as instant beverages and nutraceuticals is also noted to be progressively contributing to the growth of the market because health conscious consumers are more inclined towards buying naturally flavored beverages made from fresh fruits and vegetables, because of their rich anti-oxidant qualities. Besides, as dehydrated fruits & vegetables are lighter, convenient and do not require refrigeration, their shelf life is much high as compared to the fresh fruits & vegetables which creates an enormous opportunity for the market for dehydrated fruits & vegetables. The demand for

clean label food & beverage products in the market has been escalating in recent years; this trend is forecasted to drive the expansion of the market further in the forecast period. Escalating consumer awareness with regards to the trend of food traceability throughout the supply chain so as to identify and trace ingredient's origin has stimulated the growth of the market substantially. Additionally, Superfruit powders are experiencing speedy growth as they are being used as ingredients in beverages, foods, and pharmaceutical products.

The companies in the market are also increasingly focused on redesigning existing designs with better features or developing innovative packaging designs, such as fittings that are easy to open and close, attention-grabbing shapes, strong protection barriers, and use of sustainable materials to increase the product durability. The innovative packaging is considerably helping in capturing consumer attention and increasing the sale of products further. The growing acceptance of instant beverages in quick service restaurants is anticipated to be among the major factors for the rising growth of instant beverages, thereby growing the market for dehydrated fruits and vegetables. The growing urban middle class population with higher levels of disposable incomes available to them is anticipated to power the sales of ready to eat food products which are considered to be one of the key factors for intensifying the growth of dehydrated fruits & vegetables in the emerging economies.

The surplus demand for healthy food products among the consumers has been creating lucrative growth opportunities. In order to cater to the increasing demand for natural and healthy food ingredients, food manufacturers are emphasizing to include dehydrated fruits and vegetables in their product line.

Dehydrated fruits and vegetables retain 100% of the nutrition content of fresh fruits and vegetables while it only takes half of the space, which offers manufacturers with better convenience to transport food items from one place to another. Apart from convenience in transportation, dehydrated fruits and vegetables are rich in nutrients and dietary fiber content which have been helping the market gain traction.

The challenging work environment in urban centers results in amplified work time, making it more difficult for customers to spend time at home for cooking food. Hectic lifestyle is compelling consumers to opt for packaged and ready-to-eat meals. Dehydrated fruits and vegetables help customers enjoy tasty foods that consume less time to prepare. Meanwhile dehydrated fruits and vegetables are available in a wide range of varieties, which has been presenting increasing choices to consumers.

Consumers are seeking out reasonably priced, convenient and tasty food products that will suit their fast-paced lifestyle, thus providing abundant growth opportunities for dehydrated fruits and vegetable products manufacturers.

The dehydrated fruits and vegetables market globally is segmented on the basis of type, form, and region. On the basis of the type, the market is categorized into fruits & vegetables. The fruits segment is projected to be responsible for the substantial market share of 67.5 percent in the year of 2018, and the segment is likely to achieve USD 1,667.41 million in revenue with registering a CAGR of 5.83 percent for the duration of the forecast period from 2018 to 2023. Fruits are further segmented into bananas, cherries, apples, apricots, pineapple, and others. While the vegetable segment is further segmented into tomato, onions, mushrooms, garlic, and others. Moreover, the vegetable segment is anticipated to grow at an amplified development rate in the forecast period.

The form based segmentation of the dehydrated fruits & vegetable market consists of granules, powder, and others. The powder segment is expected to be accredited for the key market portion of 81.2 percent in 2018, and the development is projected to carry on through the forecast period of The Powder segment is estimated to accomplish USD 31,291.45 million in revenues by the end of 2023. The granules segment is anticipated to observe a modest growth rate of 7.89 percent through the forecast period.

India remains one of most prominent markets for dehydrated fruits and vegetables manufacturers globally. The country is home to the world's leading food producers, importers, and exporters. FMI has forecast India to remain one of the highly

profitable markets over the course of the forecast period. India is the world's 2nd largest producer of fruit and vegetables in the world next only to China.

