
Pre-Feasibility Study

FRUIT PULPING & GRADING UNIT (MANGO & GUAVA)



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

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1 DISCLAIMER

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2 EXECUTIVE SUMMARY

Nature has blessed Pakistan with an ideal climate for growing a large variety of fruits, most notably Mango, Citrus, Guava, Apple, etc. The growing demand of fruit drinks, juices, processed fruit and value added fruit products in local / international market provides ample opportunities for investment in fresh fruit processing on commercial basis.

This particular pre-feasibility study is for setting up a Fruit Pulping & Grading Unit mainly for Mango and Guava. The proposed unit is a large size business venture and assumed to be located in the cities nearby to Mango and Guava producing areas, such as Multan, Rahim Yar Khan, Mirpur Khas, Lahore or Karachi where basic infrastructure is available for easy transportation of raw material and finished goods. The finished product is pulp of Mango and Guava (i.e. used as basic raw material for juices, ice creams and other value added fruit products) along with graded fruits to high-end super store.

The unit will have the installed capacity of producing 3,600 tons of Mango Pulp and 1,800 tons of Guava per year on seasonal basis Pulp. Similarly, installed capacity for Fruit Grading will be 6,000 tons per year. Initial operational capacity is assumed at 60% for both fruit pulping and grading while maximum operational capacity utilization is considered as 100%. This production capacity is estimated to be economically viable and justifies the huge capital as well as operational costs of the project. However, complete adherence to best agronomic practices is critical to the success of this project. Therefore, technical knowledge and experience of the entrepreneur is absolutely necessary. The entrepreneur will establish the proposed unit on purchased land along with carrying out the necessary civil works.

The Total estimated cost for setting up the proposed Fruit Pulping and Grading unit is Rs. 714.91 Million with fixed investment of Rs. 645.91 million and working capital Rs. 69.00 million. The project NPV is around Rs. 848.44 million, with an IRR of 32% and Payback Period of 3.94 years. The project will provide employment opportunities to 36 people.

3 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the

number, scale and competitiveness of SMEs", SMEDA has carried out 'sectorial research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

4 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in **Fruit Pulping and Grading Unit (Mango & Guava)** by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any investment decision.

5 BRIEF DESCRIPTION OF PROJECT & PRODUCT

Nature has blessed Pakistan with an ideal climate for growing a large variety of fruits, most notably Mango, Citrus, Guava, Apple, etc. Unfortunately, production of fruits in Pakistan has often not been accompanied by better post-harvest management and appropriate modernization of the processing techniques. It has

been observed that demand of value added fruit products, especially pulps, has increased tremendously due to its use as raw material for juices, ice cream, fruit yogurts and other similar items in both local and international markets.

Pakistan is the 5th largest fresh mango exporter of the world and has huge demand in the international market due to rich flavor, aroma, and health value, i.e., nutrients and minerals contents. However, we are nowhere in the export of mango pulp that has huge exporting potentials. Similarly, fruit juices and beverages industry is recognized as the leading industries, which also requires adequate supply of fruit pulp from the local market. Additionally, in order to cater for the demand of local super store / international markets our fruit processors requires modern processing facilities.

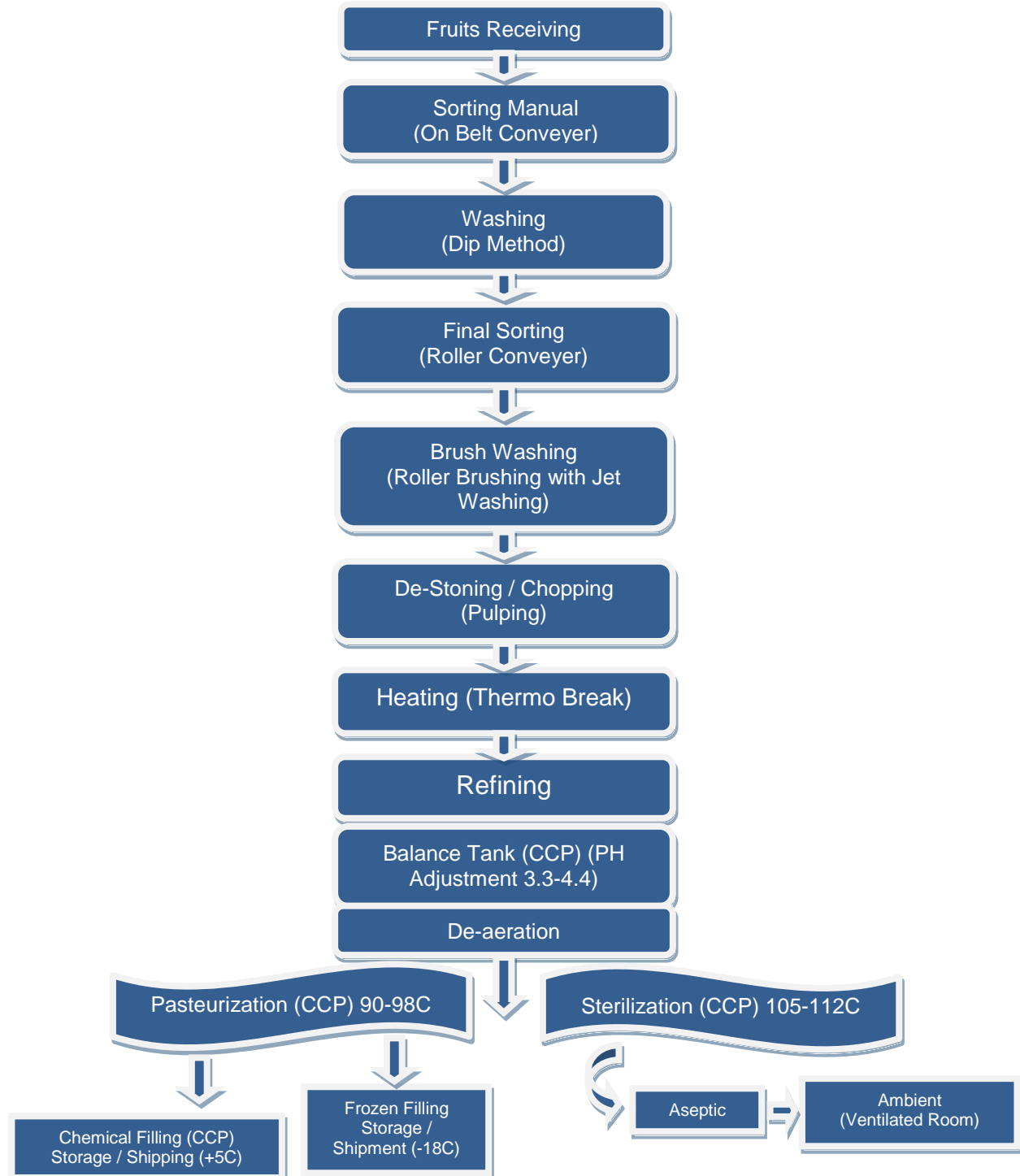
Due to stated reasons, the grading and pulping of fresh fruits is a commercially viable business option for investors. Accordingly, this particular project is related to setting-up a modernly equipped 'Pulping and Grading Unit' especially for Mango and Guava fruits that has huge market potentials at both local and international market levels. According to the proposed business model, fresh fruits will be purchased directly from farmers or distributors, pulping and grading will be carried out and finished good which will be sold both in local and international markets.

