



Pre-feasibility Study

FRUIT JUICE MANUFACTURING

January 2020

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Small and Medium Enterprises Development Authority
Ministry of Industries and Production
Government of Pakistan

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DOCUMENT CONTROL

Document No.	PREF-7
Revision	3
Prepared by	SMEDA- Sindh
Revision Date	January, 2020
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PROJECT PROFILE

1.1 OPPORTUNITY RATIONALE

The fruit juice industry coupled with beverage industry is considered to be one of the largest industrial sectors in Pakistan. As per new research report on Fruits and Vegetable Juices, Asia-Pacific, which includes Pakistan is forecasted to emerge as the region holding significant growth potential at a CAGR (Cumulative Annual Growth Rate) of 13.7% over the period 2017-2024.¹

Modernization of this industry, in consonance with the change in urban life style, massive shift of rural population to the urban areas, growth in population, etc., predict a growing potential for instant solutions in fruit juice segment of the beverage industry. Traditionally in Pakistan and generally all over the world people prefer to use natural drinks rather than carbonated soft drinks and this perception is gaining more currency day by day, which also adds to the advantage of the fruit juice industry.

Common people especially young generation is inclined to have ready to consume drinks; in addition hotels, hospitals are also increasing in number are day by day where juices could be marketed successfully. Moreover, the global trend of preferring fresh fruits and juices also marks possibilities of growth in this sector. Furthermore, the growing exports volume and withdrawal of CED (customs and excise duty) on fruit juices (produced locally) could further assist in significant growth in the fruit juice industry.

1.2 PROJECT BRIEF

Fruit juices are produced and consumed for their refreshing character and nutritional qualities being rich in vitamins and minerals and having regulatory functions to the body systems; such as argument of alkaline reserve of the blood and proper functioning of blood vessels, including capillary, permeability and fragility as a result of contained flavonoids. Juices also increase body retention of calcium, magnesium, nitrogen and are also good sources of quick energy. These qualities need to be maximized in technologies used to process fruit juices.

JUICE is generally defined as liquid extracted from the fruit, although many fruit juices are the results of expressing the liquid from the whole or cut fruit. There are some fruits where the distinction is not so apparent, e.g. fruits like mango, apple and banana when squeezed yields little or no juice; rather flesh is obtained which when comminutes will result in a dense puree and directly cannot be consumed as drink. Whereas in case of lemon, expressed fluid cannot be called juice, it is too sour to consume and can only be used as juice when diluted with sugar and water.

¹Keneath Research Addition

For commercial purposes, procedure involved in juice manufacturing varies from fruit to fruit. This process is a bit technical and lengthy which we will discuss in detail later in this document; however, broadly the fruit juice making process starts from fruit washing, drying, skin removing (normally for citrus fruits i.e. orange), deseeding, pulp macerating, pressing, pasteurizing and storage which is then used for producing fruit juices. The process takes place using fruit processing machinery and during the process, preservatives are also added in order to avoid microbial growth and increasing shelf life. During the discussions with the industry experts and business stakeholders it was found that usually C grade (A grade is of export quality, B is consumed locally) fruit is used for the juicing or pulping purposes.

For industrial scale manufacturing of fruit juice, pulp is used which is available round the year; on the other hand, fresh fruits are also being used for 100% pure juice production. However, based on our discussions with industry experts, we understand that business viability could be a question mark when fruit juice business starts with fresh fruits processing.

The primary objective of the fruit processing is to preserve the perishable fruits in a stable form or juice that can be stored and supplied to local and distant markets during all months of the year. Processing also can change fruits into new or more usable forms and make fruits more convenient to prepare.

In Pakistan, people generally prefer fresh fruit juice, which is extracted directly from the fresh fruit by using simple equipments like blender or squeezing machine. This type of micro scale commercial setups can be seen in mega cities and towns as an unorganized sector. However, preserved juices using tetra packs and other packaging forms and intended for direct consumption are obtained by the mechanical process from ripe fruits and subsequently preserved exclusively by physical means. The juice may be turbid or clear. The juice may have been concentrated and later reconstituted with water suitable for the purpose of maintaining the essential composition and quality factors of the juice.

It is absolutely necessary for someone starting a juice manufacturing operation to be familiar with the regulations and requirements of the market. For commercial purposes, it is important to define the differences (from other juice products) carefully and ensure that specifications and labeling are correct. There are circumstances where a 100 percent juice or puree product is impractical while dilution with other juices and/or water and sweeteners are practical, as long as the products are correctly identified. Water, sugar, organic acids and low cost bulk juices are much cheaper than higher value fruit solids. Thus, unlabelled dilution and adulteration practices are common in the market.

Following are the main types of fruit drinks:

- Sport or isotonic beverages
- Energy beverages
- Nutraceutical beverages
- Herbal beverages
- Smart beverages

- Fun beverages

Sport or Isotonnesic Beverages

These products are designed to replace fluids and electrolytes and provide extra energy during periods of intense exercise. Typically, they have a low content juice base of 5 to 10 percent juice, added levels of sucrose, glucose (less sweet).

Energy Beverages

These are designed to increase the consumers' perception that they could have more energy by either increasing the levels of sugars in the beverage or having a stimulant like caffeine. These can be marketed to office workers in cities or to laborers who need additional energy during a long day.

Nutraceutical Beverages

This category is designed to provide healthful benefits beyond the calories they contain and are aimed at reducing the risk of various diseases. These beverages can contain vitamin C from citrus, vitamin A from fruits or vegetable juices and a mixture of plant extracts that are believed by local consumers to promote good health.

Herbal Beverages

These are similar to Nutraceutical drinks, but are made by adding herbs to a beverage. A word of caution is necessary here - while many of these herbs are safe at low levels of consumption they can become toxic at higher levels.

Smart Beverages

This popular group of beverages is believed to increase mental capacities on a short-term basis. Some of these drinks contain carbohydrates, such as glucose that is readily absorbed. Smart beverages may contain local herbs assumed to be effective for increasing mental capabilities.

Fun beverages

This category of beverages is designed to have a maximum eye appeal and must taste very good. Some of these have suspended colored particles or have weird names that appeal to kids. Typically, fun beverages contain a minimal amount of juice, but a maximum amount of advertising and label hype.

Some common juice designations are given in the following table:

	Term	Criteria	Remarks
1	Pure juice 100%	All juice	No adjustment, not from concentrate
2	Fresh squeezed	Not pasteurized	Held refrigerated, Food-safety concerns
3	Chilled, ready to serve	All juice	Held refrigerated, made from concentrate or pasteurized juice
4	Not from Concentrate	Single strength	Reconstituted and pasteurized
5	Fresh frozen	Unpasteurized	Single strength, frozen after extraction
6	Juice blend	Unpasteurized	Single strength, frozen after extraction
9	Nectar	Pulpy or clear	Sugar, water and acid added, 25 to 50% juice
7	Juice blend	All juice	A mixture of pure juices
8	Puree	Pulp-containing	More viscous than juices, totally fruit
10	Nectar base	Requires reconstitution	Possesses sufficient flavor, acid and sugar to require water dilution for consumption
11	⁴ Juice drink	Low in juice	Contains 10 to 20% juice
12	Juice beverage	Low in juice	Contains 10 to 20% juice
13	Fruit + ade	Lemonade	Contains greater then 10% fruit juice, sugar and water
14	Juice extract	Water extract	Fruit extracted by water, then concentrated
15	Fruit punch	Token juice	1% juice, + natural flavors
16	Juice cocktail	Low in juice	Contains 10 to 20% juice
17	Natural flavored	Token juice	Usually greater then 1% juice

⁴ juice designations we have proposed for this pre-feasibility report

1.3 MARKET ENTRY TIMING

Beginning of summer (May, in most of the country regions) season is supposed to be the best time to start fruit juice marketing operations, where, production operations could be started from January to February Since fruit juice is considered to be a highly agro based industry, juice production should be started when fresh crop is coming into the market and pulp is easily available at low prices._This will also be highly dependable on what

fruit is being selected for juice production, however, for the purpose of this pre-feasibility we propose to go for Mango, Guava and Orange juices for which pulp is available throughout the year at reasonable prices.

Hot weather increases liquid consumption all over the country; and instantly available drinks become more attractive and valuable for the general public in metro cities and towns & for seasonal consumers (especially in Northern areas). All these conduce to a mass consumption of drinks in the form of plain water, carbonated drinks and fresh/instant fruit juices etc. People everywhere in general and in northern areas especially are inclined to use fruit juices for gaining extra energy, which supports extra physical activities. This is the most suitable time to market fruit juice.

Another thing that has to be taken into account before entering into this business is that usually in the peak seasons when fresh crops coming into the market people shift to the freshly extracted juices rather than preserved solutions.

1.4 PROPOSED BUSINESS LEGAL STATUS

The legal status of business tends to play an important role in any setup; the proposed Fruit Juice Manufacturing setup is assumed to operate on Partnership firm or SME company or Private limited. The reason being it is easy to setup and manage. Another thing is that people in Pakistan generally do not know the procedures involved in operating a private limited or public limited business setups.