According to FMI, India holds more than 13% of share in globally in year 2021. It is estimated to increase in the coming years, which is indicative of notable scope for extension it will offer to dehydrated fruits and vegetables manufacturing companies.

2.6 MARKETING STRATEGY FOR DEHYDRATED APPLE SLICES

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 Apple products.

2.7 DETAILED PROJECT ASSUMPTIONS

This model DPR for Dehydrated apple slices 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 dehydration processing 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. Apple cost considered @ Rs.40/-per kg.
 2. 1 kg Apple will produce 17 % 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 Dehydrated apple slices Unit | 75 | MT/annum |
| Utilization of capacity | 1st Year Implementation, 55% in second, 65% in third, 75% in fourth year, 90% in fifth onwards | |
| Working days per year | 300 | days |
| Working hours per day | 10 | hours |
| Interest on term and working capital loan | 12% | |
| Repayment period | Seven year with one year grace period is considered. | |
| Average prices of raw material | 40 | |
| Average sale prices per Kg | 620 | Rs/kg |
| Powder extraction | 17% | |
| Dehydrated apple slices | 1 kg Dehydrated apple slices from 6.82 kg Apple | |

2.8 FIXED CAPITAL INVESTMENT

2.8.1 MACHINERY AND EQUIPMENT

| Sr No. | Equipment | Quantity | Capacity | Area (in feet) | Price (Rs. In Lacs) |
|--------|-----------|----------|----------|----------------|---------------------|
| 1 | Cold Room | 1 | 10000 kg | 12*14*10 | 11.4 |

| | | | | | |
|---|-------------------------|---|------------------|-------|-------|
| 2 | Bubble washer | 1 | 200 kg per batch | 6*4 | 2.9 |
| 3 | Fruit slicer | 1 | 200 kg hr | 4*3 | 1.2 |
| 4 | Tray drier with trolley | 1 | 500 kg/hr | 8*10 | 6 |
| 5 | Cont. sealing machine | 1 | Suitable | 4*3 | 0.25 |
| 6 | Batch coding machine | 1 | Suitable | | 0.12 |
| 7 | Weighing balance | 1 | Suitable | | 0.06 |
| 8 | Accessories | 1 | Suitable | | 0.5 |
| | | | | Total | 22.43 |

2.8.2 OTHER COSTS:-

Utilities and Fittings:-

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

Other Fixed Assets:

| | |
|--------------------------|-------------------|
| Other Fixed Assets | |
| 1. Furniture & Fixtures | Rs. 0.9 lac 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 40.18 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

| Particulars | Period (days) | Year 2 (55%) | Year 3 (65%) | Year 4 (75%) |
|-----------------------|---------------|--------------|--------------|--------------|
| Raw material stock | 5 | 3.59 | 4.24 | 5.79 |
| Work in progress | 10 | 7.18 | 8.49 | 11.57 |
| Packing material | 10 | 0.15 | 0.18 | 0.24 |
| Finished goods' stock | 10 | 7.72 | 9.12 | 12.44 |
| Receivables | 20 | 15.43 | 18.24 | 24.87 |
| Working expenses | 14 | 0.54 | 0.64 | 0.87 |
| Total current assets | | 34.61 | 40.90 | 55.78 |
| Trade creditors | | 0.00 | 0.00 | 0.00 |
| Working capital gap | | 34.61 | 40.90 | 55.78 |
| Margin money (25%) | | 8.65 | 10.23 | 13.94 |
| Bank finance | | 25.96 | 30.68 | 41.83 |

2.10 TOTAL PROJECT COST AND MEANS OF FINANCES

| Particulars | Amount in Lakhs |
|--|-----------------|
| i. Land and building (20 x 32 x 12 ft - LxBxH) | 5.3 |
| ii. Plant and machinery | 22.43 |
| 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 | 8.65 |
| Total project cost (i to vii) | 40.18 |
| Means Of finance | |
| i. Subsidy | 10.00 |
| ii. Promoters Contribution | 10.44 |
| iii. Term Loan (@49%) | 19.72 |

