Pre-Feasibility Study

DEHYDRATION PLANT

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Government of Pakistan

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EXECUTIVE SUMMARY

- Pakistan's economy extended its impressive expansion in all three major components namely, agriculture, manufacturing and services in year 2004-2005. The Real GDP grew by 8.4 percent in 2004-05 as against 6.4 percent last year and surpassed the target (6.6%) for the year by a wide margin. The growth in year 2004-2005 is supported by a healthy performance in large-scale manufacturing (15.4%), impressive recovery in agriculture (7.5%) and a strong growth in services sector (7.9%).

- Agriculture being the dominant sector of the economy contributes 23 percent to the GDP, employs 42 percent of the total work force, serves as a major supplier of raw materials to the industry as well as market for the industrial products and also contributes substantially to Pakistan's exports earnings.

- Agriculture sector showed a growth of 7.5 % in 2003-04. Pakistan grows over 5.8 million tones of fruits and more than 2.9 million tones vegetables every year. Among the fruits, mango, guava, citrus, apple, pears, banana and dates are the main products. Potatoes, onions and Garlic are the main vegetables grown in Pakistan. They are marketed nearly throughout the year but there is a lot of price variation between them.

- Potatoes, onions and garlic are among the important cash vegetable crops in the country. They enjoy good market both within the country and overseas. They are also included in the list of essential kitchen crops.

- Price of potatoes, onions and garlic fluctuate highly. Potatoes, onions and garlic are perishable and unless handled efficiently will deteriorate in quality and consequently lose their marketability. The prices of potatoes, onion and garlic vary from year to year, from the start of the season to the main supply period, from day to day and from market to market

- Area of potatoes during the period from 1994/5 to 2003/4 increased by 4% while production increased by 7.79%.Onions crop increased by 4.61% and production by 5.01%.Garlic crop decreased by 2.10% and production decrease by 3.06 %.

- Potatoes, Onion and Garlic are mainly produced in Punjab, while Sindh and Balochistan are the main producers of onions where as NWFP is also taking major part in production of Potatoes, onion and Garlic.

- Dehydration offers an economical and satisfactory means to extend the shelf life of vegetables and Fruits. The main advantages of dehydration are Light in weight and occupy much less space that the original, frozen or canned materials, cheap to pack compared to tinned materials, stable under ordinary storage conditions.

- The dehydrated vegetables and fruits can serve as a good stand-by either for daily dishes or for off-season consumption.

- The advantages of dehydrated vegetables and fruits are for the housewives, caterers, farmers, suppliers and food manufacturing industries. Dehydrated vegetables and fruits

produced scientifically under standardized conditions of acceptable quality have potential for exports, local consumptions, armed forces and inaccessible areas. Dehydrated vegetables are used as culinary vegetables and as industrial raw materials

- The process for dehydration is the same for most of the vegetables and fruits except blanching, washing and slicing which is not needed for onions, peppers and mushrooms. All fruits should be washed, pitted and sliced

- Three vegetables have been selected including potatoes, onions and Garlic for the feasibility as product mix that has much demand in local industry. The other vegetables and fruits can be dehydrated on order to order basis

- The exporting country has to follow some quality standards like Safe Quality Food (SQF) and has to make sure that the moisture level of dried vegetables should be from 4% to 8%.

- The proposed plant should preferably be located at Lahore near to the main vegetable and fruit market so that the infrastructure facilities power, water, fuel, transportation and waste disposal can easily be available for the smooth operation.

- The estimated cost of the project is Rs.27.45 million for processing capacity of about 2000 tons/annum. The project shall be financed through equity contribution of 50% by Equity Contributor-Private Investor and 50% by Bank Loan. The project will be run by qualified professionals.

- Based on the projected financial statements, the returns on the project are satisfactory. Financial ratios of the project is as follows:

Year	1	2	3	4	5	6	7	8	9	10
Net Sales	43.47	51.30	60.53	75.89	89.55	111.89	132.03	155.79	194.05	233.80
Gross Profit	8.13	9.83	11.95	15.91	19.09	24.85	29.55	35.03	44.71	54.22
Operating Profit	3.90	5.30	7.07	10.44	13.07	18.12	21.84	26.32	34.49	42.40
Profit before Tax	3.08	3.78	5.73	9.27	12.08	17.69	21.84	26.32	34.49	42.40
Net Profit After Tax	3.08	3.78	4.12	5.87	7.70	11.35	14.07	16.99	22.31	27.46

Internal rate of return – on project cost 22.4%

Payback period – based on cash inflows approx. 3 Years

1. INTRODUCTION

The continuation of fiscal discipline, prudent monetary policy and focusing attention on bettering the infrastructure and social sector indicators clearly shows the possibility that the economy can maintain its long term growth trajectory. During the year 2004-2005 Pakistan's economy extended its impressive expansion in all three major components namely, agriculture, manufacturing, services. The Real GDP grew by 8.4 percent in 2004-05 as against 6.4 percent last year and surpassed the target (6.6%) for the year by a wide margin. The growth in year 2004-2005 is supported by a healthy performance in large-scale manufacturing (15.4%), impressive recovery in agriculture (7.5%) and a strong growth in services sector (7.9%).

The per capita income in dollar term has grown at an average rate of 13.5 percent per annum during the last three years rising from $ 579 in 2002-03 to $ 657 in 2003-04 and further to $736 in 2004-05.

One of the major contributors to this year's growth is agriculture. The agriculture sector grew by 7.5 percent in 2004-05, which is higher than actual growth of 2.2 percent last year and a target of 4.0 percent. Major crops, accounting for 37 percent of agricultural value added, grew by 17.3 percent as against a mere 1.9 percent last year. Minor crops, which contribute 12 percent of value addition in agriculture, grew by 3.1 percent in 2004-05 over last year's 2.6 percent.

Pakistan is blessed with vast agricultural resources and has one of the best irrigation systems in the world. Pakistan's economy is agricultural and agriculture plays a vital role in the development of the country. Major crops like Cotton, Wheat and Sugar are the key players.

Exports were targeted to grow by 11.3 percent in 2004-05 rising from $12.3 billion last year to $13.7 billion this year, thereby registering an increase of $1.3 billion in absolute terms. One-half of the net increase in exports amounting to $651 million has come from the non-traditional exports items, followed by 27 percent from other manufactures and 13.4 percent from primary commodities exports.[1]

On a monthly basis, exports increased by 35 percent to a provisional $1.5 billion in September 2005 from $1.1 billion during the same month last year. The unexpected growth was because the government has asked exporters to dispose of f all the duty-paid stocks before September 30.[2]

Pakistan produces variety of vegetables which include Potatoes, Onions, Tomatoes, Pea beans, Okra, Turnips etc. Due to non availability of adequate storage facilities and preservation/dehydration facilities the surplus/excess is wasted. If some percentage of these losses is saved they can be used locally or exported. Although food processing industry has made some headway but still has weak impact on the agriculture.

[1] Economic Survey 2004 -2005
[2] SBP's Annual Report FY 05

2. AGRICULTURAL SECTOR

Pakistan is blessed with vast agricultural resources and has one of the best irrigation systems in the world. Pakistan's economy is agricultural and agriculture plays a vital role in the development of the country. Major crops like Cotton, Wheat and Sugar are the key players. Agriculture being the dominant sector of the economy contributes 23 percent of Pakistan's national income (GDP) and employs 42 percent of its workforce. [3]

The total gross disbursement of agriculture credit increased by 47.8 percent amounting to Rs 108.7 billion during FY05 as compared to 25.0 percent in FY04. The increasing penetration of commercial banks in the agri-credit market reflects attractiveness of this market segment as relative margins were higher compared to that in the corporate sector. [4]

2.1 VEGETABLE AND FRUIT SECTOR

Within agriculture the horticulture i.e. fruits, vegetables and floriculture is an important sub-sector of agricultural economy. Pakistan grows over 5.8 million tones of fruits and more than 2.9 million tones vegetables every year. Among fruits, mango, guava, citrus, apple, pears, banana and dates are main products. Important vegetables and spices include potatoes, onions, tomato, chilies, garlic, ginger, cauli flower and a large variety of leafy, root and other crops.[5]

Vegetables are among the readily perishable commodities, which form an important part of global food supplies. Pakistan produces seasonal vegetables in abundance almost all the year round. A considerable proportion of these vegetables get spoiled before reaching the consumer. According to Agriculture Department, 30% of vegetables/fruits are wasted due to negligence and lack of processing facilities. These losses can be minimized by adopting scientific techniques to convert the surplus produce of the glut season into non-perishable products by way of preservation.

2.2 POTATO, ONION AND GARLIC CROPS

Potatoes, Onions and Garlic are among the important cash vegetable crops in the country. They enjoy good market both within country and overseas. They are also included in list of essential kitchen crops. At the same time cultivation of potatoes and onions require lot of investment.

Potato is the fourth most important food crop in the world, with annual production approaching 300 million tons. More than one-third of the global potato output now comes from developing countries. A single medium-sized potato contains about half the daily adult requirement of vitamin C. Boiled potato has more protein than maize, and nearly twice the calcium.[6]

Onion is another important condiments widely used in all households to enhance flavour of foods. It not only provides flavour but also health promoting photochemical and nutrients. Onion consumption prevents gastric ulcers, growth of ulcer-forming macro-organisms. It is also a source of vitamin C, potassium, dietary fibre and folic acid.[7]

[3] Economic Survey 2004-2005
[4] SBP's Annual Report 2004-2005
[5] Pakissan news channel May 2005
[6] Agricultural Marketing Report
[7] Dawn News December 12, 2005

Garlic is the second most widely used cultivated vegetable after onion. It has long been recognized all over the world as a valuable spice for foods and a popular remedy for various ailments and physiological disorders. Garlic is grown through out Pakistan and consumed by most of the people. It is used practically all over the world for flavouring various dishes. In Pakistan it is being used in several food preparations especially in dishes, curry powders, curried vegetables, meat preparation, tomato ketchup etc. Garlic is considered as a rich source of carbohydrates, protein, phosphorous.

The ten years average production of the country from 1994-1995 to 2003-2004 of potato has increased by 7.79 percent, onion by 5.01 percent, while that of garlic decreased by 3.06 percent.[8]

2.2.1 Prices of Fresh Potatoes, Onions and Garlic

Due to seasonal and sensitive nature prices of potatoes, onions and garlic are regularly monitored at level not less than Economic Coordination Committee of the Cabinet (ECC). Price of potatoes, onions and garlic fluctuate highly. Potatoes and onions are perishable and unless handled efficiently will deteriorate in quality and consequently lose their marketability.

The potatoes have good storage life and facilities for their storage exist. Storage facilities for onions are non-existent. Garlic bulbs can be best stored for 3-4 months in well ventilated room. Storability is also affected by enzyme activity and the cultivars most suitable for storage generally have low ascorbate and polyosenol oxidize activity.

The potatoes are marketed throughout the year. In Pakistan, the climatic diversity enables their production around the year. In addition, fresh potatoes harvests are supplemented by releases from cold storage. Onions are traded from the fresh harvest due to the absence of long term storage facilities. This extreme variance in prices makes potatoes and onions production potentially both very profitable and very risky.

Generally prices are high at the beginning and late crop harvest, and during lean crop period. The peak harvest periods are usually met with market gluts leading to lowest prices. The prices of potatoes, onion and garlic vary from year to year, from the start of the season to the main supply period, from day to day and from market to market. A critical look at the prices pattern leads to the following:

- Prices for potatoes are lowest during **January to March** due to peak harvest months of main autumn crop.
- The prices are inversely related with production i.e. they are lower when crop size is high and vice versa.
- The prices are directly related to exports i.e. they are high when exports are high.
- Prices for onions are lowest during **December to April** due to peak harvest months (Lower Sindh crop). The prices also are low when Balochistan has bumper crop, the second largest producer of onions.
- Prices for garlic are lowest during **April to May**.

[8] Federal Bureau of Statistics

The inability of the farmers to adjust their production decisions to the fluctuating prices often causes market dips and shortages. This situation can be improved through effective market information, service guiding production and marketing decisions of the farmers.

2.3 AREA AND PRODUCTION

The table below shows that area under cultivation during the period from 1994/5 to 2003/4. The potato area increased by 4.0% while production increased by 7.79%. The Onion crop area increased by 4.61% while production by 5.01%. The Garlic crop area decreased by 2.10% while production decreased by 3.06% as shown in table below:[9]

Table 1 AREA AND PRODUCTION

	Potato		Onion		Garlic	
Year	Area (000ha)	Production (000 MT)	Area (000ha)	Production (000 MT)	Area (000ha)	Production (000 MT)
1994-95	79.3	1,105.0	74.8	1,013.1	8.5	76.9
1995-96	78.9	1,063.5	77.9	1,097.6	9.1	82.5
1996-97	85.8	963.6	80.8	1,131.0	8.5	76.1
1997-98	104.7	1,425.5	81.4	1,076.5	8.8	79.8
1998-99	109.5	1,810.4	85.5	1,138.2	9.2	82.7
1999-00	110.5	1,868.4	109.8	1,648.0	8.6	76.3
2000-01	101.5	1,665.7	105.6	1,563.3	7.9	63.9
2001-02	105.2	1,721.6	103.8	1,385.0	7	56.5
2002-03	107.0	1,696.3	105.3	1,622.0	7	57.7
2003-04	109.7	1938.1	109	1449	6.9	56.5
Change (%)	4.0	7.79	4.61	5.01	-2.10	-3.06

Potatoes are mainly produced in Punjab, while Sindh and Balochistan are the main producers of onions as shown in the table below: [10]

Province	Potatoes	Onions	Garlic
	(000 tons)	(000 tons)	(000 tons)
Punjab	1358.92	233	25.89
Sindh	5.82	538	2.63
NWFP	113.43	1396	8.42
Balochistan	41	382	8.15
Total	1558.82	1292.93	70.89

[9] Pakistan Agricultural Statistics, Ministry of Food, Agriculture & Livestock, Government of Pakistan, Islamabad, 2003/04
[10] Pakistan Agricultural Statistics, Ministry of Food, Agriculture & Livestock, Government of Pakistan, Islamabad, 2003/04

3. DEHYDRATION

Dehydration offers an economical and satisfactory means to extend the shelf life of vegetables. The main advantages of dehydration over other methods of preservation being that the dehydrated products are:

1. Light in weight and occupy much less space **than** the original, frozen or canned materials.
2. Cheap to pack compared to tinned materials
3. Stable under ordinary storage conditions.

The dehydrated vegetables can serve as a good stand-by either for daily dishes or for off-season consumption.

3.1 DEHYDRATED PRODUCTS

There are a lot of vegetables and fruits which can be dehydrated. The major vegetables and fruits which are used in world as dehydrated are as follows:

Potato Fingers / Granules/ Powder	Coriander Leaves/Powder	Grape Fruit Juice Powder
Onion Powder/Flakes	Capsicum Slice	Lime Juice Powder
Garlic Powder/Flakes/Granules	Red Beet Juice Powder	Mango Juice Powder / Slices
Ginger Powder	Orange Juice Powder	Mushroom Pieces
Tomato Powder	Papaya Powder	Mustard Leaves
Green Chili	Banana Powder	Mint Leaves / Powder/ Flakes
Cauliflower	Bitter Gourd (Momordica Charantia)	Spinach Leaves
Carrot Flakes / Bits/ Powder	Curry Leaves	Pineapple Fruit Juice Powder
Cabbage	Fenugreek Leaves	

3.2 DEHYDRATION GUIDE FOR VEGETABLES AND FRUITS

A brief dehydration guide for major vegetables and fruits are given below. The dehydration plant can be used for these or any other product, vegetable and fruit but for convenient and considering some primary and secondary survey three major vegetables Potato, Onion and Garlic have been selected as product mix for the purpose of project feasibility.

3.2.1 Vegetables

All vegetables except onions and peppers and mushrooms should be washed, sliced, and blanched. Dehydration of vegetables products depends upon drying conditions and drying times.

- **Potato flakes**, monoglycerides, sodium acid phrophosphate, sodium bisulfite, citric acid, and **Butylated hydroxyanisole** (BHA) and the related compound **Butylated hydroxytoluene** BHT are phenolic compounds that are often added to foods to preserve fats.

- **Diced Potatoes**, Dehydrated potato dices, sodium bisulfate added to preserve quality.
- **Potato Powder, starch**, Prepared from by products of diced and chips potatoes. And many more like, potato salts and other mix of products can be produced.
- **Slices:** Slice 1/8-inch thick. Dry 6-12 hours until crisp.
- **Onions:** Slice 1/4-inch thick. Dry 6-12 hours until crisp.
- **Chopped, Whole, Dried and Cut**, 100% chopped onions.
- **Garlic Powder, flakes and Salt**, Garlic powder and garlic salt are fine in meat rubs, and all these products are useful in a pinch, none of them has a great flavor of fresh garlic.
- **Tomatoes:** Dip in boiling water to loosen skins, peel, slice or quarter. Dry 6-12 hours until crisp.
- **Beans, green:** Stem and break beans into 1-inch pieces. Blanch. Dry 6-12 hours until brittle.
- **Beets:** Cook and peel beets. Cut into 1/4-inch pieces. Dry 3-10 hours until leathery.
- **Broccoli:** Cut and dry 4-10 hours.
- **Carrots:** Peel, slice or shred. Dry 6-12 hours until almost brittle.
- **Cauliflower:** Cut and dry 6-14 hours.
- **Corn:**Cut corn off cob after blanching and dry 6-12 hours until brittle.
- **Mushrooms:** Brush off, don't wash. Dry at 90 degrees for 3 hours, and then 125 degrees for the remaining drying time. Dry 4-10 hours until brittle.
- **Peas:** Dry 5-14 hours until brittle.
- **Peppers, sweet:** Remove seeds and chop. Dry 5-12 hours until leathery.
- **Zucchini:** Slice 1/8-inch thick and dry 5-10 hours until brittle.

3.2.2 Fruits

All fruit should be washed, pitted and sliced. Arrange in single layers on trays. Dehydrate at 135 degrees Fahrenheit. These can be pre-treated with lemon juice or ascorbic acid or it won't darken while you are preparing it for dehydration/drying. Just slice the fruit into the solution and soak for 5 minutes.

- **Apples:** Peel, core and slice into 3/8-inch rings, or cut into 1/4-inch slices. Pre-treat and dry 6-12 hours until pliable.
- **Apricots:** Cut in half and turn inside out to dry. Pretreat and dry 8-20 hours until pliable.
- **Bananas:** Peel, cut into 1/4-inch slices and pre-treat. Dry 8-16 hours until plialbe or almost crisp.
- **Blueberries:** Dry 10-20 hours until leathery.
- **Cherries:** Cut in half and dry 18-26 hours until leathery and slightly sticky.
- **Peaches:** Peel, halve or quarter. Pre-treat and dry 6-20 hours until pliable.
- **Pears:** Peel, cut into 1/4-inch slices, and pre-treat. Dry 6-20 hours until leathery.
- **Pineapple:** Core and slice 1/4-inch thick. Dry 6-16 hours until leathery and not sticky.
- **Strawberries:** Halve or cut into 1/4-inch thick slices. Dry 6-16 hours until pliable and almost crisp.