1.5 PROJECT CAPACITY AND RATIONALE

1.5.1 Basis/Rationale

In recommending the plant capacity we have considered the following main factors:

- Current and future demand for the products in the local market.
- Availability of raw materials (fruit pulp) and the seasonal supply.
- The need to have a medium sized but manageable fruit juice processing plant.
- Discussions with the industry experts and entrepreneurs

1.5.2 Plant Capacity

The proposed project will have a capacity to produce **7,560 liters** (around 1259 trays of 24 packs in 250ml tetra pack servings) of fruit juice daily and the juice specifications and other details would be as follows:

Product Name	Juice Term	Fruit Pulp/Juice	Juice Criteria	No. of Trays Produced / Day
Guava Juice	Fruit Juice Drink	Containing 17% Juice	Low in Juice	315
Mango Juice	Fruit Juice Drink	Containing 17% Juice	Low in Juice	944

The plant will be operated at 70% capacity utilization for 12 hours a day in the beginning; however, a 5% annual increase in capacity utilization is assumed with a cap of 90%. Expansion to a higher capacity can be considered later and will mainly be dictated by the level of business performance.

1.5.3 Raw Material Sourcing – Backward Integration

To support the production operations, continuous supply of fruit pulp plays a key role for the success in the fruit juice business. Therefore, it is proposed for the fruit juice manufacturer to finalize the buying deal with the pulp processor six months prior to the commencement of the production operations. **The transporting the raw material as pulpe is not the issue as compared to marketability of finished goods because of its frozen form.**

1.6 PROJECT INVESTMENT

Total cost of the project is estimated at around Rs. 26.85 million. The working capital requirement is around Rs. 11.9 million and the rest will be the fixed capital. It has been estimated that *the proposed business will need to inject around Rs. 5 million* to meet requirements i.e. contingency cash for initial stages and to finance the receivables. *For this purpose a provision of Rs. 5 million has been included in the working capital.*

1.7 PROPOSED PRODUCT MIX

For the purpose of this feasibility, the product mix is assumed to be as follows:

S. No.	Fruit	Product Name	Product Specification	Packaging	Quantity	Selling Price (Rs.)
1	<u>Guava</u>	<u>Guava Drink</u>	Guava Pulp 17%, Treated Water, Sugar, Citric Acid, Natural Guava Flavor, Color and Preservatives	Tetra pak	250 ml	25
2	<u>Mango</u>	<u>Mango Drink</u>	Mango Pulp 17%, Treated Water, Sugar, Citric Acid, Natural Mango Flavor, Color and Preservatives		250 ml	25

Around 70% of the total fruit juice market is accounted for by 250ml tetra pack servings while the rest 30% includes 500ml and 1000ml packs. This shows significant convenience (from consumer's perspective) and high sales frequency in 250ml package category. Based on this market situation, it could be observed that the entrepreneur should focus more on small serving packs rather than one liter or other serving sizes.

Since a 100 percent juice or puree product is impractical especially in the case of fleshy/pulpy fruits i.e. mango, to convert them into consumable drink, dilution with other juices and/or water and sweeteners is required. Therefore, we have proposed the product mix as presented in the table above. It is expected to be practically workable and financially viable for an entrant in the fruit juice business. Another reason for proposing the above product mix is that high quality 100% pure juices would cover the

manufacturing cost only if provided in big size serving packs i.e. one liter or 1 ½ liter or bulk supply to contract customers and mass availability of fruit pulp is ensured, which is a difficult task for a new starter.

In the context of the aforesaid, it is suggested that a new entrant should consider the 100% pure juice production once the first course is complete and understanding of the typical business demographics, export market as well as contemporary fruit juice business skill is developed.

1.8 RECOMMENDED PROJECT PARAMETERS

Capacity	Human Resource	Technology/Machinery	Location
55% Capacity Utilisation	19	Both Local and Foreign	Major Cities
Financial Summary			
Project Cost	IRR	NPV	Payback Period
Rs. 48.92 million	38%	78,199,407	4.2

1.9 PROPOSED LOCATION

Location to setup a fruit juice-processing unit largely depends on the continuous (and at reasonable price) availability of raw material; however, factors like availability of work force, utilities and easy market access should be carefully assessed. The unit is majorly processing unit to be operated through electricity therefore availability of electricity in industrial zone is highly favorable while for better distribution of finished goods the major cities are best location for decreasing the transportation cost and claims of distributors.

Most of the existing fruit juice units are being operated in Lahore, Bahawalpur, Karachi, Hyderabad, Hattar (NWFP), Loralai, and Sargodha. For citrus fruits, Sargodha is the best location; and NWFP and Baluchistan are preferred locations for setting up processing units for apple, apricot, pear, grape, and pomegranate. Province wise proposed locations are provided below:

- Punjab - Lahore, Sargodha, Gujranwala
- Sindh – Hyderabad, Karachi
- NWFP - Malakand or Hattar Industrial State
- Balochistan - Loralai

Southern belt from Hyderabad to Sahiwal is supposed to be the potential area for fruit juice business. During the discussions with the industry experts, it was observed that in this region on average, daily fruit juice consumption is estimated at more than 15,000

trays (one tray comprises of 24 packs of 250ml). High population density and growth rate, people belonging to lower and middle income groups (but with income levels sufficient to buy small serving packs); easy availability of skilled labor and established agriculture and fruit farming base coupled with easy access to other facilities like water and utilities make this region fit for starting fruit juice business.

1.10 KEY SUCCESS FACTORS/PRACTICAL TIPS FOR SUCCESS

Fruit Juice Business is highly dependent on the trade margins given to the distributors and retailers; however, following additional factors are considered as important for success:

1.10.1 Backward Integration

Frequent and continuous availability of quality fruit pulp is a prerequisite for Fruit Juice Business. It is the only way to integrate operations from fruit orchards to pulp processing to juice making and packing. Integrated and earlier pulp supply arrangements with pulp producers and suppliers would be critical in business success.

1.10.2 Product Quality

Quality should be emphasized at each step right from the beginning to the marketing of the product. Over the years, an image of high quality products should be cultivated.

1.10.3 Distribution Network

Distribution network should be given extra emphasis. Market share could be gained by enhancing retailer and distributor margins. Normally distribution and retailer margins in fruit juice business are from 15 to 20%.

1.10.4 Branding and Promotion

After production of standardized and qualitative product, the branding and promotion of product is highly successful to aware the consumer and to be the part of market leading product and it needs proper advertising through print and electronic media along with other promotional activities.

1.11 PRODUCT MARKETING AND EXISTING COMPETITION

1.11.1 Existing Competition

Imported fruit juices are not more than 2% of the total quantity consumed locally; and are generally available on those departmental stores, hotels, and foodstuff specialty shops almost reserved for high income groups. Therefore, imported juices are not considered as direct or indirect competitors.

Competition from the formal sector might be with FROST and TWIST who are enjoying major share of the Punjab market in 250ml serving packs, where in Sindh, FROOTO is almost a household name in the same fruit juice category. However, there are other juice brands i.e. Golden, Tropicana, etc. which could be considered as likely competitors.

The major competition threat would be from informal sector units who are engaged bulk juice manufacturing. They produce chemical based, adulterated, fake juices using artificial flavorings and colors with minimum overheads and substandard juice manufacturing methodology, which result in low manufacturing cost and high margins for distributors and retailers. A detailed account of the local competitors and players has been provided in the second section of the report in sector analysis.

Despite the stiff competition, given the right marketing strategies, market penetration is still possible because the market is growing at an annual rate of 25% according to the Digest of Agricultural Statistics of Pakistan

1.11.2 Other Marketing Aspects

1.11.2.1 Seasonality of Demand

Processed food products are in great demand during July-December. This is the peak period for tourists and hoteliers as well as tour operators to stock the products in large quantities to cater for the increased number of arrivals. It is also a dry season when the fruit juices are in great demand by the local consumer.

1.11.2.2 Market Characteristics

Customers are sensitive to the quality, price, color, and size (weight) of the product. They would purchase the products frequently, immediately and with minimum effort; to the marketer of food-processed products, this calls for prompt and regular supply of the products and effective marketing/advertising.