2.11 MANPOWER REQUIREMENTS

| Total Monthly Salary (Rs.) | No | Wages | Total Monthly | Total Annually |
|-------------------------------|----|-------|---------------|----------------|
| Supervisor (can be the owner) | 1 | 15000 | 15000 | 180000 |
| Technician | 1 | 12000 | 12000 | 144000 |
| Helper | 3 | 5500 | 16500 | 198000 |
| Sales man | 1 | 7000 | 7000 | 84000 |
| | | | 50500 | 606000 |

2.12 EXPENDITURE, REVENUE AND PROFITABILITY ANALYSIS

| | Particulars | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th year |
|---|---|-----------------------|---------------|---------------|---------------|---------------|
| A | Total Installed Capacity (MT) | 512 MT Apple/Annum | 41.25 | 48.75 | 56.25 | 67.5 |
| | Capacity utilization (%) | Under Const. | 55% | 65% | 75% | 90% |
| B | Expenditure (Rs. in Lakh) | 0 | | | | |
| | Apple (Av. Price @ Rs. 40/Kg) | 0.00 | 112.58 | 133.05 | 153.52 | 184.23 |
| | Packaging materials | 0.00 | 2.48 | 2.93 | 3.38 | 4.05 |
| | Utilities (Electricity, Fuel) | 0.00 | 2.21 | 2.61 | 3.01 | 3.62 |
| | Salaries (1st yr only manager's salary) | 1.80 | 6.06 | 6.06 | 6.06 | 6.06 |
| | Repair & maintenance | 0.00 | 0.70 | 0.80 | 0.90 | 0.90 |
| | Insurance | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| | Miscellaneous expenses | 0.50 | 2.30 | 2.30 | 2.30 | 2.30 |
| | Total Expenditure | 2.60 | 126.63 | 148.05 | 169.47 | 201.45 |
| C | Total Sales Revenue (Rs. in Lakh) | 0.00 | 255.75 | 302.25 | 348.75 | 418.50 |
| | Sale of Deydrated apple slices (Av. Sale Price @ Rs. 620/kg) | 0.00 | 255.75 | 302.25 | 348.75 | 418.50 |
| D | PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows | -2.60 | 129.12 | 154.20 | 179.28 | 217.05 |
| | Depreciation on civil works @ 5% per annum | 0.27 | 0.25 | 0.24 | 0.23 | 0.22 |
| | Depreciation on machinery @ 10% per annum | 2.24 | 2.02 | 1.82 | 1.64 | 1.47 |
| | Depreciation on other fixed assets @ 15% per annum | 0.12 | 0.10 | 0.09 | 0.07 | 0.06 |
| | Interest on term loan @ 12% | 2.05 | 1.98 | 1.90 | 1.82 | 1.72 |
| | Interest on working capital @ 12% | 0.00 | 3.11 | 3.68 | 5.02 | 5.02 |

| | | | | | | |
|---|---|--------------|---------------|---------------|---------------|---------------|
| E | Profit after depreciation and Interest (Rs. in Lakh) | -7.28 | 124.77 | 150.16 | 175.53 | 213.58 |
| F | Tax (assumed 30%) (Rs. in Lakh) | 0.00 | 37.43 | 45.05 | 52.66 | 64.07 |
| G | Profit after depreciation, Interest & Tax (Rs. in Lakh) | -7.28 | 87.34 | 105.11 | 122.87 | 149.50 |
| H | Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh) | 2.05 | 1.98 | 1.90 | 1.82 | 1.72 |
| I | Coverage available (Rs. in Lakh) | 2.05 | 1.98 | 1.90 | 1.82 | 1.72 |
| J | Total Debt Outgo (Rs. in Lakh) | 0.69 | 0.76 | 0.83 | 0.92 | 1.02 |
| K | Debt Service Coverage Ratio (DSCR) | 3.00 | 2.62 | 2.28 | 1.97 | 1.69 |
| | Average DSCR | 2.16 | | | | |
| L | Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh) | -4.65 | 89.71 | 107.25 | 124.81 | 151.25 |
| M | Payback Period | 2.0 Years | | | | |
| | (on Rs. 40.18 Lakhs initial investment) | | | | | |