3.3 PROSPECTS OF DEHYDRATED VEGETABLES AND FRUITS

Dehydrated vegetables produced scientifically under standardized conditions of acceptable quality have potential for the following purposes:

1. **Local consumption:** It is difficult to state with certainly the size of demand of different dehydrated vegetables and Fruits in the retail market. Consumer's acceptance for such products would, however, affected by the quality, presentation and price. Such quality products, with convenience in use, should make them quite popular among the consumers.

2. **Armed Forces:** The Army has great demand for dehydrated vegetables. Such demand increases during military exercises or war conditions. Certain private concerns which are dehydrating potatoes exclusively for armed forces are unable to meet their entire demand. The Director General Procurement (DGP) of at Rawalpindi demand dehydrated potato, onion from local suppliers and manufactures to meet the need of entire army.

3. **Inaccessible Areas:** Our Northern areas which get snow-bound during winter should also benefit from the dehydrated vegetables.

4. **Export:** There is a potential for the export of dehydrated vegetables. The demand for such products in international market is increasing every year. But there is sever competitions regarding cost and quality, Pakistan can compete with other countries in price and quality for the export of dehydrated vegetables.

3.4 ADVANTAGES OF DEHYDRATED VEGETABLES AND FRUITS

3.4.1 Food Manufacturing Industries

1. Consistent product quality
2. All-year-round availability **of dehydrated products.**
3. Little preparation labor
4. No wastage, no pollution
5. Minimum storage space requirement

3.4.2 House-wives and Caterers

1. Dehydrated vegetables offer quality along with convenience in storage, preparation and serving.
2. Dehydrated vegetables help in stabilizing the prices of seasonal produce.

3.4.3 Farmers and Suppliers

1. Easy disposal of harvested crop.
2. Stability in the price of produce. Any situation of over-production is likely to be buffered by outlets to the dehydration industry.

3.5 REGULATIONS TO DEHYDRATED PRODUCTS

The current Laws, Regulations and Government Duties on dehydrated potatoes and onion are as follows:

3.5.1 Custom Duties and Taxes

Chapter 7 and 11 of Custom Tariff and Trade Controls lists the tariff applicable to dehydrated potato and onion, which are as follows:

Table 2 CUSTOM DUTIES AND TAXES

HS Code	Description	CD %	ST %
07.01	**Potatoes, fresh or chilled.**		
0701.9000	Potatoes, fresh or chilled.	10	
07.03	**Onions, shallots, garlic, leeks and other alliaceous vegetables, fresh or chilled**		
0703.1000	Onion and shallots	10	
0703.2000	Garlic	10	
0710.1000	Potato, Frozen	10	
07.12	**Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared.**		
0712.2000	Onion; Whole Dried, Cut	15	
07.14	**Manioc, arrowroot, salep, Jerusalem artichokes, sweet potatoes and sillier roots and tubers with high starch or inulin content, fresh, chilled, frozen or dreid, whether or not sliced or in the form of pellets; sago pith.**		
0714.2000	Sweet potatoes	5	
11.05	**Flour, meal, powder, flakes, granules and pellets of potatoes.**		
1105.1000	Flour, meal and powder	20	15
1105.2000	Flakes, granules and pellets	25	15
11.08	**Starches; inulin.**		
1108.1300	Potato starch	15	15

3.5.2 Quality and Other Standards

At the moment there are two general, voluntary, standards with which manufacturers can comply: ISO14001. Both standards are based on ISO 9000 series of standards for quality management. Safe Quality Food (SQF) has recently been introduced in the European Union. Finished dried vegetables must not be treated with water or steam to improve appearance or increase weight. Excessive drying is avoided as it affects the color of the product.

The other most significant practices which need to be observed in food processing unit are Hazard and Critical Control Point Analysis i.e. HACCP and Sanitary and Phyto-Sanitary standards (SPS) which relate to the protection of the raw material for food industry from the risks arising from the disease causing organism and other chemical additives etc. It also offers protection from disease carried out from plants, animals and pests. SPS measures are getting universal importance on allowing the import of food products.

4. MARKET ANALYSIS

4.1 MARKET SUPPLY

The supply of various crops depends upon harvesting season. A good harvest will result in large quantity of products availability in the market. The harvest seasons are given below:

Potato Harvest Season

November – April	Autumn crop from Punjab & NWFP plains, February – Mid March peak harvest period
July – October	High hills crop – NWFP (mainly Swat / Mangora / Kalam) and Balochistan

Onion Harvest Seasons

November – March	Lower Sindh
April – May	Upper Sindh
Mid April – July	Punjab
Mid July – October	NWFP
August – November	Balochistan

Garlic Harvest Seasons

February – March	Sindh & Balochistan
April – May	Punjab
August – September	Northern Areas

In Pakistan 90% of potato crop is harvested in autumn a part of this crop is marketed fresh including both domestic and overseas markets and part of it goes into cold storages. Potato can be safely stored up to 6 months. The stored potatoes are then gradually released during the lean crop periods generally from June onwards. The size of the hill crop directly impacts price of stored potatoes. Commercial long-term storage facilities for onion do not exist. Therefore, onion crop can't be held beyond certain period and has to be marketed. The lacking processing facilities further compound the marketing problems of potatoes and onions.

The production seasons for the major vegetables and fruits are as follow:

Products	Main Varieties	Jan	Feb	Mar	Apr	May	Jun	jul	Aug	Sep	Oct	Nov	Dec
Potato	Diamont,Cardinal,Faisalabad white												
Onion	Phulkara,Swat-1,Chilltan red,Sariab-86												
Garlic													
Okra	Sabzpari,T-13,Pusa green												
Cucumber	Alpha beta,Japanese long green												
Tomato	Roma,Gala,Faisalabad-1												
Watermelo	Sugar baby,charles ton												
Grapes	Bedana,Kishmish,Flame(seed less),Shunda Khani												
Peach	Floridison,Florida King,Robin,6A,8A												
Apple	Tur Kulu												
	Shain Kulu												
	Amri												
	Galas												
Citrus	Sweet Orange(Mosumbi,Red Blood)												
	Mandarin(Kino)												
Mango	Sindhri												
	Chunsa												
	Dusheri												
	Langra												
	Began pali												

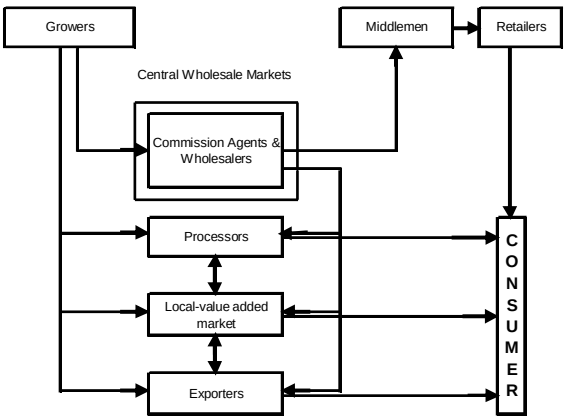
4.2 MARKET SUPPLY MECHANISM

The medium used for supply mechanism of vegetables and fruits from grower to consumer are as follows.

1. Wholesaler/Trader.
2. Commission Agent.
3. Pharia.
4. Retailer (Stall holder, Hawker)

Whereas most prevailing marketing channels for supply to end consumer are as follows.

1. Grower-Wholesaler -Comm. Agent -Pharia à Retailer - Consumer
2. Grower - Comm. Agent - Pharia - Retailer - Consumer
3. Grower - Comm. Agent - Pharia - Consumer.
4. Grower - Wholesaler - Comm. Agent - Retailer - Consumer



4.3 MARKET DEMAND

As mentioned above the production of potato and onion increased by 7.79% and 5.01% but the production of garlic decrease by 3.06 % .due to huge demand in local market the potato and onion market recorded inclining tendency.

Increase in exports of Fresh vegetables is due to the fact that there has been a greater market access allowed by the European Union, overall increase in unit values of our export items, stable exchange rate, low inflation rate, lower mark-up rates, reduced tariffs, aggressive marketing, market diversification, abundant availability and reduced cost of finance.

The main elements of export strategy are reducing cost of doing business, increasing market access, technology, environmental & Security Compliance, encouraging export-oriented foreign investment, region-specific strategy, country & business image building and value addition.

4.3.1 Export of Fresh Potato, Onion and Garlic

Good quality potatoes, onions and garlic have ready demand in the export markets especially in the food deficit regions of Middle and Far East. Owing to their nature, there is often a production dip which depresses the prices thereby forcing growers to divert to other crops. Thus hard earned export markets are lost besides shortage of these essential items within the country. Therefore, exports of potato and onions from the country have shown an erratic trend in the table below

4.3.2 Export of Fresh Potatoes, Onions and Garlic from Pakistan 2000 – 2005

The per unit export price of potato varied from 0.11 to 0.15 US $ per kg, onion from 0.10 to 0.13 US$ per kg and garlic from 0.49 to 0.62 US $ per kg. The export prices are low primarily due to poor grading, packing and unhealthy competition among the exporters. The export of fresh potato, onion and garlic over the past 5 years are given below:[11]

Table 3 EXPORTS OF FRESH POTATO, ONION & GARLIC

YEARS	POTATOES			ONION			GARLIC		
	QTY	VALUE	PRICE PER K.G	QTY	VALUE	PRICE PER K.G	QTY	VALUE	PRICE PER K.G
	000'K.G	000' $	US $	000'K.G	000' $	US $	000'K.G	000' $	US $
2000-2001	58,450	6,656	0.11	77,168	10,280	0.13	359	177	0.49
2001-2002	56,987	6,091	0.11	53,379	5,427	0.10	2,479	1,542	0.62
2002-2003	69,348	6,818	0.10	63,711	6,086	0.10	2,161	836	0.39
2003-2004	56,042	5,807	0.10	49,078	6,332	0.13	681	204	0.30
2004-2005	20,762	3,100	0.15	29,597	3,738	0.13	51	17	0.33
AVERAGE	**52,318**	**5,694**	**0.11**	**54,587**	**6,373**	**0.12**	**1,146**	**555**	**0.43**

The exports from Pakistan in year 2004-2005 was 91,239 US $ and its share is 0.63 % whereas, in the year 2003-2004 exports was 102,679 US $ and its share is 0.83 %. The exports from Pakistan decrease by 11.14 %. India and U.S.S.R are the main import markets for Pakistani fruits and vegetables. The country wise exports of Fruits & Vegetables are as follow:[12]

Country-wise export of Potato, Onion and Garlic from Pakistan 2002-2003

Table 4 COUNTRY WISE EXPORT 2002-2003

Rupees in, 000

POTATO			ONION			GARLIC		
Countries	Quantity	Value	Countries	Quantity	Value	Countries	Quantity	Value
	KG'			KG'			KG'	
Afghanistan	28,250,636	135,977	Abu Dhabi	388,210	1,935	Afghanistan	6,500	140
Brunei Darussalam	184,300	1,849	Afghanistan	1,001,050	5,553	Canada	1,887,729	41,465
Daubi	238,305	1,362	Bahrain	362,000	1,792	Daubi	55,740	2,293
Hong Kong	88,998	644	Bangladesh	11,600	99	Saudi Arabia	70,200	1,269
Indonesia	48,024	322	Brunei Darussalam	27,450	238	Turkmenistan	40,000	1,520
Japan	37,000	205	Daubi	35,603,894	183,579	U S A	100,900	2,144
Luxembourg	10,000	91	Greece	256,266	1,309			
Malaysia	10,178,165	63,774	Hong Kong	24,000	110			
Mauritius	84,000	487	Indonesia	24,000	97			
Oman	25,000	157	Kuwait	598,900	2,645			
Other Asia	379,330	2,409	Malaysia	6,434,255	44,417			
Sharja	36,000	145	Oman	2,788,149	13,816			
Singapore	1,157,732	6,538	Philippines	21,000	124			
Sri Lanka	28,214,267	182,435	Qatar	956,200	4,487			
Turkmenistan	340,000	1,471	Saudi Arabia	369,450	1,730			
U S A	76,002	512	Sharja	759,480	4,007			
United Kingdom	321	120	Singapore	1,212,424	7,359			
			Spain	9,244	2,566			
			Sri Lanka	12,805,669	79,443			
			Turkey	46,000	264			
			United Kingdom	11,400	144			
TOTAL	**69,348,080**	**398,498**	**TOTAL**	**63,710,641**	**355,714**	**TOTAL**	**2,161,069**	**48,831**

[11] Export Promotion Bureau, Pakistan
[12] Export Promotion Bureau of Pakistan.

4.3.3 Market for Dehydrated Vegetables

Basically, dehydrated vegetables are used as culinary vegetables and as processed raw materials.

1. **Culinary vegetables:** Dehydrated vegetables are used as culinary vegetables by hotels, industrial canteens and housewives. These are also used in armed forces rations and emergency rations.
2. **Processed raw materials:** Dehydrated vegetables are used as industrial raw materials by a wide range of food manufacturing industries. Main users are:
   - i) **Soup mix industry:** The major dehydrated vegetables including tomatoes, onions, potatoes, carrots, peas and spinach is used for the purpose.
   - ii) **Other food Industries:** The following products utilize a variety of dehydrated vegetables
     - Dry mixes – ready meal mixes, stuffing mixes, spice mix (curry powder), and sauce mix.
     - Baby foods – both canned and dried baby foods.
     - Baker products – dehydrated potato products are used in the production of garnish pasties, pies and bread making.
     - Canned foods – dehydrated vegetables such as potatoes, carrots, and onions are used in canned stews and soups.
     - Processed meat – hamburgers, sausages and many delicatessen-type meat products.

In short, the market sectors which have demand for dehydrated vegetables are as follows:

1. Catering industry and Armed Forces Mess.
2. Dried soup manufacturers.
3. Other food manufactures.
4. Retail trade in dehydrated vegetables.
5. Garlic powder has utility in certain pharmaceuticals.

4.3.4 Local and International Market

Some units with limited capacity for dehydration of vegetables are operating in Pakistan. The economically viable units working in domestic market are:

- M/S Almaida Foods at 2-KM Multan Road –ECO Foods
- M/S Family Food in Gujranwalla
- Amir Foods in Faisalabad
- Perfect Foods Industries
- Falkon Foods
- Kinza Foods Chungi Amar sadhu-Bank Stop Lahore
- Army Plant at Noshera
- PCSIR in Sakardo, Lahore
- Agha Khan Research Centre in **Gilgit** Area

There are several un-organized individuals operating in domestic market who supply to Army and also fulfill demand by hotels and fast food restaurants. Apparent household demand for these products is limited. The general consumers have not yet been exposed to these products. The main local buyers of products are:

- Unilever former Rafhan Best food limited

- Shan Private Limited
- National Food
- Shangrila Foods
- Salman Foods
- Ahmad Food
- K.S Sulemanji Esmailji & Sons (Pvt.) Ltd.-Kolson
- K&N Foods-Raiwind Road
- Army & PIA
- and other hotels and fast food restaurants

The above mentioned companies by using dehydrated potato powder, flakes, starch, dried onion and other of this kind after value addition sell products e.g., Kolson used potato powder and starch for Slanty.

4.3.5 Imports of Dehydrated Vegetables-Potato, Onion and Garlic 2000-2003

Pakistan also importing dehydrated potato flakes, powder and onion as raw material for the use in products the imports of the selected commodities by country are as follows: [13]

Table 5 IMPORTS OF DEHYDRATED PRODUCTS 2000-2003

Rupees in , 000

		2002 - 2003		2002 - 2003		2001 - 2002		2000 - 2001	
HSCODE	COMMODITY / COUNTRY	Apr-Jun		Cumulative From July					
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
7,019,000	**Potatoes, fresh or chilled**								
	Afghanistan	-	-	3,508,330	4,260	-	-	-	-
7,031,000	**Onions and Shallots**								
	Afghanistan	23,235	71	10,054,011	30,391	-	-	-	-
	Oiran (Islmic Rep.)	-	-	154,111	874	-	-	-	-
7,032,000	**Garlic**								
	Afghanistan	-	-	439,993	5,494	-	-	-	-
	Bhutan	-	-	56,000	894	-	-	-	-
	China	6,328,556	70,493	46,456,015	596,998	-	-	-	-
	Djibouti	-	-	105,000	1,946	-	-	-	-
	Hong Kong	176,200	2,046	2,065,640	26,715	-	-	-	-
	Iran (Islamic Reg.)	-	-	107,300	2,079	-	-	-	-
	Other Asia	-	-	54,000	738	-	-	-	-
7,101,000	**Potato, Frozen**							-	
	China	26,000	368	26,000	368	-	-	-	-
	Dubai	5,504	444	5,504	444	-	-	-	-
	Netherlands	-	-	81,500	2,450	-	-	-	-
7,122,000	**Onion;Whole Dried, Cut**								
	U S A	4,997	456	23,238	2,207	-	-	-	-
	Afghanistan	-	-	-	-	-	-	31,404	97
11,081,300	**Potato, Starch**								
	Belgium	80,000	1,723	240,000	5,327	22,000	947	-	-
	Daubi	15,500	349	15,500	349	-	-	10,000	248
	France	20,000	466	20,150	480	40,000	950	22,000	659
	Germany	81,750	1,952	150,250	3,896	118,125	2,906	38,500	807
	Italy	-	-	12,000	337	-	-	-	-
	Japan	-	-	2,805	236	-	-	15,000	416
	Netherlands	-	-	203,297	5,102	180,000	4,814	420,000	9,694
	Thailand	-	-	-	-	-	-	100,000	238
	Denmark	-	-	-	-	42,000	1,021	-	-
11,051,000	**Flour, Meal&Powder of Potatoes**								
	Germany	-	-	51,000	2,761	33,000	1,573	-	-
	Belgium	-	-	-	-	25,500	1,183	-	-
	U S A	-	-	-	-	-	-	19,727	1,181
11,052,000	**Flake, Granule/Pellets Potatoes**								
	Bangladesh	-	-	6,240	390	10,460	666	8,000	483
	Belgium	156,000	8,952	435,000	24,094	140,000	6,658	21,250	1,182
	Dubai	-	-	-	-	10,263	532	-	-
	Netherlands	-	-	-	-	117,300	6,014	117,250	6,040
	U S A	-	-	-	-	-	-	102,005	6,003

[13] Federal Bureau of Statistics, Government of Pakistan

In addition to the dehydrated potato, some value added products are also **being** imported. Pringles Chips are one of the products that are imported. Dehydrated potato is used as ingredient in Pringles chips they are imported under chapter 2 of the Custom Tariff and Trade Controls lists under the H.S code 2005.2000. [14]

4.3.6 International Scenario

The international scenario has been studied on the basis of the exhaustive data obtained through secondary research. The analysis of the international trade has been derived from the bureau of census U.S department of Commerce. European Union (E.U) comprising of 15 member countries, U.S.A and Japan as these three regions constitute most of the global trade in dehydrated vegetable products. While E.U and U.S.A have significant intra as well as extra import/export trade in these products, Japan is basically a net importer.

