

Pre-Feasibility Study

FRESH FRUITS PROCESSING

(Kinnow)



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1 INTRODUCTION

1.1 Project Brief

The scope of the project includes processing of fresh citrus fruit locally known as "Kinnow". Kinnow fruit is a hybrid of Mandarins. There is huge demand for processed Pakistani Kinnows in the international markets. The major operational activities of the project include following processes:

- Sorting
- Washing
- Waxing
- Drying
- Grading
- Packaging

1.2 Opportunity Rationale

The human resource (labour) costs, in the Western Hemisphere and in developed countries, are much higher. Although, these countries now employ sophisticated farm machinery and implements, yet the production costs are on a higher side. So far, most of these countries compete due to heavy direct or indirect subsidies offered to them by governments and Trade Associations. However, under WTO (World Trade Organisation) convention, of which Pakistan is also a member country, subsidies are totally discouraged. The rising production cost and diminishing subsidies would make it difficult for these countries to compete in the international markets.

With 1.76 million tons, Pakistan is the 10th largest producer of Kinnow (mandarin hybrid) and oranges in the world. Kinnow is only grown in Pakistan and its aroma and taste has obtained a good reputation and acceptability in the international markets. Pakistan's world mandarin and orange market share is 8 percent. Above state of affairs provide Pakistani Kinnow with an opportunity to compete in the international markets.

1.3 Viable Economic Size (Processing Capacity)

A plant having a capacity of processing 8 tons of Kinnow per hour is considered to an economically viable plant. This means, that for a total season of 135 days, a total of 8,100 tons of Kinnow can be processed, if the plant runs at 8 hours per day.

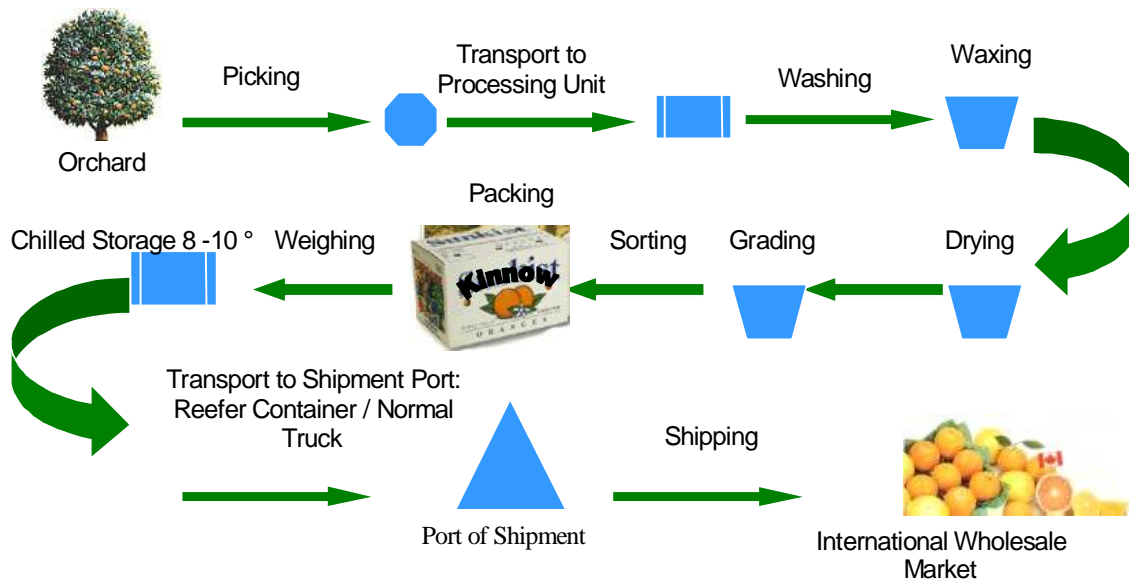
1.4 Total Project Cost

Rs. 13.390 million

Process Flow Chart



1.5 Total Flow System



2 CURRENT INDUSTRY STRUCTURE

Table 2-1: Major Orange & Mandarin Producing Countries - Production & Yield (FAO 2004-5)

Country	Production (000MT)	Utilization (000MT)
World	92,775	25,533
Brazil	18,313	11,723
USA	10,397	7,164
China	13,930	396
Spain	6,091	895
Italy	3,171	1,389
Egypt	2,251	Not Available
Argentina	2,660	1,185
Turkey	2,264	Not Available
South Africa	1,560	355
Others	25,589	1,119

