



Horticulture Processing and Pulping Unit in Sindh

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Introduction

Pakistan is predominantly agrarian society and stands in world top ten producers of fresh fruits, vegetables, dairy and meat products. Pakistan produces a variety of fruits and vegetables like apple, mango, dates, banana, cherries, apricot, pomegranate, peas, carrot, tomato, onion, potatoes etc due to diverse climate as it is blessed with tropical, sub tropical and temperate climate.

Over the years, the agriculture sector's growth has increased manifold due to better yields and growers have brought more area under cultivation and hence increased the production output. Increased output has resulted in increased total national horticulture production levels. Productions and relative shares of fruits, vegetables in the total horticulture production for the year 2011-12 are shown in the following table:

Horticulture	Production Tons
Fruits	6,796,818
Vegetables	6,186,297

(Source: Ministry of National Food Security and Research, Government of Pakistan)

Major Fruits and Vegetable Production for the year 2011-12

Fruits	Cultivated Area (Hectares)	Productions (Tons)
Citrus	193,937	2,147,340
Mango	172,384	1,700,010
Dates	93,088	557,279
Apple	110,411	598,804
Guava	66,662	495,229
Tomato	57,215	577,803

(Source: Ministry of National Food Security and Research, Government of Pakistan)

In Pakistan, most of the fruits and vegetable produce is consumed in fresh form in the local market. The rest is used for value-added derivative products such as pulps & juice concentrates for the production of value added consumer products like juices, jams, ketchup etc. In year 2009-10, over 177,000 tons of fruit and vegetables were processed into 52,000 tons of different pulps and concentrates; annual exports being only 10,000 tons of pulp/concentrates, which are insignificant considering world's appreciation for superb aroma, flavor and taste of indigenous Pakistani horticulture produce.

Pulping Industry in Pakistan

There are around 23 industrial units engaged in Fruit and Vegetable Pulping out of which only few have State-of-the Art production facility catering for the needs of high end domestic and export markets meeting international standards including aseptic processed and frozen pulps and concentrates. The rest of the units produce chemically preserved pulps mostly catering for the needs of low end domestic markets. Many of such units have old plants comprising some local machinery and scrap components.



Province Wise Pulping Units

Province	Pulping Units
Punjab	16
Sindh	6
KPK	1
Baluchistan	0
Total	23

(Source: USAID Pakistan Firms Project)

Continuous increase in production of fruits and vegetables, coupled with rising population and short shelf life of fruits and vegetables, there is a growing domestic demand and a significant export potential for fruit and vegetable pulps and juice concentrates manufacturing. However, this sector needs to be developed with latest state of the art production facilities at par with international standards for competitive edge as compared to other exporting countries.

Overview

In Pakistan, Mango, Citrus and Apple are the three main fruits processed by the local pulping sector with mango being the most sought after product. In vegetables, tomato is the most commonly processed product used as tomato ketchup and tomato paste. Fruit and vegetable pulp production details for the year 2009-10 are provided as under along with fruit wise pulp and concentrate production:

Fruits/ Vegetables	Pulp Production (tons)	Fruit/vege Processed for Pulp (tons)	Concentrate Production (tons)	Fruit/vege processed for Concentrate (tons)	Total Fruit/Vege processed (tons)
Mango	26,500	45,000	0	0	45,000
Citrus	500	1,000	9,000	95,000	96,000
Apple	5,800	6,100	1,300	7,200	13,300
Guava	3,450	4,050	0	0	4,050
Peach	315	370	-	-	370
Strawberry	670	750	-	-	750
Banana	110	220	-	-	220
Falsa	100	125	-	-	125
Carrot	500	555	-	-	555
Tomato	-	-	4,050	17,000	17,000
Total	37,845	58,170	14,350	119,200	177,370

(Source: USAID Pakistan Firms Project)

On an overall basis, there is a capacity of processing 474 tons per hour of fruits and vegetables to manufacture pulp. Punjab has the highest share of 70.4% of this capacity; followed by Sindh with a share of 26.4%. The balance is contributed by KP.

Key Challenges of Pulping Sector in Pakistan

Most of the processing companies of Pakistan have not been able to successfully break into the world markets of fruits/vegetables pulps and concentrates markets. Along with issues in product quality, lack of adequate marketing knowledge, skills and efforts are the other important limiting factors. Export marketing entails high costs in activities like international travelling, participation in international trade fairs, etc. Moreover, following factors have also hampered the export potential such as:

- Diminishing Competitive Advantage in terms of increased raw material costs as agriculture input costs are rising; increased utility expenditures as well as more competitive market with competition from China and India.