The major countries producing and exporting the dehydrated vegetables are as follows;

Canada and U.S.A	dehydrated potato, garlic, onion, raisins, peas, and prunes products;
China	dehydrated vegetables, onion and mushrooms,
Turkey, Iran and some other countries in the middle east	dried apricot, dates etc.
India	The Indian contribution to world trade is rather insignificant even though it is the second largest producer of fruits and vegetables in the world.

4.3.7 Dehydrated Potato Imports of selected Countries, 1999-2003

The major countries importing the dehydrated potatoes are as follows;[15]

Value in 1000 dollars

Table 6 IMPORT OF DEHYDRATED POTATO 1999-2003

	1999	2000	2001	2002	2003
Value:					
Canada	1,800	3,245	6,524	8,470	12,971
Netherlands	--	--	3	15	--
Switzerland	35	30	8	14	31
Others	1,147	1,964	3,343	1,772	1,572
World	2,982	5,239	9,878	10,271	14,574
Volume: in pounds					
Canada	4,423,781	8,325,217	16,043,191	20,773,556	25,491,178
Netherlands	--	--	1,764	9,789	--
Switzerland	13,008	10,981	2,937	5,117	10,520
Others	1,361,561	2,425,541	4,966,516	2,603,313	2,427,119
World	5,798,350	10,761,739	21,014,408	23,391,775	27,928,817

[14] Statistics from **PRAL** (PCT list of cleared item for the period July 2004

[15] : Bureau of the censes, U.S department of Commerce

4.3.8 Export Market

There is no export of dehydrated products from Pakistan but after value addition food industries mentioned above including Kolson, National Food, Rafan Best Foods, Shan and other exporting value added products to Middle East and Saudi Arabia.

The proposed export market for the dehydrated products can be in Middle East, Far East Asian countries like Singapore, Malaysia, Thailand and other European countries. The leading importing countries are also a good market for the export.

4.4 RESEARCH & DEVELOPMENT ACTIVITIES

Over the last 20 years, research has brought about a vast change in Pakistan agriculture. In brief, the position of the Pakistan agriculture would have been much worse if the new high yielding, disease-resistant varieties had not been introduced. Research, therefore, has the important role of anticipating and countering any unfavourable changes in the biological status of Pakistan agriculture. Breeding a selection of new varieties must be a continuous process to productivity per unit are must be enhanced by all possible means including extension, adequate and timely supplies of inputs, and appropriate incentives.

4.4.1 Pakistan Council of Scientific and Industrial Research-PCSIR

Pakistan Council of Scientific and Industrial Research (PCSIR) was created with the major objective of assisting in the expansion of industrial base through research and development. One of the areas in which PCSIR has done sustentative research is Fruits and vegetables. It has multi-discipline laboratories located at Karachi, Lahore, Peshawar and Quetta. PCSIR laboratory at Lahore has a unit for dehydration of vegetables which is multipurpose. It can **process** fruit and vegetables for different kind and provides the service to several companies on commercial bases.

4.4.2 Punjab Agri Marketing Company-PAMCO

Punjab Agri marketing Company (PAMCO) is a government sponsored autonomous organization managed by professionals from the private sector, focusing on, establishment of local and international market for Agri-Products, Assisting investors to explore opportunities in the agriculture sector, Introducing state-of-the-art technology for processing and value addition of agriculture produce, Facilitating the agro-Processing industry in upgrading its processes to meet international standards, Installing internationally recognized processing and packaging technologies, Establishing modern cold storage facilities.

4.4.3 Pakistan Agricultural Research Council-PARC

Pakistan Agricultural Research Council (PARC) is the apex national organization working in close collaboration with other federal and provincial institutions in the country, to undertake, aid, promote and coordinate agricultural research; arrange the expeditious utilization of the research results; establish research centers mainly to fill in the gap in existing program of agricultural research, arrange the training of high level scientific manpower in agricultural sciences, generate, acquire and disseminate information relating to agriculture, establish and maintain a reference and research library, perform any other functions related to the matters aforesaid.

4.4.4 Pakistan Horticultural Development Export Board-PHDEB

Pakistan Horticultural Development Export Board (PHDEB) collaborates with various research institutions to assist companies in providing technical and marketing support in line with the latest techniques, developments and changes occurring in the international trade. PHDEB also assists in pre/post harvest activities such as developing new varieties that are popular world-wide, increasing yield of existing varieties and bringing uniformity in the produce, grading & packaging, orchard management, etc.

4.5 GLOBAL CHALLENGES AND WTO

Pakistan is in full conformity with WTO Agreement on Agriculture. Pakistan has reduced its tariff on agriculture items more than 36% on average and more than 15% on each tariff line from the base year (1986-88). Pakistan Custom Tariff on imports has been reduced from maximum 65% in 1995 to 25% in 2002-03 on agricultural items.

Pakistan cannot provide export subsidy on any item because in the base year Period i.e. 1986 -90 we were not giving any export subsidy and this was notified in WTO in 1995. Only provision, which is available in the agreement, is Article 9.4 (d &e) according to which export subsidies can be provided for up gradation and transportation of agriculture commodities.

In major agricultural commodities such as wheat, rice cotton, sugarcane, Pakistan, by and large has enjoyed comparative advantage. However, because of inadequate infrastructure and inefficient processing/manufacturing sector, the country not always been in a position to translate its comparative advantage into production and export surplus.

Contrary to this domestic scenario Pakistan agricultural exports are facing very tough competition in international markets because developed countries are exporting agricultural products through subsidies not only at marketing stage but also at production stage. It created artificial competitive edge to developed countries, which hurt the export prospects for Pakistan.

LIST OF DIFFERENT PUBLIC AND PRIVATE INSTITUTES/ORGANIZATIONS

- Tissue Culture, NARC.
- Plant Virology, Faisalabad.
- Potato Research Centre, Abbottabad
- Potato Seed Unit, Deptt. Of Agri. Gilgit.
- Jaffar Brothers Ltd.
- A.G.B.C
- Gilgit Area Marketing Association.
- VASSPP, Quetta.
- Arid Zone Research Institute, Quetta
- Arid Zone Research Station, Bahawalpur

5. STRATEGIC FACTORS

5.1 STRATEGIC RECOMMENTDATION

The industry for dehydration of vegetables and fruits in Pakistan can only survive in the present scenario on the strength of technical capabilities, product quality and cost competitiveness, which can be achieved in the following ways:

- The plant should be operated by technical staff/Food technologist to consider the quality standards of ISO, Food and Hazard Analysis and Critical Control Policy (HACCP).
- For high quality plan for growing raw material through contract farming.
- Keeping close interaction with the market demand and producing products in concurrence with the market requirements.
- The project employer should employ people who have a complete technical know how of the value added product mix to make project feasible.
- Product mix and value added production from by products of dehydrated vegetables can be a winning strategy like production of starch, flour, salts of onion, red chili, Potato and other vegetables and fruits.
- There is need to create awareness in a niche market to make regular use of the dehydrated vegetables. In domestic niche market there is not too much awareness regarding the dehydrated, dried and frozen products. That is why the usage of these products is only in industry.
- Promoting the products in a professional manner etc.
- Training for the personnel responsible for raw material procurement, plant operation and quality control.

5.2 SUCCESS STRATEGY

Following factors are the key in making the project profitable:

- Regular flow of local as well as Export orders is the key success factor for efficiently running of the project.
- Selection and procurement of consistent quality raw material would be another contributing factor for carrying out successful operations of proposed project.
- Production of quality products meeting the Health Standards of International level is necessary for Export sales.
- Competitive price of end products.
- Abundant supply of raw material.
- Cost efficiency through better management.
- Media campaign for the awareness of the retail customers.
- Availability of low cost skilled labor.
- The main elements of export strategy are reducing cost of doing business, increasing market access, technology, environmental & Security Compliance, encouraging export-oriented foreign investment, region-specific strategy, country & business image building and value addition.

5.3 WEAKNESSES

The major weaknesses in this field of business are:

- **Poor-availability of suitable processing variety of raw materials at present.**
- Lack of in-house quality control and testing facilities in conformity with the international standards.
- Lack of post harvest handling and long term storage facility.
- Existing technology obsolescence.
- Poor infrastructure facilities such as irregular power supply, high inland transportation cost and lack of cold chain facilities etc.
- The other major weakness in Pakistan food industry is the lack of coherence and co-operation amongst the processors and exporters due to which the problems can not be effectively addressed and tackled collectively.
- **Non Availability of properly quality raw material at competitive prices, which fluctuate depending upon the harvesting season crop.**

5.4 THREATS

The proposed project will be facing the following threat:

- Competition from the local unorganized sector (cottage industry).
- Increase in International competition with China, India and Eastern Europe.
- Imposition of Quality and Environment standards by importing countries.
- Decline in the average sale price for Pakistani products.
- **Crop failure**
- **Influence of major local and foreign brands operating in the market**
- **Change in Government regulations**
- **WTO Agreement on Agriculture.**

6. THE PROCESS AND PLANT LAYOUT

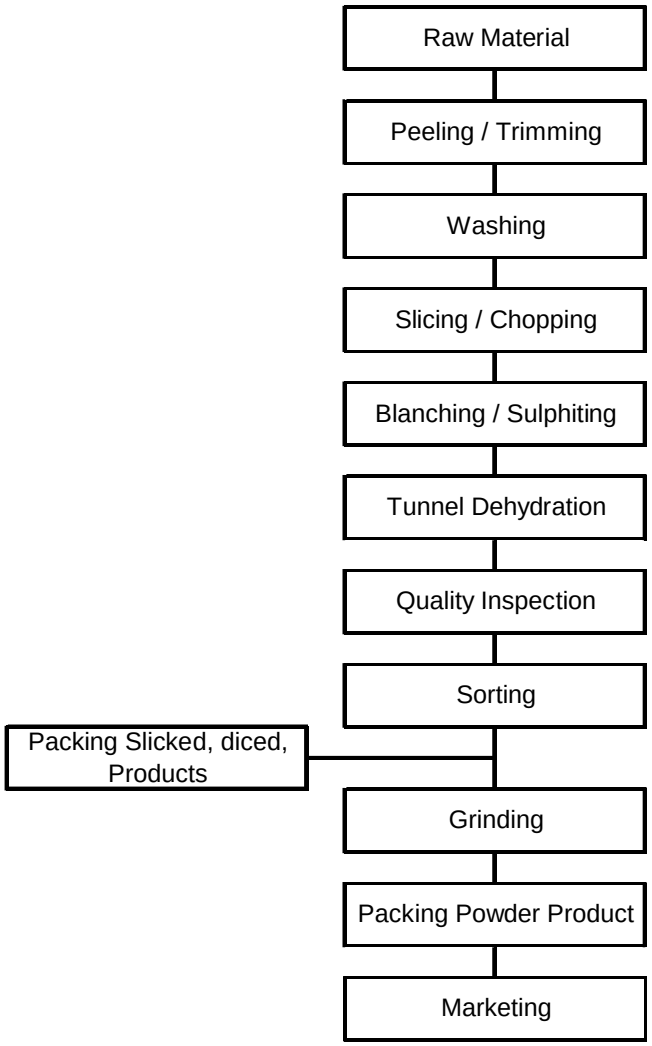
6.1 PROCESS DESCRIPTION

There are many methods used for dehydration like Sun drying, Kiln Drier but most distinctive and commercially used is Forced Draught Tunnel, consisting long chamber constructed by special bricks through which the trays of vegetables move on trolleys. In order to facilitate dehydration and to preserve original qualities during dehydration and storage the following process takes place:

- The fresh vegetables are prepared and subjected to pre-treatment operations prior to dehydration.
- The vegetable is first of all sorted carefully to remove the blemished/damaged pieces.
- Sorted vegetables are passed through a washer into a peeler. The peeled vegetable is trimmed, washed and sliced mechanically.
- The sliced material is spread on trays and stacked on trolleys.
- These trolleys, each loaded with about 50 kg of prepared/pre-treated material, are passed through the blancher
- These trolleys are then cycled through the Twin-Tunnel Dehydrator at regular intervals of time.
- The moisture is eliminated from the material under controlled conditions of temperature and humidity, using counter-current and/or con-current arrangement of hot air flow in the tunnels.
- The partially dried material, containing 15-20% residual moisture, is taken out of the tunnels and stacked in a finishing bin (cabinet dryer type) for lowering the moisture level to about 4 to 5 %.
- The final product is packed in polythene bags and stored in hermetically sealed containers **(refers to a container that is designed and intended to be secure against the entry of microorganisms and thereby to maintain the commercial sterility of its contents after processing.)**

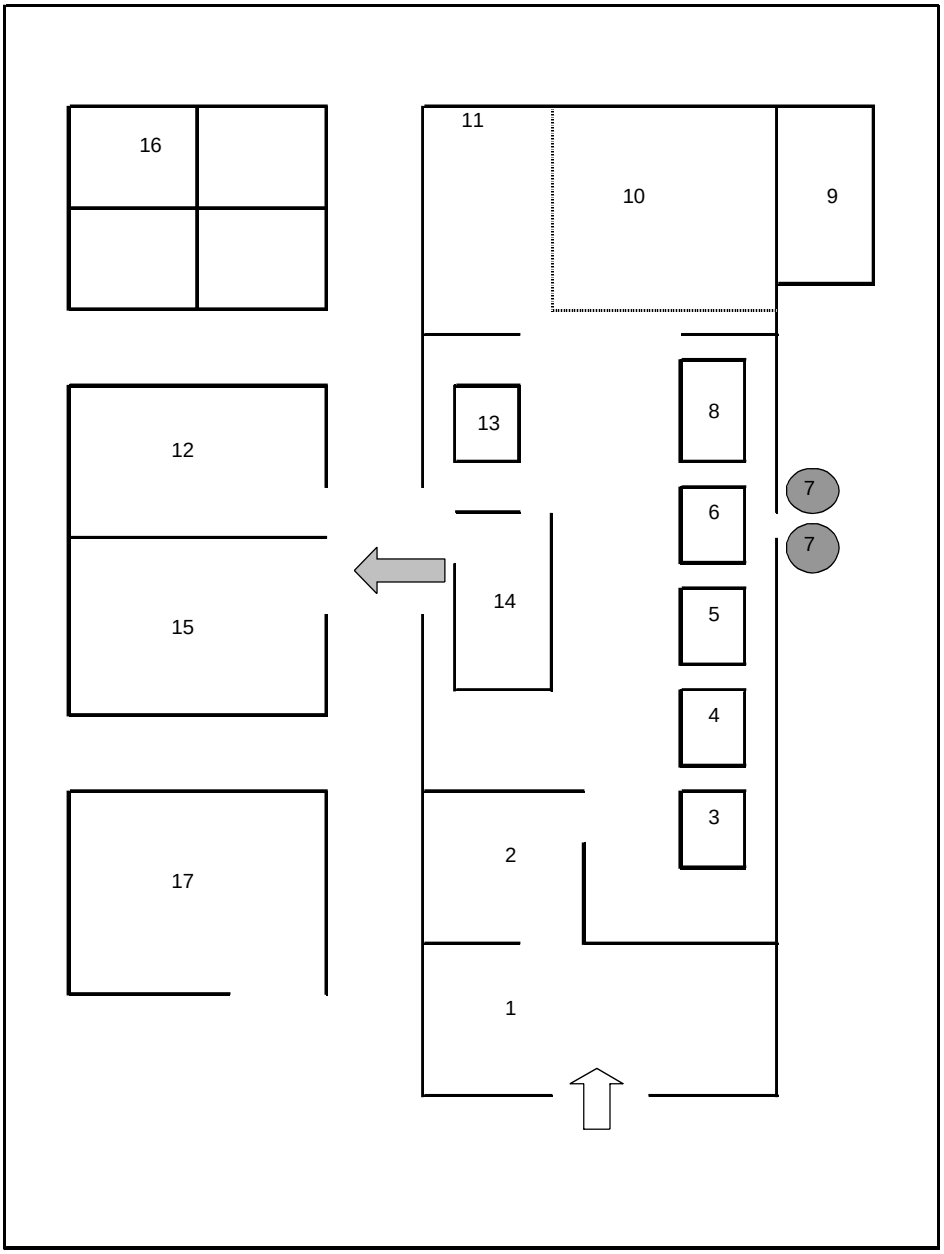
Note: Blanching is not needed for onions therefore boiler will not operate for onions. Similarly, grinding mill will only operate for the powder products of onions.

6.2 FLOW CHART FOR VEGETABLE DEHYDRATION



6.3 PLANT LAYOUT

No scale



1 Reception and Weighing
2 Raw Material Store
3 Selection and Grading
4 Peeling / Trimming
5 Washing
6 Slicing / Chopping
7 Waste Drums
8 Blanching / Sulphiting
9 Boiler Room
10 Tunnel Dehydration
11 Finishing Bin
12 Quality Inspection Room
13 Grinding
14 Packing
15 Storage Room for Finish Products
16 Toilets
17 Office

7. PROJECT SITE

Punjab is a land of diverse landscapes and natural beauty. Punjab is geographically bounded by the river Indus in the west and by the river Yamuna in the east. Divided into natural regions by the five tributary rivers of the Indus, It has rich agricultural land and keeps going on exploiting its horticulture resources to the maximum. It is easy to reach to wholesale markets from far flung areas.

The major vegetable produced in the province apart from others includes Potato, Tomato, Onion, Garlic, Wheat, Rice, Cotton, Sugarcane, and Maize, Pulses and Vegetables etc. **Punjab gives 85 % of country potato production and out of this winter potato contributes 75** %.[16] Due to seasonal nature of these vegetables it attracts buyers from other provinces. Lahore is the major market in Punjab province, the data on vegetables production in PUNJAB for the year 2003-2004 is as under.[17]

Province	Potatoes	Onions	Garlic
	(000 tons)	(000 tons)	(000 tons)
Punjab	1775.2	251.2	22.9
Sindh	2.9	610.7	9.7
NWFP	119	192.2	22.3
Balochistan	41	394.9	1.6
Total	1938.1	1449	56.5

7.1 MARKET MECHANISM OF LAHORE REGION

Four major market types exist that may play an important role in the sale and distribution of vegetables and fruits in the area.