The major scope of processing activities will include post-harvest handling, pre-cooling, grading, ripening, pulping, packing and logistics. For that purpose fully automatic imported machinery / plant comprising of Washing, Sorting / Grading, Pulping and Packing facilities will be installed. It is recommended to acquire Swiss or Italian technology, which is more durable and reliable.

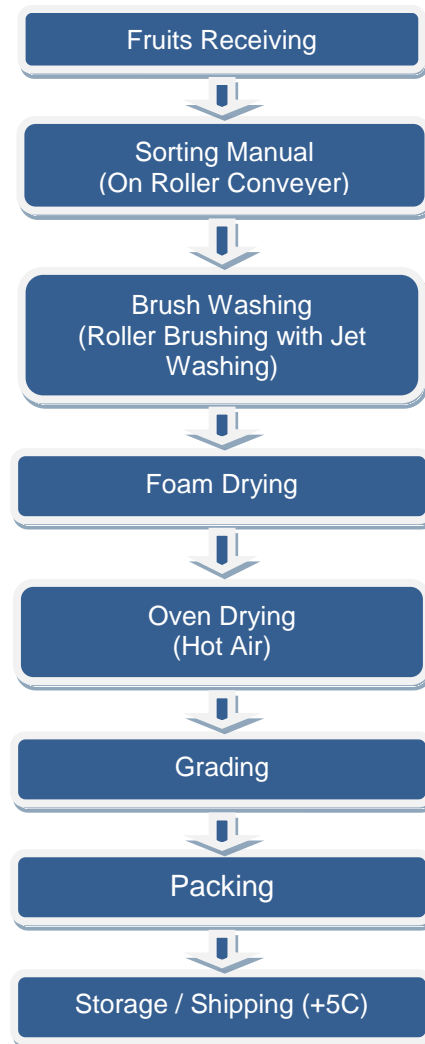
5.1 Production Process Flow

The production process flow of the proposed venture mainly comprises of two parallel lines i.e. Pulping and Grading. The process flow for both are presented in the following diagrams:

Process Flow for Fruit Pulping (Mango and Guava)



Process Flow for Fruit Grading (Mango and Guava)



5.2 Installed and Operational Capacities

The proposed Fruit Pulping and Grading Unit has a maximum capacity of producing 3,600 tons of Mango Pulp and 1,800 tons of Guava Pulp along with Grading of 6,000 tons annually. As the fruits (i.e. Mango and Guava) are seasonal commodities, therefore, pulping and grading of fruits will be done on seasonal basis.

Capacity utilization during first year of operation is assumed at 60% with an annual growth rate of 10% up to maximum level of 100% capacity utilization in 5th year of operation. This production capacity is estimated to be economically viable and justifies the capital as well as operational costs of the project.

Details of operational and installed capacity according to product mix are provided

in the table below:

Table 1: Installed and Operational Capacities – Fruit Pulping

Description	Processing Season	Production Capacity Per hour (tons)	Total Production Capacity per Season in tons (8 hour shift basis)	Operational Capacity 60% - in tons (Year 1)	Maximum Operational Capacity 100% - in tons (Year 5)
Mango	June ~ Aug 90 Days	10	3,600	2,160	3,600
Guava	Jan~ Mar 90 Days	5	1,800	1,080	1,800
Fruit Grading	Jan~ Dec	5	6,000	3,600	6,000

6 CRITICAL FACTORS

- ⇒ Complete adherence to best agronomic practices is critical to the success of this project; therefore, technical knowledge & experience of the entrepreneur in the field of horticulture and in fresh fruit processing business is absolutely necessary.
- ⇒ Awareness about HACCP standards and Strict Quality assurance of process and products.
- ⇒ Selection of quality fruits on the basis of best analysis of cost and revenues for a given season; cost efficiency through better management.
- ⇒ Appropriate post-harvest arrangement for transportation of product to the processing unit.
- ⇒ Appropriate storage arrangement and internal control for processed fruits; cold chain refer container arrangements for transportation to local and international markets.
- ⇒ Properly trained seed staff should be engaged and comprehensive staff training programs to be adopted for capacity building.
- ⇒ Processing contract with farmers and traders for value added business opportunities.

- ⇒ Careful selection of good location and purchase of land at competitive price.
- ⇒ Effective marketing and distribution of the product particularly to the exporters, industrial units and super store buyers.

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The unit can be installed anywhere in Pakistan where the raw materials (fresh fruits i.e. Mango and Guava) are easily accessible. But the most appropriate area for setting-up Fruits Pulping and Grading Unit are the areas where the raw material, mango, and guava are in abundance and it will also minimize the transportation cost.

As per current agricultural practices, major mango orchards are in South Punjab and Rural Sindh, while orchards of guava are mainly in upper Punjab, Hyderabad, Larkana, Moro, Haripur, Kohat and Bannu. Therefore, following urban areas could be the most appropriate locations for the proposed unit:

Multan, Bahawalpur, Rahim Yar Khan, Khairpur, MirpurKhas, Hyderabad, Lahore and Karachi.