Table 2-2: Existing Capacity of Kinnow Processing in Pakistan

Item	Total	Working	Idle
Processing Plant (08ton per hour) (Local Manufactured)	90	85	05
Processing Plant (10 ton per hour) (Imported)	1	1	0
Processing Plant (5 ton per hour) (Imported)	5	4	1

Table 2-3: Major Players in Pakistan

Name	Location
Al-Mehmood Establishment	Sargodha
Roshan Enterprises	Sargodha
Arif Overseas	Sargodha
Questpack Ltd.	Karachi
Sarah Fruit Trading Co. (Pvt.) Ltd	Karachi

3 MARKETING

Table 3-1A: Exporters and Importers¹

Country	Export (000MT)
World	11,308
Spain	3,535
USA	960
South Africa	990
Turkey	862
Morocco	521
Egypt	480
Argentina	620
Mexico	360
China	418
Others	2,261

¹ FAO 2005

Table 3-1B²

Country	Importers (000MT)
World	9,700
Germany	1,116
USSR	1,056
France	1,054
UK	806
Netherlands	659
Japan	498
USA	452
Canada	418
Belgium	360
Others	3,249

3.1 Target Customers:

The target customers for processed fresh Kinnows are the prospective and progressive fruit and vegetable exporters of Pakistan. Such exporters are those, who do not have "in-house" fresh Kinnow processing facilities and source fresh processed Kinnows from the processing plants. Although, fresh Kinnow processing plants provides an opportunity to target international customers and export directly, but it is not more often used in this field. However, this opportunity may now be exploited directly by the Growers or processors.

RAW MATERIAL

Table 4-1: List of Raw & Processing Material

Description	Price (Rs)	Availability (Local or Imported)
Kinnow average price per season (per kg)	6	Local
Wax (per litre)	290	Imported
Hi speed diesel (per Litre)	37.26	Local
Cardboard carton for packaging (each)	39.25	Local
Dividers – 3 ply water proof for packing (each)	1.10	Local

² FAO 2004

4 MANPOWER REQUIREMENT

Table 5-1: Number of People Required

Positions	Number	Salary/Month (Rs)	Annual Salary (Rs)
Production Staff (for 5 months)			
Processing Plant Operator	1	7,000	35,000
Helper	1	3,000	15,000
Supervisor	1	6,500	32,500
Direct Labour (skilled)	40	4,000	800,000
Total Payroll (Production Staff)	43		882,500
Administrative Staff (for 12 months)			
Skilled machine mechanic	1	8,000	96,000
Accounts/store clerk	1	7,000	84,000
Security Guards	1	4,000	48,000
Total Payroll (Admin Staff)	3		228,000
Total	46		1,110,500

The fresh Kinnow processing plant does not require highly specialised operating skills. However, a trained plant machine foreman/mechanic is required to preventive accidental shutdowns and to carry out routine daily maintenance. The larger part of the manpower accounts for unskilled labour. The labour is required for manual sorting, loading and packing jobs etc.

5 MACHINERY & EQUIPMENT

Table 6-1: Machinery & Equipment List

Processing Machinery	Quantity/Number	Cost/Machine	Total Cost (Rs)
Kinnow Washing, Waxing & Grading Plant ³	1		1,275,000
Plastic Baskets	3,600	350	1,260,000
Generator 25 KVA	1	500,000	500,000
Transformer 50 KV	1	100,000	100,000
Cost of Installation			15,000
Main Electrical wiring cost			20,000
Electric Wiring			10,000
Total Cost of Processing Machinery			3,180,000

³ Includes ad valorem sales tax and income tax

6 LAND & BUILDING

Table 7-1: Total Land Required (Area) & Building Construction Cost

Building and Civil Works	Area (Sq. Ft)	Construction Cost (Rs/sq. ft)	Total Cost (Rs)
Main Factory Building			
Boundary Wall	625	400	250,000
Production Hall	8,400	450	3,780,000
Stores	225	300	67,500
Labour living Room	840	250	210,000
Store cum Generator Room	100	300	30,000
Total	9,565		4,337,500
Office Block			
Management Office	150	550	82,500
Toilets	240	150	36,000
Total	390		118,500
Total Cost of Building	9,955		4,456,000
Free Space	12,444		
Total Cost of Land	22,399	@ Rs100,000/4500 sq. ft	497,750

The Processing plant is proposed to be set-up within or in the vicinity of Sargodha district. The requirement of land is 22,399 Sq. ft (approximately 5 Kanals). The land cost has been estimated as Rs. 100,000/Kanal. The land requirement has been proposed keeping in view the future expansion needs (if any) for example installation of cold storage facility etc.