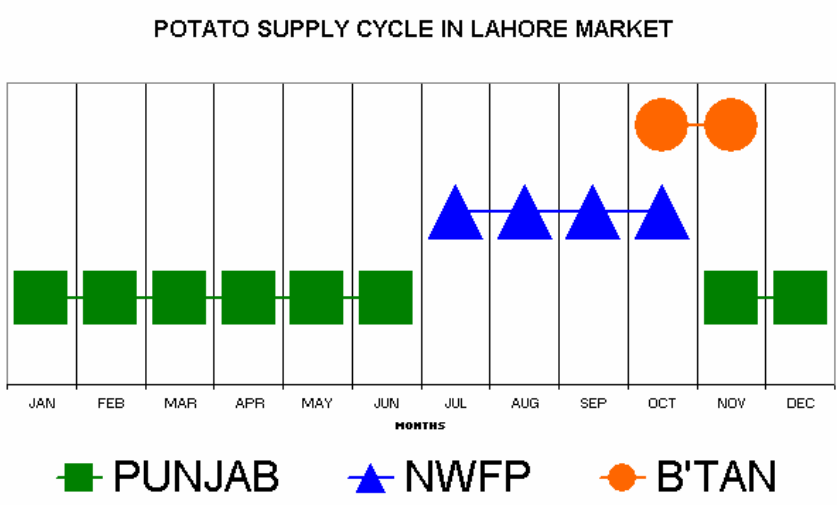
- Domestic market
- Central Market in the region
- Markets in NWFP and Punjab
- Market in Sindh

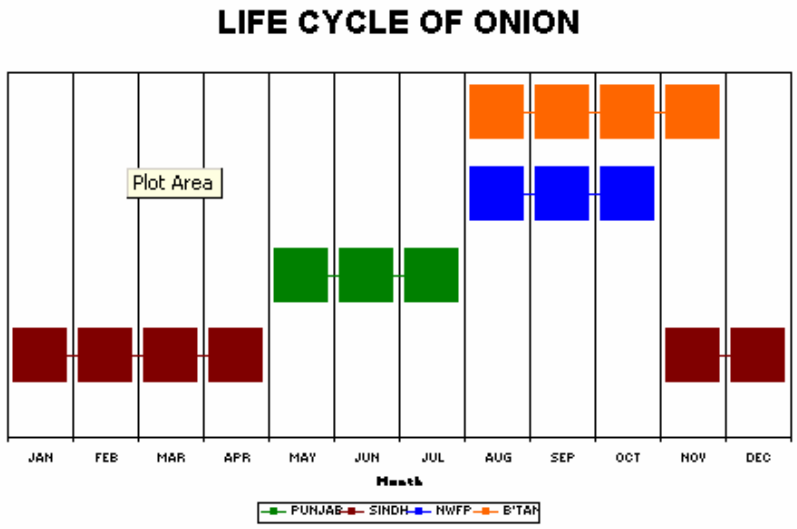
There are **five major** vegetable/fruit markets (Lahore, Faisalabad, Sargodha, Multan, and Gujranwala) located in the region and are considered important for the sale and purchase of vegetables and fruits. Lahore is the best market in accordance with the consumption of vegetable/fruits.

7.2 SUPPLY CYCLE FOR POTATO AND ONION

The supply cycle of dehydrated vegetables especially for potato and onion can be seen from the below mentioned charts.[18]

[16] Pakistan Agricultural Marketing
[17] Ministry of Food, Agriculture & Livestock, Government of Pakistan, Islamabad
[18] Economic and Marketing review of Agricultural Commodities. Directorate of Agriculture-Lahore





The supply cycle shows availability of potato and onion in different months from the different cities. For dehydration purposes potato will be cheaper to purchase from Punjab market as the supply cycle shows the bulk availability of potato in this period. Whereas the prices of potato and onion in Punjab market are as follow which are best economical for the purchase from Punjab as compare to any other province during the glut season. **The yearly prices and its trend are given as follows**.[19]

[19] Economic and Marketing review of Agricultural Commodities. Directorate of Agriculture-Lahore

MONTHLY AVERAGE WHOLESALE PRICES OF POTATO

Rs. Per 100 KG

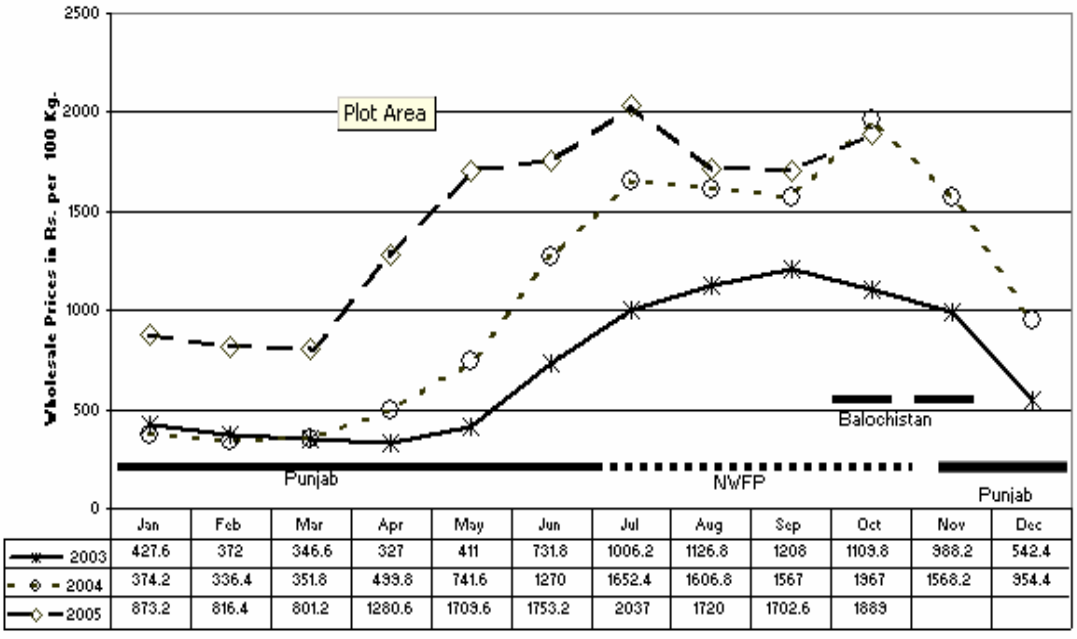
Table 7 MONTHLY WHOLESALE PRICES OF POTATO

Year, 2003	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	488	450	363	355	450	690	1100	1105	1180	1070	1120	530
Faisalabad	381	348	319	362	422	795	962	965	1135	1072	989	527
Sargodha	453	359	355	301	399	750	1122	1287	1335	1260	917	525
Multan	446	353	364	300	391	662	972	1210	1230	1097	960	610
Gujranwala	370	350	332	317	393	762	875	1067	1160	1050	955	520
Average	**428**	**372**	**347**	**327**	**411**	**732**	**1006**	**1127**	**1208**	**1110**	**988**	**542**

Year, 2004	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	430	350	390	570	780	1210	1550	1480	1440	1890	1512	926
Faisalabad	323	342	343	497	740	1350	1775	1594	1535	1850	1625	937
Sargodha	396	321	355	512	725	1325	1805	1905	1820	2205	1545	985
Multan	382	331	331	470	743	1235	1602	1570	1635	1890	1584	1024
Gujranwala	340	338	340	450	720	1230	1530	1485	1405	2000	1575	900
Average	**374**	**336**	**352**	**500**	**742**	**1270**	**1652**	**1607**	**1567**	**1967**	**1568**	**954**

Year, 2005	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
Lahore	890	860	850	1340	1616	1730	2050	1680	1650	2000
Faisalabad	865	765	732	1260	1725	1735	1905	1610	1669	1865
Sargodha	850	787	811	1290	1825	1808	2040	1885	1856	2230
Multan	876	785	853	1233	1687	1853	2244	1825	1800	1680
Gujranwala	885	885	760	1280	1695	1640	1946	1600	1538	1670
Average	**873**	**816**	**801**	**1281**	**1710**	**1753**	**2037**	**1720**	**1703**	**1889**

Potato Price trend 2003-05



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	427.6	372	346.6	327	411	731.8	1006.2	1126.8	1208	1109.8	988.2	542.4
2004	374.2	336.4	351.8	499.8	741.6	1270	1652.4	1606.8	1567	1967	1568.2	954.4
2005	873.2	816.4	801.2	1280.6	1709.6	1753.2	2037	1720	1702.6	1889		

MONTHLY AVERAGE WHOLESALE PRICES OF ONION

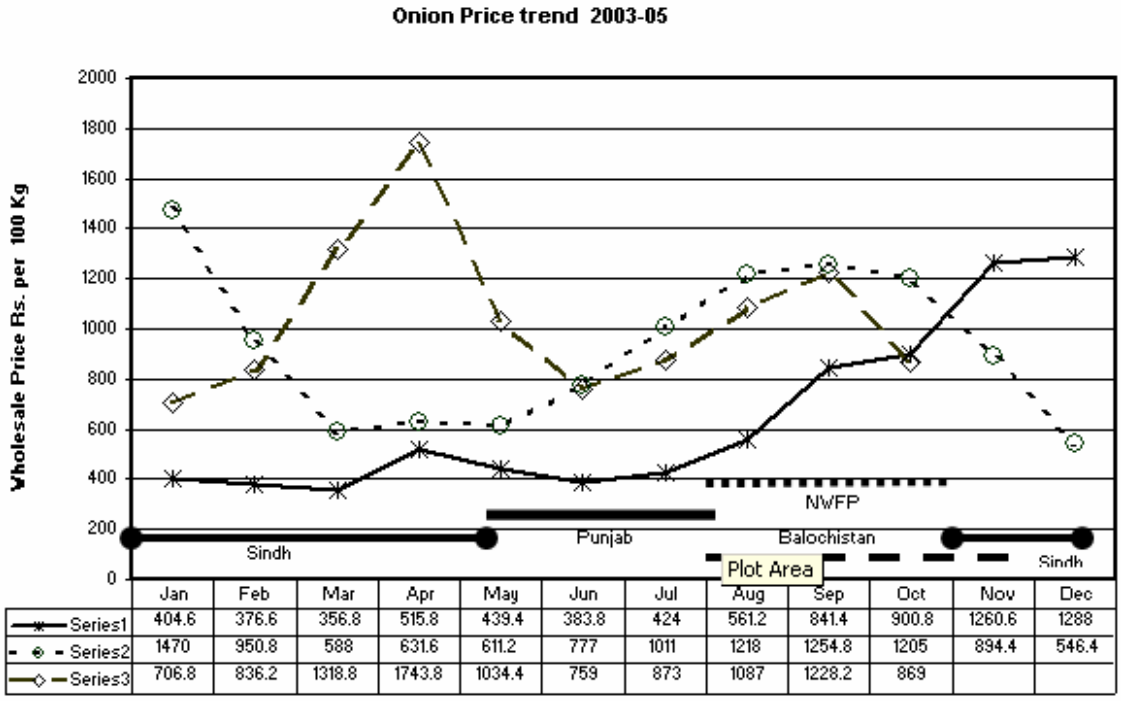
Prices in Rs. Per 100 Kgs

Table 8 MONTHLY WHOLESALE PRICES OF ONION

Year, 2003	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	443	450	370	590	450	430	470	580	960	930	1290	1290
Faisalabad	356	350	325	495	408	346	410	563	865	952	1261	1294
Sargodha	437	378	375	526	487	400	455	600	892	952	1370	1370
Multan	381	330	342	492	430	372	375	498	660	830	1200	1226
Gujranwala	406	375	372	476	422	371	410	565	830	840	1182	1260
Average	**405**	**377**	**357**	**516**	**439**	**384**	**424**	**561**	**841**	**901**	**1261**	**1288**

Year, 2004	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	1440	1050	600	700	650	840	970	1180	1240	1220	875	540
Faisalabad	1540	915	599	635	618	795	1040	1235	1300	1260	916	557
Sargodha	1610	1035	592	648	673	755	1070	1225	1214	1155	918	550
Multan	1290	864	550	540	530	760	935	1235	1280	1175	838	545
Gujranwala	1470	890	599	635	585	735	1040	1215	1240	1215	925	540
Average	**1470**	**951**	**588**	**632**	**611**	**777**	**1011**	**1218**	**1255**	**1205**	**894**	**546**

Year, 2005	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
Lahore	690	990	1370	1840	1120	850	990	1110	1300	960
Faisalabad	730	805	1295	1850	1060	720	807	1105	1263	891
Sargodha	685	775	1262	1752	1087	788	895	1100	1253	925
Multan	713	781	1327	1522	985	734	815	1085	1150	834
Gujranwala	716	830	1340	1755	920	705	857	1035	1175	735
Average	**707**	**836**	**1319**	**1744**	**1034**	**759**	**873**	**1087**	**1228**	**869**



MONTHLY AVERAGE WHOLESALE PRICES OF GARLIC

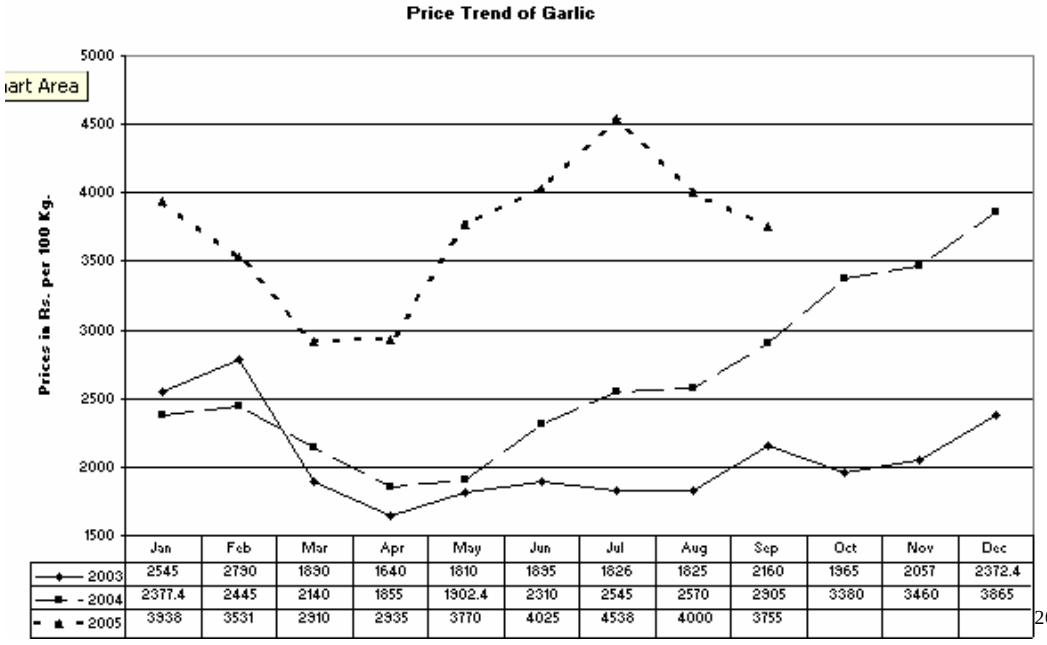
Prices in Rs. Per 100 Kgs

Table 9 MONTHLY WHOLESALE PRICES OF GARLIC

Year, 2003	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	2475	3150	1500	1500	1800	1725	1775	1750	2000	1975	1950	2200
Faisalabad	2450	2750	1700	1550	1700	1800	1805	1750	2250	2050	2150	2512
Sargodha	2950	2750	2350	1850	2100	1950	1800	1750	2300	1900	2100	2625
Multan	2350	2500	1750	1900	1850	1850	1675	1675	2000	1900	1875	2275
Gujranwala	2500	2800	2150	1400	1600	2150	2075	2200	2250	2000	2210	2250
Average	**2545**	**2790**	**1890**	**1640**	**1810**	**1895**	**1826**	**1825**	**2160**	**1965**	**2057**	**2372**

Year, 2004	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	2200	2500	2000	2000	2050	2250	2250	2400	3300	3500	3750	4300
Faisalabad	2275	2350	2250	1900	2275	2650	2725	2650	2975	3250	3350	3250
Sargodha	2700	2675	2350	1825	1712	2650	2700	2700	2850	3400	3150	3700
Multan	2412	2450	2100	2100	1875	2150	2600	2600	2700	3375	3050	3925
Gujranwala	2300	2250	2000	1450	1600	1850	2450	2500	2700	3375	4000	4150
Average	**2377**	**2445**	**2140**	**1855**	**1902**	**2310**	**2545**	**2570**	**2905**	**3380**	**3460**	**3865**

Year, 2005	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Lahore	4300	3950	2650	3175	3575	4250	4360	3750	3900			
Faisalabad	3250	3250	3000	2950	4125	4050	5200	4350	3750			
Sargodha	3850	3250	3175	2250	3175	4100	5200	4150	3812			
Multan	3950	3455	3050	3500	4325	3875	4160	3500	3300			
Gujranwala	4340	3750	2675	2800	3650	3850	3770	4250	4012			
Average	**3938**	**3531**	**2910**	**2935**	**3770**	**4025**	**4538**	**4000**	**3755**			



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Pakistan Agricultural Marketing

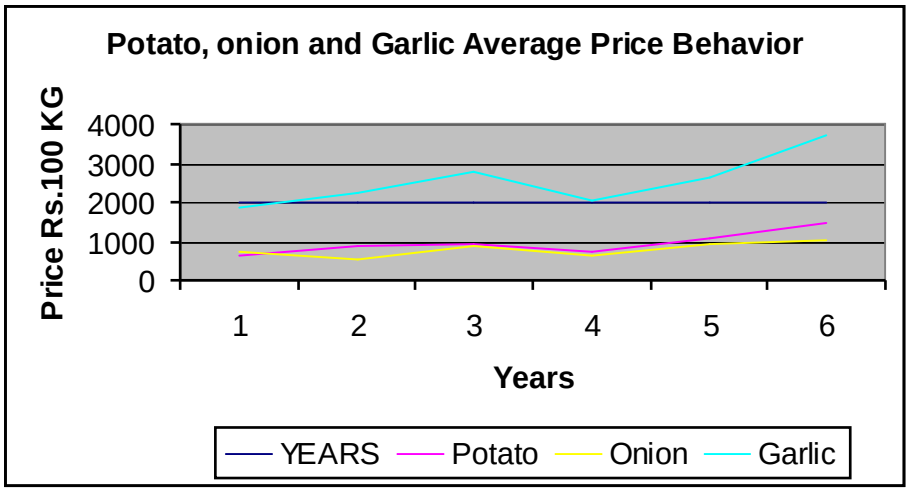
7.3 PRICE TREND

The price analysis of above mentioned data and considering the five years prices of potato, onion and garlic there is average 24% increase in fresh potato, 31 % increase in Fresh onion and 19% increase in fresh garlic the price trend can be seen from the following tables:

Table 10 PRICE TREND OF POTATO, ONION AND GARLIC

Price for 100 kg

YEARS	2000	2001	2002	2003	2004	2005
Potato	615	890	919	716	1,074	1,458
Onion	730	530	894	646	930	1,046
Garlic	1,875	2,234	2,758	2,065	2,646	3,711



7.4 HUBS OF FOOD PROCESSING UNITS

Most of the vegetable and fruit processing units are located in vicinity of Lahore, Islamabad, Karachi, Hyderabad, Hattar and Sargodha. A few factories are also located in small towns and working on very small-scale basis near Lahore like Gujranwal, Faisalabad and Sahiwal.