8 POTENTIAL TARGET CUSTOMERS / MARKETS

The proposed unit will produce pulp and graded fruit of Mango and Guava. Both of these products are not directly catered to general consumers but target the industrial consumers. For instance pulp is used as basic raw material for production of juices, ice creams, frozen desserts, flavoured yogurts, jelly, jams and many others. Accordingly, the main buyers of fruit pulp will be manufacturing concerns of stated value added fruit products and fruit juice producers both in local and international markets. On the other hand, major buyers of graded fruits are either export markets or local super / departmental stores of big cities.

The main export markets for Pakistani processed fruits / pulp are USA, Europe, Middle East, Far East, Canada, Russia and Sri Lanka.

9 PROJECT COST SUMMARY

9.1 Project Economics

All the figures in this financial model have been calculated for installed capacity of 3,600 tons of Mango Pulp and 1,800 tons of Guava Pulp along with 6,000 tons of

grading fruits per year with an initial operating capacity of 60% (for both Pulping & Grading).

The following table shows Internal Rate of Return, Payback Period and Net Present Value of the proposed venture.

Table 2: Project Economics

Description	Details
Internal Rate of Return (IRR)	32%
Payback Period (Yrs.)	3.94
Net Present Value	848,442,073

9.2 Project Financing

Following table provides details of the equity required and variables related to bank loan:

Table 3: Project Financing

Description	Details
Total Equity (50%)	Rs. 357,456,339
Bank Loan (50%)	Rs. 357,456,339
Annual Markup to the Borrower– Long Term Loan	14%
Tenure of the Loan (Years)	5
Annual Markup to the Borrower – Short Term Debt	15%

9.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

Table 4: Project Cost

Description	Amount Rs.
Capital Cost	
Land	37,500,000
Building / Infrastructure	143,261,428
Plant and Machinery	434,458,133
Furniture and Fixtures	1,230,250

Office Vehicles	2,724,800
Office Equipment	1,702,050
Pre-operating Cost	18,824,000
Misc. and Contingency	6,208,767
Total Capital Cost	645,909,427
Working Capital	
Equipment Spare Part Inventory	3,000,000
Upfront Insurance Payment	2,471,264
Cash	4,491,986
Raw Material Inventory	59,040,000
Total Working Capital	69,003,250
Total Project Cost	714,912,677

9.4 Space Requirement

Approximately 5 acres of land would be required for establishment of proposed unit, it is recommended that required land should be procured in the industrial estates of identified potential cities. The cost of land is estimated at a rate of Rs. 7.5 million per acre; hence total cost of required land is Rs. 37.50 million.

The infrastructural requirements of the project mainly comprises of the construction of Management Building, Sorting, Processing Hall, Cold Store and other facilities. The cost of construction of building for the proposed unit is provided in the table below:

Table 5: Space Requirement

Description	Unit	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Office Block	sq. ft.	2,320	2,500	5,800,000
Committee Room	sq. ft.	1,600	2,500	4,000,000
Micro Lab, Lab & Office	sq. ft.	1,300	2,500	3,250,000
Processing Hall	sq. ft.	13,020	1,800	23,436,000
Sorting Hall	sq. ft.	2,400	1,800	4,320,000
Cold Storage	sq. ft.	5,460	2,000	10,920,000
Freeze Room	sq. ft.	620	2,000	1,240,000
Machine Room	sq. ft.	600	2,000	1,200,000

Lobby	sq. ft.	480	1,800	864,000
Store	sq. ft.	1,700	1,800	3,060,000
Shed	sq. ft.	3,500	1,500	5,250,000
Fruit Ripening Area	sq. ft.	25,000	1,200	30,000,000
Utility Hall	sq. ft.	2,790	1,800	5,022,000
Dining	sq. ft.	600	2,000	1,200,000
Kitchen	sq. ft.	400	2,000	800,000
Masjid	sq. ft.	1,200	2,000	2,400,000
Toilets	sq. ft.	600	2,000	1,200,000
Change Room	sq. ft.	400	2,000	800,000
Guard Room	sq. ft.	120	1,500	180,000
Total Building Cost	sq. ft.	64,110		104,942,000
External Development				
Pavement / Driveway	sq. ft.	25,200	150	3,780,000
Main Gate	no.	1	200,000	200,000
Grounds Landscaping	sq. ft.	43,400	25	1,085,000
Overhead Water Tank	gallons	10,000	400	4,000,000
Under Ground Water Tank	gallons	10,000	70	700,000
External Development	lumpsum			3,000,000
Plant Electrification	lumpsum			10,000,000
Boundary Wall	r. ft.	2,283	1,000	2,282,500
Misc. & Contingency	%	3%		3,899,685
Design & Supervision Charges	%	7%		9,372,243
Total External Development Cost				38,319,428
Total Building and External Development Cost				143,261,428

9.5 Machinery & Equipment Requirement

Plant, machinery and equipment required for the proposed project are stated below:

Table 6: Machinery & Equipment Requirement

Sr. #	Description	Total Cost Rs. Mn.
A	Fruit Pulping Plant	231.423
B	Fruit Grading and Packaging Line	31.587
C	Utilities Machinery and Equipment	64.200
D	Laboratory Equipment – Microbiological Lab	4.254
E	Laboratory Equipment – Analytical Lab	1.994
F	Cold Store	20.000
G	Metal Drums	81.000
	Total Machinery & Equipment Cost	434.458

Detailed Machinery Specifications are mentioned in the following tables:

A - Fruit Pulping Plant

Sr. #	Description	Total Cost Rs. Mn.
1	Fresh fruit treatment composed by Inoxall 10b with belt conveyor on bottom, water recycling/filtering group, sorting line selinox roller type, accessories	11.232
2	Fruit puree extraction, treatment and aseptic line	
2.1	Brusher mod. 10b with bypass with feeding elevator	11.280
2.2	Maxi mango destoner	7.824
2.3	Chopper 4p for guava treatment complete with dosing group	5.076
2.4	Heating group composed by tank 1000, monoscrew pump, scrape surface pre-heater 5000	28.032
2.5	Pulping/refining group composed by 2-stages pulper / refiner super bicreamer with bin brl 300 and monoscrew pump extraction pump	10.308
2.6	Buffer mixing tank 5.000 complete with extraction monoscrew	2.712
2.7	Aseptic treatment group composed by de-aerator 6/5000/s/ra and tubular sterilizer sttc 5000	40.248
2.8	2 Heads aseptic filler gemina	21.336
2.9	Scaffolding	4.152