1.11.2.3 Packaging

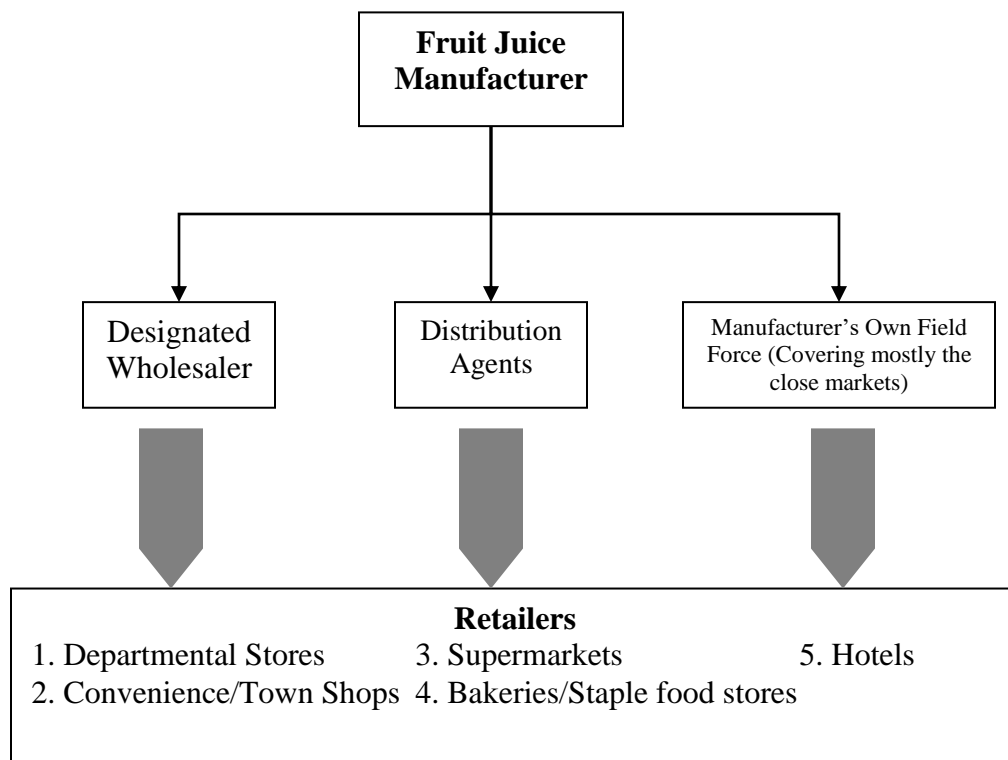
Processed food products are packed in tins/cans, Tetra packs and aluminum laminate pouch packaging in milliliters/liters or kilograms. The quantity of fruit juice products varies from 200 ml to over 1 ½ liter. Most of the local juice manufacturers penetrating the Pakistani market using tetra pack cartons, which come in 1 liter, 500ml and 250 ml handy packs.

Our study has shown that except in few cases, locally processed fruit juice products are characterized by poor packaging, labeling and absence of vacuum packing unlike the imported products, which are well packed and marked. Thus, appropriate and attractive packaging is one of the areas, which a new entrepreneur should strive to effect and maintain.

1.11.3 Product Distribution

The effectiveness of distribution coverage and practice is of paramount importance in achieving the desired fruit juice sales. Understanding of the distribution channels is crucial in order for the manufacturer to plan and implement an effective distribution strategy. Our study shows that the distribution of fruit products and juices is done through multiple channels involving producers, importers, wholesalers, retailers and users. While it is the common practice for the individual customers to buy the products from the retail outlets; institutional/ organizational buyers such as tourist hotels and agencies would normally place orders directly with the producers/importers and wholesalers.

A typical distribution setup in fruit juice business involves the following hierarchy starting from the manufacturer to the consumer:



Fruit Juices are consumed both in rural and urban areas without any exception and brand loyalty does exist for fruit juices i.e. Frooto in Karachi and Twist and Frost have a strong penetration in Punjab's urban and rural markets, whereas, low cost and cheap juices having token juice element are available in the rural areas.

As in case of other consumer goods, the effectiveness of distribution network for fruit juices is a function of similar parameters, i.e. distribution margins, frequency of distribution and product penetration. However, 'sale first pays after' type distribution strategy was also observed during the study in which usually new comers of the industry offers to the retailers to keep the fruit juice in their shop and pay as the product is sold.

The distribution and retail margin is around 15% to 20% for the fruit juice industry, which is relatively higher than the other consumer goods due to the strong competition.

A domestic producer is generally able to handle distribution within his home city and surrounding areas. Most manufacturers use their own sales force for distribution in the close local area. Very few market players in the fruit juice business have their own national scale distribution networking, e.g. Shezan.

For a fruit juice manufacturer, when he expands the market to another city (or one outside his local distribution capability) he normally signs up a distribution agent to cover the entire city market. Distribution agents generally work to target the city market (including hotels) and cover the full spectrum of retailers; however, a manufacturer can designate own distribution to the hotels where bulk delivery is expected in large packaging.

The wholesaler's main job is to sell and promote the manufacturer's product at one wholesale market. Manufacturers generally appoint a designated (or primary) wholesaler, either one per city, if the city is a bigger one and its markets cater to different non-overlapping localities, or one per wholesale market. Smaller cities move all of their consumer goods through a single major wholesale market. Sometimes manufacturers rent or buy a stand in the major wholesale markets of their home city and act as their own primary wholesaler, although this is rather uncommon.

Secondary wholesalers generally sell to small local retailers (convenience stores), although sometimes their products go onto tertiary wholesalers in even smaller localities. The retail price formation formula varies significantly for different products as they move through the above distribution channels. Generally speaking, lower-value bulk products are modestly marked up by manufacturers and wholesalers and rely on large volumes to achieve profitability.

Based on discussion with industry experts, it appears advisable to operate with a mixed distribution setup. For the purpose of the project under consideration, we propose that company owned distribution team would cover the home city and the factory surrounding areas to capture the niche market, which will provide business a room for survival whereas distant distribution operations will be outsourced to the distribution agents playing around the distribution margins and other promotional schemes. Designated wholesalers and secondary wholesalers may also play a key role in capturing far off markets for the product.

1.12 Product Marketing

1.12.1 Advertisement /Promotional Activities and Demand Creation

The marketing and promotional activities of fruit juice and related commodity groups are crucial in increasing the demand for fruit juices. These activities include, but are not limited to, promotion, advertising, new product development, and packaging innovations.

Marketers adopt their strategies in accordance with specified consumer wants and needs. They also create product image and influence consumer purchases. Often, consumer demands for processed food like juices are difficult to categorize. Consumers tend to purchase products and services that cover a broad spectrum of price and value combinations. Servicing the educated, nutritionally aware consumer who dwell in the localities i.e. Defence, Clifton, Gulshan-e-Iqbal etc. in Karachi and same type of consumer category in Lahore and other metro cities is a complex role, which marketers strive to master. In these type of areas, people use to have a pure fruit juice at least once a day, with an imported or prime local fruit juice. Similarly, this market could be catered through intensive marketing and promotion campaign on television or other sophisticated media.

New product developments in conjunction with technological advancements have improved the marketing of fruit juices like many other food items. Relatively recent innovations appearing on supermarket shelves are single serving aseptically packaged fruit juices, fruit roll-ups and fruit juice blends.

Marketing infrastructure, which includes refrigerated transportation facilities and the composition of retail and wholesale markets, is correlated to the consumer demand for high quality produce. Equipment that transports from the field to the supermarket, field wrapping machines, improved cooling techniques, and temperature controlled distribution centers have been developed to ensure the delivery of quality produce to retail outlets.

It is also important to ensure that the product has a meaningful point of difference i.e. sophisticated and healthy attractive packaging, less use of preservatives and clearly mentioning of purity of the juice etc. Most new products fail in the market because they are "me-too" products with no unique benefit (or attraction) for the consumer.

Generally for the fruit juice business advertising budget is around 3% of the Total Revenue but for a small or medium scale unit, it may vary (on the higher side).

Billboards, Television, Radio, F.M Channels, and Newspapers are the conventional mediums, which have been powerfully used for the promotion of fruit juice products.

1.12.2 Guidelines on Product Marketing

Road Side Stands

Roadside stands in the peak season of the fruit will be helpful for the juice producer to develop the brand awareness in a short time period, which would be coinciding with harvest schedules and weather circumstances and seasonality. Advantages of a roadside stand include the following:

- You can manage time more efficiently between factories and stand operations.
- Transportation costs are reduced.
- You can expand production to meet consumer demand.
- You can expand production as you improve your regional-sales ability.
- You can improve facilities as volume and returns increase.

Restaurants and Hotels

Selling directly to restaurants eliminates middlemen, which helps in increasing profit margins. By assuming traditional wholesaler functions, the juice producer can keep the profit that normally goes to the wholesaler. Often chef and restaurant owners are willing to make the extra effort to get high quality and specialty items, but they demand the same consistent quality and service from the producer that they can get from a wholesaler/importer—broad product line, partial cases of product, clean produce, frequent delivery schedules, convenient ordering, etc.

Urban, suburban, and tourist destination areas usually have the number and type of restaurants that could make selling directly to restaurants economically feasible. A restaurant's needs depend on its style of cuisine, chef's preferences, number of customers, and menu prices. Generally, restaurants that feature regional specialties, vegetarian dishes, or unique cuisine are the best candidates for direct sales. For example, restaurants in the Northern areas and metro cities could be the potential customers.

Frequently cited advantages for direct-to-restaurant/Hotels sale include:

- A higher wholesale selling price
- A potentially higher net profit
- A possible outlet for specialty or unusual products
- More precise production planning
- Effective counter competitive strategy aimed at wholesaler and established brands like Shezan, Maza who have a year-round products line and regular sale staff

1.12.3 Product Marketing Plan and Budget Expenditures

Marketing and promotion of a new fruit juice brand will be critical. Before going into the details of marketing and promotion it would be recommended to also take into account the following points:

- Fruit juices in smart neat packaging with clearly written specifications (i.e. 100% pure etc.) attracts consumer in first light. Therefore, if the juice is visibly placed on a separate stand in a neat and clean shop, it is likely to attract the consumer and there will be no requirement of pre-sale buy-in.
- Well balanced price and quality combination will be helpful to attract the consumer.
- Juice stands are good promotional mediums when placed in the restaurant of good reputation in terms of cleanliness and sophistication i.e. KFC, McDonalds, and

Pizza Hut (there could be other comparable hotels and restaurants). Although, this type of promotional format would be unconventional, yet it would be a unique point for marketing if somehow made possible.