7.5 BUSINESS NEED ASSESSMENT

- The flow of horticulture produce from the other districts is toward Lahore therefore the Lahore has been established as one of the biggest markets for horticulture products grown in the surrounding districts.
- *Total exports out of fresh produce are estimated as 162,500 tones in the year 2003-04 only due to non availability of proposed plant and post harvest losses, post harvest losses of perishable commodities are estimated at about 20 to 40 percent of initial harvest through assembly and distribution to the final consumer.
- PAMCO is planning for a well disciplined cold storage /wholesale point therefore; the proposed infrastructure will heavily affect the viability of project.
- The propose plant is expected to reduce the wastage and have a positive impact on the exports as well as local consumption of vegetables.

8. RATIONALE & JUSTIFICATION

Almost all vegetables, especially, Potatoes, Onion, Garlic, Tomatoes and Chilies etc. are available in the market. Dehydrated vegetables have long shelf life subject to high quality packing from 8 to 12 months. Current demand-supply indicates potential of good quality dehydrated vegetables in international markets with proper marketing arrangements.

There is a big export potential for these products in overseas countries especially Europe, Japan, United States and Middle East.

8.1 SURPLUS OF RAW MATERIAL

There is surplus of vegetables and during the harvesting season large quantity of vegetables are wasted due to lack of proper storage and preservation.

8.2 DIFFERENT HARVESTING SEASON

Due to different harvesting season, the vegetables are available around the year, so it can be processed through out the year and plant can achieve maximum production

8.3 PRICES OF VEGETABLES

During the season there is glut of vegetable which are available at a cheap price.

8.4 EXPORT POTENTIAL

Stable marketing and established export network adds sales growth and returns on investment.

8.5 SHELF LIFE

Compared to frozen fruits and vegetables for dehydration units less energy is required and product becomes more stable with long shelf life without the aid of any external facilities like refrigeration, high-priced packaging material, etc.

8.6 STORAGE

Proper storage is critical in maintaining high quality. Onions should be stored in cool, dry, and well-ventilated building at 40 to 45 F with a relative humidity of 64 percent. The ventilation system should provide about 1.5 cubic feet of air per minute every cubic food of onions. Onions stored in this manner may be kept in good condition for many months. Garlic bulbs can be best stored for 3-4 months in well ventilated room.

8.7 BENEFITS TO FARMER

The proposed project will boost the demand of vegetables in the market and will results in better returns to the farmers.

8.8 FINANCIAL JUSTIFICATION

Based on certain assumptions the financial results of the project have been projected and found satisfactory, as can be observed from the following table:

Sales and Profits

(Rs. in millions)

Year	1	2	3	4	5	6	7	8	9	10
Net Sales	43.47	51.30	60.53	75.89	89.55	111.89	132.03	155.79	194.05	233.80
Gross Profit	8.13	9.83	11.95	15.91	19.09	24.85	29.55	35.03	44.71	54.22
Operating Profit	3.90	5.30	7.07	10.44	13.07	18.12	21.84	26.32	34.49	42.40
Profit before Tax	3.08	3.78	5.73	9.27	12.08	17.69	21.84	26.32	34.49	42.40
Net Profit After Tax	3.08	3.78	4.12	5.87	7.70	11.35	14.07	16.99	22.31	27.46

Ratios & Percentages

Year	1	2	3	4	5	6	7	8	9	10
Gross Profit	18.7%	19.2%	19.7%	21.0%	21.3%	22.2%	22.4%	22.5%	23.0%	23.2%
Operating Profit	9.0%	10.3%	11.7%	13.8%	14.6%	16.2%	16.5%	16.9%	17.8%	18.1%
Pre-Tax Profit	7.1%	7.4%	9.5%	12.2%	13.5%	15.8%	16.5%	16.9%	17.8%	18.1%
After Tax Profit	7.1%	7.4%	6.8%	7.7%	8.6%	10.1%	10.7%	10.9%	11.5%	11.7%
Earning Per Share	Rs. 2.24	Rs. 2.75	Rs. 4.17	Rs. 6.75	Rs. 8.80	Rs. 12.88	Rs. 15.91	Rs. 19.18	Rs. 25.12	Rs. 30.89

The profit before tax ratios for the first and second year is 7.1% and 7.4% respectively. There are no financial charges, so the cash flows of the project is reasonable.

Based on the above circumstances and figures, it is evident that the project is economical for earning potential.

9. THE PROJECT

9.1 VIABLE ECONOMIC SIZE

The proposed size of the project is capable to produce an average of 1000 kgs dehydrated vegetables per day. Considering the Local market demand and Pakistan's export trends, initially the project would be able to receive and entertain such number of orders which are required for the project to be economically viable.

9.2 PROPOSED CAPACITY

The plant has a processing capacity of about 2000 tons/annum on single shift with 360 working days basis. Production supported by duplicating the existing dehydration unit. Scale up beyond this capacity at a particular location is not recommended for the following reasons.

1. The cultivation of vegetables is not localized; it is rather spread over vast areas in the country.
2. Transportation of fresh commodity over long distances will be expensive and detrimental to the product quality.
3. A huge unit may cause shortage of vegetables in the area, unless it is supported by parallel large farms of vegetables.

It is, therefore suggested that at Lahore a medium capacity plant be installed and labour-intensive unit be encouraged. It would be unsuitable to install at one location a fully automatic huge unit (capacity 15,000 tons or more).

9.3 PROJECT

The details of the cost of project are as follows:

	Rupees. In thousands
Land – (8 Kanals @ 0.5 million per Kanal)	4,000
Building – Civil Works	16,875
Machinery & Equipment including Laboratory Equip.	3,542.5
Vehicle	650
Office Equip. and Furniture & Fixture	351.5
Preliminary Expenses	785
Working Capital	1,250
Total Project Cost	**27,454**

9.4 PROJECT FINANCING

The estimated cost of the project is Rs.27.454 million including the working capital of Rs. 1.25 million. The project will be based on 50% equity by Sponsors and the remaining 50% will be financed by the Bank Loan. The proposed equity participation includes:

		%	Rupess
Equity Contribution by	Sponsor	50%	13,727,000
Loan	Bank	50%	13,727,000
Total Capital including land		100%	**Rs. 27,454,000**

9.5 PROJECT DETAILS

9.5.1 Location (Lahore)

Lahore region is rich in horticulture. Lahore has been established as one of the big markets for horticulture products grown in surrounding districts. The following are the important factors, which determine the viability of the Dehydration Plant at Lahore.

- Availability and supply of desired quality raw material.
- Sufficient supply of electrical power.
- An ample supply of water.
- Adequate facilities for effluent and waste disposal.
- Availability of suitable labour and technical staff.
- Access to transportation facilities.
- Proximity to proposed collection point of Lahore including whole sale Market, Cold Storage, Pulp plant, sorting, cleaning, grading & packing.

The most important factor is that Lahore has flow of vegetables from neighboring divisions/districts like Kasur, Gujranwala, Faisalabad, Sheikhupura, Sargodaha, Multan, Depalpur. The availability of quality raw material is possible and plant will be located near to main vegetable market alongwith facilities of utilities, fuel, transportation and waste disposal.

Whereas the industrial estate at Sundar which was inaugurate on August 30, 2004. The PIEDMC initially decided to initiate work only on the 500-acre first phase of the project. The Sundar Industrial Estate is ultimately to encompass 1,500 acres. The PIEDMC start the allotment of plots- on September 1 and completed it **on September 30, 2004 the development work at Sundar Industrial Estate was at full swing and more than 20 percent of the construction work has already been completed.**

9.5.2 Second Best Location.

The second best location for the Dehydration plant is in Punjab at Faisalabad or Multan. It is also fast emerging as trade center of country. It is emerging as second Hub for the Pakistan.

9.5.3 Land

Keeping in view the proposed capacity, approximately eight (8) Kanals of land i.e. thirty six thousand (36,000) square feet is sufficient to set up the Dehydration Plant. An amount of Rs.4,000,000 has been allocated for the acquisition of eight (8) Kanals land in the area of Lahore However, cost of land may vary according to location.

9.5.4 Building

The Construction for infrastructure will be carried on an area of 22,500 sq.ft. The rest of the area will be left uncovered. The dehydrator & bins may be accommodated in a covered shed of cheap structure. The total cost of construction is estimated at Rs.16.875 million. The proposed building will comprises of the following:

Raw Material Store*	Inspection and Testing Laboratory
Processing Section	Packing Section
Twin Tunnel Dehydrator Hall	Finished Products Store
Finishing Bin	Admin Block
Washrooms	Flooring/driveways/pavements

***The store space required for raw material is assumed 450sq.ft for 30 days stock of 166,667 kgs on the basis of 5,556 Kg/day.**

9.5.5 Machinery and Equipment

The machinery, equipment and accessories required for dehydration of vegetables plant at Lahore are fabricated locally. Most advanced technology for drying parameter control, belt control and belt structure is also used. For this purpose international suppliers are also available to produce finished products confirm to national as well as international standards.

Alternatively the economies and scale can also be achieved by using spray drawing technology which is the best one available in international market and used by most of the international food processing companies. The technology not only can reduce the cost of production but also reduces the cost of manpower required and other related overhead cost up to 15 % percent as compare to locally fabricated machinery.

List of Suppliers

International

Table 11 LIST OF SUPPLIERS

Sr.#	Name & Address
1	Raymond Lebeuf Engg.
	Lalonde & Associates Ltd.,
	1400 sauve, West Montreal, Canada.
	Ph:001-05-825571
2	Mali PloegerB.V
	Standard Buitensedikhk
	3, 4751 SG Oud-Gastel. P.O Box: 149,
	4730 AC Oudenbosch, Netherland.
	Ph:0031-78405
3	Artisan Industries Inc.
	73 Pond Street, Waltham, MA 02451-4594
	U.S.A
	Ph:001-781-893-6800 sales@artisanind.com

Local

Sr.#	Name & Address
1	Mr. Qyum
	Ploy Asia Engineering Works
	Faisal Colony, Bus Stop, Afsar Mills, G.T.Road Muridke.
	Ph:042-7980168 Cell: 0300-4238452, 0300-4344234
2	Mian Sultan Noorani
	Noorani Industries
	Faisalabad
	Ph: 041-8544683, 041-8541456, 0300-8650205
3	Pakistan Agricultural Machinery & Implements Manufac. Association
	G-6/21/2026, Nazar Bagh. G.T.Road, Peshawar
	Ph:091-211835 Fax:091-216723
4	Pakistan Agricultureal Pesticides Association
	909-910, Park Avenue, P.E.C.H.S. Block 6, Shahrah-e-Faisal, Karachi
	Ph: 0214541562 Fax: 0214546131

The detail of Machinery and Equipment is as follow:

List of Machinery and Equipment

Sr. No.		Qty	Unit Price	Total Amount
1-	Sorting Conveyors (18 'X2')	1	40,000	40,000
2-	Washing Tanks (6'x2-1/2x2-1/2')	2	30,000	60,000
3-	Rotary Washing Machine-ss3 16	2	155,000	310,000
4-	Peeling Machine	2	40,000	80,000
5-	Chopping Machine-s.s	2	85,000	170,000
6-	Slicing	1	150,000	150,000
7-	Dicing Machine	1	195,000	195,000
8-	Blanching / Sulphiting Tank	1	20,000	20,000
9-	Steam Blancher, Trolly Load (3' x3' x6')M.S	1	42,000	42,000
10-	Twin Tunnel Dehydrator	1	300,000	300,000
	Trolly-Dehydrator	24	24,000	576,000
	Drying Trays Aluminium Frame	600	200	120,000
11-	Finishing Bins			
	Finishing Chambers (13'x3.5'x7')-Complete	1	100,000	100,000
	Drying Trays-Finishing Bin	40	200	8,000
	Trolleys-Finishing Bin-M.S	2	18,000	36,000
12-	Grinding Mill-S.S	1	25,000	25,000
13-	Threshing Machine	1	115,000	115,000
14-	Working Tables S.S (10'x4")	2	35,000	70,000
15-	Storage Vessels (10x4)	3	40,000	120,000
16-	Plate form Scale 200 M.T capacity	1	55,000	55,000
17-	Steam Jacketed Kettles S.S Capacity 100 Kg.	2	27,500	55,000
18-	Boiler (estimated)	1	500,000	500,000
19-	Laboratory Equipments etc.	1	150,000	150,000
20-	Storage Conveyors SS	2	75,000	150,000
21-	Rotto Sealer Machine	1	90,000	90,000
22-	Poly Sealer-Paddle	1	5,500	5,500
				3,542,500

9.5.6 Office Equipment and Furniture and Fixture

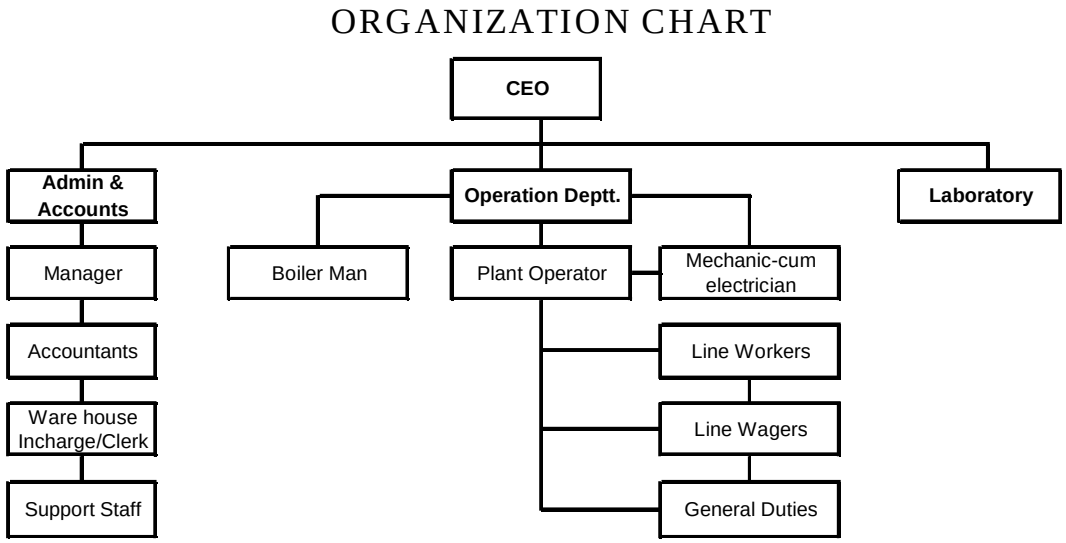
The estimated cost of office equipment and furniture & fixture required for the proposed project is Rs.351,500.

Items	Number	Unit Cost	Total Cost
Executive Table	1	20,000	20,000
Computer and other Tables	6	6,000	36,000
Sofas	1	10,000	10,000
Store Rags / Shelves	5	15,000	75,000
Chairs	15	1,500	22,500
Fans & Lights	20	3,000	60,000
Carpet, Curtains, etc.	1	25,000	25,000
Fire Extinguisher	5	5,000	25,000
Computer	2	28,000	56,000
Printer Laser	1	10,000	10,000
Fax	1	12,000	12,000
Total			**351,500**

9.6 MANPOWER AND TECHNICAL KNOW-HOW

Operating labour, supervisory and managerial staff requirements are given in Annexure 3.4.1 The shift labour and supervisory requirement is based on 360 days of the year. The preparation/pre-treatment-line labours (20 labour/shift, daily-wage basis) work in collaboration with the permanent workers of the factory.

Table 12 ORGANIZATION CHART



9.7 FUEL AND ELECTRICAL POWER

An industrial connection of natural gas is required at the plant site. Average daily consumption of the gas is 12 Hm^3 for vegetables. Natural gas has been charged at Rs. 350/Hm^3.

The factory site will be connected with a WAPDA power connection. Average daily consumption of electricity is 900 KW depending on the number of unit operations involved in the process. The costing has been done @ Rs. 7.1/unit. A 100 KVA transformer has been assumed to be required.

10. BASIS FOR FINANCIAL PROJECTIONS

10.1 MATERIAL INPUTS & PRICES

The feasibility is worked out analyzing prices of raw material as well as finished products. The concerned vegetables are available cheapest during its peak season. Therefore it is unrealistic to expect firm prices throughout the year. In order to ensure all-year-round plant operation, potatoes, Onion and Garlic are processed for 90, 180 and 90 days that is total 360 days. The current whole sales purchase prices taken for financial projections are as follows:

	Potato	**Onion**	**Garlic**
Cost of Fresh Vegetable / Kg.	Rs.13	Rs.8.5	Rs.41

The prices are based on following months average prices of 2005:

Material Inputs and Out Puts	**Potato**	**Onion**	**Garlic**
Months of Purchasing	March to May	Nov to Feb June to July	Aug. to Oct
Processing days	90	180	90
Average Prices on 2005 baisis of fresh vegetables	12.64	8.4	40.8

Regarding the quality of the raw material, it is important that potatoes are of appropriate variety and maturity. The supply should be free of soil, husks and blemished pieces as far as possible. Whereas WHITE ONION is required, especially for export purpose. Over the past few years, there has been considerable variation in the production and price levels of a particular vegetable.

10.2 REVENUE ASSUMPTIONS

10.2.1 Local Sales Prices

The local sales prices of dehydrated Potato ranged between Rs. 100 to 105, for dehydrated Onion from Rs. 180 to 185 and dehydrated Garlic from Rs.160 to 165 based on the specific demand of commercial users, which are Unilever former Rafhan Best food limited, Shan Private Limited, National Food, Ahmad Food, K.S Sulemanji Esmailji & Sons (Pvt.) Ltd.-Kolson, K&N Foods-Raiwind Road and other hotels and food industries, Army and many more hotels and Fast food stores.

Theses local prices fluctuate on the basis of raw material availability in market and the seasonal variation. Many local suppliers are also providing sun drying products at cheap prices because it is the most simple and economic method and requires no complicated machines and equipments. The main draw back of this method is that the need of proper hygienic condition is overlooked and the apprehensions of dust, flies, bees etc are always remains. The demand for tunnel dehydration is more and it is quite distinct process.

PCSIR charge for commercial dehydration with the amount of Rs. 7-12 per Kg for raw material. (Fresh Vegetable).

10.2.2 Export Sales Prices

The export sales price estimation based on some secondary data of dehydrated products and the comparison of import by certain dehydrated countries.