6.1 Infrastructure Requirement

Following essential utilities and infrastructure required for the operations of processing plant:

- Electricity (3 Phase)
- Water connection
- Telephone facility
- Access roads
- Drainage

7 PROJECT ECONOMICS

Table 8-1: Project Economics

Account Head	Total Cost (Rs)
Land	529,000
Building and Civil Works	4,456,00
Plant and Machinery	3,180,000
Furniture/Fixture & Equipment	74,000
Pre-operational Expenses ⁴	102,000
Total Fixed Cost	8,373,200
Cash	2,916,000
Raw Material Inventory	2,101,343
Up-Front Insurance Payment (year 1)	262,506
Total Working Capital	5,017,343
Total Project Cost	13,390,543

Table 8-2: Financing Plan

Financing		Rs.
Equity	50%	7,538,397
Debt	50%	7,538,397

Table 8-3: Project Return

Internal Rate of Return (IRR)	59.70%
Net Present Value (NPV) (Rs) @ 20%	45,472,407
Payback period (years)	2.56

⁴ Includes salaries and utilities.

8 KEY SUCCESS FACTORS

The commercial viability of the venture totally depends upon the regular and consistent supply of Kinnow. Although, Kinnow is available in abundance but regular and consistent supply of high quality Kinnow during the season is of vital importance. The cost of purchase of Kinnow involves heavy cash outlays, which would have to be met from working capital. Working capital requirement is controlled from suppliers' credit of 45 days.

The other important aspect is the need for strong linkage with the progressive fruit and vegetable exporters. These exporters are of two types, those who outsource their production along-with their own in-house production and those which do not have in-house production facility and purchase processed Kinnow from processing plants ready for export.

9 FINANCIAL ANALYSIS

9.1 Projected Income Statement⁵

Projected Income Statement										
	Rs.									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales	60,507,000	66,678,350	73,479,767	80,975,631	89,236,902	98,341,797	108,376,531	119,436,132	131,625,349	145,059,643
Cost of Sales	49,595,697	53,291,383	57,273,659	61,557,176	66,164,900	71,121,557	76,453,773	82,190,219	88,361,767	95,001,666
Gross Profit	10,911,303	13,386,966	16,206,108	19,418,455	23,072,003	27,220,241	31,922,758	37,245,913	43,263,582	50,057,976
Operating Expenses	1,755,158	1,756,162	1,761,765	1,769,959	1,780,994	1,795,149	1,812,728	1,834,065	1,859,530	1,889,528
Operating Profit	9,156,146	11,630,804	14,444,343	17,648,497	21,291,009	25,425,092	30,110,030	35,411,848	41,404,051	48,168,448
<i>Less:</i>										
Financial expenses	816,652	528,528	197,375	-	-	-	-	-	-	-
	816,652	528,528	197,375	-	-	-	-	-	-	-
Profit Before Taxation	8,339,494	11,102,276	14,246,968	17,648,497	21,291,009	25,425,092	30,110,030	35,411,848	41,404,051	48,168,448
Income Tax	1,667,899	2,220,455	2,849,394	3,529,699	4,258,202	5,085,018	6,022,006	7,082,370	8,280,810	9,633,690
Net profit After Taxation	6,671,595	8,881,821	11,397,575	14,118,797	17,032,807	20,340,073	24,088,024	28,329,478	33,123,241	38,534,758
Retained earnings	-	6,671,595	15,553,416	26,950,991	41,069,788	58,102,595	78,442,668	102,530,692	130,860,170	163,983,411
Profit transferred to balance sheet	6,671,595	15,553,416	26,950,991	41,069,788	58,102,595	78,442,668	102,530,692	130,860,170	163,983,411	202,518,170