Besides aforementioned options, the value and penetration of conventional mediums cannot be denied. We propose the following promotional formats for a new business entrepreneur:

Promotional Format/Activity	Frequency of advertisement and other details	Approximate Cost
1. Promotional gift schemes and special discount for distributors and retailers (e.g. 1 additional pack in each tray of juice)	Twice in a year and for one month period each	Rs. 400,000/-
2. Advertisement in the Local Television and Radio channel (i.e. FM radio channels or the national radio) ¹	5 to 10 spot ads (1 minute each) in summer season	Rs. 1,000,000/-
3. Co-branding with a local chain of restaurants / fast food / fueling station.	*	*
4. Inviting school children for a study visit to your factory and provide them free gift packs.	Once in a year and target 5 to 10 schools	Rs. 50,000/-

* For these types of advertisement and promotional activities, substantive logistic support and other resources like 100% pure juices in big packaging sizes or bulk production may be needed which perhaps would be difficult in the beginning; therefore it is suggested to avoid them during the initial operations and consider them after 3 to 4 years of business establishment.

¹ Average rate would be approximately US\$ 71 for a 30 second commercial (on the national radio channel of Pakistan).

2. SECTOR & INDUSTRY ANALYSIS

2.1 SECTOR CHARACTERISTICS AND OVERVIEW

Agriculture sector highly depends on the weather circumstances. God has gifted Pakistan with several varieties of fruits and vegetables. Modern processing and packaging techniques make seasonal fruits and vegetables available all year round to almost all parts of the globe. Tropical fruit like mangoes can be enjoyed in temperate countries.

The current global value of fruit trade has reached up to 75 billion dollars in 2018 and this figure has shown an average growth of 2 million tons each year as compared to last 10 years².

The global export of fruits juices, which stood at 16.1 million USD thousands in 2018, the leading exporter of fruit juices remained Brazil with 2.35 USD thousands. Globally, the fruit imports also registered to USD 16.85 Million USD thousands in 2018, while America remained top importer of the year with imports of fruit juice worth 2.36 million USD thousands³.

² Fruita Vegetable facts-FVF

³ Trade Map

Today, the world horticulture industry is a \$180 billion market comprising of the following sub sectors:

- Vegetables; fresh or preserved
- Fruits and nuts; fresh or preserved (excluding oil nuts)
- Fruit and vegetable juices (unfermented).
- Spices
- Bulbs, tubers, rhizomes of flowerings
- Cut flowers and foliage

The break up of the world horticulture market is Fruits 41%, Vegetables 39%, Juices 8%, Flowers 7% and Bulbs 5%.⁴

It is interesting to note that in terms of volume, Pakistan is globally ranked 10th for the production of Kinoo, 4th for the production of mangoes and 26th for the production of apples.

Pakistan produces a wide variety of fruits and vegetables, with total annual production estimated at 12 million metric tons. Production estimates for various fruits are given in the following table:

Fruit	Production in metric tons
Citrus Fruit	2,351,386
Mango	1,735,000
Apple	564,693
Guava	586,070
Apricots and other fruits	1,811,085

Source: fruit, vegetables and condiments statistics of Pakistan 2017-18

Provincial fresh fruits production share is provided below:

Province	% Share
• Punjab	65
• Sindh	14
• KPK	5
• Balochistan	16

Source: fruit, vegetables and condiments statistics of Pakistan 2017-18

Although mechanized grading and packaging has started but still nearly 50 percent of total fruit and vegetable production is reportedly lost during harvesting, transportation, preservation, and storage.

⁴ Source: Pakistan Horticulture Development & Export Board

2.2 SUB SECTOR INFORMATION

2.2.1 FRUIT JUICE INDUSTRY

Products, which come under beverage industry, are carbonated drinks, fruit juices, squashes, syrups, powder drinks and mineral water; for the purpose of this study, we are confined to the fruit juice segment.

The juice industry is expanding day by day by opening of hotels and hospitals where juices are successfully marketed. Fruit juice industry coupled with beverage industry is considered to be one of the largest industrial zones in Pakistan. Currently in Pakistan, there are 170 fruit juice/pulp processing units and a number of small units in the informal sector are working. The present installed capacity is estimated around 400,000 metric tons per annum with an estimated growth rate of 20% to 25% annually (EAC-2003 and discussions with the industry experts). ⁵The fruit juice market is estimated around 2.5 billion to 2.8 billion Rupees.

Most of the fruit juice manufacturing units are operating in Lahore, Sargodha, Bahawalpur, Hyderabad, Gujranwala, Hattar NWFP and Karachi. The following table presents a synopsis of some well known local and imported brands:

Table 2.2.1

Fruit Juice / Energy Drinks Brand	Company Name	Juice Category	Available in Packaging
1. Frost	Nestle	Token Juice (< 1%)	250ml Tetra Pak
2. Nestle	Nestle	100% Pure Orange Juice	1000ml Tetra Pak
3. Golden	Standard Fruits Ltd.	Token Juice	250ml Tetra Pak
4. Poly	-	Token Juice	250ml Tetra Pak
5. Mango Drink	Maaza Pakistan Pvt. Ltd.	Dense or Thick Mango	250ml Tetra Pak and Glass Bottle
6. Frooto	Frooto Industries (Pvt.) Ltd.	Token Juice	250ml Tetra Pak
7. Punch	Shezan International Ltd.	Both in 100% Pure Orange Juice & Mixed Fruit Blended	1000ml Tetra Pak
8. Caution	Shezan International Ltd.	Energy Drink (Not Actually Fruit Juice)	200ml Tetra Pak
9. Twist	Shezan International Ltd.	Token Juice	250ml Tetra Pak
10. Red Bull	Imported	Energy Drink (Not Actually Fruit Juice)	250ml Tetra Pak
11. Lacnor	Imported	100% Pure Orange Juice	1000ml Tetra Pak

⁵ Digest of Agricultural Statistics of Pakistan 2003

Following are considered to be the major players of fruit juice industry. Some of them have closed their operations due to political instability during the last five years e.g. Monalisa and Sunflo Cit-Rus:

S. No.	Name	S.No.	Name
1	Sunflo Cit-Russ	14	National Fruit Juices
2	Cargill Pakistan	15	Standard Fruits
3	Fresh Juices	16	Bambino Food Industry
4	Hyderabad Beverages	17	Fruit Sap
5	Shezan	18	FADCO
6	Milk Pak	19	Pakistan Fruit Juices
7	Indus Fruit Juices	20	Ali Hassan Corporation
8	Tops Foods & Beverages	21	Monalisa
9	Malik Food Industry	22	Kamran Distributors
10	Shaheen Foods	23	Popular Food Industry
11	Sinsas Enterprises	24	Benz Industries
12	Langar-e-Sulaimani	25	Mitchells
13	Nestle		

Shezan, Ahmed and Mitchell's largely considered market leaders in fruit and vegetable processing industry; yet, each of them has its own product specialty i.e. Ahmed enjoys an almost monopoly like situation in pickle and sauces segment while Mitchell's has been considered the market leader in Jams, Jellies and marmalades. Shezan has an edge over other with its own fruit farms. Currently Shezan is giving tough time to other fruit juice manufacturers due to its quality and huge export volume as well as capturing local fruit juice market where it has competition with Nestle. Most of them offer fruit juice in tetra packs where squashes and syrups are available in glass bottles.

Fruit Juice Industry – Potential Barriers

- A significant number of fruit juice manufacturers have imported cheap, second hand machinery, which is inefficient with high cost of production.
- The packaging material, such as glass bottles are inconvenient and expensive.
- Many manufacturers use small percentage of real fruit juice, rendering low quality product not offering a long life.
- Many units were established through bank loans. The project owing to various reasons could not generate sufficient funds to repay loans and have turned into sick units.
- Lack of infrastructure and limited budget for advertising & publicity.
- Most consumers continue to show a preference for fresh foods.
- High cost of processed food due to high input, processing, & packaging costs.
- Low income coupled with erosion in purchasing power
- Inadequate infrastructure facilities including storage & transportation facilities.
- Lack of awareness of standards required for processing of foods.

Tax Structure – Fruit Juice Industry

Duties and taxes are removed by Pakistan Government on export of fruit juice to other countries that's why fruit juice industry is growing rapidly in Pakistan. On the other hand import duty still exist and the sales tax is 17% on all categories.

Quality Control Issues

Government has laid down certain regulations, which include registration of food products with Pakistan Standard Quality Control Authority (PSQCA) and carrying a safety logo on the package. Failure to do so is punishable by fine and imprisonment.

3. MARKET INFORMATION

3.1 MARKET POTENTIAL

Installed capacity of fruit juices in Pakistan is around 400,000 MT. as provided in the EAC-2003 report, where exclusive sector growth rate for the fruit juice industry is not given, however, for beverage industry including fruit juice sector it is estimated around 20% to 25% per annum.