On the basis of the international prices, considering the plant processing capacity i.e. 2,000 tones /annum, standard dehydrated ratio, the finished product which can be produced for the particular products reducing the moisture content and its selling prices are given as follows:

Dehydration Ration (Fresh: Finished Dry)	6:1	10:1	4:1
Annual Processing Capacity in Kgs	2,000,000	2,000,000	2,000,000
Monthly Processing Capacity in Kgs	166,667	166,667	166,667
Fresh Commodities Processing Capacity/day	5,556	5,556	5,556
Preparatory-Line Losses %	10%	15%	15%
Prepared Material	5,000	4,722	4,722
Moisture Content	80%	88%	70%
Finish Product Per day	1000	567	1417
Finish Product Per Year (Kg)	90,000	102,000	127,500
Export Selling Ratio	20 : 80	20 : 80	20 : 80
Selling Price (in Rs.) Export	Rs.185	Rs.240	Rs.260
Selling Price (in Rs.) Local	Rs.105	Rs.185	Rs.165
Packing Cost	Rs.20	Rs.15	Rs.20

10.3 SALARY ESTIMATIONS

The salary estimations for the first year along with 10% increase per year has been taken for projections. Salaries for first year are as follows:

	No.	Monthly Salary per Month	Per Year
Director/CE	1	35,000	420,000
Production Staff:			
Boiler Man	2	8,000	192,000
Mechanic-cum electrician	2	7,000	168,000
Preparation line daily wagers	15	4,500	810,000
Plant Operator	3	7,000	252,000
Pre-treatment line workers	3	4,500	162,000
General Duties	1	3,500	42,000
Watchman/ Gateman	2	4,000	96,000
Admin. & Accounts:			
Manager	1	9,000	108,000
Accountant	1	7,000	84,000
Laboratory Technician	1	7,000	84,000
Ware house Incharge/Clerk	1	4,000	48,000
Production Staff:			1,722,000
Admin. & Accounts:			744,000
TOTAL			**2,466,000**

10.4 OPERATING EXPENSES

Operating Expenses for the project and there basis are taken as follows:

Description	Basis
Salaries Expenses	As per Salary Estimations
Staff Benefits	8% of Payroll
Printing & Stationary	1,933 per month
Entertainment	644 per month
Local Freights	2% of Local Sales
Insurance	1% of Eqp. Cost
Traveling	16,105 per month
Telephone & Fax	8,053 per month
Water	14,495 per month
Electricity (Office)	4,026 per month
Legal & Professional Charges	644 Per month
Exhibition/Marketing Visits	1 Visit @ Rs.32210
Export Freight	7.0% of Export Sales
Selling Expenses	1.5% of Sales
Misc. Expenses	3,221 Per month

The year wise details of Operating expenses and staff salaries are given in Annexure.

10.5 INFLATION RATE

An inflation rate of 10.0% is assumed while making the projections for cost of sales, operational expenses and salaries. The purchase price increase is based on price trend on Pager 42 which is 21% in Potato, 14% in Onion and 19% in Garlic. The selling price for dehydrated vegetables have been increased by 18.0% every year

10.6 DEPRECIATION ON ASSETS

Depreciation on the assets has been charged at the following rates for the calculation of profits:

Land 0%
Building 5%
Machinery & Equipment 10%
Vehicles 20%
Furniture & Fixture..... 10%

The depreciation on assets is given in Annexure.

10.7 PRELIMINARY EXPENSES

Preliminary expenses amounting to Rs.750,000 will be amortized at the rate of 20% per annum. Utility connection charges include the cost of 100 KVA transformers amounting to Rs. 650,000 and 100,000 for connection charges and 35,000 for incorporation of company and relating corporate matters.

10.8 WORKING CAPITAL

Working capital is calculated on the basis of following assumptions:

10.8.1 Accounts receivables

Export sales are mostly made on the basis of letter of credit. For local sales it is normal practice in market to extend credit to the buyers through credit sales. For the purposes of calculations, it is assumed that all export as well as local sells will be realized on average after forty five (45) days from the dispatch of shipment. Therefore, receivables for forty five days have been taken for calculating the working capital requirements.

10.8.2 Raw Material Stock

In order to obtain required quality of vegetables, 30 days are required for the processing by the supplier. Hence, 30 days stock or **166,667 kg is recommended** and has been included in the working capital requirements for **which 450 sq. ft area for Raw material store is allocated.**

10.8.3 Stores and Spares

Tools and spare parts required for the project has been estimated at 10% of the machinery cost for computing the working capital.

10.8.4 Accounts Payable

It is normal practice to pay suppliers after 50 days and utilities are normally paid after 30 days.

10.8.5 Advances to Employees

Advances to employees are calculated on the basis of 30 days payroll and staff benefits.

Basis for Financial Projections

Plant Processing Capacity			2000 MT
Project Cost			27,454,000
Inflation Rates			10%
Increase in Selling Price			18.0%
Material Inputs and Out Puts	**Potato**	**Onion**	**Garlic**
Months of Purchasing	March to May	Nov to Feb June to July	Aug. to Oct
Processing days	90	180	90
Average Prices on 2005 baisis of fresh vegetables	12.64	8.4	40.8
Cost of Fresh Vegetables / Kg	Rs.13.00	Rs.8.50	Rs.41.00
Average Increase in Prices	21%	14%	19%
Dehydration Ration (Fresh: Finished Dry)	6:1	10:1	4:1
Annual Processing Capacity in Kgs	2,000,000	2,000,000	2,000,000
Monthly Processing Capacity in Kgs	166,667	166,667	166,667
Fresh Commodities Processing Capacity/day	5,556	5,556	5,556
Preparatory-Line Losses %	10%	15%	15%
Prepared Material	5,000	4,722	4,722
Moisture Content	80%	88%	70%
Finish Product Per day	1000	567	1417
Finish Product Per Year (Kg)	90,000	102,000	127,500
Export Selling Ratio	20 : 80	20 : 80	20 : 80
Selling Price (in Rs.) Export	Rs.185	Rs.240	Rs.260
Selling Price (in Rs.) Local	Rs.105	Rs.185	Rs.165
Packing Cost	Rs.20	Rs.15	Rs.20
Average Daily Consumption of Natural Gas			12 HM3
Price of Gas / HM^3			Rs.350
Average Daily Consumption of Electricity			900 KW
Electricity Rate Per Unit			Rs.7.1

Working Capital

No. of days processing		360
Current Assets	**Basis**	
Receivables	Sales	45
Raw Materials Stock	Raw Materials	30
Advances to Employees	Payroll+Benefits	30
Store and Spares	10.0% of machinery	
Current Liabilities		
Accounts Payable	Cost of Sales	50
Utilities Payable	One Month Bill	30

11. FINANCIAL PROJECTIONS

11.1 PROJECTED BALANCE SHEET

YEAR	Start up	1	2	3	4	5	6	7	8	9	10
FIXED ASSETS	25,419,000	24,055,850	22,799,828	21,639,729	20,565,886	19,569,913	18,644,501	17,783,245	16,980,511	16,231,316	15,531,233
	25,419,000	24,055,850	22,799,828	21,639,729	20,565,886	19,569,913	18,644,501	17,783,245	16,980,511	16,231,316	15,531,233
Preliminary Expenses	785,000	628,000	471,000	314,000	157,000	-	-	-	-	-	-
	26,204,000	24,683,850	23,270,828	21,953,729	20,722,886	19,569,913	18,644,501	17,783,245	16,980,511	16,231,316	15,531,233
CURRENT ASSETS											
Accounts Receivables	-	5,434,200	6,412,356	7,566,580	9,486,600	11,194,188	13,986,150	16,503,657	19,474,315	24,256,341	29,225,061
Stocks	-	433,333	524,333	634,443	815,656	986,944	1,264,449	1,529,984	1,851,280	2,364,497	2,921,273
Advances to Employees	-	208,600	241,406	265,547	292,101	321,311	353,443	402,180	442,398	486,638	535,301
Tools & Spares	-	177,125	194,838	214,321	235,753	259,329	285,262	313,788	345,167	379,683	417,651
Cash & Bank Balances	1,250,000	3,862,944	7,360,413	11,054,899	16,166,102	23,127,305	33,173,118	45,989,285	61,571,628	81,842,987	107,220,342
	1,250,000	10,116,203	14,733,346	19,735,790	26,996,213	35,889,077	49,062,422	64,738,893	83,684,787	109,330,146	140,319,629
TOTAL ASSETS	27,454,000	34,800,053	38,004,173	41,689,519	47,719,099	55,458,990	67,706,922	82,522,138	100,665,298	125,561,461	155,850,862
	-	-	-	-	-	-	-	-	-	-	-
CAPITAL EMPLOYED REPRESENTED BY:											
SHARE CAPITAL											
1,372,700 Shares @ Rs.10/- each	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000	13,727,000
UNAPP. PROFIT/(LOSS)	-	3,077,419	6,858,640	10,980,901	16,846,920	24,546,579	35,901,499	49,973,637	66,968,426	89,277,079	116,734,222
	13,727,000	16,804,419	20,585,640	24,707,901	30,573,920	38,273,579	49,628,499	63,700,637	80,695,426	103,004,079	130,461,222
LONG TERM LIABILITIES											
Finance Lease	-	-	-	-	-	-	-	-	-	-	-
Long Term Loan	13,727,000	13,004,526	11,559,579	10,114,632	8,669,684	7,224,737	5,779,789	4,334,842	2,889,895	1,444,947	0
Others	-	-	-	-	-	-	-	-	-	-	-
	13,727,000	13,004,526	11,559,579	10,114,632	8,669,684	7,224,737	5,779,789	4,334,842	2,889,895	1,444,947	0
CURRENT LIABILITIES											
Creditors	-	4,909,183	5,760,100	6,747,675	8,331,461	9,786,759	12,088,600	14,232,960	16,773,490	20,742,120	24,942,149
Utilities Payable	-	81,925	98,854	119,311	144,034	173,915	210,034	253,699	306,488	370,315	447,491
	-	4,991,108	5,858,955	6,866,986	8,475,495	9,960,674	12,298,634	14,486,659	17,079,978	21,112,435	25,389,640
TOTAL	27,454,000	34,800,053	38,004,173	41,689,519	47,719,099	55,458,990	67,706,922	82,522,138	100,665,298	125,561,461	155,850,862

11.2 PROJECTED INCOME STATEMENT

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales	43,473,600	51,298,848	60,532,641	75,892,798	89,553,502	111,889,199	132,029,255	155,794,520	194,050,730	233,800,491
Cost of Sales	35,346,114	41,472,722	48,583,260	59,986,519	70,464,665	87,037,917	102,477,313	120,769,126	149,343,265	179,583,472
Gross Profit	8,127,486	9,826,126	11,949,380	15,906,279	19,088,837	24,851,282	29,551,941	35,025,394	44,707,466	54,217,019
Operating Expenses:										
Operating Expenses	2,706,297	3,114,687	3,561,726	4,234,068	4,862,310	5,806,694	6,853,499	7,900,416	9,471,416	11,119,193
Depreciation	1,363,150	1,256,023	1,160,098	1,073,843	995,973	925,413	861,256	802,734	749,195	700,083
Amortization of Preliminary Exp.	157,000	157,000	157,000	157,000	157,000	-	-	-	-	-
	4,226,447	4,527,710	4,878,825	5,464,911	6,015,283	6,732,107	7,714,755	8,703,150	10,220,611	11,819,276
Operating Profit	3,901,039	5,298,416	7,070,555	10,441,368	13,073,554	18,119,175	21,837,187	26,322,244	34,486,855	42,397,743
Interest on Loan	823,620	1,517,195	1,343,801	1,170,407	997,014	433,484	-	-	-	-
Interest on Lease	-	-	-	-	-	-	-	-	-	-
	823,620	1,517,195	1,343,801	1,170,407	997,014	433,484	-	-	-	-
Profit before Tax	3,077,419	3,781,221	5,726,754	9,270,960	12,076,540	17,685,691	21,837,187	26,322,244	34,486,855	42,397,743
Taxation (see working)	-	-	1,604,493	3,404,942	4,376,881	6,330,771	7,765,048	9,327,456	12,178,201	14,940,601
Profit after Tax	**3,077,419**	**3,781,221**	**4,122,262**	**5,866,019**	**7,699,659**	**11,354,920**	**14,072,138**	**16,994,789**	**22,308,653**	**27,457,143**
Balance B/F	-	3,077,419	6,858,640	10,980,901	16,846,920	24,546,579	35,901,499	49,973,637	66,968,426	89,277,079
Retained Earnings	3,077,419	6,858,640	10,980,901	16,846,920	24,546,579	35,901,499	49,973,637	66,968,426	89,277,079	116,734,222
Dividend										
Cash	-	-	-	-	-	-	-	-	-	-
Bonus	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
Balance C/F	3,077,419	6,858,640	10,980,901	16,846,920	24,546,579	35,901,499	49,973,637	66,968,426	89,277,079	116,734,222
Dividend Cash %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Dividend Bonus %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

11.3 PROJECTED CASH FLOW STATEMENT

YEAR	1	2	3	4	5	6	7	8	9	10
SOURCES										
FROM OPERATION										
Profit Before Tax	3,077,419	3,781,221	5,726,754	9,270,960	12,076,540	17,685,691	21,837,187	26,322,244	34,486,855	42,397,743
Add: Depreciation	1,363,150	1,256,023	1,160,098	1,073,843	995,973	925,413	861,256	802,734	749,195	700,083
Amortization	157,000	157,000	157,000	157,000	157,000	-	-	-	-	-
	1,520,150	1,413,023	1,317,098	1,230,843	1,152,973	925,413	861,256	802,734	749,195	700,083
	4,597,569	5,194,244	7,043,853	10,501,803	13,229,513	18,611,104	22,698,442	27,124,978	35,236,050	43,097,826
APPLICATION										
Capital Expenditure	-	-	-	-	-	-	-	-	-	-
Repayments of Loan	722,474	1,444,947	1,444,947	1,444,947	1,444,947	1,444,947	1,444,947	1,444,947	1,444,947	1,444,947
Tax Payment	-	-	1,604,493	3,404,942	4,376,881	6,330,771	7,765,048	9,327,456	12,178,201	14,940,601
Dividend Paid										
- Cash	-	-	-	-	-	-	-	-	-	-
	722,473.68	1,444,947.37	3,049,440.05	4,849,889.25	5,821,828	7,775,719	9,209,996	10,772,403	13,623,148	16,385,548
SURPLUS / (DEFICIT)	3,875,095	3,749,296	3,994,413	5,651,914	7,407,685	10,835,385	13,488,447	16,352,575	21,612,901	26,712,278
INCREASE/(DECREASE) IN WORKING CAPITAL	1,262,151	251,827	299,927	540,711	446,482	789,572	672,280	770,232	1,341,542	1,334,923
NET INCREASE/(DECREASE)	2,612,944	3,497,469	3,694,486	5,111,203	6,961,203	10,045,813	12,816,167	15,582,343	20,271,360	25,377,354
OPENING BANK BALANCES	1,250,000	3,862,944	7,360,413	11,054,899	16,166,102	23,127,305	33,173,118	45,989,285	61,571,628	81,842,987
CLOSING CASH BALANCE	3,862,944	7,360,413	11,054,899	16,166,102	23,127,305	33,173,118	45,989,285	61,571,628	81,842,987	107,220,342
WORKING CAPITAL	1,262,151	1,513,978	1,813,905	2,354,616	2,801,098	3,590,670	4,262,949	5,033,182	6,374,724	7,709,647
Increase	1,262,151	251,827	299,927	540,711	446,482	789,572	672,280	770,232	1,341,542	1,334,923

Annexures

ANNEXURES

Annexure # 1 Project Cost and Means of Financing

		Rs.	Rs.
Land			
Land	8 Kanal @ 0.5 million per Kanal		4,000,000
Project Development cost			
Building - Civil Works		16,875,000	
Machinery & Equipment		3,542,500	
Vehicles		650,000	
Furniture & Fixture		351,500	21,419,000
Preliminary Expenses			
Utility Connections Charges		750,000	
Other Expenses		35,000	785,000
Working Capital			1,250,000
Total Assets			**Rs. 27,454,000**

Total Capital Employed By:

		%	Rupess
Equity Contribution by	Sponsor	50%	13,727,000
Loan	Bank	50%	13,727,000
Total Capital including land		100%	**Rs. 27,454,000**

Annexure # 1.1 List of Machinery and Equipment

Sr. No.		Qty	Unit Price	Total Amount
1-	Sorting Conveyors (18 'X2')	1	40,000	40,000
2-	Washing Tanks (6'x2-1/2x2-1/2')	2	30,000	60,000
3-	Rotary Washing Machine-ss3 16	2	155,000	310,000
4-	Peeling Machine	2	40,000	80,000
5-	Chopping Machine-s.s	2	85,000	170,000
6-	Slicing	1	150,000	150,000
7-	Dicing Machine	1	195,000	195,000
8-	Blanching / Sulphiting Tank	1	20,000	20,000
9-	Steam Blancher, Trolly Load (3' x3' x6')M.S	1	42,000	42,000
10-	Twin Tunnel Dehydrator	1	300,000	300,000
	Trolly-Dehydrator	24	24,000	576,000
	Drying Trays Aluminium Frame	600	200	120,000
11-	Finishing Bins			
	Finishing Chambers (13'x3.5'x7')-Complete	1	100,000	100,000
	Drying Trays-Finishing Bin	40	200	8,000
	Trolleys-Finishing Bin-M.S	2	18,000	36,000
12-	Grinding Mill-S.S	1	25,000	25,000
13-	Threshing Machine	1	115,000	115,000
14-	Working Tables S.S (10'x4")	2	35,000	70,000
15-	Storage Vessels (10x4)	3	40,000	120,000
16-	Plate form Scale 200 M.T capacity	1	55,000	55,000
17-	Steam Jacketed Kettles S.S Capacity 100 Kg.	2	27,500	55,000
18-	Boiler (estimated)	1	500,000	500,000
19-	Laboratory Equipments etc.	1	150,000	150,000
20-	Storage Conveyors SS	2	75,000	150,000
21-	Rotto Sealer Machine	1	90,000	90,000
22-	Poly Sealer-Paddle	1	5,500	5,500
				3,542,500

Annexure # 1.2 Depreciation Calculations

ASSETS		YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8		YEAR 9		YEAR 10	
	RATE	Cost	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.
Land	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-	4,000,000	-
Building - Civil Works	5%	16,875,000	843,750	16,031,250	801,563	15,229,688	761,484	14,468,203	723,410	13,744,793	687,240	13,057,553	652,878	12,404,676	620,234	11,784,442	589,222	11,195,220	559,761	10,635,459	531,773
Machinery	10%	3,542,500	354,250	3,188,250	318,825	2,869,425	286,943	2,582,483	258,248	2,324,234	232,423	2,091,811	209,181	1,882,630	188,263	1,694,367	169,437	1,524,930	152,493	1,372,437	137,244
Furniture & Fixture	10%	351,500	35,150	316,350	31,635	284,715	28,472	256,244	25,624	230,619	23,062	207,557	20,756	186,802	18,680	168,121	16,812	151,309	15,131	136,178	13,618
Vehicles	20%	650,000	130,000	520,000	104,000	416,000	83,200	332,800	66,560	266,240	53,248	212,992	42,598	170,394	34,079	136,315	27,263	109,052	21,810	87,242	17,448
TOTAL		26,204,000	**1,363,150**		**1,256,023**		**1,160,098**		**1,073,843**		**995,973**		**925,413**		**861,256**		**802,734**		**749,195**		**700,083**

Amortization of Preliminary Expenses

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8		YEAR 9		YEAR 10	
	RATE	Cost	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off	Op. Bal	Written Off
Preliminary Expenses	20%	785,000	157,000	628,000	157,000	471,000	157,000	314,000	157,000	157,000	157,000	-	-	-	-	-	-	-	-	-	-
			157,000		**157,000**		**157,000**		**157,000**		**157,000**		**-**		**-**		**-**		**-**		**-**