2.13 REPAYMENT SCHEDULE

| Year | Beginning | PMT | Interest | Principal | Ending Balance |
|------|--------------|------------|------------|------------|----------------|
| 1 | 1,972,973.07 | 273,689.21 | 205,189.20 | 68,500.01 | 1,904,473.06 |
| 2 | 1,904,473.06 | 273,689.21 | 198,065.20 | 75,624.01 | 1,828,849.04 |
| 3 | 1,828,849.04 | 273,689.21 | 190,200.30 | 83,488.91 | 1,745,360.13 |
| 4 | 1,745,360.13 | 273,689.21 | 181,517.45 | 92,171.76 | 1,653,188.37 |
| 5 | 1,653,188.37 | 273,689.21 | 171,931.59 | 101,757.62 | 1,551,430.75 |
| 6 | 1,551,430.75 | 273,689.21 | 161,348.80 | 112,340.41 | 1,439,090.34 |
| 7 | 1,439,090.34 | 273,689.21 | 149,665.40 | 124,023.82 | 1,315,066.52 |
| 8 | 1,315,066.52 | 273,689.21 | 136,766.92 | 136,922.29 | 1,178,144.23 |

| | | | | | |
|----|--------------|--------------|--------------|--------------|----------------|
| 9 | 1,178,144.23 | 273,689.21 | 122,527.00 | 151,162.21 | 1,026,982.02 |
| 10 | 1,026,982.02 | 273,689.21 | 106,806.13 | 166,883.08 | 860,098.93 |
| 11 | 860,098.93 | 273,689.21 | 89,450.29 | 184,238.92 | 675,860.01 |
| 12 | 675,860.01 | 273,689.21 | 70,289.44 | 203,399.77 | 472,460.24 |
| 13 | 472,460.24 | 273,689.21 | 49,135.87 | 224,553.35 | 247,906.89 |
| 14 | 247,906.89 | 273,689.21 | 25,782.32 | 247,906.89 | (0.00) |
| | | 3,831,648.96 | 1,858,675.89 | 1,972,973.07 | (1,972,973.07) |

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 | 5.30 | 5.04 | 4.78 | 4.54 | 4.32 | 4.10 | 3.90 | 3.70 |
| Depreciation | 0.27 | 0.25 | 0.24 | 0.23 | 0.22 | 0.21 | 0.19 | 0.19 |
| Depreciated value | 5.04 | 4.78 | 4.54 | 4.32 | 4.10 | 3.90 | 3.70 | 3.52 |
| | | | | | | | | |
| Plant & Machinery | 22.43 | 20.19 | 18.17 | 16.35 | 14.72 | 13.24 | 11.92 | 10.73 |
| Depreciation | 2.24 | 2.02 | 1.82 | 1.64 | 1.47 | 1.32 | 1.19 | 1.07 |
| Depreciated value | 20.19 | 18.17 | 16.35 | 14.72 | 13.24 | 11.92 | 10.73 | 9.66 |
| | | | | | | | | |
| 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 | 28.53 | 25.90 | 23.53 | 21.39 | 19.45 | 17.70 | 16.12 | 14.69 |
| Depreciation | 2.63 | 2.37 | 2.14 | 1.94 | 1.75 | 1.58 | 1.43 | 1.30 |
| Depreciated value | 25.90 | 23.53 | 21.39 | 19.45 | 17.70 | 16.12 | 14.69 | 13.39 |