Pakistan's population for the year 2017-18 census is 207.7 million with a population growth rate of 2.40% per annum⁶. If we simply workout the total fruit juice consumption on population growth rate, we can safely observe that juice consumption will definitely increase. Moreover, current developments in the local and global economic scenario also add to the constructive growth in all sectors of the country. The improvement in economic affairs of Pakistan over the last few years, government's positive measures towards expansion of the industrial sector, revision of the duty structures and exemption from excise duty (especially for fruit juices), etc. are factors which are likely to further reinforce the development of the industrial sector.

3.2 TRADE STATISTICS AND INTERNATIONAL TARGET CUSTOMERS

There is a lot of potential to export fruit juice from Pakistan to other countries i.e. U.S., European Union, South Korea and UAE etc. Five years summary of trade data relating to fruit juice is provided in the following table:

⁶ Population census of Pakistan 2017

(US Dollar Thousand)

Year	2014	2015	2016	2017	2018
Exports	37568	30289	21786	26047	23134
Imports	19454	14360	15444	17356	8109

Due to Animal and Plant Health Inspection Services (AMPHS) regulations, the fresh fruits cannot be exported to USA from Pakistan. However, there is no restriction on export of juices. For the year 2018, Pakistan's fruit juice exports to USA have been \$2490, 000. Besides USA Pakistan is exporting fruit juices to the following countries as well

Country	FY – 2015 US\$ ⁷
Netherland	4,244,000
Spain	2,774,000
United Kingdom	2,183,000
Oman	1,464,000
Canada	1,435,000
Total	12,100,000

Though there is lot of export potential in fruit juice and allied products to the above countries, export market information available about the industry is not adequate which results in putting many limitations on the Pakistani exporters when exploring the new markets.

3.3 OPPORTUNITIES AND THREATS ANALYSIS

Opportunity

- Healthy organic and natural drinks oriented global and local culture.
- Limited options in locally produced real fruit juices.
- High Export potential.
- With good pre-harvest planning, which is around 50% of the total production, could be turned into potential business opportunity.
- Reduction in excise and import duties on food processing machinery.

Threat

- Unavailability of adequate industry statistics.
- Single product company
- High processing and packaging costs
- High cost of backward integration (availability of raw material)
- Threat from other fruit juice exporting countries (India and china who are already in foreign market).
- Price sensitivity and low consciousness towards quality amongst consumers.
- Wide availability of sub-standard (with token juice) substitutes.
- Heavy advertising from existing giant players.
- High cost to meet international quality standards.

⁷ Trade Map

4. PRODUCTION PROCESS

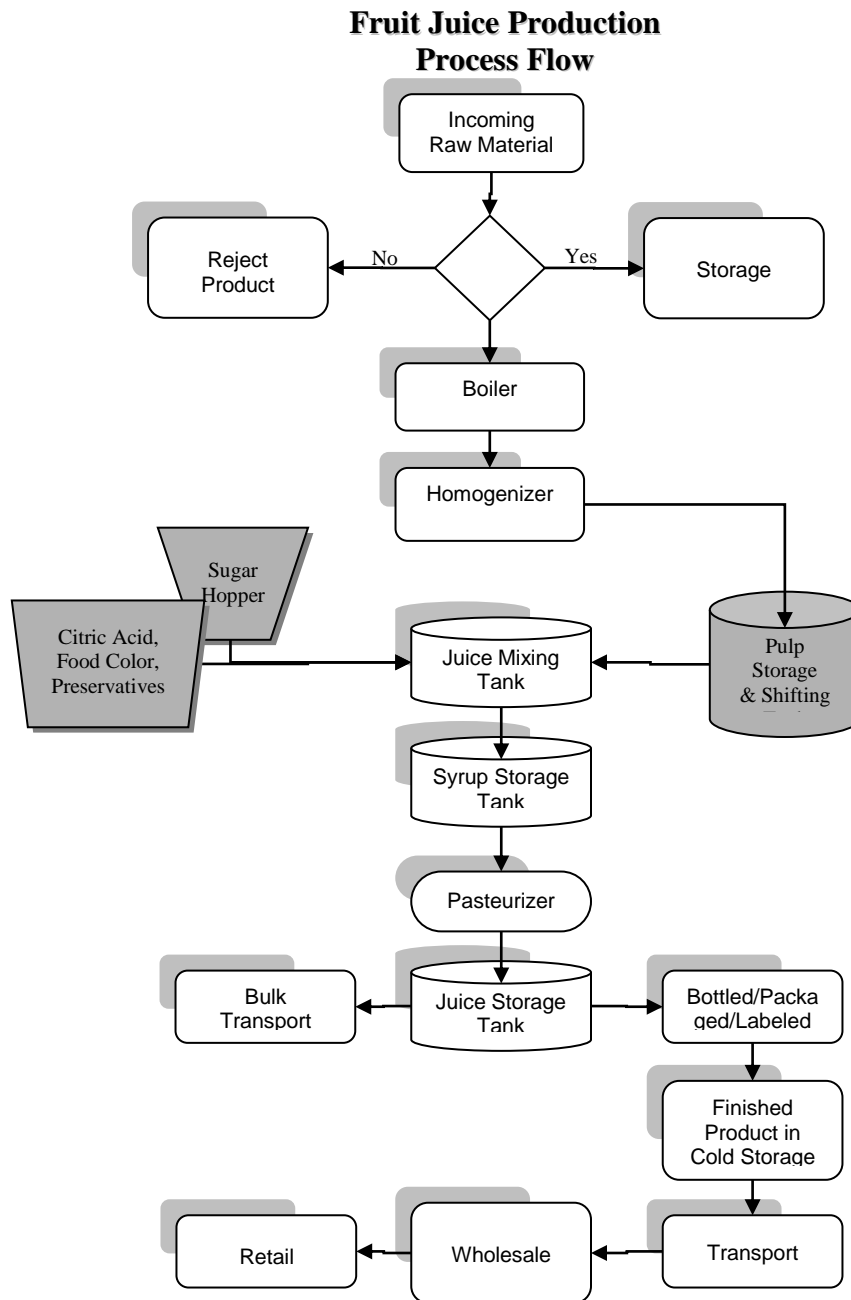
Fruit juice production procedures involved in fruit juice manufacturing depending on what type of the juice the unit is going to make. For the purpose of this pre-feasibility, we propose the 17% pure fruit juice drink of Citrus fruit (Orange), Mango and Guava.

4.1 FRUIT JUICE - PRODUCTION PROCESS FLOW

Production of fruit juices is a standardized process and type of technology depends on type of fruits, scale of operations and availability of investment financial resources. For the purpose of this pre-feasibility, the focus is on Citrus fruit (Orange), Mango and Guava juices. Initial preparatory processes for all fruits will be similar, as will be the last stages of juice/pasteurization section and packaging, although differences in handling juice composition arise in certain cases due to the nature of the fruit and percentage of pulp involved. Basically, preparation process of juices involves the following steps:-

- a. Boiling of fruit pulp
- b. Homogenization of pulp
 - i) Pulp Storage in Tank
 - ii) Sugar Hopper
- c. Pulp and ingredients mixing
- d. Syrup Storage in Tank
- e. Juice Pasteurization
- f. Juice Storage Tank
- g. Filling and Packaging
- h. Cooling and Storage

In the following pages the process flowchart and brief description of the various processes involved in fruit juice production is outlined.



i) Fruit Juice Production Process

Pulp is shifted to the boiler where it is cooked and shifted to the homogenizer where blending follows the finishing of the pulp. Pulp is then stored in the pulp storage tank. Pulp is then supplied to the mixing tank in the desired quantity while in mixing tanks, any additives to the pulp are made at this stage before it is pumped to syrup storage tanks. Blended juice is then pumped through pasteurizer; where it is heated to 90°C to inactivate enzymes and living organism. After pasteurization the juice passes through final filtration, before loading it into a juice storage tank. Juice from the tank is ready for packaging

ii) Packing

The juice will be then packed in the quantities demanded by the market. Consumer packs as we have proposed for this pre-feasibility will be in units of 250ml tetra packs.

iii) Storage.

Products will be stored in cool dry store before distribution.

4.2 RAW MATERIAL REQUIREMENT

Raw material required for manufacturing fruit juice are fruit pulp, citric acid, food color, sugar, preservatives and fruit flavors. Although, juice manufacturers use molasses to thicken the juice, this is not a good practice and therefore should be avoided. All raw materials are easily available in the local market, however, fruit pulp is considered to be the principal component of the high quality fruit juice, therefore, its continuous and within the required quantity availability will need some advance planning.


Fruit pulp could be purchased from open market or directly from pulp producers, however, it would be safe to sign a contract or negotiate with a pulp producer to insure the availability of pulp before the commencement of production operations. Prices for the fruit pulp have been collected from the market and are given below:

Fruit(s)	Purchasing Price/kg.
Guava pulp	Rs. 55
Mango pulp	Rs. 60

(Price quoted above are subjected to the volume and payment terms)

It is also observed that pulp prices fluctuate with the fruit prices and crop quality/quantity. Therefore, it would be a sane decision to firm up the pulp buying deal with the producer during the peak season of the fruit when it is available in low prices so that the unit could get into the value chain and get maximum discount and desired quantity. Seasonal availability calendar of the above fruits in Pakistan is as below:

Fruit	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Guava												
Mango												

 Peak Production Month

4.2.1 Other Raw Material

The ratio and utilization of other raw material depends on what percentage of pure juice the unit is going to produce; however, following are the main ingredients which will be required for the juice production proposed for this pre-feasibility:

- Treated Water 75%
 - Fruit Pulp 17%
 - Sugar
 - Citric Acid
 - Fruit Flavor
 - Preservative
- } 8%-10%

4.2.2 Packaging Material and Rationale

Packaging of processed foods has always been critical to decide, since health and safety matters have been of prime concern to all consumers who go for preserved food stuff. Fruit juice, being in liquid and drinkable form could be harmful for consumers' health because of high probability of microbial growth and little shelf life. That is the primary reason why 'tetra pack' packaging got enormous popularity vis-à-vis other packaging materials i.e. tin pack, aluminum laminate pouch pack, glass bottles and plastic bottles.

