

**PM Formalization of
Micro Food Processing Enterprises Scheme
DETAILED PROJECT REPORT
FOR
KIWI RTS PROCESSING**



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Project At a Glance

1	Name of the Project	Kiwi RTS
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 & 100% capacity utilization in the 2 nd , 3 rd , 4 th , 5 th & 6 th years' onwards respectively
11	Raw materials	Kiwi Fruit
12	Major product outputs	Kiwi RTS
13	Total project cost (Lakhs)	31.97
	Land development, building & civil construction	5.16
	Machinery and equipments	15.86
	Utilities (Power & water facilities)	0.8
	Miscellaneous fixed assets	0.9
	Pre-operative expenses	0.90
	Contingencies	1.20
	Working capital margin	7.15
14	Working capital Management (In Lakhs)	
	Second Year	21.44
	Third Year	25.34
	Fourth Year	34.55
15	Means of Finance	
	Subsidy grant by MoFPI (max 10 lakhs)	10.00
	Promoter's contribution (min 20%)	7.67
	Term loan (45%)	14.28
16	Debt-equity ratio	1.86 : 1
17	Profit after Depreciation, Interest & Tax	
	2nd year	27.53
	3rd year	34.27
	4th year	41.00
18	Average DSCR	2.16
	Benefit Cost Ratio	1.76
	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 KIWI PRODUCTION, CLUSTERS, POST-HARVEST MANAGEMENT AND VALUE ADDITION IN INDIA

1.1 INTRODUCTION

Kiwi, (*Actinidia deliciosa*), also called **kiwifruit** or **Chinese gooseberry**, woody vine and edible fruit of the family Actinidiaceae. The plant is native to mainland China and Taiwan and is also grown commercially in New Zealand and California. The fruit has a slightly acid taste and can be eaten raw or cooked. The juice is sometimes used as a meat tenderizer. Raw kiwis are high in vitamins C and K.

It has a thin, fuzzy, fibrous, tart but edible light brown skin and light green or golden flesh with rows of tiny, black, edible seeds. The fruit has a soft texture with a sweet and unique flavour. In 2018, China produced half of the world total of kiwifruit. It wasn't until the early 20th century that kiwi spread from China to New Zealand and began being cultivated there.

Kiwi is a relatively new fruit crop. New Zealand didn't start growing the crop commercially until the 1940s, and it wasn't introduced in the United States until the early 1960s.

In recent years, its production and consumption has increased (Izali et al., 2007). The kiwifruit is unique because of its high nutritional content, different flavours, vitamins, minerals, antioxidants, phytochemicals and fibres content. In terms of nutrient content, the kiwifruit is amongst the richest fruits: it is also very valuable in terms of health. It is usually consumed fresh but in recent years along with increased production, industrial use is increasing. It is used in the canned food industry, for marmalades, fruit sauces and candies and for fruit juice concentrates, either separately or mixed with strawberries or

apples. The fruit is also canned, dried, frozen, and used for the preparation of nectars (Göksel and Atak 2016).

In India Kiwi fruit can be grown in warm and humid climatic conditions. Deep yellow brown loamy and well-drained and fertile soil is suitable for cultivation of kiwi. One thing of major importance is to provide shelter to protect from wind as wind can damage kiwi plant, its small flowers and immature fruits.

1.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF KIWI

Kiwifruit is native to central and eastern China. The first recorded description of the kiwifruit dates to 12th century China during the Song dynasty. As it was usually collected from the wild and consumed for medicinal purposes, the plant was rarely cultivated or bred. Cultivation of kiwifruit spread from China in the early 20th century to New Zealand, where the first commercial plantings occurred. The fruit became popular with British and American servicemen stationed in New Zealand during World War II, and was later exported, first to Great Britain and then to California in the 1960s.

In New Zealand during the 1940s and 1950s, the fruit became an agricultural commodity through the development of commercially viable cultivars, agricultural practices, shipping, storage, and marketing.

Kiwis are even newer to India. According to a senior scientist at the National Bureau of Plant and Genetic Resources, kiwi cultivation was introduced to the Shimla district station in 1963.

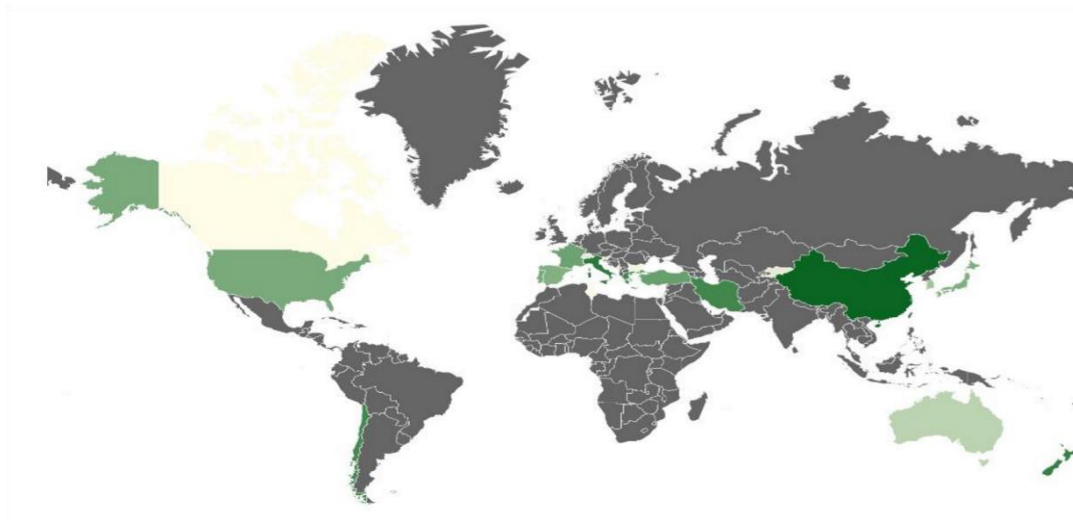
Kiwis have grown in popularity since their first appearance in Shimla's chilly hills. Much to the delight of farmers, the fruits ship and store well. When in season, kiwifruits grace the shelves of middle to high-end stores throughout the country. Even during the off-season, grocers import the fruits from China, Australia and New Zealand.

Farmers grow several commercial varieties of kiwis throughout many of India’s cooler regions, including Uttar Pradesh, Himachal Pradesh, Sikkim, Jammu and Kashmir, Arunachal Pradesh, Meghalaya, and the Nilgiri Hills. Of these areas, Himachal Pradesh produces some of the best kiwis. Serious cultivation efforts have only begun recently on account of growing demand from India’s large city centers.