- Lack of product diversification by processing sector of Pakistan by not focusing on multiple types of other value added products apart from pulps/concentrates. Some examples in this regard include:
 - Dried mango
 - Vegetable drying
 - Canning of fresh fruits

- Food sector in Pakistan requires urgent and necessary regulatory attention. Many of the fruits/vegetables processing facilities established in Pakistan do not meet the required international standards. As a result, the pulps/concentrates manufactured by such units do not meet the minimum health and safety standards and hence cannot be exported to earn a better yield.

- However, since the processing sector has mainly concentrated on the domestic market to meet existing demand from poor end market for cheaper products, this encourages them from making any heavy investments in machinery or building as they are earning revenue from low quality industrial product. In the absence of any pull from their customers, they keep producing low grade products.

- As mentioned above, these low end market products have no acceptability in the international markets. Therefore, this approach limits the potential of the low grade processors to enter into the export markets.

- Since, international market has a lot of export potential, the processing units with state of the art technology and equipped with aseptic processing technology can get export orders and earn better returns on their products.

The processing sector initially did not invest much in technology. They were manufacturing all the products chemically preserved pulps and this practice still continues. However, with the advent of awareness and enhancement of technology, the industry started switching to other modern preservation methods like freezing and aseptic processing of pulps. However, the local food laws were not changed to do away with chemicals use.

While the demand for high-end products increased significantly, the low-end consumer market also kept on growing with a steady pace. The demand for low quality cheaper pulps helped grow the low end pulping facilities. These pulping units have been developed from locally fabricated machines along with some components from imported scrap materials. The buildings under use do not fulfil the requirements of a standard food processing facility. The under skilled staff employed, on basis of their inadequate knowledge, produces low quality pulps which are sold to the low end market.

The real potential of pulping industry lies in export business especially, in the Middle East markets. A nominal portion of fruit and vegetable pulps/concentrates is exported while most of it is domestically consumed. The following factors preclude the local produce from entering the global markets:

- High prices of fruits and vegetables and other imported raw materials.
- Rising production costs comprising fuel and electricity.
- Poor international marketing skills and efforts.
- High costs of sales in the international markets.
- Competition from strong players in the region like China and India.
- Lack exposure and awareness in/about global markets.
- Product quality issues.

Project Rationale

As discussed above, agriculture produce/output has increased in the past few years due to better yield and increased area under cultivation. Increased output has made available more quantity of fruits/vegetables available for pulp and concentrates. Domestic demand for fruit juices, nectars, and drinks has grown consistently at a high rate. Moreover, there is also a strong demand for guava and mango pulp in international markets as well.

Most of the agriculture produce has a limited shelf life and requires post harvest management and storage facilities. In the absence of these, the produce is wasted. It is said that around 35%-40% of agriculture produce is wasted in Pakistan and it suffers a loss of US\$ 800 Million.

In Sindh, the three most widely fruits/vegetables available for processing are: mango, guava and tomato and there are only six processing units. In order to cater to domestic demand as well as export potential/demand, there is an opportunity to establish modern, state of the art guava / mango / tomato processing facility for production of nectars/ juices and tomato paste with aseptic packaging.

Production details of Guava, Mango & Tomato in Sindh & Pakistan

(Production '000' tones)

	Guava	Mango	Tomato
Sindh	80,000	650,000	180,000
Pakistan	560,000	1,750,000	550,000

Note: Two seasons for Guava (Winter - November to March); (Summer - April to August) in a year;

Mango (May to July) whereas Tomato is available (Jan – April) in a year.

In order to improve the viability of this project, the possibility of adding tomatoes as one of the products for making paste/puree is suggested. Products, such as tomato paste/puree/pulp have potential demand with local fruit/vegetable processors as well as the retail market. Establishment of tomato processing facilities in the country can contribute in reducing the dependence of local industry on imported tomato paste. The paste is currently being imported mainly from China, Iran and Turkey.

Objectives

SEDF intends to establish processing facility with an **experienced processor as a Joint Venture with a provision of buy back.**

The proposed processing capacity is 5 to 10 tons per hour of fresh fruits, aseptic packaging, and appropriate size cold store.

SEDF is also willing to provide temporary capital support (up to 5 years) for the project.

The project will inculcate efficiencies in the value chain of Guava, Mango, and Tomato leading to strong backward linkages and better farm prices for the farmers. The proposed facility will contribute towards reducing the post harvest losses, increasing employment opportunities in the area and maximizing crop value for the farmers.