Though materials like aluminum laminate pouch packs, bottles of glass and plastic and tin packs are also safe for packaging food stuff; however, the material cost, availability and comparable cost and similar related factors make it difficult to prefer them over tetra pack.

In the following lines we have outlined our findings regarding different foodstuff packaging materials:

i) Aluminum Laminate Pouch Packs:

- It is not locally available and need to be imported.
- Juice manufacturer will have to import the material in minimum 3 ton quantity.
- Material for one 250ml pack will cost around 10 rupees, which is financially unfeasible.
- Machinery costs around 250 million Euros which when coupled with the raw material, appears to be very high.

ii) Tin packs:

- Locally available tin plates are not of good quality and food grade.
- Substandard tin plates reduce the shelf life of the product.
- Not safe for fruit juices

iii) Glass /plastic bottles:

Plastic and glass bottles are not feasible in small serving packs due to high cost of material and huge distribution logistics requirement.

4.2.3 Product Shelf Life

Fruit juice shelf is a matter of high importance and should be given ample attention before getting into the course of juice production operations. It was observed that generally most of the juice packs are provided with their shelf life written very clearly; however, it was observed that a juice in 250ml or in small serving packs have shelf life of less than 6 months, whereas, 100% pure juices in large packs are available with longer shelf life from 6 months to 1 year. Shelf life mainly depends on the preservatives, their quality/quantity and the production process followed.

4.2.4 TECHNOLOGY AND PROCESSES

Machinery required for the processing of fruit and juice packaging is available both local and imported. Local packaging machinery reportedly give poor quality output especially for fruit juice packaging which is considered to be highly sophisticated and hygienic; hence it could not be done by using local machinery. However, pulp processing and juice production could be done on locally fabricated machinery. Following machinery will be required for setting up a fruit juice plant:

- I. Fruit Juice Pre-Packaging Production Line
- II. Fruit Juice Filling & Packaging Line
- III. Fruit Juice Cooling and Refrigeration Machinery

4.2.5 MACHINERY REQUIREMENT

For the fruit juice production, packaging and storage both local and imported machinery can be used, however, for packaging it is proposed to use imported machinery rather than local machinery which is although a low cost option, yet do not provide good quality and quantity of output.

On the other hand for juice production and processing machinery; local machinery fabricators use local and imported material and parts (available locally), and their performance is considered to be as good as of imported plant in quality and output. It will also help in reducing the fixed cost of the project. Required machinery for the proposed project will include the following for which cost and other specifications are also being provided:

S. No.	Machine	Required No. of Units	Capacity	Per Unit Cost	Local/Imported
1	Boiler	1	2.5 tons	2,600,000	Local
2	Air Compressor	1	7 Bar	580,000	Local
3	Homogeniser	1	-	1,000,000	Local
4	Double Jecketed Pesturiser	1	1500 liter	500,000	Local
5	Sugar Hopper	1	500 k.g.	500,000	Local
6	Syrup Storage Tank (316 Grade Stainless Steel)	2	2000 liter	525,000	Local
7	Mixing Tank with Scale Moderator	2	500L	660,000	Local
8	Juice Storage Tank	4	1500 liter	435,000	Local
9	CIB Tank	3	1000 liter	2,658,000	Local
10	Pulp Storage & Shifting Tanks	3	1000 liter	547,000	Local
11	Turbine	1	1/2 Cusec	500,000	Local
12	Fork Lifter (Second Hand)	2	2.5 tons	450,000	Local
13	Shrink Wrapping / Tray Making Machine	2	200 tray/hr.	778,000	Local
14	Conveyor	1	-	500,000	Local
15	Straw Applicator	3	-	16,667	Local
	Total			12,249,667	

S. No.	Machine	Required No. of Units	Capacity	Total Cost (in million Rupees)	Local/Imported
1	Juice Packing Machine	1	4000 packs of 250ml/hr	8,023,488	Imported

S. No.	Machine	Required No. of Units	Capacity	Total Cost (in million Rupees)	Local/Imported
1	Electric Generator (Second Hand)	1	150 KVA	1,000,000	Local
2	Cold Storage Machinery & Equipment	-	500 sq. ft.	1,000,000	Imported
3	Tools & Equipment	-	-	200,000	-
4	Laboratory Equipment & Water Treatment	-	-	400,000	-
	Total			2,600,000	
	Total Machinery Cost			22,873,155 Rs.	

Source: Based on the information gathered from the market experts and other sources during the study

4.2.6 Packaging & Storage

To maintain the quality of product, it is proposed to have a cold storage facility for storing pulp and finished product. For this purpose refrigeration machinery and chilling room building has been included in the project cost.

4.2.7 Machinery Suppliers and Plant Fabricators

Some of the local fabricators of *fruit juice pre-packaging production machinery* are as follows:

- i. Installation & Fabrication Engineers (Private) Limited
21/22 K. M. Ferozpur Road, Lahore
- ii. Unique Engineering works (Private) Limited,
233-S, Industrial Estate, Township, Lahore

- iii. Central Engineering Services (Private) Limited,
119-S Industrial Estate, Township, Lahore
- iv. Two Star
Industrial Estate, Township, Lahore

For *refrigeration machinery* following could be contacted:

- i. Pakistan Air-conditioning Engineering Co. (Private) Limited
Gardee Trust Building, Napier Road, Lahore
- ii. Kold Kraft,
Industrial Estate, 247-S Kot Lakhpat, Lahore

4.2.8 Imported Machinery

Imported Plants from Italy and China are available comprising of main sections of the plant only, which is to be supplemented with ancillary local components. Offices of suppliers of foreign plants for fruit juice pre-packaging production line process are located at:

- i. Burtuzi, Lahore Cantt.
- ii. Tetra Pak, Upper Mall, Lahore

4.2.9 PLANT AND MACHINERY MAINTENANCE

Plant and Machinery is expected to be serviced on an annual basis. During the projection period, maintenance expenses are estimated to be around 1.5% of the cost of machine for first five years and thereafter rise to 2.5% for the next five years.

5. LAND & BUILDING REQUIREMENT

5.1 SITE DEVELOPMENT

The fruit juice processing project is estimated to require a total area of 12,000 sq. ft. This area will give ample space in the beginning for sitting buildings and different services necessary for the project i.e. juice processing and packaging machinery installation, storage and vehicle parking area, etc.

5.2 Land & Building Requirements for Fruit Juice Factory

Building requirements for the fruit juice factory would be as follows:

Details	Size/Area (Sq. Ft.)	Civil Works /Renovation Cost/Sq. Ft.	Total Renovation Cost
Factory / Covered Area			
Process Hall	5,000	350	1,750,000
Cold Storage	0	2000	0
Storage Godown (Raw Material)	3000	350	1,050,000
Factory Office	500	350	175,000
Other Services (water plant, boiler, tool shop)	500	350	175,000
Total Covered Area	9,000		3,150,000
Total Open Space for Parking Area	3,000	-	-
City Business Development Office / Guest Waiting Space	200	350	70,000
Total Land/Construction Cost	12,000		3,220,000

City Business Development Office (Small)

A small business development office will also be required within the nearest city to facilitate the overall business operations, meetings with wholesalers/distributors, marketing, distribution, order booking and market logistics etc. Monthly rental value of the Office would be around Rs. 100,000. Other details are provided in the table above.

Recommended Mode and Location*

Due to high investment on the purpose built construction for production, civil works and plant fabrication, the land is proposed to be on rent for minimum 5 year contract, whereas, for city business office from where marketing and other non-production operations would be carried out; space is proposed to be acquired also on rental basis. The details of the land and building with city office are provided in the table below:

Purpose of Land	Mode of Acquisition	Size	Total Cost/Monthly Rent	Expected Annual Increase in rent
Factory Space	On Rent	9,000 sq. ft.	Rs. 150,000	10%
City Office	On Rent	200 sq. ft.		

*Factory construction, land costs and the rental values are subjected to the site location, therefore could vary as the location would change
Source for Land Cost: BOI Website

The location for the factory is proposed to be *in major cities*. The rationale behind is that utilities, water, electricity and skilled manpower are easily available, whereas, its proximity to the fruit growers, good transport and communication facilities, and being a business center of the region also account for its selection (for more details see 1.9).

HUMAN RESOURCE REQUIREMENT

A total 24 persons will be required to handle the business operations of a fruit juice manufacturing unit. The business unit will work on one shift basis. Technical staff with relevant experience is sufficient to look after specific tasks at the plant while trained staff will be required for operating production plant and packaging machine. The staff will be provided training by the plant & machinery supplier.