Production:

World Scenario

China (2.1M tonnes) constituted the country with the largest volume of kiwi fruit production, accounting for 50% of total production. Moreover, kiwi fruit production in China exceeded the figures recorded by the world's second-largest producer, Italy (555K tonnes), fourfold. New Zealand (437K tonnes) ranked third in terms of total production with a 10% share. (World - Kiwi Fruits - Market Analysis, Forecast, Size, Trends and Insights Report.2020).



Countries Producing Kiwifruit

(Source: World - Kiwi Fruits - Market Analysis, Forecast, Size, Trends and Insights Report 2020)

Country	Productions (Tonnes)
China	1,765,847
Italy	447,560
New Zealand	382,337
Chile	255,758
Greece	162,800

(Source: World - Kiwi Fruits - Market Analysis, Forecast, Size, Trends and Insights Report 2020)

Indian Scenario

Kiwi is among the very few recent introductions which have surpassed in popularity due to its tremendous commercial potential in the sub-Himalayan region of India. In fact, no other fruit has attracted so much attention in such a short period in history of commercial fruit production since 1960s. In India, kiwi was first planted in the Lal Bagh Gardens (1960) at Bangalore as an ornamental tree. Later on, for cultivation purpose at IARI, Regional Station, Phagli, Shimla (H.P) -1963 from USA with extensive research and development support its commercial cultivation has been extended to the mid-hills of Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Arunachal Pradesh, Sikkim, Meghalaya, and Nilgiri hills in India.

Kiwifruit	2018-19		2019-20 (1st Advance Estimate)		2019-20 (2nd Advance Estimate)	
	Area (in '000 Ha)	Production '000 MT	Area (in '000 Ha)	Production '000 MT	Area (in '000 Ha)	Production '000 MT
	5	13	5	13	5	13

(Source: National Horticulture Board)

1.3 VARIETIES

There are different varieties of kiwi growing worldwide. Varieties of kiwi growing worldwide are described below.

1. **Abbott:** The oblong, medium sized, fruits are covered with dense hairs. They are very sweet in taste with lower ascorbic acid content and medium titratable acidity. Fruit oblong, of medium size, with brownish skin and especially dense, long, soft, hairs; flesh is light-green and of good flavor. Of good keeping quality. Resembles 'Allison'. Ripens in early May. Vine is vigorous, precocious, and productive. Petals do not overlap; styles are horizontal. Most exports to the United Kingdom have been of this cultivar.
2. **Allison:** It is an early ripening, heavy bearer and sweet in taste. Ascorbic acid and titratable acidity are on the lower side. This variety is most suited for Himachal Pradesh. Fruit large, elongated cylindrical, broadest at apex; has darker-brown skin than other cultivars and dense, short, bristly hairs. Flesh is light-green, of good flavor. Ripens in early May. Vine is vigorous and productive, blooms with or slightly after 'Allison'. Sometimes exported. Flowers borne singly or sometimes in pairs. Petals narrower and overlap less; styles longer and stouter than those of 'Abbott', more regularly arranged than those of 'Allison'.
3. **Bruno:** This cultivar requires comparatively less chilling period. The fruits are tapering in shape towards the stem end. The fruits are dark brown having very dense, short and bristly hair, highest in ascorbic acid and titratable acidity. The bearing is very heavy. Fruit large, elongated cylindrical, broadest at apex; has darker-brown skin than other cultivars and dense, short, bristly hairs. Flesh is light-green, of good flavor. Ripens in early May. Vine is vigorous and productive, blooms with or slightly after 'Allison'. Sometimes exported. Flowers borne singly or sometimes in pairs. Petals narrower and

overlap less; styles longer and stouter than those of 'Abbott', more regularly arranged than those of 'Allison'.

4. Monty: It is a late flowering cultivar but fruit maturity is not late. The fruit is somewhat wider towards blossom end with higher acidity and medium sugar content. Fruit oblong, somewhat angular, widest at apex; of medium size; skin brownish with dense hairs. Flesh is light-green. Fruit ripens in early May. Vine is highly vigorous and productive, sometimes excessively so. Petals overlap only slightly at the base.
5. Hayward: Most popular cultivar or the world. It is superior in flavour with high sugar and ascorbic acid content. It requires comparatively more chilling hours. Fruit exceptionally large, broad-oval, with slightly flattened sides; skin light greenish-brown with dense, fine, silky hairs. Flesh light green; of superior flavor and fruit is of good keeping quality. Ripens in early May. Vine is moderately vigorous, blooms very late; is moderately prolific, partly because of scanty pollination and late-blooming males must be planted with it. Flowers borne singly or, rarely, in pairs. The petals are broad, overlapping, cupped, and the styles more erect than those of other cultivars though they vary from horizontal to vertical. This is the leading cultivar in New Zealand; the only commercial cultivar in California; produces 72% of Italy's crop.
6. Greensill: It is the most cylindrical of all, flattened on both ends, slightly wider at base than at apex; a little shorter than 'Allison' but thicker. Petals narrow, constricted, do not overlap at the base; styles are mostly erect.

1.4 HEALTH BENEFITS AND NUTRITIONAL INFORMATION

The kiwi – shortened from its full name, the kiwifruit – is actually a large berry that grows on a species of woody vine in the genus *Actinidia*. Kiwis have been famously cultivated in New Zealand, but this bold berry actually originated in eastern China.

The kiwi typically grows in the shape of an oval and is roughly around the size of a typical chicken egg. Its skin is camel-colored, fibrous, and coated in a light fuzz. Despite its fuzzy covering, the kiwi’s skin is edible and tart. The kiwi’s flesh is bright green with a unique but pleasing texture and rows of distinctive tiny black seeds, which can also be eaten. Kiwis have a sweet, tart, and bold taste — making them a popular addition to a healthy breakfast or lunch.

Kiwis are high in **Vitamin C** and dietary **fiber** and provide a variety of health benefits. This tart fruit can support heart health, digestive health, and immunity. The kiwi is a healthy choice of fruit and is rich with vitamins and **antioxidants**. Its tart flavor, pleasing texture, and low calorie count make it a delicious and healthy option for snacking, sides, or a unique dessert.

According to the United States Department of Agriculture (USDA), 100 grams serving of kiwifruit has 61 calories, 14.66 grams of carbohydrates, 1.14 grams of protein, 0.52 gram of fat and 3 grams of fibre. Kiwifruit is also known for its intriguing appearance and taste. With fuzzy brown exterior and glistening, bright green flesh, kiwi is juicy and refreshing with a sweet and tarty taste.

Nutritional value per 100 g

Nutritional composition of 1 kiwi fruit (69 g)	
Energy (calories)	42.1
Carbohydrates (g)	10.1
Fiber (g)	2.1
Calcium (mg)	23.5
Magnesium (mg)	11.7
Phosphorus (mg)	23.5

Potassium (mg)	215
Copper (mcg)	90
Vitamin C (mg)	64
Folate (mcg)	17.2
Beta carotene (mcg)	35.9
Lutein & zeraxanthin (mcg)	84.2
Vitamin E (mg)	1.0
Vitamin K (mcg)	27.8

CONSTITUENTS AND HEALTH BENEFITS OF KIWI FRUITS

Kiwi fruits also have many potential health benefits.