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 | |
|---|--------------|----------|-----------|----------|----------|----------|---------|
| Capital cost (Rs. in Lakh) | 40.18 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Recurring cost (Rs. in Lakh) | 2.60 | 126.63 | 148.05 | 169.47 | 201.45 | | |
| Total cost (Rs. in Lakh) | 42.78 | 126.63 | 148.05 | 169.47 | 201.45 | | 688.38 |
| Benefit (Rs. in Lakh) | 0.00 | 255.75 | 302.25 | 348.75 | 418.50 | | |
| Total Depreciated value of all assets (Rs. in Lakh) | | | | | 13.39 | | |
| Total benefits (Rs. in Lakh) | 0.00 | 255.75 | 302.25 | 348.75 | 418.50 | 13.39 | 1325.25 |
| Benefit-Cost Ratio (BCR): (Highly Profitable project) | 1.925 | | | | | | |
| Net Present Worth (NPW): | 636.87 | | | | | | |

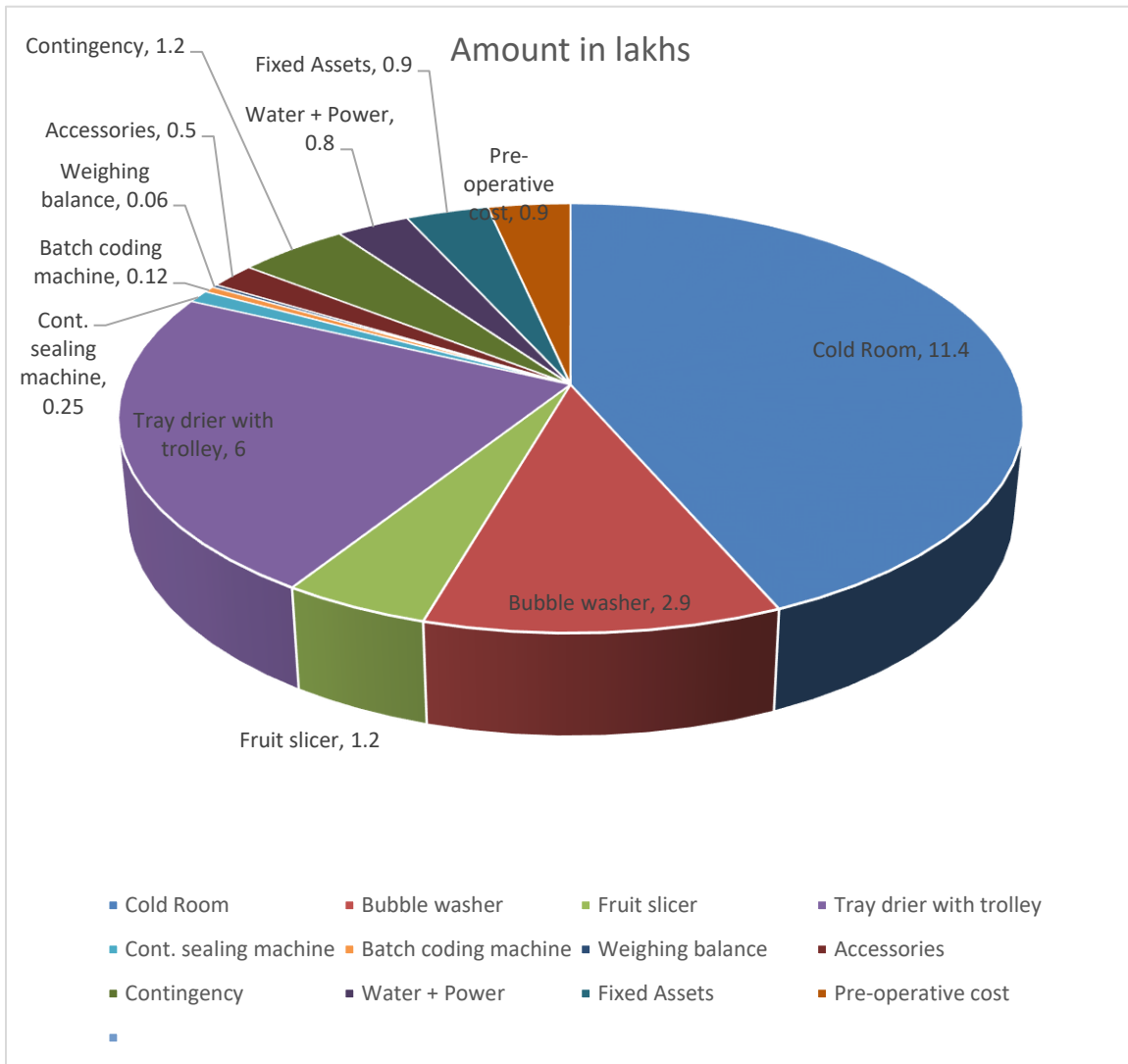
2.16 BREAK EVEN ANALYSIS

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.