Expected Outcome

- A joint venture with a known fruit processor to create synergies based on experience and knowledge.
- Produce international quality product for export and local market.
- To reduce post harvest wastages and introduce value addition

Market Analysis & Viability of the Project

Guava

Guava, a tropical fruit, originated in Central and South America, it is South Asia now that dominates the production of Guava. Pakistan today stands as the second largest producer of Guava with India as the largest producer in the world. It is one of the few fruits, which have two harvesting seasons one in summer and another in winter. There are two varieties of Guava, "apple guava" the most widely known, bearing green or yellow skin color and "strawberry guava" with red or orange skin color. Guava is a highly perishable fruit with a short shelf life, which necessitates processing and manufacturing of derivatives.

Pakistan produces around 560,000 tons of guavas annually with 59,000 hectares of land under its cultivation. Sindh is the second largest guava producer in the country with annual production at around 80,000 tons, at a total cultivated area of 24,000 acres. It is usually available for 3 months in a year. Larkana district is leading contributor in guava production accounting for 45% of Sindh produces annually. Main varieties produced in Sindh are Thadharmi (Pink- fleshed), Riyali Sindhi, Allahabadi (Seedless), Ramzani and Indian.

At the domestic level, Guava is mainly consumed as fresh fruit as internationally consumption of guava as fresh fruit has not yet taken foothold. Therefore, there lies a great opportunity in the international markets and large production volume (around 40%) which is wasted due to absence of cold storages and processing plants could be used for processing and resultantly export purposes.

Mango

Mango "King of Fruits" is one of the two most delicious and admired tropical fruits in the world along with pineapple. Mango is a highly nutritious and healthy fruit

containing rich quantities of pre-biotic fiber, vitamins A and C along with smaller quantities of vitamin B, proteins and minerals.

Pakistan is the 6th largest producer of Mangoes. In Pakistan, Chaunsa and Sindhri are the two important mango varieties used for making pulp. These have a different taste and it is difficult to shift the customers from Indian taste to Pakistani taste. This is the situation in spite of the fact that the Pakistani products are technically or nutritionally superior; since they have a higher Brix (sugar percent). Chaunsa mango pulp has a Brix of about 22-24; compared to 14-16 for Alphonso mango pulp. The taste and aroma of Pakistani mango is much better and in fresh fruit market, Pakistani mango is considered a superior product. This acceptability creates the opportunity where mango pulp made from the same superior mango can also capture its due share in the international markets.

The total annual production of Mangoes in Pakistan is around 1.6 – 1.8 million tons out of which 0.6 - 0.7 million tons comes from Sindh (40%). Average Export Price of mangoes from Sindh hovers around \$360 per ton while carefully processed and packaged mangoes from other countries conveniently fetch more than \$ 1000 per ton. Mangoes should be transported within 12 hours to cold storage or processing plant in order to prolong shelf life and preserve quality.

Tomato

Tomatoes are one of the most widely grown and commercially important vegetable crops and are valuable sources of food minerals and vitamins, particularly vitamins A and C. Processed and canned tomato sauces and ketchups are consumed by urban households, restaurants, hotels, hospitals etc. In Pakistan, business opportunities in processing of vegetables and fruit products are yet to be fully exploited.

In Sindh province, main districts where tomato is grown are Badin, Thatta, Mirpurkhas, Umarkot, Tando Muhammad Khan and Sanghar with annual production of over 175,000 tons. It is usually available round the year; however, its peak season is usually for 3-4 months in a year. Tomato, like other vegetables/fruits is a perishable commodity and has a shorter shelf life in normal temperature so problems are faced in the supply chain due to non-existence of a cold chain system in the country, which results in losses of product and drastic price variations.

Tomato Paste provides a way out with extremely positive outcome both commercially and financially. Indeed, tomato consumption by the food processing industry revolves around the availability of user-friendly intermediate products like tomato paste, puree, ketchup, and sauces.

Paste & pulp is differentiated mainly on the basis of BRIX (measure of solid contents in the pulp) Tomato concentrate containing more than 8% but less than 24% natural soluble solids (brix degree) is termed as Tomato puree. Tomato Paste 30%-32% Tomato Puree 12%-15% Fruit Pulp 10%-26% (source SMEDA prefeasibility report on Tomato).