Health benefits:

1. *High Source of Vitamin C:*

According to the nutritional break-up of kiwi fruit, per 100 grams contain 92.7 mg of Vitamin C, which is almost twice that of lemons and oranges. Vitamin C acts as powerful antioxidant, eliminating free radicals that could cause inflammation or cancer. It also helps in boosting the immunity of the body against harmful pathogens.

2. *Sleep Inducer:*

According to a research done by Taipei Medical University, “Numerous studies have revealed that kiwi fruit contains many medicinally useful compounds, among which

antioxidants and serotonin may be beneficial in the treatment of sleep disorders.” It is said that having two kiwi fruits one hour before bedtime can help immensely in inducing sleep.

3. *Good Source of Dietary Fiber:*

This exotic fruit is loaded with dietary fiber, which helps in the prevention of numerous diseases. According to a study done by the University of Leeds, “Increasing consumption of fibre-rich foods can lower risks of both cardiovascular disease (CVD) and coronary heart disease (CHD).” According to researchers at the University of Massachusetts Medical School, high fiber foods keep one full for longer and control metabolic markers like blood pressure, cholesterol and blood sugar. It also facilitates weight loss and is often recommended to diabetics.

4. *Helps in Digestion:*

Kiwi fruit contains an enzyme known as actinidain which is known for its protein dissolving properties, similar to that of papain in papaya. This is the reason why it is commonly used as a meat tenderiser. Moreover, it helps in the digestion of proteins in the body and is also known to help patients suffering from irritable bowel syndrome.

5. *Good Source of Folate:*

It is a good source of folate, which is said to be beneficial for pregnant women because it helps in the development of the foetus, making it healthy. It is also considered to be good for growing children.

6. *Powerhouse of Vitamins and Minerals*

Kiwi fruit is loaded with vitamins and minerals such as Vitamins A, B6, B12, E, and potassium, calcium, iron and magnesium. These contribute collectively to the proper functioning of the body such as blood circulation through the vessels, fight stress, iron absorption for healthy bones and teeth, good vision, etc. The high levels of potassium, 312 mg per 100 grams, help in maintaining blood pressure whereas magnesium helps in the nerve and muscle functions.

7. *Beautiful Skin*

Kiwi is alkaline in nature, which means it helps in countering the effects of acidic foods that we quite often consume. A healthy body is one which has a good pH balance, which helps in keeping you active, full of energy, and with a youthful skin. The vitamins present in kiwi (C and E) are said to be great for the skin as they act as antioxidant, preventing skin degradation. Take a few slices and apply them on your skin for good results. In addition to the above mentioned qualities, kiwi fruits contain omega 3 fatty acids, carotenoids, polyphenols, and promotes heart health. Meaning, benefits of kiwi are innumerable, adding them to your diet will be quite beneficial.

1.5 CULTIVATION, BEARING & POST HARVEST MANAGEMENT:-

The kiwifruit is borne on a vigorous, woody, twining vine or climbing shrub reaching 30 ft (9 m). Its alternate, long-petioled, deciduous leaves are oval to nearly circular, cordate at the base, 3 to 5 in (7.5-12.5 cm) long. Young leaves and shoots are coated with red hairs; mature leaves are dark-green and hairless on the upper surface, downy-white with prominent, light-colored veins beneath. The fragrant, dioecious or bisexual flowers, borne singly or in 3's in the leaf axils, are 5- to 6-petalled, white at first, changing to buff-yellow, 1 to 2 in (2.5-5 cm) broad, and both sexes have central tufts of many stamens though those of the female flowers bear no viable pollen. The oval, ovoid, or oblong fruit, up to 2 1/2 in (6.25 cm) long, with russet-brown skin densely covered with short, stiff brown hairs, is capped at the base with a prominent, 5-pointed calyx when young but this shrivels and dehisce from the mature fruit while 5 small sepals persist at the apex. The flesh, firm until fully ripe, is glistening, juicy and luscious, bright-green, or sometimes yellow, brownish or off-white, except for the white, succulent center from which radiate many fine, pale lines. Between these lines are scattered minute dark-purple or nearly black seeds, unnoticeable in eating. Cross-sections are very attractive. In some inferior types, the central core is fibrous or even woody.

The flavor is sub acid to quite acid, somewhat like that of the gooseberry with a suggestion of strawberry.

Kiwi is mostly grown in the mid hills of Himachal Pradesh, Uttar Pradesh, J & K, Sikkim, Meghalaya, Arunachal Pradesh and Kerala. Having been very newly introduced in the country estimates of area and production have not yet become available.

Cultivation and Bearing:-

Kiwi fruit has high nutritive and medicinal value. It is a rich source of vitamin B & C and minerals like phosphorus, potassium & calcium. Fruits are consumed fresh or combined with other fruits in salads and desserts. It is also used for preparation of squash and wine.

Kiwifruit can be grown in most temperate climates with adequate summer heat. Where fuzzy kiwifruit (*A. deliciosa*) is not hardy, other species can be grown as substitutes.

Often in commercial farming, different breeds are used for rootstock, fruit bearing plants and pollinators. Therefore, the seeds produced are crossbreeds of their parents. Even if the same breeds are used for pollinators and fruit bearing plants, there is no guarantee that the fruit will have the same quality as the parent. Additionally, seedlings take seven years before they flower, so determining whether the kiwi is fruit bearing or a pollinator is time-consuming. Therefore, most kiwifruits, with the exception of rootstock and new cultivars, are propagated asexually. This is done by grafting the fruit producing plant onto rootstock grown from seedlings or, if the plant is desired to be a true cultivar, rootstock grown from cuttings of a mature plant.

Kiwifruit plants generally are dioecious, meaning a plant is either male or female. The male plants have flowers that produce pollen, the females receive the pollen to fertilise their ovules and grow fruit; most kiwifruit requires a male plant to pollinate the female plant. For a good yield of fruit, one male vine for every three to eight female vines is

considered adequate. Some varieties can self pollinate, but even they produce a greater and more reliable yield when pollinated by male kiwifruit. Cross-species pollination is often (but not always) successful as long as bloom times are synchronised.

Kiwifruit is picked by hand and commercially grown on sturdy support structures, as it can produce several tonnes per hectare, more than the rather weak vines can support. These are generally equipped with a watering system for irrigation and frost protection in the spring.

Steep land is contoured into terraces for planting vines. The rows are to be oriented in a north-south direction to avail maximum sunlight. A thorough preparation of soil is essential for the successful establishment of its vineyard. Preparation of pits, mixture of farmyard manure and filling of pits are to be completed by December.