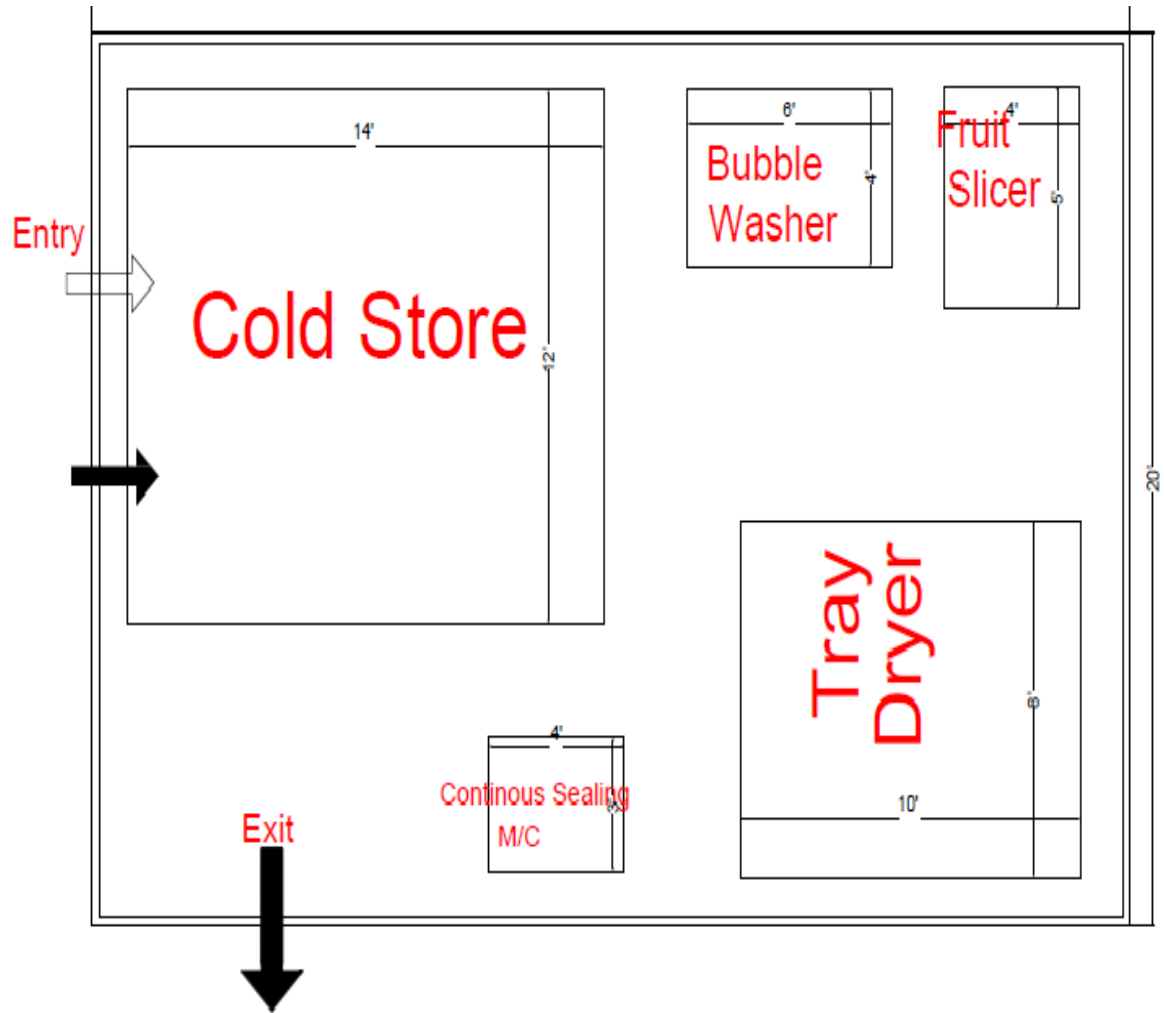
| Particulars | 1st Year | 2nd year | 3 rd year | 4th year | 5th year |
|--|--------------|--------------|--------------|--------------|--------------|
| Capacity utilization (%) | Under Const. | 55% | 65% | 75% | 90% |
| Production MT/Annum | | 41.25 | 48.75 | 56.25 | 67.5 |
| Fixed Cost (Rs. in Lakh) | | | | | |
| Permanent staff salaries | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 |
| Depreciation on building @ 5% per annum | 0.27 | 0.25 | 0.24 | 0.23 | 0.22 |
| Depreciation on machinery @ 10% per annum | 2.24 | 2.02 | 1.82 | 1.64 | 1.47 |
| Depreciation on other fixed assets @ 15% per annum | 0.12 | 0.10 | 0.09 | 0.07 | 0.06 |
| Interest on term loan | 2.05 | 1.98 | 1.90 | 1.82 | 1.72 |
| Insurance | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Total Fixed Cost (Rs. in Lakh) | 11.04 | 10.71 | 10.40 | 10.11 | 9.83 |
| Sales Revenue (Rs. in Lakh) | 0.0 | 255.8 | 302.3 | 348.8 | 418.5 |
| Variable Cost (Rs. in Lakh) | | | | | |
| Apple (Av. Price @ Rs. 40/Kg) | 0.00 | 112.58 | 133.05 | 153.52 | 184.23 |
| Packaging materials | 0.00 | 2.48 | 2.93 | 3.38 | 4.05 |