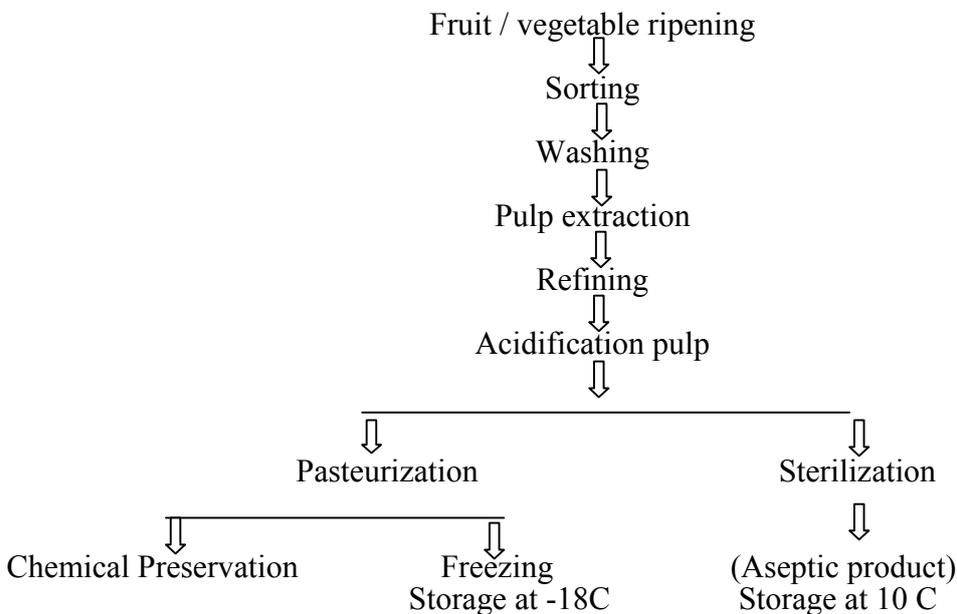
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Value Added Product Recovery from Fruits and Vegetables

Fruits	Value added product	Yield %
Mango	Pulp	55-60
Guava	Pulp	85
Tomato	Pulp	95
Tomato	Puree 15 Brix	24-26
Tomato	Paste 28 Brix	14

(Source: Profiling and Capacity need assessment of pulping units, by Mr. Tanveer-ul-Islam)

Process for Guava & Mango Pulp and Tomato Puree



Current Status

Company has been incorporated under the name of Larkana Horticulture Company Private Limited.

Land (4 acres) has been acquired at an appropriate location in Larkana.

Sindh Board of Investment has reached an understanding with Nestle Pakistan for technical assistance and possibility of buy back arrangement of product.

Project Size

Project capacity: 10 tons per hour for mango; 5 tons per hour each for guava and tomato.

List of proposed machinery: Mango De-stoner; Thermo break (continuous cooker); Two-stage refiner; Vacuum kettle for tomato puree production; Aseptic processing & packaging equipment with two filler (5 tons pulp/hour)

Project Location:

District Larkana (being the heart of Guava growing area with Mango fruit coming from adjoining districts).

Project Milestones

Tentative Financial Close by January 2015

Tentative Commercial Operations by June 2015

Project Cost:

Capital Cost*	PKR 272,700,000	USD 2,700,000
Working Capital*	PKR 37,370,000	USD 370,000

*Indicative

Feasibilities

Prospective investor is required to conduct the detailed feasibility of the project in the proposed region.

Incentives offered by Government of Sindh

Sindh Enterprise Development Fund offers technical and financial assistance for projects involving agri-business value chain.

Tax Holidays/Exemptions

Duty free import of machinery

Contact Information**Mehboob ul Haq**

Chief Executive Officer

Sindh Enterprise Development Fund

Block-B, 1st Floor, FTC Building, Shahrah-e-Faisal, Karachi.

Tel: 021-99207512-4, Fax: 99207515

Email: mehboob.haq@gmail.com; Web: www.sedf.gos.pk

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2. USAID Pakistan Firms Project Profiling and Capacity need assessment of pulping units by Mr. Tanveer-ul-Islam
3. Pakistan Horticulture Development and Export Board, Ministry of Commerce, Government of Pakistan; Prefeasibility on Tomato Paste Plant
4. Small and Medium Enterprise Development Authority, Government of Pakistan; Prefeasibility on Tomato Paste and Fruit Pulp
5. Sindh Board of Investment, Government of Sindh: Prefeasibility study on Guava Pulping and Squash Making Unit. Prefeasibility study on Mango and Dry Mango Products