Depreciation for Tax Calculations

ASSETS	RATE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8		YEAR 9		YEAR 10	
		Cost	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.	Op. Bal	Deprec.
Land	0	4,000,000																			
Building - Civil Works	5%	16,875,000	8,437,500	8,437,500	421,875	8,015,625	400,781	7,614,844	380,742	7,234,102	361,705	6,872,396	343,620	6,872,396	343,620	6,528,777	326,439	6,202,338	310,117	5,892,221	294,611
Machinery-50% Initial	10%	3,542,500	1,771,250	1,771,250	177,125	1,594,125	159,413	1,434,713	143,471	1,291,241	129,124	1,162,117	116,212	1,162,117	116,212	1,045,905	104,591	941,315	94,131	847,183	84,718
Furniture & Fixture	10%	351,500	35,150	316,350	31,635	284,715	28,472	256,244	25,624	230,619	23,062	207,557	20,756	186,802	18,680	168,121	16,812	151,309	15,131	136,178	13,618
Vehicles-50% Initial	20%	650,000	130,000	520,000	104,000	416,000	83,200	332,800	66,560	266,240	53,248	212,992	42,598	170,394	34,079	136,315	27,263	109,052	21,810	87,242	17,448
TOTAL		25,419,000	10,373,900	15,045,100	734,635	14,310,465	671,865	13,638,600	616,398	13,022,202	567,139	12,455,063	523,186	11,931,877	512,590	11,419,287	475,104	10,944,182	441,190	10,502,993	410,396
TOTAL			10,373,900		734,635		671,865		616,398		567,139		523,186		512,590		475,104		441,190		410,396

Annexure # 2 Revenue

	Potato	Onion	Garlic
Monthly Processing Capacity in Kgs	166,667	166,667	166,667
Processing days	90	180	90
Fresh Commodities Processing Capacity/day	5,556	5,556	5,556
Preparatory-Line Losses %	10%	15%	15%
Prepared Material	5,000	4,722	4,722
Moisture Content	80%	88%	70%
Finish Product Per day	1,000	567	1417
Finish Product Per Year (Kg)	90,000	102,000	127,500
Export Selling Ratio	20 : 40	20 : 40	20 : 40
Selling Price (in Rs.) Export	Rs.185	Rs.240	Rs.260
Selling Price (in Rs.) Local	Rs.105	Rs.185	Rs.165
Increase in unit price per year	18.0%		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity Utilization	80%	80%	80%	85%	85%	90%	90%	90%	95%	97%
Annual Prod. In Kgs/ Year										
Potato	72,000	72,000	72,000	76,500	76,500	81,000	81,000	81,000	85,500	87,300
Onion	81,600	81,600	81,600	86,700	86,700	91,800	91,800	91,800	96,900	98,940
Garlic	102,000	102,000	102,000	108,375	108,375	114,750	114,750	114,750	121,125	123,675
Prices										
Price per Kg/ Potato-Export	185.00	218.30	257.59	303.96	358.67	423.24	499.42	589.31	695.39	820.56
Price per Kg/Potato-Local	105.00	123.90	146.20	172.52	203.57	240.21	283.45	334.47	394.68	465.72
Price per Kg/ Onion-Export	240.00	283.20	334.18	394.33	465.31	549.06	647.89	764.51	902.13	1,064.51
Price per Kg/Onion-Local	185.00	218.30	257.59	303.96	358.67	423.24	499.42	589.31	695.39	820.56
Price per Kg/ Garlic-Export	260.00	306.80	362.02	427.19	504.08	594.82	701.88	828.22	977.30	1,153.22
Price per Kg/ Garlic-Local	165.00	194.70	229.75	271.10	319.90	377.48	445.43	525.60	620.21	731.85
Total Revenue										
Potato Revenue in Rs. Export	Rs. 2,664,000	Rs. 3,143,520	Rs. 3,709,354	Rs. 4,650,602	Rs. 5,487,710	Rs. 6,856,410	Rs. 8,090,564	Rs. 9,546,865	Rs. 11,891,151	Rs. 14,326,960
Potato Revenue in Rs. Local	Rs. 6,048,000	Rs. 7,136,640	Rs. 8,421,235	Rs. 10,558,124	Rs. 12,458,586	Rs. 15,565,904	Rs. 18,367,766	Rs. 21,673,964	Rs. 26,996,127	Rs. 32,526,070
Onion Revenue in Rs. Export	Rs. 3,916,800	Rs. 4,621,824	Rs. 5,453,752	Rs. 6,837,642	Rs. 8,068,418	Rs. 10,080,776	Rs. 11,895,315	Rs. 14,036,472	Rs. 17,483,206	Rs. 21,064,503
Onion Revenue in Rs. Local	Rs. 12,076,800	Rs. 14,250,624	Rs. 16,815,736	Rs. 21,082,729	Rs. 24,877,621	Rs. 31,082,392	Rs. 36,677,223	Rs. 43,279,123	Rs. 53,906,552	Rs. 64,948,883
Garlic Revenue in Rs. Export	Rs. 5,304,000	Rs. 6,258,720	Rs. 7,385,290	Rs. 9,259,307	Rs. 10,925,982	Rs. 13,651,051	Rs. 16,108,240	Rs. 19,007,723	Rs. 23,675,175	Rs. 28,524,847
Garlic Revenue in Rs. Local	Rs. 13,464,000	Rs. 15,887,520	Rs. 18,747,274	Rs. 23,504,394	Rs. 27,735,185	Rs. 34,652,667	Rs. 40,890,147	Rs. 48,250,373	Rs. 60,098,520	Rs. 72,409,228
Total Revenue	**Rs. 43,473,600**	**Rs. 51,298,848**	**Rs. 60,532,641**	**Rs. 75,892,798**	**Rs. 89,553,502**	**Rs. 111,889,199**	**Rs. 132,029,255**	**Rs. 155,794,520**	**Rs. 194,050,730**	**Rs. 233,800,491**

Annexure # 3 Cost of Sales

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Product Cost Daily Basis										
Potato	Rs.78,751	Rs.95,093	Rs.114,447	Rs.144,202	Rs.173,740	Rs.218,773	Rs.263,814	Rs.318,225	Rs.400,555	Rs.491,504
Onion	Rs.55,094	Rs.62,946	Rs.71,535	Rs.84,801	Rs.96,403	Rs.114,148	Rs.129,801	Rs.147,613	Rs.174,618	Rs.201,700
Garlic	Rs.202,129	Rs.240,433	Rs.285,612	Rs.358,517	Rs.426,026	Rs.533,479	Rs.634,103	Rs.753,772	Rs.941,896	Rs.1,141,676
Total Product Cost on Daily Basis	**335,974**	**398,471**	**471,593**	**587,520**	**696,169**	**866,399**	**1,027,719**	**1,219,610**	**1,517,070**	**1,834,881**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Year 9	Year 10
Cost of Sales										
Potato	7,162,600	8,543,251	10,176,136	12,740,149	15,238,978	19,116,828	22,936,913	27,551,111	34,636,742	42,415,391
Onion	9,966,914	11,338,282	12,836,422	15,191,788	17,217,904	20,362,963	23,099,753	26,213,799	30,991,534	35,755,328
Garlic	18,216,600	21,591,189	25,570,702	32,054,582	38,007,784	47,558,126	56,440,647	67,004,216	83,714,989	101,412,753
	35,346,114	**41,472,722**	**48,583,260**	**59,986,519**	**70,464,665**	**87,037,917**	**102,477,313**	**120,769,126**	**149,343,265**	**179,583,472**

Annexure # 3.1 Cost of Sales of Potatoes

	Potato		
Processing days	90	Average Daily Consumption of Natural Gas	12 HM3
Cost of Fresh Vegetable Per Kg.	13	Price of Gas / HM^3	Rs.350
Fresh Commodities Processing Capacity/day	5,556	Average Daily Consumption of Electricity	900 KW
Capacity of Packing Material for Finish Product in Kgs	5	Electricity Rate Per Unit	Rs.7.1
Price of Packeging	Rs.20		
Chemicals (Fumigant,Dessicant,Sulphite etc)	Rs.3.00		
Annual Increase	21.0%		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Prod. In Kgs/ days	**800**	**800**	**800**	**850**	**850**	**900**	**900**	**900**	**950**	**970**
Annual Prod. In Kgs/ Year	**72,000**	**72,000**	**72,000**	**76,500**	**76,500**	**81,000**	**81,000**	**81,000**	**85,500**	**87,300**
Total Processing Capacity in Kgs / day	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**
Annual Processing capacity in Kgs / year	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**
Capacity Utilization	**80%**	**80%**	**80%**	**85%**	**85%**	**90%**	**90%**	**90%**	**95%**	**97%**
Product Cost Daily Basis										
Raw Material	Rs.57,778	Rs.69,911	Rs.84,592	Rs.108,754	Rs.131,593	Rs.168,593	Rs.203,998	Rs.246,837	Rs.315,266	Rs.389,503
Chemicals (Fumigant, Dessicant, Sulphite Etc.)	Rs.2,400	Rs.2,904	Rs.3,514	Rs.4,252	Rs.5,145	Rs.6,225	Rs.7,532	Rs.9,114	Rs.11,028	Rs.13,344
Packing	Rs.3,200	Rs.3,872	Rs.4,685	Rs.5,669	Rs.6,859	Rs.8,300	Rs.10,043	Rs.12,152	Rs.14,704	Rs.17,792
Labour	Rs.4,783	Rs.5,592	Rs.6,151	Rs.6,766	Rs.7,443	Rs.8,187	Rs.9,005	Rs.9,906	Rs.10,897	Rs.11,986
Factory Over Heads Daily Basis:										
Electricity	Rs.6,390	Rs.7,732	Rs.9,356	Rs.11,320	Rs.13,698	Rs.16,574	Rs.20,055	Rs.24,266	Rs.29,362	Rs.35,528
Natural Gas	Rs.4,200	Rs.5,082	Rs.6,149	Rs.7,441	Rs.9,003	Rs.10,894	Rs.13,181	Rs.15,949	Rs.19,299	Rs.23,352
Total Product Cost on Daily Basis	**78,751**	**95,093**	**114,447**	**144,202**	**173,740**	**218,773**	**263,814**	**318,225**	**400,555**	**491,504**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Year 9	Year 10
Cost of Sales										
Material Cost	5,200,000	6,292,000	7,613,320	9,787,875	11,843,328	15,173,393	18,359,806	22,215,365	28,373,958	35,055,279
Chemicals (Fumigant, Dessicant, Sulphite Etc.)	216,000	216,000	216,000	216,000	216,000	216,000	216,000	216,000	216,000	216,000
Packing Cost	288,000	288,000	288,000	306,000	306,000	324,000	324,000	324,000	342,000	349,200
Labor Cost	430,500	503,250	553,575	608,933	669,826	736,808	810,489	891,538	980,692	1,078,761
Transportation cost	75,000	90,750	109,808	132,867	160,769	194,531	235,382	284,812	344,623	416,994
Factory Over Heads	953,100	1,153,251	1,395,434	1,688,475	2,043,054	2,472,096	2,991,236	3,619,396	4,379,469	5,299,157
	7,162,600	**8,543,251**	**10,176,136**	**12,740,149**	**15,238,978**	**19,116,828**	**22,936,913**	**27,551,111**	**34,636,742**	**42,415,391**

Annexure # 3.2 Cost of Sales of Onion

	Onion		
Processing days	180	Average Daily Consumption of Natural Gas	12 HM3
Cost of Fresh Vegetable Per Kg.	9	Price of Gas / HM^3	Rs.350
Fresh Commodities Processing Capacity/day	5,556	Average Daily Consumption of Electricity	900 KW
Capacity of Packing Material for Finish Product in K	3.5	Electricity Rate Per Unit	Rs.7.1
Price of Packeging	Rs.15		
Annual Increase	14.0%		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Prod. In Kgs/ days	**453**	**453**	**453**	**482**	**482**	**510**	**510**	**510**	**538**	**550**
Annual Prod. In Kgs/ Year	**81,600**	**81,600**	**81,600**	**86,700**	**86,700**	**91,800**	**91,800**	**91,800**	**96,900**	**98,940**
Total Processing in Kgs / day	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**
Annual Processing in Kgs / year	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**
Capacity Utilization	**80%**	**80%**	**80%**	**85%**	**85%**	**90%**	**90%**	**90%**	**95%**	**97%**
Product Cost Daily Basis										
Raw Material	Rs.37,778	Rs.43,067	Rs.49,096	Rs.59,468	Rs.67,793	Rs.81,830	Rs.93,286	Rs.106,346	Rs.127,970	Rs.148,957
Packing	Rs.1,943	Rs.2,215	Rs.2,525	Rs.2,878	Rs.3,281	Rs.3,741	Rs.4,265	Rs.4,862	Rs.5,542	Rs.6,318
Labour	Rs.4,783	Rs.5,592	Rs.6,151	Rs.6,766	Rs.7,443	Rs.8,187	Rs.9,005	Rs.9,906	Rs.10,897	Rs.11,986
Factory Over Heads Daily Basis:										
Electricity	Rs.6,390	Rs.7,285	Rs.8,304	Rs.9,467	Rs.10,792	Rs.12,303	Rs.14,026	Rs.15,989	Rs.18,228	Rs.20,780
Natural Gas	Rs.4,200	Rs.4,788	Rs.5,458	Rs.6,222	Rs.7,094	Rs.8,087	Rs.9,219	Rs.10,510	Rs.11,981	Rs.13,658
Total Product Cost on Daily Basis	**55,094**	**62,946**	**71,535**	**84,801**	**96,403**	**114,148**	**129,801**	**147,613**	**174,618**	**201,700**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Year 9	Year 10
Cost of Sales										
Material Cost	6,800,000	7,752,000	8,837,280	10,704,155	12,202,737	14,729,422	16,791,541	19,142,356	23,034,635	26,812,316
Packing Cost	349,714	349,714	349,714	371,571	371,571	393,429	393,429	393,429	415,286	424,029
Labor Cost	861,000	1,006,500	1,107,150	1,217,865	1,339,652	1,473,617	1,620,978	1,783,076	1,961,384	2,157,522
Transportation cost	50,000	57,000	64,980	74,077	84,448	96,271	109,749	125,113	142,629	162,597
Factory Over Heads	1,906,200	2,173,068	2,477,298	2,824,119	3,219,496	3,670,225	4,184,057	4,769,825	5,437,600	6,198,864
	9,966,914	**11,338,282**	**12,836,422**	**15,191,788**	**17,217,904**	**20,362,963**	**23,099,753**	**26,213,799**	**30,991,534**	**35,755,328**

Annexure # 3.3 Cost of Sales of Garlic

	Garlic		
Processing days	90	Average Daily Consumption of Natural Gas	12 HM3
Cost of Fresh Vegetable Per Kg.	41	Price of Gas / HM^3	Rs.350
Fresh Commodities Processing Capacity/day	5,556	Average Daily Consumption of Electricity	900 KW
Capacity of Packing Material for Finish Product in Kgs	5.0	Electricity Rate Per Unit	Rs.7.1
Price of Packeging	Rs.20		
Annual Increase	19.0%		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Prod. In Kgs/ days	**1,133**	**1,133**	**1,133**	**1,204**	**1,204**	**1,275**	**1,275**	**1,275**	**1,346**	**1,374**
Annual Prod. In Kgs/ Year	**102,000**	**102,000**	**102,000**	**108,375**	**108,375**	**114,750**	**114,750**	**114,750**	**121,125**	**123,675**
Total Processing in Kgs / day	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**	**5,556**
Annual Processing in Kgs / year	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**
Capacity Utilization	**80%**	**80%**	**80%**	**85%**	**85%**	**90%**	**90%**	**90%**	**95%**	**97%**
Product Cost Daily Basis										
Raw Material	Rs.182,222	Rs.216,844	Rs.258,045	Rs.326,266	Rs.388,256	Rs.489,203	Rs.582,151	Rs.692,760	Rs.870,183	Rs.1,057,318
Packing	Rs.4,533	Rs.5,395	Rs.6,420	Rs.7,639	Rs.9,091	Rs.10,818	Rs.12,874	Rs.15,320	Rs.18,230	Rs.21,694
Labour	Rs.4,783	Rs.5,592	Rs.6,151	Rs.6,766	Rs.7,443	Rs.8,187	Rs.9,005	Rs.9,906	Rs.10,897	Rs.11,986
Factory Over Heads Daily Basis:										
Electricity	Rs.6,390	Rs.7,604	Rs.9,049	Rs.10,768	Rs.12,814	Rs.15,249	Rs.18,146	Rs.21,594	Rs.25,697	Rs.30,579
Natural Gas	Rs.4,200	Rs.4,998	Rs.5,948	Rs.7,078	Rs.8,422	Rs.10,023	Rs.11,927	Rs.14,193	Rs.16,890	Rs.20,099
Total Product Cost on Daily Basis	**202,129**	**240,433**	**285,612**	**358,517**	**426,026**	**533,479**	**634,103**	**753,772**	**941,896**	**1,141,676**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year6	Year 7	Year 8	Year 9	Year 10
Cost of Sales										
Material Cost	16,400,000	19,516,000	23,224,040	29,363,896	34,943,036	44,028,225	52,393,588	62,348,369	78,316,480	95,158,645
Packing Cost	408,000	408,000	408,000	433,500	433,500	459,000	459,000	459,000	484,500	494,700
Labor Cost	430,500	503,250	553,575	608,933	669,826	736,808	810,489	891,538	980,692	1,078,761
Transport Cost	25,000	29,750	35,403	42,129	50,133	59,659	70,994	84,483	100,535	119,636
Factory Over Heads	953,100	1,134,189	1,349,685	1,606,125	1,911,289	2,274,434	2,706,576	3,220,826	3,832,782	4,561,011
	18,216,600	**21,591,189**	**25,570,702**	**32,054,582**	**38,007,784**	**47,558,126**	**56,440,647**	**67,004,216**	**83,714,989**	**101,412,753**