| Casual staff salaries | 0.00 | 4.56 | 4.56 | 4.56 | 4.56 |
| Utilities (Electricity, Fuel) | 0.00 | 2.21 | 2.61 | 3.01 | 3.62 |
| Repair & maintenance | 0.00 | 0.70 | 0.80 | 0.90 | 0.90 |
| Miscellaneous expenses | 0.50 | 2.00 | 2.00 | 2.00 | 2.00 |

| | | | | | |
|---|-------------|---------------|---------------|---------------|---------------|
| Interest on working capital @ 12% | 0.00 | 3.11 | 3.68 | 5.02 | 5.02 |
| Total Variable Cost (Rs. in Lakh) | 0.50 | 127.64 | 149.63 | 172.39 | 204.37 |
| Break Even Point (BEP) | | | | | |
| as % of sale | - | 12.00 | 10.00 | 8.00 | 8.00 |
| Break Even Point (BEP) in terms of sales value (Rs. in Lakhs) | - | 30.69 | 30.23 | 27.90 | 33.48 |

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



2.18 TYPICAL DEHYDRATED APPLE SLICES MANUFACTURING UNIT LAYOUT



2.19 MACHINERY SUPPLIERS

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

1. Bajaj Process pack Limited, Noida, India 0
2. Shriyan Enterprises. Mumbai, 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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