Plants are mostly propagated vegetatively through cuttings and grafting.

Planting is usually done in the month of January. The planting should be done at the same depth at which the plants were growing in the nursery. The soil should be firmly placed around the roots. The plants are pruned hard to about 30 cm. to encourage vigorous growth.

Planting distance varies according to variety and system of training. Usually, T-bar and pergola system are adopted for planting. In T-bar , a spacing of 4 m. from row to row and 5-6 m. from plant to plant is common whereas in pergola system, a spacing of 6 m. from row to row should be maintained

Kiwifruit vines require vigorous pruning, similar to that of grapevines. Fruit is borne on one-year-old and older canes, but production declines as each cane ages. Canes should be pruned off and replaced after their third year. In the northern hemisphere the fruit ripens in November, while in the southern it ripens in May. Four year-old plants can produce up to 14,000 lb (6,400 kg) per acre while eight year-old plants can produce 18,000 lb

(8,200 kg) per acre. The plants produce their maximum at eight to ten years old. The seasonal yields are variable; a heavy crop on a vine one season generally comes with a light crop the following season.

Fruits harvested when firm will ripen when stored properly for long periods. This allows fruit to be sent to market up to 8 weeks after harvest.

Firm kiwifruit ripen after a few days to a week when stored at room temperature, but should not be kept in direct sunlight. Faster ripening occurs when placed in a paper bag with an apple, pear, or banana. Once a kiwifruit is ripe, however, it is preserved optimally when stored far from other fruits, as it is very sensitive to the ethylene gas they may emit, thereby tending to over-ripen even in the refrigerator. If stored appropriately, ripe kiwifruit normally keep for about one to two weeks.

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 glands can be ruptured. The released oil burns the fruit surface (oleocellosis) and also stimulates fungal spores to germinate. The burn Marks can take 2-3 days to develop;
- Wear cotton gloves when harvesting. This reduces puncture marks from Fingernails and jewellery;
- 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 kiwi. 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:-

Fruit beverages and drinks are one of the popular categories of beverages that are consumed across the globe. The fruit beverages and drinks are easily digestible, highly refreshing, thirst quenching, appetizing and nutritionally far superior to most of the synthetic and aerated drinks. In recent past the consumption of fruit based beverages and drinks has increased at a fast rate. Fruit RTSs or pulp used for the preparation of these products are subjected to minimal processing operations like filtration, clarification and pasteurization. The fruit RTS or pulp, are mixed with ingredients like sugar, acid, stabilizers, micronutrients and preservative to develop beverages and drinks. The principle groups of fruit beverages are as follows:

- Ready-to-Serve (RTS) pre-packaged Beverages



- Fruit RTS and Nectars
- Dilutable beverages

Beverages are essential for growth, development as well for carrying out various physiological processes that are critical for living a healthy life. In adult individuals 70 percent of body weight, 73 percent of lean muscle, 25 percent of adipose tissues, 22 percent of bone and 80 percent of blood consists of water. Consumption of beverages help in maintaining the water content in body and prevent dehydration.

The water assists in digestion, assimilation and excretion of foods. It also helps in removing the toxic substances produced in body as a result of metabolisms such as urea, uric acid, ammonia etc. through kidney. Water in beverages help in regulating the temperature of body through the process of sweating. Beverages specially the fruit and vegetable based ones are source of micronutrients (vitamins and minerals) and antioxidants (carotenoids, flavonoids).

The ready-to-serve beverages as per FSSAI specifications should contain at least 10% fruit content and not less than 10 % TSS besides 0.3% acid maximum as citric acid. The levels of permitted preservatives include 70 ppm (maximum) for sulphur dioxide and 120 ppm (maximum) for benzoic acid. The total plate count and yeast and mold counts should not exceed, to 50.0 cfu/ml and 2.0 cfu/ml, respectively. The Coliform counts should be nil in 100 ml beverage samples. Since these beverages are consumed as such without dilution, hence are termed as Ready-to-serve beverage. The majority of packaged fruit beverages belong to this category.

Wide range of fruits are preferred for RTS beverages. Required amount of sugar, acid, stabilizer, colouring and flavouring ingredients are added in RTS or pulp along with water and the mixture is blending properly, filtered if desired. The RTS mix is pasteurized (80-90°C) in bottle (20-30 min), continuous RTS pasteurizer (few seconds to one minute) and

cooled immediately. Nowadays, UHT processing of RTS beverages is quite popular because of longer shelf-life and less loss of nutrients during processing.

The amount of fruit RTS or pulp may vary according to fruit and cost effectiveness. The presence of oxygen in headspace often leads to oxidation resulting in off-flavour and loss of nutritive value, hence anti-oxidants such as ascorbic acid is often added in RTS beverages. Besides it, colour and flavour ingredients which are stable to heat and oxygen are preferred.

RTS and RTS products represent a very important segment of the total processed fruit industry. RTS products are being marketed as refrigerated, shelf-stable, and frozen, in a variety of packages with increased emphasis on functionality, health attributes, new flavours or blends, and in some cases fortified with vitamins and minerals. High-quality RTS operations are dependent upon a source of high-quality raw material. Most fruit RTSs are excellent sources of vitamin C, several are good sources of carotene and many contain moderate amounts of pyridoxine, inositol, folic acid and biotin. Fruit RTS is regarded as source of energy due to their rich carbohydrate content. The organic acids present in the fruit RTS plays a significant role in the maintenance of the acid-base balance in the body.

The process starts with sound fruit, freshly harvested from the field or taken from refrigerated or frozen storage. Thorough washing is usually necessary to remove dirt and foreign objects and may be followed by a sanitation step to decrease the load of contaminants. Sorting to remove decayed and mold contaminated fruit is necessary to make sure that the final RTS will not have a high microbial load, undesirable flavours, or mycotoxin contamination. For most fruits, preparation steps such as pitting and grinding is required prior to RTS extraction. Heating and addition of enzymes might also be included before the mash is transferred to the extraction stage. RTS extraction can be performed by pressing or by enzymatic treatment followed by decanting. The extracted RTS will then be treated according to the characteristics of the final product.

For cloudy RTSs, further clarification might not be necessary or may involve a coarse filtration or a controlled centrifugation to remove large insoluble particles. For clear RTSs,



complete de-pectinization by addition of enzymes, fine filtration, or high speed centrifugation is required to achieve visual clarity. The next step is usually a heat treatment or equivalent non-thermal process to achieve a safe and stable RTS and final packaging if single-strength RTS is being produced.

For a concentrate, the RTS is fed to an evaporator to remove water until the desired concentration level is obtained. Other processes used for water removal include reverse osmosis and freeze concentration, which are best suited for heat-sensitive RTSs. The concentrate is then ready for final processing, packaging, and storage.