⁵ See Annexure 12.1 and 12.2 for CGS and O.E

9.2 Projected Cash-flow Statement

Cash Flow Statement											Rs.
Operating activities	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net profit	-	6,671,595	8,881,821	11,397,575	14,118,797	17,032,807	20,340,073	24,088,024	28,329,478	33,123,241	38,534,758
Amortization (Pre-operational E	-	10200	10200	10200	10200	10200	10200	10200	10200	10200	10200
Depreciation	-	771040	771040	771040	771040	771040	771040	771040	771040	771040	771040
Raw Material Inventory	(2,101,343)	481,368	(123,523)	(132,942)	(143,078)	(153,988)	(165,730)	(178,367)	(191,967)	(206,605)	2,916,174
Accounts receivable	-	(8,857,350)	(907,878)	(1,000,936)	(1,103,532)	(1,216,644)	(1,341,350)	(1,478,838)	(1,630,419)	(1,797,537)	(1,981,785)
Accounts payable	-	2,257,804	172,158	185,285	199,413	214,618	230,982	248,595	267,550	287,951	309,907
Tax Payable	-	1,667,899	552,557	628,938	680,306	728,502	826,817	936,988	1,060,364	1,198,441	1,352,879
<i>Cash provided by operations</i>	(2,101,343)	3,002,556	9,356,374	11,859,160	14,533,145	17,386,535	20,672,033	24,397,641	28,616,246	33,386,731	41,913,175
Financing activities											
Long term debt principal repayment		(1,929,290)	(2,217,414)	(2,548,567)	-	-	-	-	-	-	-
Addition to long term debt	6695271										
Owner's investment	6695271										
<i>Cash provided by/ (used for) financing</i>	13390543	(1,929,290)	(2,217,414)	(2,548,567)	-	-	-	-	-	-	-
Investing activities											
Capital expenditure	(8,373,200)										
<i>Cash (used for)/ provided by investing</i>	(8,373,200)	-	-	-	-	-	-	-	-	-	-
Net Cash	2,916,000	1,073,266	7,138,960	9,310,593	14,533,145	17,386,535	20,672,033	24,397,641	28,616,246	33,386,731	41,913,175
Cash balance brought forward	-	2,916,000	3,989,266	11,128,225	20,438,818	34,971,963	52,358,498	73,030,531	97,428,172	126,044,418	159,431,149
Cash carried forward	2,916,000	3,989,266	11,128,225	20,438,818	34,971,963	52,358,498	73,030,531	97,428,172	126,044,418	159,431,149	201,344,323

10.3 Projected Balance Sheet

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
Capital and Reserves											
Share Capital	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271	6,695,271
Retained Earnings	0	6,671,595	15,553,416	26,950,991	41,069,788	58,102,595	78,442,668	102,530,692	130,860,170	163,983,411	202,518,170
	6,695,271	13,366,866	22,248,687	33,646,262	47,765,059	64,797,866	85,137,939	109,225,963	137,555,441	170,678,682	209,213,441
Loan / Running Finance	6,695,271	4,765,981	2,548,567	0	-	-	-	-	-	-	-
Current Liabilities											
Tax Payable		1,667,899	2,220,455	2,849,394	3,529,699	4,258,202	5,085,018	6,022,006	7,082,370	8,280,810	9,633,690
Accounts Payable	-	2,257,804	2,429,962	2,615,246	2,814,659	3,029,277	3,260,259	3,508,854	3,776,404	4,064,354	4,374,262
	-	3,925,703	4,650,417	5,464,640	6,344,358	7,287,478	8,345,277	9,530,860	10,858,773	12,345,165	14,007,951
	13,390,543	22,058,550	29,447,671	39,110,902	54,109,417	72,085,344	93,483,216	118,756,823	148,414,215	183,023,847	223,221,392
Fixed Assets											
Fixed Assets	8,271,200	7,500,160	6,729,120	5,958,080	5,187,040	4,416,000	3,644,960	2,873,920	2,102,880	1,331,840	560,800
Pre-operating expenses	102,000	91,800	81,600	71,400	61,200	51,000	40,800	30,600	20,400	10,200	-
Current Assets											
Raw Material Inventory	2,101,343	1,619,974	1,743,498	1,876,439	2,019,518	2,173,506	2,339,236	2,517,602	2,709,570	2,916,174	-
A/C Receivable	-	8,857,350	9,765,228	10,766,164	11,869,696	13,086,340	14,427,690	15,906,528	17,536,947	19,334,484	21,316,269
Cash/Bank	2,916,000	3,989,266	11,128,225	20,438,818	34,971,963	52,358,498	73,030,531	97,428,172	126,044,418	159,431,149	201,344,323
	5,017,343	14,466,590	22,636,951	33,081,422	48,861,177	67,618,344	89,797,456	115,852,303	146,290,935	181,681,807	222,660,592
	13,390,543	22,058,550	29,447,671	39,110,902	54,109,417	72,085,344	93,483,216	118,756,823	148,414,215	183,023,847	223,221,392
	-	-	-	-	-	-	-	-	-	-	-