2.10	Accessories	7.344
3	Electric panel with PLC	8.772
4	Cleaning of the plant including n°2 centrifugal pumps	0.960
5	Waste elimination system including a set of screw conveyor	3.756
	Total Ex-works price	163.032
6	Other Costs	
6.1	Packing Cost	4.248
6.2	Spare Parts	1.800
6.3	N°80 man / absence / days for technical assistance to supervise the plant erection, pre-commissioning, and start-up phases and for training	7.800
	Import incidentals & local transportation cost	54.543
	Total other costs	68.391
	Total - A	231.423

The above Pulping Plant is selected because it is already successfully running in Agro-Food Processing Facilities (AFP), Multan. AFP the first ever fruits pulping & processing plant in public sector installed by the Small and Medium Enterprises Development Authority (SMEDA) as a common facility centre for SMEs with the government investment.

The pulping plant installed by Bertuzi Food Processing, Italy, having a capacity of processing 10 tons of Mangoes and 5 tons of guava in an hour, has created a great value addition facility for the small and medium growers of fruits and vegetables in the country.

As per an estimate of Agriculture Department, 30 per cent production of the fruits and vegetables in the country is wasted due to lack of processing facilities, which may now be avoided through the AFP. The plant offers equal facilities for processing and apart from processing, grading and packing facilities for fresh fruits and vegetables, a consultancy service has also been made available at the plant for growers to have information on the latest food processing techniques and technology.

B - Fruit Grading and Packaging Line

Capacity: 4-5 Tons per hour

Sr. #	Machinery & Equipment	Description	Total Cost Rs. Mn.
1	Feeder	Fruit Feeding	
2	Brush washer	Rotating brushed for cleaning of the fruit	
3	Drying	1st drying with foam rollers then with hot air	
4	Waxing	Wax application by spraying	
5	Drying	Drying of applied wax using air	
6	Sorting	Roller sorter for sorting of damaged and bruised fruit	
7	Grader (Sizer)	Mechanical (By Size) Electronic (By Weight)	
Total - B			31.587

C - Utilities Machinery and Equipment

Sr. #	Machinery / Equipment	Description	Qty.	Unit Cost Rs. Mn.	Total Cost Rs. Mn.
1	Boiler	Smoke tube packaged boiler, 3-4 ton/hr x 10kg cm ² dual burner (gas & heavy oil)	1	6.800	6.800
2	Water Treatment Plant (Water Softner)	To convert hard water in soft water by Zeoliteion exchange process Required degree of hardness after treatment is 0.	1	3.500	3.500
3	Belt Conveyer	To Convey fruit @ 10ton/hr from sorting area to washing unit, Length 18m, Width 0.9m; belt made in reinforced rubber 2 ply belt thickness 2mm Drive: geared with starter and safety interlocking system supporting structure in MS	1	1.200	1.200
4	Stainless steel tanks with agitators	1500 L	2	0.650	1.300
		2500 L	2	1.100	2.200
5	Generator 250KVA	Turbo Type, 250KVA, 400 Volts, 50 Cycles, 1500 RPM, Power	1	5.300	5.300

		Factor 0.8			
6	Water chiller	-	1	4.800	4.800
7	Centrifugal Pump	Capacity 12,000 - 15,000 Ltr/hr	2	0.240	0.480
8	Monix pump	Capacity 10,000 - 12,000 Ltr/hr	2	0.220	0.440
9	CIP System	Set of 04 SS Tanks of 500L each, heat exchange system, pumps and valves for water, steam & air	1	2.300	2.300
10	Piping, and valves for water, steam and air	-			6.200
11	Fuel tank for generator	-	1	0.200	0.200
12	Fans	Industrial	20	0.080	1.600
13	Storage tank for air	1000 Ltr MS Tank	1	0.400	0.400
14	Waste Screw Conveyer	-	1	2.200	2.200
15	Fork lift truck	Battery operated with solid rubber tyres, capacity 2.5 tons, fork length 4 ft, stacking height 12 ft	1	4.200	4.200
16	Waste Hopper Bin	MS Sheet hopper with the stand. Bottom height 12 ft, bottom opening gate 2x 2 ft with hydraulic controlled opening. 10-12 tons holding of solid waste of fruit processing	1	1.300	1.300
17	Air Compressor	With dryer and filter oil free screw type capacity 08 bar consumption 300-350 ltr/min.	1	2.200	2.200
18	SS Vat 3mm sheet of SS316 L Food Grade	Double jacketed with the option of steam and water circulation. Foldable lid of 316 L SS sheet and a channel stand for the vat. A screw type mixer at the bottom.	1	0.880	0.880
19	Weigh Bridge	30 x 10 feet size, 60 tons capacity	1	2.100	2.100
20	Cooling Tower		1	1.900	1.900

21	Effluent Water Treatment Plant		1	4.200	4.200
22	Workshop Items		-		2.500
23	Electrical Panels		-		2.500
24	Others (Installation, Labor charges, welding plants, tools etc.)		-		3.500
Total - C					64.200

D - Laboratory Equipment - Microbiological Lab

Sr. #	Equipment	Description	Qty.	Unit Cost Rs. Mn.	Total Cost Rs. Mn.
1	Water Bath	6-8 holes with adjustable temperature	1	0.150	0.150
2	Spirit Lamp	burner with stand and stainless steel tongs	2	0.001	0.002
3	Oven	incubator with 3-5 shelves	1	0.150	0.150
4	Auto Clave	Electric autoclave, temperature range 125-135 C	1	0.310	0.310
5	Colony Counter	With adjustable magnifying glass	1	0.050	0.050
6	Microscope	4, 10, 40 and 100X binocular	1	0.062	0.062
7	Lab ware	Autoclavable and non auto clavable	-		0.210
8	Media	Different types of medias	-		1.100
9	Incubator	3-5 Shelves, Temp range 10 - 60 C	1	0.580	0.580
10	Laminar Air Flow Cabinet		1	0.140	0.140
11	Misc.		-		1.500
Total - D					4.254