2. MODEL KIWI READY TO SERVE 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 ideal locations for establishment of exclusive Kiwi ready to serve processing unit are in the production clusters of Kiwi growing states/Areas such as the mid hills of Himachal Pradesh, Uttar Pradesh, J & K, Sikkim, Meghalaya, Arunachal Pradesh and Kerala where adequate quantities of surplus raw materials can be available for processing.

2.2 INSTALLED CAPACITY OF THE KIWI READY TO SERVE PROCESSING UNIT

The maximum installed capacity of the Kiwi ready to serve manufacturing unit in the present model project is proposed as 150 tonnes/annum or 500 kg/day Kiwi ready to serve. 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, 5th year onwards 90 percent capacity utilization is assumed in this model project.

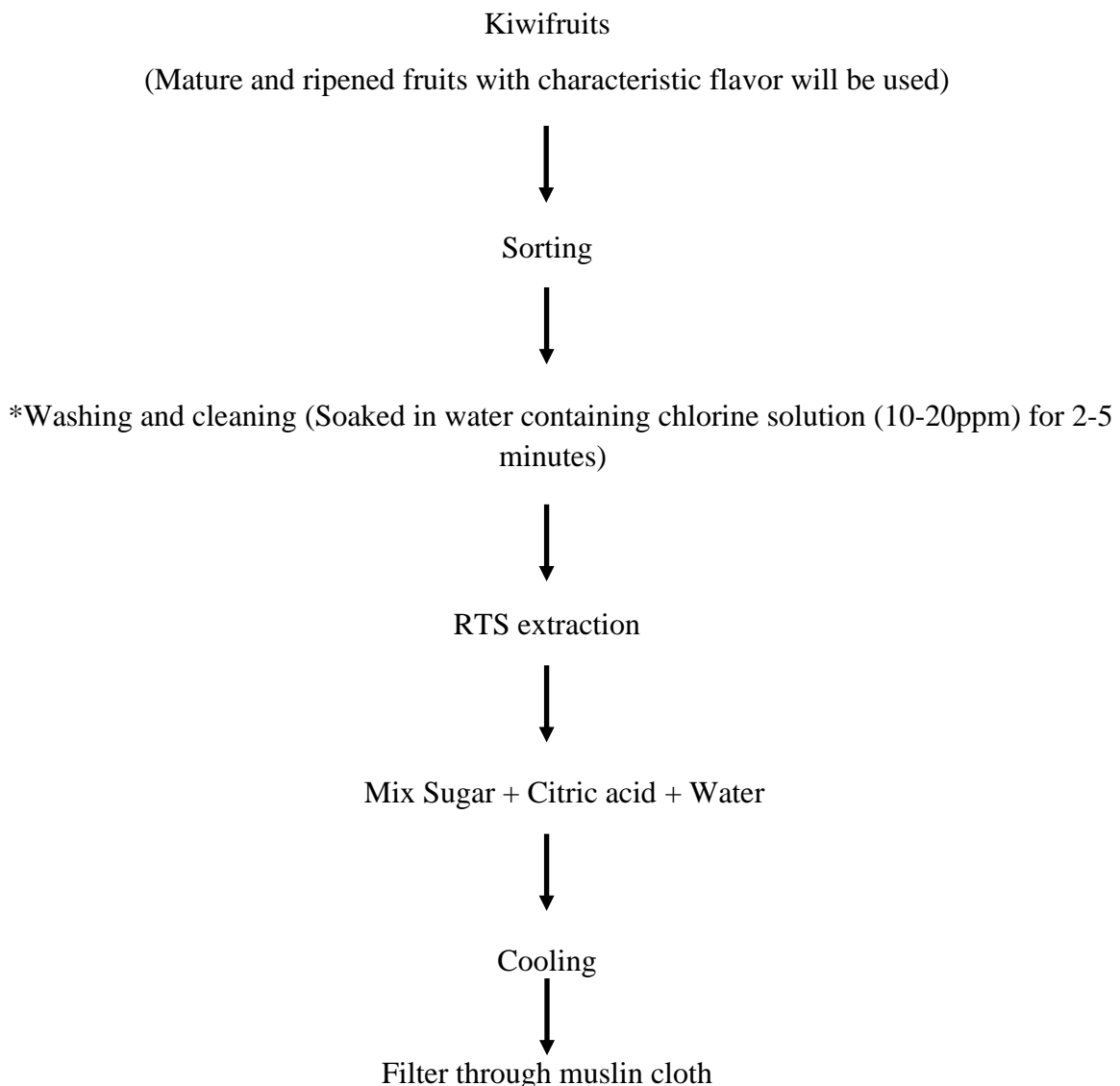
2.3 RAW MATERIAL REQUIREMENTS FOR THE UNIT

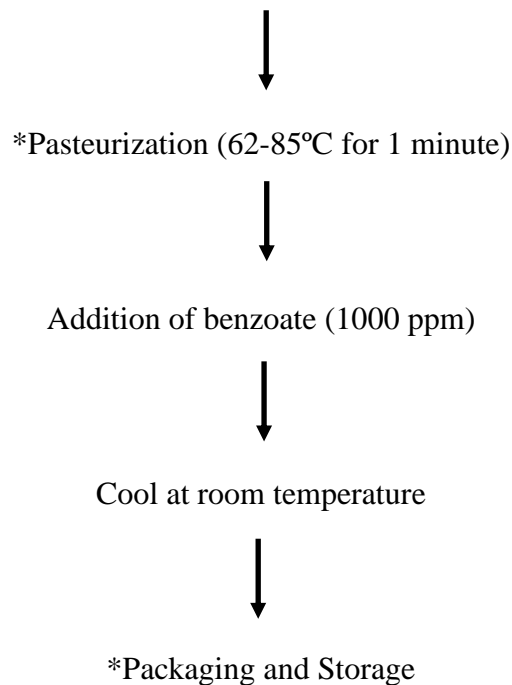
A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled. In the Kiwi ready to serve manufacturing project, the unit

requires 141.16 kg/day, 166.83 kg/day, 192.5 kg/day, 231 kg/day and 256.66 kg/day Kiwifruit at 55, 65, 75, 90 and 100 percent capacity utilization, respectively. The Mature Kiwi must be plucked from plant; and then stored below 6°C temperature.

2.4 MANUFACTURING PROCESS OF THE KIWI READY TO SERVE

The typical Procedure for manufacturing of Kiwi ready to serve is as below:





***Established Critical Control point**

Kiwi RTS is a complex product. A good understanding of the basic nature and properties of kiwi RTS is therefore needed for processing and packaging kiwi RTS. In fact, such knowledge is indispensable for ensuring that high product quality is maintained during RTS processing. The quality of kiwifruit is important for the characteristics of the final kiwi RTS product. Kiwi are natural products and therefore vary significantly in flavour, vitamin C content and colour according to the variety of kiwi, the time of season when harvested and the region of the world where they are grown.