Total approximate manpower required for the business operations along with the respective salaries are given in the table below:

Staff Title	No of Persons	Per Person Salary	Total Monthly Salary	Annual Salary
Production Staff (Factory)				
1. Business Unit Manager/Owner	-	-		
2. Factory Manager (Technical Manager)	1	100,000	100,000	1,200,000
3. Processing Supervisor	1	70,000	70,000	840,000
5. Electrician	1	30,000	30,000	360,000
6. Chemist / QA	1	30,000	30,000	360,000
7. Skilled Workers	2	25,000	50,000	600,000
8. Helpers	5	17,500	87,500	1,050,000
Total Factory Staff	11	272,500		4,410,000
General Administration/ Selling & Distribution Staff				
9. Selling & Distribution Incharge*	1	75,000	75,000	900,000
10. Selling & Distribution Officer*	2	50,000	100,000	1,200,000
11. Accountant/Cashier	1	50,000	50,000	600,000
12. Store Keeper	1	30,000	30,000	360,000
13. Purchase Officer	1	35,000	35,000	420,000
14. Guard/Chowkidar	2	18,000	36,000	432,000
Total G A / S & D Staff	8	258,000		3,912,000
TOTAL	19	530,500		8,322,000

* An amount equivalent to 10% of the targeted sales would be awarded as commission to the selling and distribution staff.

A chemist with bachelor degree in chemistry with some experience in food processing sector is recommended. The electrician should be a diploma holder and production and processing staff will be with sufficient (at least one year) experience in plant operations. However, awareness to food, safety, health and hygiene standards would be a pre-requisite for all the factory staff.

6. FINANCIAL ANALYSIS & KEY ASSUMPTIONS

The project cost estimates for the proposed “Fruit Juice Business” have been formulated on the basis of discussions with industry stakeholders and experts. The projections cover the cost of land, machinery and equipment including office equipment, fixtures etc. Assumptions regarding plant and machinery have been provided, however, the specific assumptions relating to individual cost components are given as under.

6.1 Land & Building

As we have given above, factory land would be purchased and space for city office will acquired on rent. Initial advance rent of 12 months would be paid for the possession of city office after which the rent will be payable on a monthly basis. In addition construction and renovation will cost around Rs. 100,000/- which will depreciate at 10% per annum using diminishing balance method. Total initial outflow for acquisition of land and city office would be as follows:

	Months	Rent
Advance Rent (City Office + Factory)	12	Rs. 1,800,000
Total		Rs. 1,800,000

6.1.1 Overall Factory & Office Renovation

To renovate the factory / office premises in Year 5 and Year 10 a cost would incur for which an amount equivalent to 5% of the total factory/office construction cost is estimated.

6.2 Factory / Office Furniture

A lump sum provision of Rs. 454,000 for procurement of office/factory furniture is assumed. This would include table, desk, chairs, and office stationery. The breakup of Factory Office Furniture & Fixtures is as follows:

Item	Quantity	Per Unit	Total Cost
Table & Chair for Owner	1	35,000	35,000
Tables & Chairs for Staff	6	30,000	180,000
Carpet for Office	1	15,000	15,000
Air Conditioner	2	65,000	130,000
Waiting Chairs	6	9,000	54,000
Sofa Set	1	40,000	40,000
Curtains & Interior Decoration only for city office		35,000	35,000
Electrical Fittings & Lights		35,000	35,000
Others		50,000	50,000
Total			574,000

6.3 Vehicles for Transportation

The proposed setup would require one vehicle to carryout all factory and office activities and to cater urgent delivery requirements, if any. The cost of vehicles is assumed to be Rs. 1,100,000.

6.4 Second Hand Power Generator

Due to the perishable nature of the product, finished goods and raw material (fruit juice and pulp) could be spoiled in case of power failure/non-availability. Therefore to cover up this risk, a second hand power generator with 100 KVA capacities will be purchased. A used generator of this capacity will cost around Rs. 1,000,000/-.

6.5 Depreciation Treatment

The treatment of depreciation would be on a diminishing balance method at the rate of 10% per annum on the following.

1. Plant & machinery
2. Land & Building Construction and Renovation
3. Vehicles
4. Furniture and Fixtures etc.

This method is also expected to provide accurate tax treatment.

6.6 Utilities

The proposed fruit processing machinery will be operated using electricity for running production, packaging, and refrigeration machineries. This would draw considerable amount of electricity. The cost of the utilities including electricity, Gas, Diesel/fuel (for power generator), telephone, and water are estimated to be around Rs. 21,720,000/- per annum. The utility expenses are assumed to increase at 10% per annum:

Utility	Total Monthly Cost (Rs.)	Total Annual Cost (Rs.)
1. Electricity	1,000,000	12,000,000
2. Diesel for Generator	400,000	4,800,000
3. Water	200,000	2,400,000
4. Telephone	10,000	120,000
Total	1,610,000	19,320,000

6.7 Working Capital Requirements

It is estimated that an additional amount of approximately Rs. 14.15 million will be required as cash in hand to meet the working capital requirements, contingency cash for initial stages and to finance the receivables. These provisions have been estimated based on the following assumptions for the proposed fruit juice business.

Cost	Amount in Rs.
First Three Months Salaries (Production staff)	11,02,500
First Three Months Utilities Charges	4,830,000
Inventory (Raw Material-1 Month)	4,326,424
Permanent portion of working capital in the form of Cash	5,000,000
Total	14,156,424

6.8 Plant & machinery Installation & trial run expenses

Plant and machinery installation and trial run expenses has been assumed to be around Rs. 400,000/-. It has been included in the plant and machinery cost.

6.9 Preliminary Expenses

A lump sum provision of Rs. 500,000 is assumed to cover all preliminary expenses like registration, documentation charges, etc. which will be amortized over the 5 years period.

6.10 Miscellaneous Expenses

Miscellaneous expenses of running the business are assumed to be Rs. 100,000 per month. These expenses include various items like office stationery, daily consumables, fuel expenses of vehicles, traveling allowances etc. and are assumed to increase at a nominal rate of 10% per annum.

6.11 Raw Materials Inventory

It is assumed that an initial raw material inventory for One month would be purchased the total cost of which would be around Rs.4.3 million. The cost of raw materials is expected to increase at the rate of 7% per annum for the projected period.

6.12 Finished Goods Inventory

The proposed setup is assumed to maintain a Finished Goods Inventory of 15 days of the total annual production.

6.13 Losses during Transportation and Delivery

As per our findings during the discussions with existing industry players and experts, losses during transportation and delivery are expected in fruit juice industry because of the delicate packaging. The losses are assumed to be around 0.5% of the total gross production.

6.14 Revenue Projections

For the revenue projections, fruit juice is assumed to be produced in 250ml Tetra pack with initial average price Rs. 600 per tray, which will increase by 5% annually. Of total juice production Mango juice will be 75% and Guava will be 25%

It has been assumed that it will take some time for the business to reach the optimal capacity utilization point for the projected period. Therefore the first year sales are assumed to be based on 70% capacity utilization and an annual increase of 5% in capacity utilization is assumed over the projection period. It is assumed that machine will operate at a maximum of 90% capacity utilization (around 8 working hours/day). It is also assumed that the sales price of the product will increase at 5% in the projected year 3, 6 and 9. A provision for wastage is assumed to be around 0.01% of the daily production.

6.15 Accounts Receivables

A collection period of 60 days is assumed for sales which are based on our findings during the discussions with the industry experts. A provision for bad debts have been assumed equivalent to 1% of the annual gross sales.

6.16 Accounts Payables

A payable period of 60 days is assumed for raw material purchases.

6.18 Taxation

The business is assumed to be run as a sole proprietorship; therefore, tax rates applicable on the income of an individual tax payer are used for income tax calculation of the business.

6.20 Owner's Withdrawal

It is assumed that the owner will draw funds from the business once the desired profitability is reached from the start of operations. The amount would depend on business sustainability and availability of funds for future grow