E - Laboratory Equipment - Analytical Lab

Sr. #	Equipment	Description	Qty.	Unit Cost Rs. Mn.	Total Cost Rs. Mn.
1	Weigh Balance	0.1g readability and capacity of 600-1200g	1	0.022	0.022
2	pH meter	Bench type with pH and temperature probes	1	0.037	0.037
3	Conductivity meter	Protabe with multiple probe including conductivity / TDS / Salt and Temperature	1	0.041	0.041
4	Viscometer	Spindle Type	1	0.570	0.570
5	Viscometer	Time / Flow Type	1	0.260	0.260
6	Centrifuge	General Purpose variable speed with 15ml conical test tubes	1	0.290	0.290
7	Refractometer Hand type	0-32 brix and 0-53 brix	2	0.014	0.028
8	Refractometer Abbe's	0-95 brix	1	0.300	0.300
9	Thermometer	Digital probe type with wide temperature range	1	0.046	0.046
10	Magnifying glass	General Purpose	1	0.005	0.005
11	Desiccator	-	3	0.002	0.006
12	Stirrer	Hot plate type magnet stirrer	1	0.021	0.021
13	Burette	Digital auto burette	2	0.060	0.120
14	Glass ware	-	-		0.150
15	Refrigerator	12 Cubic Feet Size	1	0.040	0.040
16	Misc.		-		0.058
Total - E					1.994

F – Cold Store

Sr. #	Description	Total Cost Rs. Mn.
1	Cold Store	20.000
Total - F		20.000

G – Metal Drums

Description	Quantity	Unit Rate	Total Amount Rs. Mn.
Metal Drums	27,000	3,000	81.000
Total - G			81.000

9.6 Furniture & Fixtures Requirement

Details of the furniture and fixture required for Fruit Pulping & Grading unit are given below:

Table 7: Furniture & Fixture Requirement

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Managers Tables with Side Tables	10	20,000	200,000
Manager / Officers Chairs	10	7,500	75,000
Visitor Chairs	20	6,000	120,000
Officers Tables with Side Tables	10	20,000	200,000
File Racks	10	15,000	150,000
Sofa Set	2	30,000	60,000
Split AC 1.5 Ton	7	55,000	385,000
Misc. & Contingency		5%	40,250
Total			1,230,250

9.7 Office Equipment Requirement

Following office equipment will be required for Fruit Pulping & Grading unit.

Table 8: Office Equipment Requirement

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Laptop	1	150,000	150,000
Computers With LCD	10	75,000	750,000
Printer	3	20,000	60,000
Scanner	1	15,000	15,000
Networking Equipment & Accessories			150,000
Telephone Exchange	1	125,000	125,000
Telephone Sets	15	2,000	30,000
Fax Machine	1	15,000	15,000
Photo Copy Machine	1	200,000	200,000
Water Dispenser	2	18,000	36,000
Refrigerator	1	50,000	50,000
Electric Water Cooler	2	20,000	40,000
Misc. & Contingency		5%	81,050
Total			1,702,050

9.8 Raw Material Requirement

Fresh fruits of mango and guava are the main raw material for the proposed business, which will be procured either directly from fruit farms or from distributors of local fruit mandi. After that, fresh fruit will be processed and marketed through distributors and retailers in local market and through exporters in international market. According to the estimated installed and operational capacity of the proposed plant, following table provides the details of seasonal requirements of fresh fruits as a raw material:

Table 9: Raw Material Requirement

Description	Cost / Kg (Rs.)	Total Cost (Rs. Mn.) / Per Season
Mango Pulping		
Cost of Mango	55	118.80
Aseptic Bag	6	12.96
Chemical + Polythene Bag	1.5	3.24
Ripening & Unloading of Fruit	0.5	1.08
Total Mango Pulping		136.08
Guava Pulping		
Cost of Guava	30	32.40
Aseptic Bag	6	6.48
Chemical + Polythene Bag	1.5	1.62
Ripening & Unloading of Fruit	0.5	0.54
Total Guava Pulping		41.04

The raw material requirement in subsequent years will be determined according to the capacity utilization of the unit. The purchasing cost of raw material is assumed to increase at 10% annually. However, it is only estimated, as the market price of fruits may vary due to Government pricing strategy and other seasonal fluctuations.

9.9 Human Resource Requirement

To smoothly run the operations of the proposed Fresh Fruit Processing Unit, details of required human resource along with their monthly salaries are recommended as under:

Table 10: Human Resource Requirement

Description	No. of Employees	Monthly Salary per Person (Rs.)
CEO / Owner	1	125,000
Manager Plant	1	75,000
Manager Finance & Admin	1	75,000
Manager Marketing	1	75,000
Assistant Manager – Plant	1	40,000
Quality Control Officer	1	35,000
Electrical In charge	1	30,000
Plant Foreman	1	30,000
Mechanical Foreman	1	30,000
Boiler Engineer	1	25,000
Accounts officer	2	20,000
Store Keeper	1	20,000
Assistant to Quality Assurance Officer	1	15,000
Assistant to Admin & HR	1	15,000
Office coordinator	1	15,000
Filler Operator	3	15,000
Supervisors	1	15,000
Boiler Operator	1	15,000
Cold Store Operator	1	15,000
Mechanic	2	18,000
Electrician	1	18,000
Assistant Operator	3	13,000
Weigh Bridge Operator	1	13,000
Driver	1	14,000
Lifter Operator	1	13,000
Office Boy	2	13,000
Gardener	1	13,000
Sweeper	2	13,000
Total	36	933,000

9.10 Utilities and Other Costs

During the first year the electricity expenses are estimated to be around Rs. 7,174,800 whereas, gas expenses are estimated to be Rs. 2,268,000 and fuel expense is around Rs. 11,196,000. Furthermore, promotional expense being essential for marketing of Fruit Pulping & Grading unit is estimated as 30% of administrative cost.

9.11 Revenue Generation

Based on the assumed capacity utilization for pulping and grading of Mango and Guava, sales revenue during the first year of operations is estimated as under:

Table 11: Revenue Generation – Year 1

Description	No. of units sold (tons)	Sale Price / Tons (Rs.)	Sales Revenue (Rs.)
Mango Pulping	2,160	130,000	280,800,000
Guava Pulping	1,080	90,000	97,200,000
Fruit Grading	3,600	4,500	16,200,000
Total			394,200,000

10 CONTACT DETAILS

In order to facilitate potential investors, contact details of private sector Service Providers relevant to the proposed project be given.