10 KEY ASSUMPTIONS

10.1 Machinery Assumptions

Capacity of processing plant (Tons/Hour)	8
Waste production (% of production)	10
First Year Production (Increasing @ 5% each successive Year)	60%
Machine maintenance cost (% of machine cost)	2.0%
Machine maintenance growth rate	2.5%
Seasonal production capacity (100%)	8,100

10.2 Operating Assumptions

Production In First year (excluding waste) Tons	4,373
Hours operational per day (½ an Hour Break Included)	8
Days operational per month	27
Day operational per season	135

10.3 Economy Related Assumptions

Electricity growth rate	10%
Wage growth rate	10%
Factory overhead growth rate	1%
Interest rate on long-term loan	16%
Raw material price growth rate	2.5%
Kinnow purchase price growth rate	2.5%
Waste price growth rate	3%
Gas price growth rate	10%
Insurance rate	3.5%

10.4 Cash Flow Assumptions

Accounts receivable cycle (in days)	45
Accounts payable cycle (in days)	15
Raw material inventory (in days)	15
Kinnow purchase inventory (in days)	1
Kinnow purchase price (Rs./Metric Tons)	6,000
Equipment spare part inventory (in days)	30

10.5 Revenue Assumptions

Production capacity of the unit (average increase over the seasons)	5%
Kinnow sales price (Rs/Metric Ton)	13,500
Waste Kinnow sale price (Rs/Metric Ton)	3,000
Sales price growth rate per annum	5%
Maximum capacity utilization	100%

10.6 Other Assumptions

Kinnow packaging per carton (Tons)	10
Kinnow wax consumption per ton (Liter)	1.38

Table 11-7: Financial Assumptions

Project life (Years)	10
Debt	50%
Equity	50%
Interest rate on long-term debt	16%
Interest rate on short term debt	13%
Debt tenure (Years)	5
Debt payments per year	1
Discount rate (weighted Avg. cost of capital for NPV)	25%
Minimum Cash Balance	500,000

12 Annexure

12.1 Cost of Good Sold

	1	2	3	4	5	6	7	8	9	10
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
RAW MATERIAL USED	60,332,344	65,963,363	76,064,002	86,628,447	97,673,574	109,216,815	116,611,703	129,089,156	137,216,991	145,670,538
WAGES & SALARIES	882,500	970,750	1,067,825	1,174,608	1,292,068	1,421,275	1,563,403	1,719,743	1,891,717	2,080,889
TRANSPORTATION COST	3,409,200	3,579,660	3,758,643	3,946,575	4,143,904	4,351,099	4,568,654	4,797,087	5,036,941	5,288,788
DIRECT ELECTRICITY	20,714	17,377	19,045	20,714	22,383	24,052	24,886	26,555	27,389	28,224
STORE & SPARES	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600
REPAIR & MAINTENANCE	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600	63,600
TOTAL COST	64,771,958	70,658,349	81,036,716	91,897,544	103,259,129	115,140,441	122,895,846	135,759,740	144,300,239	153,195,639
<i>FINISHED GOODS STOCK ADJUSTMENT</i>										
OPENING	0	0	0	0	0	0	0	0	0	0
CLOSING	0	0	0	0	0	0	0	0	0	0
COST OF GOODS SOLD	64,771,958	70,658,349	81,036,716	91,897,544	103,259,129	115,140,441	122,895,846	135,759,740	144,300,239	153,195,639

12.2 Operating Expenses

YEAR	1	2	3	4	5	6	7	8
ADMINISTRATIVE SALARIES	223,200	245,520	270,072	297,079	326,787	359,466	395,412	434,954
ELECTRICITY	6,945	5,826	6,386	6,945	7,505	8,065	8,344	8,904
ADMINISTRATION & OTHER OVERHEADS	907,605	916,681	925,848	935,106	944,457	953,902	963,441	973,075
INSURANCE	262,506	235,519	208,533	181,546	154,560	127,574	100,587	73,601
DEPRECIATION	521,423	521,423	521,423	521,423	521,423	521,423	521,423	521,423
AMORTISATION	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200
	1,931,879	1,935,169	1,942,461	1,952,300	1,964,932	1,980,629	1,999,408	2,022,156
Total Operating Expenses	1,931,879	1,935,169	1,942,461	1,952,300	1,964,932	1,980,629	1,999,408	2,022,156