Receiving of Kiwifruits: Fruit goes through inspection lines for removal of bruised or damaged fruits.

Washing and cleaning: The fruits are graded and soaked in water containing chlorine solution (10-20ppm) for 2-5 minutes, scrubbed by revolving brushes, rinsed with clean water, and inspected again to remove the damaged ones.

RTS extractor: RTS is extracted by pressing of whole kiwi to get juice in machine. These extractors produce RTS free of peel extractives.

Filtration: Clarification is done to separate RTS by removing pulp. Extracted fruit RTS contains varying amount of suspended solids – broken fruit tissue, seed, skin & various gums, pectic substances and proteins in colloidal suspension. After Juice extraction, the juice is clarified and separated from the pulp. The mechanical separation of sieving is used as the final process. The pulp strain containing seeds, sacs further subjected to pulp washing and recovery.

Pasteurization: Pasteurization deactivates the enzymes present in the RTS and makes the RTS microbiologically stable. It is carried out using tubular or plate heat exchangers. RTS beverages is more sensitive to microbial contamination and also dissolved oxygen causes vitamin-c deterioration during storage. Hence pasteurization is major concern in RTS processing to enhance the shelf life of RTS beverage. In pasteurization tank kiwi RTS is preheated at 74°C and then pasteurized to kill bacteria. Two main aim of pasteurization of RTS beverages are

- 1) To deactivate enzymes
- 2) To make the RTS microbiologically safe.

Packaging: Different types of packaging including cans, bottles, cartons, drums and barrels made up of glass, metals, plastic, or laminates are used for the packaging of Kiwi juice.

2.5 MARKET DEMAND AND SUPPLY FOR KIWI READY TO SERVE

Kiwi Fruits and peel were processed into various value added products like Kiwi jam, Kiwi jelly, Kiwi marmalade, Kiwi sherbets, Kiwi puree, Kiwi Nectar, Kiwi Juice, Kiwi Juice concentrates, Kiwi wine, Kiwi canned slice, Kiwi frozen slices and Kiwi dried slices. Due to sensitivity to chilling injury and limited shelf life of Kiwi fruit, it becomes important to process it in the form of RTS to reduce the surplus in the market in its peak season of production. Preservation of fruit in the form of RTS has turn out to be the business activity of great significance and countries with rich fruit resources with short harvesting season are emphasizing more for establishes storage to keep

up quality of fruits, enhance shelf life and preserve fruit RTS for availability in off-season. Fruit beverages and drinks are one of the popular categories of beverages that are consumed across the globe. The fruit beverages and drinks are easily digestible, highly refreshing, thirst quenching, appetizing and nutritionally far superior to most of the synthetic and aerated drinks. In recent past the consumption of fruit based beverages and drinks has increased at a fast rate.

2.6 MARKETING STRATEGY FOR KIWI READY TO SERVE

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 Kiwi fruit based products.

2.7 DETAILED PROJECT ASSUMPTIONS

This model DPR for Kiwi ready to serve 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 juice 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. Kiwi cost considered @ Rs.75/-per kg.
 2. 1 kg Kiwi will produce 30% 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 Kiwi RTS mfg. Unit	150	MT/annum
Utilization of capacity	1st Year Implementation, 55% in second, 65% in third, 75% in fourth, 90% in fifth year 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	75	
Average sale prices per Kg	120	Rs/kg
Pulp extraction	30	
Kiwi RTS	1 Kg Kiwi RTS from 0.51 kg Kiwi fruit	

2.8 FIXED CAPITAL INVESTMENT

2.8.1 MACHINERY AND EQUIPMENT

Sr No.	Equipment	Capacity	Area (ft)	Quantity	Price (Rs. In Lacs)
1	Cold store	1	9.2 x 8.6 x 10	1500 kg	6
2	Fruit washer	1	6 x 4	100 kg/hr	1.5
3	Pulper	1	3 x 4	100 kg/hr	1
4	Sugar syrup preparation tank	1	3 ft dia.	100 liters	0.8
5	Mixing/blending tank	1	3.5 ft dia.	100 liters	0.6
6	Filter press	1	3 x 2	100 liter	0.6
7	Homogenizer	1	4 x 6	100 liters/hr	1.8
8	Pasteurizer (PHE)	1	7 x 6	100 liters/hr	1.6
9	Filling & Capping	1	8 x 4	Suitable	1.4
10	Weighing balance	1		Suitable	0.06
11	Accessories	1		Suitable	0.5
				Total	15.86

2.8.2 OTHER COSTS:-

Utilities and Fittings:-

Utilities and Fittings	
1. Water	Rs. 0.8 Lacs 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 31.97 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	Year 2 (70%-70 MT)	Year 3(80%-80MT)	Year 4 (90%-90 MT)
Raw material stock	15 days	3.70	4.37	5.96
Work in progress	15 days	7.40	8.74	11.92
Packing material	15 days	0.90	1.06	1.45
Finished goods' stock	15 days	5.16	6.10	8.31
Receivables	30 days	10.32	12.19	16.62
Working expenses	30 days	1.12	1.32	1.80
Total current assets		28.59	33.78	46.07
Trade creditors		0.00	0.00	0.00
Working capital gap		28.59	33.78	46.07
Margin money (25%)		7.15	8.45	11.52
Bank finance		21.44	25.34	34.55

2.10 TOTAL PROJECT COST AND MEANS OF FINANCES

Particulars	Amount in Lakhs
i. Land and building (20 x 32 x 12 ft - LxBxH)	5.16
ii. Plant and machinery	15.86
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	7.15
Total project cost (i to vii)	31.97
Means Of finance	
i. Subsidy	10.00
ii. Promoters Contribution	7.67
iii. Term Loan (@10%)	14.28