10.1 Machinery Suppliers

Name	Address	Phone	Email/Website
Italian Machinery Supplier			
Bertuzzi Food Processing	21052 Busto-Varese-Italy	+390331356299	www.bertuzzi.it
Other Machinery Suppliers			
Faheem baig	Shahra-e-Faisal Karachi-75530	0092-21-35660920-22	faheem@helperco.com.pk
Helperco (Pvt) Limited Lahore	Room # 3, 3rd Floor Al-Hafeez Towe	0092-42-35785395-96	www.helpercopvtltd.enic.pk
Jaffer Brothers Pvt. Ltd.	3, Mall mansion, 30-Shahrah-e-Quaid-e-Azem Lahore	+92-42-37320186	
SigmaTech Imports	1-Mozang road, Behind High Court Lahore	+92-51-2803154	
S.T Associates	Office No. 10,2 nd floor, Mujahid Plaza, Blue Area Islamabad	0321-5155764	
Afga Tech	C-10,Ground Floor, Ruqia square, Block No. 14, Fereral Area, Karachi	+92-300-8299892	
Kold Kraft	247-S Industrial Estate KotLakhpat, Lahore	+92-42-35116727-28	
Al-Aziz Enterprises	10-km, Lahore Road Sargodha	+92-300-9606642	

10.2 Raw Material Suppliers

Name	Address	Phone	Email/Website
Wax (Polish) Al-Aziz Enterprises	10-km,Lahore Road, Sargodha	+92-300-9606642	

Packaging Zahid Packages	4-km,Kot-Momin Bhawal Road, Bhalwal	+92-0486-892245-46	
Roshan Packages	71-A,Ahmed Block,New Garden Town	+92_425855324	sales@roshanpackages.com.pk

10.3 Technical Expert/ Consultants

Name	Address	Phone
Dr. MAslam Pervez	Director Institute of Horticultural Sciences, Faculty of Agriculture, University of Agriculture Failalabad	+92-41-9201281

11 USEFUL WEB LINKS

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of Industries & Production	www.moip.gov.pk
Ministry of Education, Training & Standards in Higher Education	http://moptt.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Trade Development Authority of Pakistan (TDAP)	www.tdap.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Sindh Small Industries Corporation	www.ssic.gos.pk
Pakistan Horticulture Development and Export Company (PHDEC)	www.phdec.org.pk
Punjab Vocational Training Council (PVTC)	www.pvtc.gop.pk

Technical Education and Vocational Training Authority (TEVTA)	www.tevta.org
Pakistan Readymade Garment Technical Training Institute	www.prgmea.org/prgtti/
Livestock & Dairy Development Department, Government of Punjab.	www.livestockpunjab.gov.pk
Punjab Industrial Estates (PIE)	www.pie.com.pk
Faisalabad Industrial Estate Development and Management Company (FIEDMC)	www.fiedmc.com.pk
Pakistan Horticulture Development Export Company (PHDEC)	ww.phdec.org
Ministry of National Food Security and Research (MNFSR)	www.mnsfr.gov.pk
Pakistan Agriculture Research Council (PARC)	www.parc.gov.pk
National Agriculture Research Council (NARC)	www.narc.gov.pk
Agriculture University of Faisalabad (UAF)	www.uaf.edu.pk