PROJECTED BALANCE SHEET

Projected Balance Sheet (Rs.)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current Assets											
Cash & Bank Balance	10,932,500	272,100	4,936,409	14,425,254	29,116,097	50,237,233	79,088,163	113,417,616	162,587,267	228,762,057	316,933,447
Raw Material Inventory	4,326,424	4,326,424	5,092,201	5,993,521	7,054,374	8,302,998	9,772,629	11,502,384	13,538,307	15,934,587	18,755,009
Finished Goods Inventory	0	2,314,146	2,660,687	3,063,520	3,532,206	4,077,965	4,713,968	5,455,680	6,321,262	7,332,045	8,513,092
Accounts Receivable	0	22,217,155	27,496,152	33,274,464	40,266,786	48,728,149	58,967,152	71,357,217	86,350,205	104,492,891	126,446,898
Prepaid Rent	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
Total Current Assets	17,058,924	30,929,825	41,985,448	58,556,759	81,769,464	113,146,346	154,341,913	203,532,897	270,597,040	358,321,580	472,448,446
Fixed Assets											
Plant Machinery & Facility	26,473,155	23,825,839	21,443,255	19,298,930	17,369,037	15,632,133	14,068,920	12,662,028	11,395,825	10,256,243	9,230,618
Factory Construction	3,220,000	2,898,000	2,608,200	2,347,380	2,112,642	2,062,378	1,856,140	1,670,526	1,503,473	1,353,126	1,378,813
Land for Factory	0	0	0	0	0	0	0	0	0	0	0
Furniture & Fixtures	574,000	516,600	464,940	418,446	376,601	338,941	305,047	274,542	247,088	222,379	200,141
Vehicle	1,100,000	990,000	891,000	801,900	721,710	649,539	584,585	526,127	473,514	426,163	383,546
Total Fixed Assets	31,367,155	28,230,439	25,407,395	22,866,656	20,579,990	18,682,991	16,814,692	15,133,223	13,619,901	12,257,910	11,193,119
Intangible Assets											
Preliminary Expenses	500,000	400,000	300,000	200,000	100,000	0	0	0	0	0	0
Total Assets	48,926,079	59,560,264	67,692,844	81,623,414	102,449,455	131,829,337	171,156,605	218,666,120	284,216,940	370,579,490	483,641,565
Owner's Equity	48,926,079	46,580,991	52,416,240	63,642,851	81,286,332	106,920,342	141,838,717	184,158,967	243,602,021	322,775,730	427,376,539
Short-term Liabilities											
Account Payable	0	12,979,273	15,276,604	17,980,563	21,163,123	24,908,995	29,317,887	34,507,153	40,614,920	47,803,760	56,265,026
Total Equity & Liabilities	48,926,079	59,560,264	67,692,844	81,623,414	102,449,455	131,829,337	171,156,605	218,666,120	284,216,940	370,579,490	483,641,565

PROJECTED INCOME STATEMENT

Projected Income Statement (Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net (Adjusted Sales)	88,868,620	109,984,606	133,097,854	161,067,146	194,912,598	235,868,609	285,428,868	345,400,820	417,971,563	505,787,593
Cost of Sales	75,647,091	86,734,816	99,600,924	114,545,456	131,920,384	152,138,705	175,685,142	203,128,728	235,137,616	272,496,484
Raw Material	51,917,091	61,106,416	71,922,252	84,652,490	99,635,981	117,271,550	138,028,614	162,459,679	191,215,042	225,060,104
Labor (Production Staff)	4,410,000	4,762,800	5,143,824	5,555,330	5,999,756	6,479,737	6,998,116	7,557,965	8,162,602	8,815,610
Utilities	19,320,000	20,865,600	22,534,848	24,337,636	26,284,647	28,387,418	30,658,412	33,111,085	35,759,972	38,620,769
Gross Profit	13,221,529	23,249,790	33,496,931	46,521,690	62,992,214	83,729,904	109,743,727	142,272,092	182,833,947	233,291,109
Gross Profit Margin	15%	21%	25%	29%	32%	35%	38%	41%	44%	46%
General Administrative & Selling Expenses										
Salaries	3,912,000	4,224,960	4,562,957	4,927,993	5,322,233	5,748,011	6,207,852	6,704,481	7,240,839	7,820,106
Rent Expense	1,800,000	1,890,000	1,984,500	2,083,725	2,187,911	2,297,307	2,412,172	2,532,781	2,659,420	2,792,391
Factory/Office Miscellaneous Expenses	-	-	-	-	-	-	-	-	-	-
Amortization of Preliminary Expenses	100,000	100,000	100,000	100,000	100,000	-	-	-	-	-
Depreciation Expense	3,136,715	2,823,044	2,540,740	2,286,666	2,057,999	1,868,299	1,681,469	1,513,322	1,361,990	1,225,791
Maintenance Expense	397,097	397,097	397,097	397,097	397,097	661,829	661,829	661,829	661,829	661,829
Marketing, Selling & Distribution	6,220,803	7,698,922	9,316,850	11,274,700	13,643,882	16,510,803	19,980,021	24,178,057	29,258,009	35,405,132
Subtotal	15,566,616	17,134,024	18,902,143	21,070,181	23,709,122	27,086,249	30,943,343	35,590,470	41,182,087	47,905,248
Operating Income	(2,345,087)	6,115,766	14,594,787	25,451,509	39,283,092	56,643,655	78,800,384	106,681,622	141,651,860	185,385,861
Earnings Before Taxes	(2,345,087)	6,115,766	14,594,787	25,451,509	39,283,092	56,643,655	78,800,384	106,681,622	141,651,860	185,385,861
Tax	-	40,518	3,008,176	6,808,028	11,649,082	17,725,279	25,480,134	35,238,568	47,478,151	62,785,051
Net Profit	(2,345,087)	6,075,248	11,586,612	18,643,481	27,634,010	38,918,376	53,320,249	71,443,054	94,173,709	122,600,809

CASH FLOW STATEMENT

Projected Statement of Cash Flows (Rs.)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash Flow From Operating Activities											
Net Profit	0	-2,345,087	6,075,248	11,586,612	18,643,481	27,634,010	38,918,376	53,320,249	71,443,054	94,173,709	122,600,809
Add: Depreciation Expense	0	3,136,715	2,823,044	2,540,740	2,286,666	2,057,999	1,868,299	1,681,469	1,513,322	1,361,990	1,225,791
Amortization Expense	0	100,000	100,000	100,000	100,000	100,000	-	-	-	-	-
(Increase) / decrease in Receivables	-	-22,217,155	-5,278,997	-5,778,312	-6,992,323	-8,461,363	-10,239,003	-12,390,065	-14,992,988	-18,142,686	-21,954,008
Increase / (decrease) in Payables	-	12,979,273	2,297,331	2,703,959	3,182,560	3,745,873	4,408,892	5,189,266	6,107,766	7,188,841	8,461,266
(Increase) / decrease in RM	-	0	-765,777	-901,320	-1,060,853	-1,248,624	-1,469,631	-1,729,755	-2,035,922	-2,396,280	-2,820,422
(Increase) / decrease in FG Inventory	-	-2,314,146	-346,541	-402,833	-468,686	-545,759	-636,003	-741,712	-865,582	-1,010,784	-1,181,046
Net Cash Flow From Operations	0	-10,660,400	4,904,309	9,848,845	15,690,844	23,282,135	32,850,931	45,329,453	61,169,651	81,174,790	106,332,390
Cash Flow From Financing Activities											
Receipt of Long Term Debt	0										
Repayment of Long Term Debt		0	0	0	0	0	-	-	-	-	-
Owner's Equity	48,926,079	0	-240,000	-360,000	-1,000,000	-2,000,000	-4,000,000	-11,000,000	-12,000,000	-15,000,000	-18,000,000
Net Cash Flow From Financing Activities	48,926,079	0	-240,000	-360,000	-1,000,000	-2,000,000	-4,000,000	-11,000,000	-12,000,000	-15,000,000	-18,000,000
Cash Flow From Investing Activities											
Capital Expenditure	-30,793,155					-161,000					-161,000
Factory/Office Furniture	-574,000										
Preliminary Operating Expenses	-500,000										
Security Deposit and Advance Rent	-1,800,000										
Raw Material Inventory (2 Months)	-4,326,424										
Net Cash Flow From Investing Activities	-37,993,579	0	0	0	0	-161,000	0	0	0	0	-161,000
NET CASH FLOW	10,932,500	-10,660,400	4,664,309	9,488,845	14,690,844	21,121,135	28,850,931	34,329,453	49,169,651	66,174,790	88,171,390
Cash at the Beginning of the Period	0	10,932,500	272,100	4,936,409	14,425,254	29,116,097	50,237,233	79,088,163	113,417,616	162,587,267	228,762,057
Cash at the End of the Period	10,932,500	272,100	4,936,409	14,425,254	29,116,097	50,237,233	79,088,163	113,417,616	162,587,267	228,762,057	316,933,447

ASSUMPTIONS

OTHER ASSUMPTIONS		
1	Depreciation	10%
2	Losses during Transportation and Delivery	0.5%
3	Bad debts (as % of gross sales)	1%
4	Wastage During production (as % of daily production)	0.01%
5	Plant and Machinery Annual Repair & Maintenance (as %age of total cost of plant)	
	For the first five years	1.50%
	After five years	2.50%
	Selling & Distribution Expenses + Marketing Expense	7.00%
INCREASE IN PRICE AND GROWTH		
6	Increase in the Raw Material Price (Annual)	7%
7	Increase in fuel and other consumables price	7%
8	Fuel Expenses/Annum (Generator)	300,000
	Monthly Rent - City Office	150,000
9	Expected Increase in Rent/Annum (City Office)	5%
10	Factory & Office Renovation (in Year 5 & 10)	5%
Factory Operations and Capacity Utilisation Assumptions		
	Capacity Utilisation at the beginning of the period	55%
	Increase in capacity utilisation (Annual)	10%
	Maximum Capacity Utilisation	90%
	Increase in Sales Price (in year 3, 6 and 9)	10%
	Operational Hrs./day	8
	Operational Days / Month	26
	Operational Months	12
	Annual Operational Days	312
Economy related assumptions		
	Electricity charges growth rate	8%
	Increase in Salaries	8%
	Oil and other consumables price growth rates	8%
	Increase in Misc. Expenses	8%
Cash Flow Assumptions		
	Accounts Receivable period (days)	60
	Accounts Payable period (days)	60
	Annual increase in selling price	10%
	Inventory (Raw Material Month)	1
	Finished Goods Inventory (Days)	15

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