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

	Particulars	1st Year	2nd Year	3rd Year	4 th Year	5th year	6th year
A	Total Installed Capacity (MT)	77 MT					
	Capacity utilization (%)	Kiwi/Annum	82.5	97.5	112.5	135	150
		Under Const.	55%	65%	75%	90%	100%
B	Expenditure (Rs. in Lakh)	0					
	Kiwi(Av. Price @ Rs. 75/Kg)	0.00	31.76	37.54	43.31	51.98	57.75
	Sugar @ Rs. 35/kg	0.00	3.47	4.10	4.73	5.67	6.30
	other material	0.00	0.16	0.19	0.22	0.26	0.29
	Packaging materials	0.00	9.90	11.70	13.50	16.20	18.00
	Utilities (Electricity, Fuel)	0.00	1.45	1.71	1.98	2.37	2.64
	Salaries (1st yr only manager's salary)	1.80	6.43	6.43	6.43	6.43	6.43
	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	2.60	56.47	65.06	73.66	86.41	94.91
C	Total Sales Revenue (Rs. in Lakh)	0.00	99.00	117.00	135.00	162.00	180.00
	Sale of Kiwi RTS (Av. Sale Price @ Rs.120/kg)	0.00	99.00	117.00	135.00	162.00	180.00
D	PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows	-2.60	42.53	51.94	61.34	75.59	85.09
	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	1.59	1.43	1.28	1.16	1.04	0.94
	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%	1.49	1.43	1.38	1.31	1.25	1.17
	Interest on working capital @ 12%	0.00	2.57	3.04	4.15	4.15	4.15
E	Profit after depreciation and Interest (Rs. in Lakh)	-6.05	39.32	48.95	58.57	73.03	82.74
F	Tax (assumed 30%) (Rs. in Lakh)	0.00	11.80	14.69	17.57	21.91	24.82
G	Profit after depreciation, Interest & Tax (Rs. in Lakh)	-6.05	27.53	34.27	41.00	51.12	57.92
H	Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh)	1.49	1.43	1.38	1.31	1.25	1.17
I	Coverage available (Rs. in Lakh)	1.49	1.43	1.38	1.31	1.25	1.17
J	Total Debt Outgo (Rs. in Lakh)	0.50	0.55	0.60	0.67	0.74	0.81
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)	-4.09	29.30	35.87	42.45	52.44	59.10
M	Payback Period	2.5 Years					
	(on Rs. 31.97 Lakhs initial investment)						

2.13 REPAYMENT SCHEDULE

Year	Beginning	PMT	Interest	Principal	Ending Balance
1	1,428,916.21	198,218.09	148,607.29	49,610.80	1,379,305.41
2	1,379,305.41	198,218.09	143,447.76	54,770.33	1,324,535.08
3	1,324,535.08	198,218.09	137,751.65	60,466.44	1,264,068.64
4	1,264,068.64	198,218.09	131,463.14	66,754.95	1,197,313.69
5	1,197,313.69	198,218.09	124,520.62	73,697.47	1,123,616.22
6	1,123,616.22	198,218.09	116,856.09	81,362.00	1,042,254.22
7	1,042,254.22	198,218.09	108,394.44	89,823.65	952,430.57
8	952,430.57	198,218.09	99,052.78	99,165.31	853,265.26
9	853,265.26	198,218.09	88,739.59	109,478.50	743,786.76
10	743,786.76	198,218.09	77,353.82	120,864.27	622,922.50
11	622,922.50	198,218.09	64,783.94	133,434.15	489,488.35
12	489,488.35	198,218.09	50,906.79	147,311.30	342,177.05
13	342,177.05	198,218.09	35,586.41	162,631.68	179,545.37
14	179,545.37	198,218.09	18,672.72	179,545.37	(0.00)
		2,775,053.24	1,346,137.03	1,428,916.21	(1,428,916.21)

2.14 ASSET'S DEPRECIATION

Assets' Depreciation (Down Value Method)	Amounts in Lakhs							
	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Civil works	5.16	4.90	4.66	4.42	4.20	3.99	3.79	3.60
Depreciation	0.26	0.25	0.23	0.22	0.21	0.20	0.19	0.18
Depreciated value	4.90	4.66	4.42	4.20	3.99	3.79	3.60	3.42
Plant & Machinery	15.86	14.27	12.85	11.56	10.41	9.37	8.43	7.59
Depreciation	1.59	1.43	1.28	1.16	1.04	0.94	0.84	0.76
Depreciated value	14.27	12.85	11.56	10.41	9.37	8.43	7.59	6.83
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	21.82	19.86	18.08	16.48	15.03	13.71	12.52	11.45
Depreciation	1.96	1.77	1.60	1.45	1.31	1.19	1.08	0.98
Depreciated value	19.86	18.08	16.48	15.03	13.71	12.52	11.45	10.47

2.15 FINANCIAL ASSESSMENT OF THE PROJECT

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

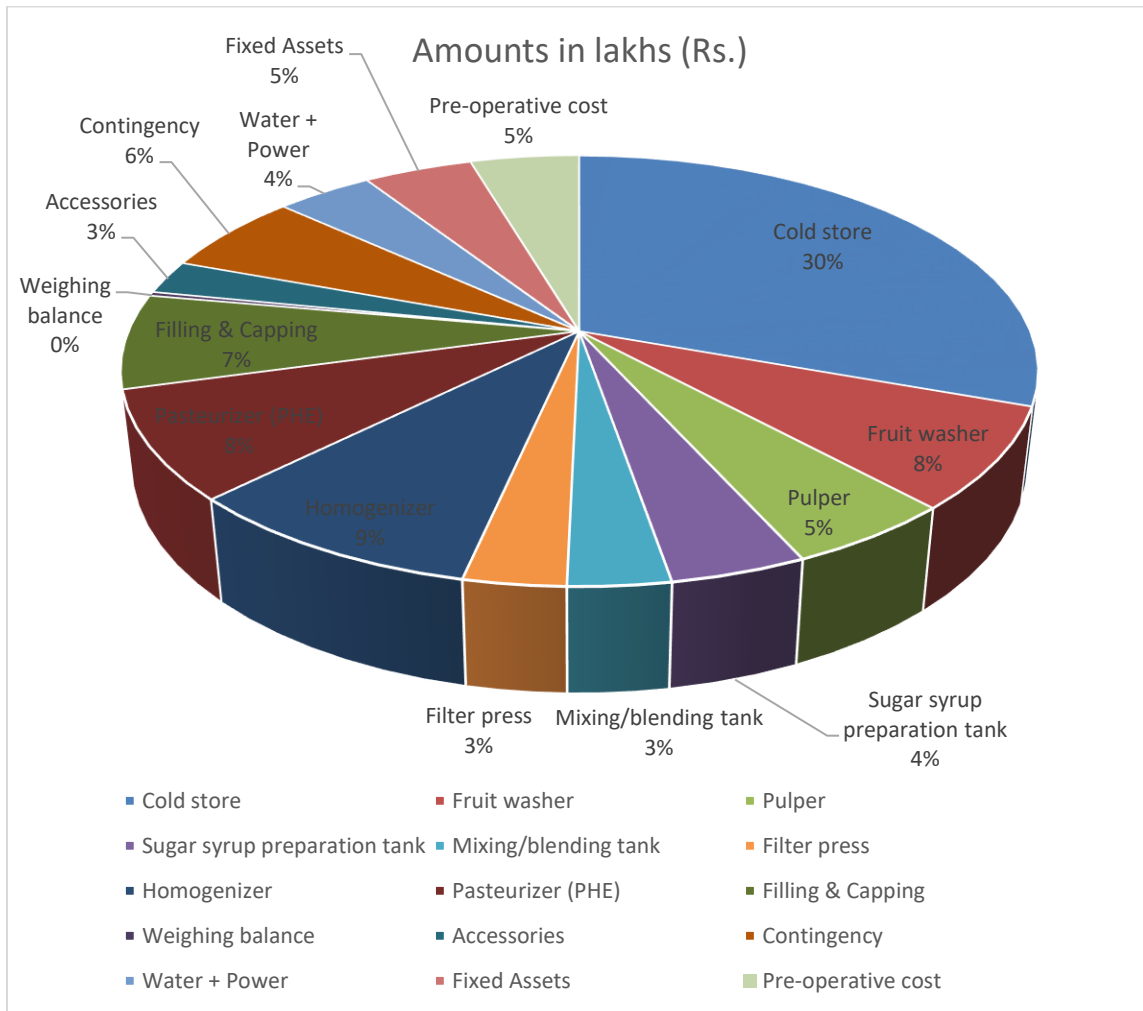
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year	
Capital cost (Rs. in Lakh)	31.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recurring cost (Rs. in Lakh)	2.60	56.47	65.06	73.66	86.41	94.91	94.91	94.91	
Total cost (Rs. in Lakh)	34.57	56.47	65.06	73.66	86.41	94.91	94.91	94.91	600.89
Benefit (Rs. in Lakh)	0.00	99.00	117.00	135.00	162.00	180.00	180.00	180.00	
Total Depreciated value of all assets (Rs. in Lakh)								10.47	
Total benefits (Rs. in Lakh)	0.00	99.00	117.00	135.00	162.00	180.00	180.00	190.47	1063.47
Benefit-Cost Ratio (BCR): (Highly Profitable project)	1.770								
Net Present Worth (NPW):	462.58								