12 ANNEXURES

12.1 Income Statement

Income Statement										
	60%	70%	80%	90%	100%	100%	100%	100%	100%	100%
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	394,200,000	505,890,000	635,976,000	787,020,300	961,913,700	1,058,105,070	1,163,915,577	1,280,307,135	1,408,337,848	1,549,171,633
<i>Cost of sales</i>										
Raw Material Cost of Mango Pulping	136,080,000	166,698,000	200,037,600	236,294,415	275,676,818	289,460,658	303,933,691	319,130,376	335,086,895	351,841,239
Raw Material Cost of Guava Pulping	41,040,000	50,274,000	60,328,800	71,263,395	83,140,628	87,297,659	91,662,542	96,245,669	101,057,952	106,110,850
Labor Wages for Pulping & Grading	8,922,253	10,929,760	13,115,712	15,492,934	18,075,090	18,978,845	19,927,787	20,924,176	21,970,385	23,068,904
Production Labor	5,868,000	6,454,800	7,100,280	7,810,308	8,591,339	9,450,473	10,395,520	11,435,072	12,578,579	13,836,437
Machinery Maintenance	500,000	550,000	605,000	665,500	732,050	805,255	885,781	974,359	1,071,794	1,178,974
Electricity Cost	7,174,800	9,207,660	11,575,344	14,324,488	17,507,708	19,258,479	21,184,326	23,302,759	25,633,035	28,196,338
Gas Cost	2,268,000	2,910,600	3,659,040	4,528,062	5,534,298	6,087,728	6,696,501	7,366,151	8,102,766	8,913,042
Fuel Cost	11,196,000	14,368,200	18,062,880	22,352,814	27,320,106	30,052,117	33,057,328	36,363,061	39,999,367	43,999,304
Total cost of sales	213,049,053	261,393,020	314,484,656	372,731,917	436,578,036	461,391,213	487,743,476	515,741,622	545,500,774	577,145,089
Gross Profit	181,150,947	244,496,980	321,491,344	414,288,383	525,335,664	596,713,857	676,172,101	764,565,512	862,837,075	972,026,544
<i>General administration & selling expenses</i>										
Administration expense	5,328,000	5,860,800	6,446,880	7,091,568	7,800,725	8,580,797	9,438,877	10,382,765	11,421,041	12,563,145
Administration benefits expense	266,400	293,040	322,344	354,578	390,036	429,040	471,944	519,138	571,052	628,157
Utilities (Electricity, Gas, Water etc)	1,076,220	1,381,149	1,736,302	2,148,673	2,626,156	2,888,772	3,177,649	3,495,414	3,844,955	4,229,451
Travelling expense	839,700	923,670	1,016,037	1,117,641	1,229,405	1,352,345	1,487,580	1,636,338	1,799,972	1,979,969
Communications expense (phone, fax, mail, internet, etc.)	1,119,600	1,231,560	1,354,716	1,490,188	1,639,206	1,803,127	1,983,440	2,181,784	2,399,962	2,639,958
Office vehicles running expense	156,000	171,600	188,760	207,636	228,400	251,240	276,364	304,000	334,400	367,840
Office expenses (stationary, entertainment, janitorial services, etc.)	1,119,600	1,231,560	1,354,716	1,490,188	1,639,206	1,803,127	1,983,440	2,181,784	2,399,962	2,639,958
Promotional expense	3,358,800	3,190,860	3,031,317	2,879,751	2,735,764	2,598,975	2,469,027	2,345,575	2,228,297	2,116,882
Insurance expense	2,471,264	2,215,963	1,960,662	1,705,361	1,450,061	1,326,409	1,061,128	795,846	530,564	265,282
Professional fees (legal, audit, consultants, etc.)	559,800	615,780	677,358	745,094	819,603	901,563	991,720	1,090,892	1,199,981	1,319,979
Depreciation expense	51,447,075	51,447,075	51,447,075	51,447,075	51,447,075	51,779,778	51,779,778	51,779,778	51,779,778	51,779,778
Amortization of pre-operating costs	3,764,800	3,764,800	3,764,800	3,764,800	3,764,800	-	-	-	-	-
Amortization of Contingency Cost	620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877
Miscellaneous expense	1,119,600	1,231,560	1,354,716	1,490,188	1,639,206	1,803,127	1,983,440	2,181,784	2,399,962	2,639,958
Subtotal	73,247,735	74,180,293	75,276,559	76,553,617	78,030,519	76,139,178	77,725,261	79,515,973	81,530,802	83,791,234
Operating Income	107,903,212	170,316,687	246,214,785	337,734,767	447,305,145	520,574,680	598,446,840	685,049,539	781,306,273	888,235,310
Other income (interest on cash)	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	1,089,920	-	-	-	-	-
Earnings Before Interest & Taxes	107,903,212	170,316,687	246,214,785	337,734,767	448,395,065	520,574,680	598,446,840	685,049,539	781,306,273	888,235,310
Interest on short term debt	-	-	-	-	-	-	-	-	-	-
Interest expense on long term debt (Project Loan)	42,213,438	35,050,747	26,818,365	17,356,542	6,481,672	-	-	-	-	-
Interest expense on long term debt (Working Capital Loan)	2,671,993	-	-	-	-	-	-	-	-	-
Subtotal	44,885,431	35,050,747	26,818,365	17,356,542	6,481,672	-	-	-	-	-
Earnings Before Tax	63,017,781	135,265,940	219,396,420	320,378,224	441,913,393	520,574,680	598,446,840	685,049,539	781,306,273	888,235,310
Tax	22,056,223	47,343,079	76,788,747	112,132,379	154,669,688	182,201,138	209,456,394	239,767,339	273,457,195	310,882,358
NET PROFIT/(LOSS) AFTER TAX	40,961,558	87,922,861	142,607,673	208,245,846	287,243,706	338,373,542	388,990,446	445,282,201	507,849,077	577,352,951

12.2 Balance Sheet

Balance Sheet											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
<i>Current assets</i>											
Cash & Bank	4,491,986	11,311,271	123,104,795	230,135,209	378,822,227	600,228,785	937,748,239	1,324,355,081	1,761,369,417	2,254,191,026	3,194,798,524
Accounts receivable		32,400,000	36,990,000	46,926,000	58,479,300	71,874,000	83,014,470	91,315,917	100,447,509	110,492,260	121,541,486
Equipment spare part inventory	3,000,000	3,150,000	3,307,500	3,472,875	3,646,519	3,828,845	4,020,287	4,221,301	4,432,366	4,653,985	-
Raw material inventory	59,040,000	79,556,400	105,014,448	136,453,148	175,114,874	202,257,679	233,607,619	269,816,800	311,638,405	359,942,357	-
Pre-paid insurance	2,471,264	2,215,963	1,960,662	1,705,361	1,450,061	1,326,409	1,061,128	795,846	530,564	265,282	-
Total Current Assets	69,003,250	128,633,634	270,377,405	418,692,594	617,512,981	879,515,718	1,259,451,742	1,690,504,946	2,178,418,261	2,729,544,909	3,316,340,010
<i>Fixed assets</i>											
Land	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000
Building/Infrastructure	143,261,428	136,098,357	128,935,285	121,772,214	114,609,142	107,446,071	100,283,000	93,119,928	85,956,857	78,793,785	71,630,714
Machinery & equipment	434,458,133	391,012,319	347,566,506	304,120,693	260,674,880	217,229,066	173,783,253	130,337,440	86,891,627	43,445,813	-
Furniture & fixtures	1,230,250	1,107,225	984,200	861,175	738,150	615,125	492,100	369,075	246,050	123,025	-
Office vehicles	2,724,800	2,179,840	1,634,880	1,089,920	544,960	4,388,318	3,510,654	2,632,991	1,755,327	877,664	-
Office equipment	1,702,050	1,531,845	1,361,640	1,191,435	1,021,230	851,025	680,820	510,615	340,410	170,205	-
Total Fixed Assets	620,876,661	569,429,586	517,982,511	466,535,437	415,088,362	368,029,605	316,249,827	264,470,049	212,690,270	160,910,492	109,130,714
<i>Intangible assets</i>											
Pre-operation costs	18,824,000	15,059,200	11,294,400	7,529,600	3,764,800	-	-	-	-	-	-
Legal, licensing, & training costs	6,208,767	5,587,890	4,967,013	4,346,137	3,725,260	3,104,383	2,483,507	1,862,630	1,241,753	620,877	-
Total Intangible Assets	25,032,767	20,647,090	16,261,413	11,875,737	7,490,060	3,104,383	2,483,507	1,862,630	1,241,753	620,877	-
TOTAL ASSETS	714,912,677	718,710,309	804,621,330	897,103,767	1,040,091,402	1,250,649,707	1,578,185,076	1,956,837,624	2,392,350,284	2,891,076,278	3,425,470,724
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable		23,243,133	29,012,562	35,613,186	43,173,529	50,181,551	54,549,413	59,417,550	64,854,044	70,936,995	43,184,525
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities											
Total Current Liabilities	-	23,243,133	29,012,562	35,613,186	43,173,529	50,181,551	54,549,413	59,417,550	64,854,044	70,936,995	43,184,525
<i>Other liabilities</i>											
Deferred tax		22,056,223	69,399,303	76,030,173	76,030,173	76,030,173	60,824,139	45,618,104	30,412,069	15,206,035	0
Long term debt (Project Loan)	322,954,714	274,993,056	219,868,708	156,511,977	83,693,424	-	-	-	-	-	-
Long term debt (Working Capital Loan)	34,501,625	-	-	-	-	-	-	-	-	-	-
Total Long Term Liabilities	357,456,339	297,049,280	289,268,010	232,542,150	159,723,597	76,030,173	60,824,139	45,618,104	30,412,069	15,206,035	0
<i>Shareholders' equity</i>											
Paid-up capital	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339	357,456,339
Retained earnings		40,961,558	128,884,419	271,492,092	479,737,938	766,981,644	1,105,355,185	1,494,345,631	1,939,627,832	2,447,476,909	3,024,829,860
Total Equity	357,456,339	398,417,897	486,340,758	628,948,431	837,194,277	1,124,437,982	1,462,811,524	1,851,801,970	2,297,084,171	2,804,933,248	3,382,286,199
TOTAL CAPITAL AND LIABILITIES	714,912,677	718,710,309	804,621,330	897,103,767	1,040,091,402	1,250,649,707	1,578,185,076	1,956,837,624	2,392,350,284	2,891,076,278	3,425,470,724