2.16 BREAK EVEN ANALYSIS

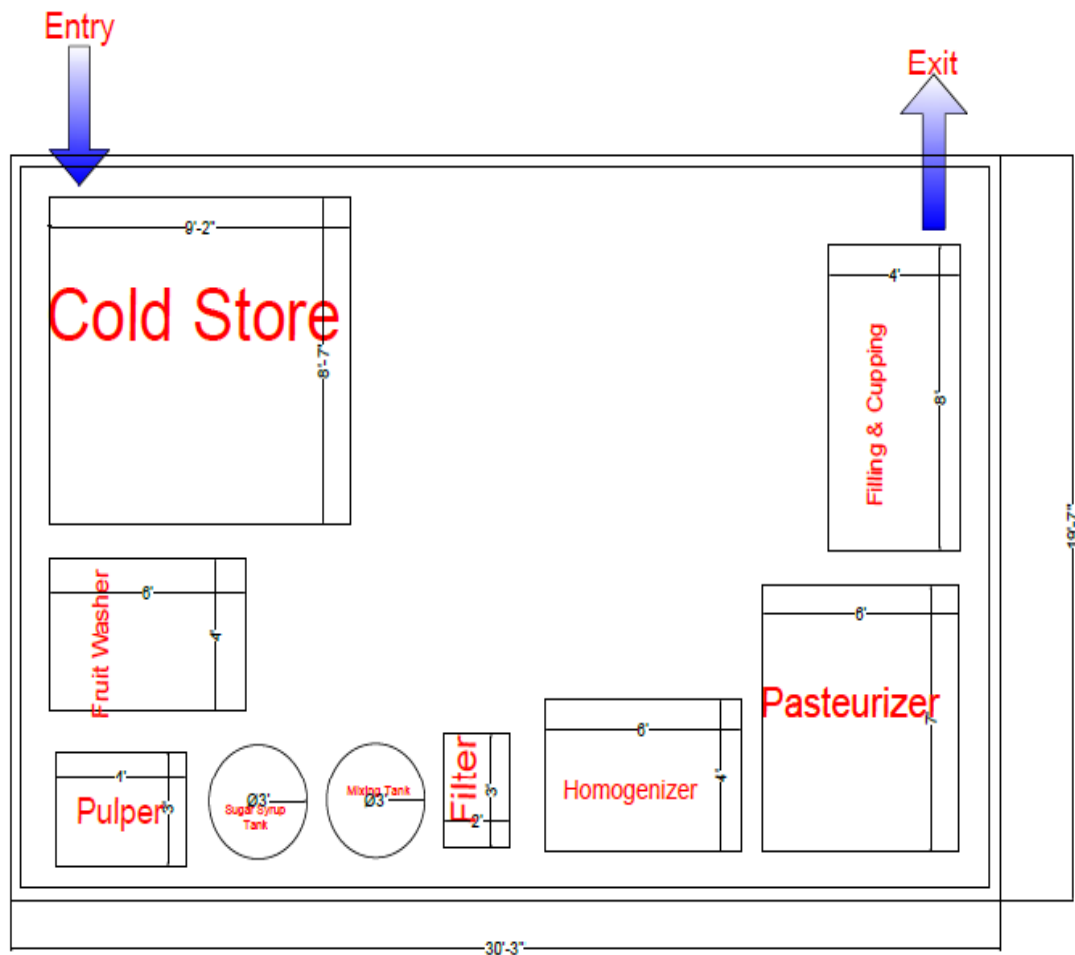
Break even analysis indicates costs-volume profit relations in the short run. This is the level at which, the firm is in no loss no profit situation.

Particulars	1st Year	2nd year	3 rd year	4th year	5th year	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	6.432	6.432	6.432	6.432	6.432	6.432	6.432	6.432
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	1.59	1.43	1.28	1.16	1.04	0.94	0.84	0.76
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	1.49	1.43	1.38	1.31	1.25	1.17	1.08	0.99
Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Fixed Cost (Rs. in Lakh)	10.18	9.94	9.71	9.49	9.29	9.08	8.89	8.69
Sales Revenue (Rs. in Lakh)	0	99	117	135	162	180	180	180
Variable Cost (Rs. in Lakh)								
Kiwi (Av. Price @ Rs.75/Kg)	0.00	31.76	37.54	43.31	51.98	57.75	57.75	57.75
Sugar @ 35 per kg	0.00	3.47	4.10	4.73	5.67	6.30	6.30	6.30
Other material	0.00	0.16	0.19	0.22	0.26	0.29	0.29	0.29
Packaging materials	0.00	9.90	11.70	13.50	16.20	18.00	18.00	18.00
Casual staff salaries	0.00	4.93	4.93	4.93	4.93	4.93	4.93	4.93
Utilities (Electricity, Fuel)	0.00	1.45	1.71	1.98	2.37	2.64	2.64	2.64
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	2.57	3.04	4.15	4.15	4.15	4.15	4.15
Total Variable Cost (Rs. in Lakh)	0.50	56.94	66.01	75.71	88.45	96.95	96.95	96.95
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)	-	11.88	11.70	10.80	12.96	12.60	12.60	10.80

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



2.18 TYPICAL KIWI READY TO SERVE 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. 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.



Contact Us

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