12.3 Cash Flow Statement

Cash Flow Statement											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		40,961,558	87,922,861	142,607,673	208,245,846	287,243,706	338,373,542	388,990,446	445,282,201	507,849,077	577,352,951
Add: depreciation expense		51,447,075	51,447,075	51,447,075	51,447,075	51,447,075	51,779,778	51,779,778	51,779,778	51,779,778	51,779,778
amortization of pre-operating costs		3,764,800	3,764,800	3,764,800	3,764,800	3,764,800	-	-	-	-	-
amortization of training costs		620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877	620,877
Deferred income tax		22,056,223	47,343,079	6,630,871	-	-	(15,206,035)	(15,206,035)	(15,206,035)	(15,206,035)	(15,206,035)
Accounts receivable		(32,400,000)	(4,590,000)	(9,936,000)	(11,553,300)	(13,394,700)	(11,140,470)	(8,301,447)	(9,131,592)	(10,044,751)	(11,049,226)
Equipment inventory	(3,000,000)	(150,000)	(157,500)	(165,375)	(173,644)	(182,326)	(191,442)	(201,014)	(211,065)	(221,618)	4,653,985
Raw material inventory	(59,040,000)	(20,516,400)	(25,458,048)	(31,438,700)	(38,661,725)	(27,142,805)	(31,349,940)	(36,209,181)	(41,821,604)	(48,303,953)	359,942,357
Advance insurance premium	(2,471,264)	255,301	255,301	255,301	255,301	123,651	265,282	265,282	265,282	265,282	265,282
Accounts payable		23,243,133	5,769,429	6,600,624	7,560,343	7,008,022	4,367,862	4,868,137	5,436,494	6,082,951	(27,752,471)
Cash provided by operations	(64,511,264)	89,282,567	166,917,873	170,387,145	221,505,572	309,488,299	337,519,454	386,606,843	437,014,336	492,821,608	940,607,499
<i>Financing activities</i>											
Project Loan - principal repayment		(47,961,657)	(55,124,349)	(63,356,731)	(72,818,553)	(83,693,424)	-	-	-	-	-
Working Capital Loan - principal repayment		(34,501,625)	-	-	-	-	-	-	-	-	-
Short term debt principal repayment		-	-	-	-	-	-	-	-	-	-
Additions to Project Loan	322,954,714	-	-	-	-	-	-	-	-	-	-
Additions to Working Capital Loan	34,501,625	-	-	-	-	-	-	-	-	-	-
Issuance of shares	357,456,339	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activities	714,912,677	(82,463,282)	(55,124,349)	(63,356,731)	(72,818,553)	(83,693,424)	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(645,909,427)	-	-	-	-	(4,388,318)	-	-	-	-	-
Cash (used for) / provided by investing activities	(645,909,427)	-	-	-	-	(4,388,318)	-	-	-	-	-
NET CASH	4,491,986	6,819,284	111,793,524	107,030,414	148,687,019	221,406,558	337,519,454	386,606,843	437,014,336	492,821,608	940,607,499

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Description	Details
Administration Benefit Expenses	5% of admin. expense
Traveling Expenses	7.5% of admin. expense
Communication Expenses	10% of admin. expense
Office expenses (stationary, entertainment, janitorial services, etc.)	10% of admin. expense
Office vehicles insurance rate	3%
Promotional expense % of admin expense	30% of admin. expense
Operating costs growth rate	10%
Depreciation on Building and Infrastructure	5%
Depreciation on Machinery	10%
Depreciation on Furniture and Fixture	10%
Depreciation on Office Equipment	10%
Depreciation on Office Vehicle	20%

13.2 Production Cost Assumptions

Description	Details
Mango Pulping (Rs./Kg)	
Cost of Mango	55
Aseptic Bag	6
Chemical + Polythene Bag	1.5
Ripening & Unloading of Fruit	0.5
Guava Pulping (Rs./Kg)	
Cost of Guava	30
Aseptic Bag	6
Chemical + Polythene Bag	1.5
Ripening & Unloading of Fruit	0.5
Production Cost Growth Rate	5%

13.3 Revenue Assumptions

Description	Details
Mango Pulp Price Per Kg (Rs.)	130
Guava Pulp Price Per Kg (Rs.)	90
Fruit Grading Per Kg (Rs.)	4.50
Growth in Sales Price	10%
Days Operational / Year	300
Mango Pulping during the first year (Tons)	2,160
Guava Pulping during the first year (Tons)	1,080
Grading during the first year (Tons)	3,600
Per Day Production Hours	8
Production Capacity in First Year	60%
Percentage Increase in Production Capacity every Year	10%
Maximum Production Capacity	100%
Domestic Sales	100%

13.4 Financial Assumptions

Description	Details
Debt	50%
Equity	50%
Interest Rate on Debt	14%
Debt Tenure	5
Debt Payment / Year	12