Annexure # 3.4 Operational Expenses

	YEAR 1			YEAR 2			YEAR 3			YEAR 4			YEAR 5		
Description	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**
Salaries Expenses	As per Salary Estimations	62,000	744,000	As per Salary Estimations	68,200	818,400	As per Salary Estimations	75,020	900,240	As per Salary Estimations	82,522	990,264	As per Salary Estimations	90,774	1,089,290
Staff Benefits	5% of Payroll	3,100	37,200	8% of Payroll	5,456	65,472	8% of Payroll	6,002	72,019	8% of Payroll	6,602	79,221	8% of Payroll	7,262	87,143
Printing & Stationary	1,200 per month	1,200	14,400	1,320 per month	1,320	15,840	1,452 per month	1,452	17,424	1,597 per month	1,597	19,166	1,757 per month	1,757	21,083
Entertainment	400 per month	400	4,800	440 per month	440	5,280	484 per month	484	5,808	532 per month	532	6,389	586 per month	586	7,028
Local Freights	2% of Local Sales	52,648	631,776	2% of Local Sales	62,125	745,496	2% of Local Sales	73,307	879,685	2% of Local Sales	91,909	1,102,905	2% of Local Sales	108,452	1,301,428
Insurance	1% of Eqp.	2,952	35,425	1% of Eqp.	2,657	31,883	1% of Eqp.	2,391	28,694	1% of Eqp.	2,152	25,825	1% of Eqp.	1,937	23,242
Traveling	10,000 per month	10,000	120,000	11,000 per month	11,000	132,000	12,100 per month	12,100	145,200	13,310 per month	13,310	159,720	14,641 per month	14,641	175,692
Telephone & Fax	5,000 per month	5,000	60,000	5,500 per month	5,500	66,000	6,050 per month	6,050	72,600	6,655 per month	6,655	79,860	7,321 per month	7,321	87,846
Water	9,000 per month	9,000	108,000	9,900 per month	9,900	118,800	10,890 per month	10,890	130,680	11,979 per month	11,979	143,748	13,177 per month	13,177	158,123
Electricity (Office)	2,500 per month	2,500	30,000	2,750 per month	2,750	33,000	3,025 per month	3,025	36,300	3,328 per month	3,328	39,930	3,660 per month	3,660	43,923
Legal & Professional Charges	400 Per month	400	4,800	440 Per month	440	5,280	484 Per month	484	5,808	532 Per month	532	6,389	586 Per month	586	7,028
Exhibition/Marketing Visits	1 Visit @ Rs.20000	1,667	20,000	1 Visit @ Rs.22000	1,833	22,000	1 Visit @ Rs.24200	2,017	24,200	1 Visit @ Rs.26620	2,218	26,620	1 Visit @ Rs.29282	2,440	29,282
Export Freight	7.0% of Export Sales	69,328	831,936	7.0% of Export Sales	81,807	981,684	7.00% of Export Sales	96,532	1,158,388	7.0% of Export Sales	121,027	1,452,329	7.0% of Export Sales	142,812	1,713,748
Selling Expenses	1.5% of Sales	3,330	39,960	1.5% of Sales	3,929	47,153	1.5% of Sales	4,637	55,640	1.5% of Sales	5,813	69,759	1.5% of Sales	6,860	82,316
Misc. Expenses	2,000 Per month	2,000	24,000	2,200 Per month	2,200	26,400	2,420 Per month	2,420	29,040	2,662 Per month	2,662	31,944	2,928 Per month	2,928	35,138
Total		163,525	**1,962,297**		191,357	**2,296,287**		221,791	**2,661,486**		270,317	**3,243,804**		314,418	**3,773,019**
Grand Total			**2,706,297**			**3,114,687**			**3,561,726**			**4,234,068**			**4,862,310**
(Operating Expenses + Salaries)															

	YEAR 6			YEAR 7			YEAR 8			YEAR 9			YEAR 10		
Description	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**	**Basis**	**Per Month**	**Per Year**
Salaries Expenses	As per Salary Estimations	99,852	1,198,219	As per Salary Estimations	122,238	1,466,853	As per Salary Estimations	134,461	1,613,538	As per Salary Estimations	147,908	1,774,892	As per Salary Estimations	162,698	1,952,381
Staff Benefits	8% of Payroll	7,988	95,858	8% of Payroll	9,779	117,348	8% of Payroll	10,757	129,083	8% of Payroll	11,833	141,991	8% of Payroll	13,016	156,190
Printing & Stationary	1,933 per month	1,933	23,191	2,126 per month	2,126	25,510	2,338 per month	2,338	28,062	2,572 per month	2,572	30,868	2,830 per month	2,830	33,954
Entertainment	644 per month	644	7,730	709 per month	709	8,503	779 per month	779	9,354	857 per month	857	10,289	943 per month	943	11,318
Local Freights	2% of Local Sales	135,502	1,626,019	2% of Local Sales	159,892	1,918,703	2% of Local Sales	188,672	2,264,069	2% of Local Sales	235,002	2,820,024	2% of Local Sales	283,140	3,397,684
Insurance	1% of Eqp. Cost	1,743	20,918	1% of Eqp. Cost	1,569	18,826	1% of Eqp. Cost	1,412	16,944	1% of Eqp. Cost	1,271	15,249	1% of Eqp. Cost	1,144	13,724
Traveling	16,105 per month	16,105	193,261	17,716 per month	17,716	212,587	19,487 per month	19,487	233,846	21,436 per month	21,436	257,231	23,579 per month	23,579	282,954
Telephone & Fax	8,053 per month	8,053	96,631	8,858 per month	8,858	106,294	9,744 per month	9,744	116,923	10,718 per month	10,718	128,615	11,790 per month	11,790	141,477
Water	14,495 per month	14,495	173,935	15,944 per month	15,944	191,329	17,538 per month	17,538	210,461	19,292 per month	19,292	231,508	21,222 per month	21,222	254,658
Electricity (Office)	4,026 per month	4,026	48,315	4,429 per month	4,429	53,147	4,872 per month	4,872	58,462	5,359 per month	5,359	64,308	5,895 per month	5,895	70,738
Legal & Professional Charges	644 Per month	644	7,730	709 Per month	709	8,503	779 Per month	779	9,354	857 Per month	857	10,289	943 Per month	943	11,318
Exhibition/Marketing Visits	1 Visit @ Rs.32210	2,684	32,210	1 Visit @ Rs.35431	2,953	35,431	1 Visit @ Rs.38974	3,248	38,974	1 Visit @ Rs.42872	3,573	42,872	1 Visit @ Rs.47159	3,930	47,159
Export Freight	7.0% of Export Sales	178,431	2,141,177	7.0% of Export Sales	210,549	2,526,588	7.0% of Export Sales	248,448	2,981,374	7.0% of Export Sales	309,456	3,713,467	7.0% of Export Sales	372,845	4,474,142
Selling Expenses	1.5% of Sales	8,571	102,846	1.5% of Sales	10,113	121,358	1.5% of Sales	11,934	143,203	1.5% of Sales	14,864	178,367	1.5% of Sales	17,909	214,904
Misc. Expenses	3,221 Per month	3,221	38,652	3,543 Per month	3,543	42,517	3,897 Per month	3,897	46,769	4,287 Per month	4,287	51,446	4,716 Per month	4,716	56,591
Total		384,040	**4,608,474**		448,887	**5,386,647**		523,906	**6,286,878**		641,377	**7,696,524**		763,901	**9,166,812**
Grand Total			**5,806,694**			**6,853,499**			**7,900,416**			**9,471,416**			**11,119,193**
(Operating Expenses + Salaries)															

Annual Increase	**10%**

Annexure # 3.4.1 Salary Estimates

	YEAR 1			YEAR 2			YEAR 3			YEAR 4			YEAR 5		
	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year
Director/CE	1	35,000	420,000	1	38,500	462,000	1	42,350	508,200	1	46,585	559,020	1	51,244	614,922
Production Staff:															
Boiler Man	2	8,000	192,000	2	8,800	211,200	2	9,680	232,320	2	10,648	255,552	2	11,713	281,107
Mechanic-cum electrician	2	7,000	168,000	2	7,700	184,800	2	8,470	203,280	2	9,317	223,608	2	10,249	245,969
Preparation line daily wagers	15	4,500	810,000	15	4,950	891,000	15	5,445	980,100	15	5,990	1,078,110	15	6,588	1,185,921
Plant Operator	3	7,000	252,000	3	7,700	277,200	3	8,470	304,920	3	9,317	335,412	3	10,249	368,953
Pre-treatment line workers	3	4,500	162,000	5	4,950	297,000	5	5,445	326,700	5	5,990	359,370	5	6,588	395,307
General Duties	1	3,500	42,000	1	3,850	46,200	1	4,235	50,820	1	4,659	55,902	1	5,124	61,492
Watchman/ Gateman	2	4,000	96,000	2	4,400	105,600	2	4,840	116,160	2	5,324	127,776	2	5,856	140,554
Admin. & Accounts:															
Manager	1	9,000	108,000	1	9,900	118,800	1	10,890	130,680	1	11,979	143,748	1	13,177	158,123
Accountant	1	7,000	84,000	1	7,700	92,400	1	8,470	101,640	1	9,317	111,804	1	10,249	122,984
Laboratory Technician	1	7,000	84,000	1	7,700	92,400	1	8,470	101,640	1	9,317	111,804	1	10,249	122,984
Ware house Incharge/Clerk	1	4,000	48,000	1	4,400	52,800	1	4,840	58,080	1	5,324	63,888	1	5,856	70,277
Production Staff:			1,722,000			2,013,000			2,214,300			2,435,730			2,679,303
Admin. & Accounts:			744,000			818,400			900,240			990,264			1,089,290
TOTAL			**2,466,000**			**2,831,400**			**3,114,540**			**3,425,994**			**3,768,593**

	YEAR 6			YEAR 7			YEAR 8			YEAR 9			YEAR 10		
	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year	No.	Monthly Salary per Month	Per Year
Director/CE	1	56,368	676,414	1	62,005	744,056	1	68,205	818,461	1	75,026	900,307	1	82,528	990,338
Production Staff:															
Boiler Man	2	12,884	309,218	2	14,172	340,140	2	15,590	374,154	2	17,149	411,569	2	18,864	452,726
Mechanic-cum electrician	2	11,274	270,566	2	12,401	297,622	2	13,641	327,384	2	15,005	360,123	2	16,506	396,135
Preparation line daily wagers	15	7,247	1,304,513	15	7,972	1,434,964	15	8,769	1,578,461	15	9,646	1,736,307	15	10,611	1,909,938
Plant Operator	3	11,274	405,849	3	12,401	446,433	3	13,641	491,077	3	15,005	540,184	3	16,506	594,203
Pre-treatment line workers	5	7,247	434,838	5	7,972	478,321	5	8,769	526,154	5	9,646	578,769	5	10,611	636,646
General Duties	1	5,637	67,641	1	6,200	74,406	1	6,821	81,846	1	7,503	90,031	1	8,253	99,034
Watchman/ Gateman	2	6,442	154,609	2	7,086	170,070	2	7,795	187,077	2	8,574	205,785	2	9,432	226,363
Admin. & Accounts:															
Manager	1	14,495	173,935	1	15,944	191,329	1	17,538	210,461	1	19,292	231,508	1	21,222	254,658
Accountant	1	11,274	135,283	2	12,401	297,622	2	13,641	327,384	2	15,005	360,123	2	16,506	396,135
Laboratory Technician	1	11,274	135,283	1	12,401	148,811	1	13,641	163,692	1	15,005	180,061	1	16,506	198,068
Ware house Incharge/Clerk	1	6,442	77,304	1	7,086	85,035	1	7,795	93,538	1	8,574	102,892	1	9,432	113,181
Production Staff:			2,947,233			3,241,957			3,566,152			3,922,768			4,315,044
Admin. & Accounts:			1,198,219			1,466,853			1,613,538			1,774,892			1,952,381
TOTAL			**4,145,453**			**4,708,809**			**5,179,690**			**5,697,659**			**6,267,425**

Annual Increase	**10%**

Annexure # 4 Working Capital

			1	2	3	4	5	6	7	8	9	10
No. of days processing		360 Days										
Current Assets	**Basis**											
Receivables	Sales	45	5,434,200	6,412,356	7,566,580	9,486,600	11,194,188	13,986,150	16,503,657	19,474,315	24,256,341	29,225,061
Raw Materials Stock	Raw Materials	30	433,333	524,333	634,443	815,656	986,944	1,264,449	1,529,984	1,851,280	2,364,497	2,921,273
Advances to Employees	Payroll+Benefits	30	208,600	241,406	265,547	292,101	321,311	353,443	402,180	442,398	486,638	535,301
Store and Spares	5.0% of machinery	10%	177,125	194,838	214,321	235,753	259,329	285,262	313,788	345,167	379,683	417,651
TOTAL CURRENT ASSETS			6,253,258	7,372,933	8,680,891	10,830,111	12,761,772	15,889,303	18,749,608	22,113,160	27,487,159	33,099,287
Current Liabilities												
Accounts Payable	Cost of Sales	50	4,909,183	5,760,100	6,747,675	8,331,461	9,786,759	12,088,600	14,232,960	16,773,490	20,742,120	24,942,149
Utilities Payable	One Month Bill	30	81,925	98,854	119,311	144,034	173,915	210,034	253,699	306,488	370,315	447,491
TOTAL CURRENT LIABILITIES			4,991,108	5,858,955	6,866,986	8,475,495	9,960,674	12,298,634	14,486,659	17,079,978	21,112,435	25,389,640
NET WORKING CAPITAL			1,262,151	1,513,978	1,813,905	2,354,616	2,801,098	3,590,670	4,262,949	5,033,182	6,374,724	7,709,647

Annexure # 5 Taxation

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
NET REVENUE		43,473,600	51,298,848	60,532,641	75,892,798	89,553,502	111,889,199	132,029,255	155,794,520	194,050,730	233,800,491
Profit (as per accounts)		3,077,419	3,781,221	5,726,754	9,270,960	12,076,540	17,685,691	21,837,187	26,322,244	34,486,855	42,397,743
Add Depreciation		1,363,150	1,256,023	1,160,098	1,073,843	995,973	925,413	861,256	802,734	749,195	700,083
		4,440,569	5,037,244	6,886,853	10,344,803	13,072,513	18,611,104	22,698,442	27,124,978	35,236,050	43,097,826
Less Depreciation as per Income Tax Rules		10,373,900	734,635	671,865	616,398	567,139	523,186	512,590	475,104	441,190	410,396
Profit/(Loss) before Tax		(5,933,331)	4,302,609	6,214,988	9,728,405	12,505,374	18,087,918	22,185,852	26,649,874	34,794,860	42,687,430
(Loss) b/f		-	(5,933,331)	(1,630,723)	-	-	-	-	-	-	-
Taxable Profit		(5,933,331)	(1,630,723)	4,584,265	9,728,405	12,505,374	18,087,918	22,185,852	26,649,874	34,794,860	42,687,430
Taxation	35%	-	-	1,604,493	3,404,942	4,376,881	6,330,771	7,765,048	9,327,456	12,178,201	14,940,601
Profit/(Loss) after Tax c/f		(5,933,331)	(1,630,723)	2,979,772	6,323,463	8,128,493	11,757,147	14,420,804	17,322,418	22,616,659	27,746,830

Annexure # 6 Ratio Analysis

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Profitability Ratios										
Gross Profit	18.70%	19.15%	19.74%	20.96%	21.32%	22.21%	22.38%	22.48%	23.04%	23.19%
Operating Profit	8.97%	10.33%	11.68%	13.76%	14.60%	16.19%	16.54%	16.90%	17.77%	18.13%
Net Profit before tax	7.08%	7.37%	9.46%	12.22%	13.49%	15.81%	16.54%	16.90%	17.77%	18.13%
Profit after Tax	7.08%	7.37%	6.81%	7.73%	8.60%	10.15%	10.66%	10.91%	11.50%	11.74%
Return on Investment (ROI)	8.84%	9.95%	9.89%	12.29%	13.88%	16.77%	17.05%	16.88%	17.77%	17.62%
Return on Equity (ROE)	18.31%	18.37%	16.68%	19.19%	20.12%	22.88%	22.09%	21.06%	21.66%	21.05%
Earning per Share (EPS)	Rs. 2.24	Rs. 2.75	Rs. 4.17	Rs. 6.75	Rs. 8.80	Rs. 12.88	Rs. 15.91	Rs. 19.18	Rs. 25.12	Rs. 30.89
Liquidity Ratios										
Current Ratio	2.03	2.51	2.87	3.19	3.60	3.99	4.47	4.90	5.18	5.53
Debt Ratios										
Debt Ratio (of total assets)	37.37%	30.42%	24.26%	18.17%	13.03%	8.54%	5.25%	2.87%	1.15%	0.00%
Debt Equity	77.4%	56.2%	40.9%	28.4%	18.9%	11.6%	6.8%	3.6%	1.4%	0.0%

Annexure # 7 Internal Rate of Return

Project Cost **Rs. 27,454,000**

Operating Cash In-flow = EAIT* + Depreciation + Amortization - Increase in Working Capital

Year	Cash Inflows
Project Cost	(27,454,000)
1	2,612,944
2	3,497,469
3	3,694,486
4	5,111,203
5	6,961,203
6	10,045,813
7	12,816,167
8	17,027,290
9	20,271,360
10	25,377,354

22.4%

Annexure # 8 Pay Back Period

	Year	Profits After Tax	Cash Inflows*
Initial Investment	0	27,454,000	
	1	3,077,419	2,612,944
	2	3,781,221	3,497,469
	3	4,122,262	3,694,486
	4	5,866,019	5,111,203
	5	7,699,659	6,961,203
	6	11,354,920	10,045,813
	7	14,072,138	12,816,167
	8	16,994,789	17,027,290
	9	22,308,653	20,271,360
	10	27,457,143	25,377,354

Average Profit After Tax	11,673,422	
Average Cash Inflows		10,741,529
Average Rate of Return on Total Investment	43%	39%

Pay Back Period (based on cash inflows) **2 Years 7/12 years**

Pay Back Period on Equity (based on cash inflows) **1 Years 3/12 Years**

* Profit after tax + Depreciation + Amortization - Increase in Working Capital

	Year	Profit + Interest Exp.
Share Capital	0	13,727,000
	1	3,901,039
	2	5,298,416
	3	5,466,063
	4	7,036,426
	5	8,696,673
	6	11,788,404
	7	14,072,138
	8	16,994,789
	9	22,308,653
	10	27,457,143

Average Profit After Tax	12,301,974
Average Rate of Return on Equity	90%

Pay Back Period **1 Years 1/12 Months**

Annexure # 9 Loan Schedule

Loan Repayment Schedule

FUND AMOUNT	Rs.	13,727,000
NO. OF YEARS		10
NO. OF INSTALLMENTS		19
PRINCIPAL AMOUNT	Rs.	722,474
NO. OF INSTALLMENT / YEAR		2
INTEREST RATE PER THOUSAND PER DAY	Rs.	0.33
ANNUAL RATE OF INTEREST (%)		12%
Semiannual Rate of Interest		6.00%

Periods	Installment	Principal	Interest	Balance Principal Amount
0	-	-	-	13,727,000
1	1,546,094	722,474	823,620	13,004,526
	1,546,094	722,474	823,620	
2	1,502,745	722,474	780,272	12,282,053
3	1,459,397	722,474	736,923	11,559,579
	2,962,142	1,444,947	1,517,195	
4	1,416,048	722,474	693,575	10,837,105
5	1,372,700	722,474	650,226	10,114,632
	2,788,748	1,444,947	1,343,801	
6	1,329,352	722,474	606,878	9,392,158
7	1,286,003	722,474	563,529	8,669,684
	2,615,355	1,444,947	1,170,407	
8	1,242,655	722,474	520,181	7,947,211
9	1,199,306	722,474	476,833	7,224,737
	2,441,961	1,444,947	997,014	
10	1,155,958	722,474	433,484	6,502,263
11	1,112,609	722,474	390,136	5,779,789
	2,268,567	1,444,947	823,620	
12	1,069,261	722,474	346,787	5,057,316
13	1,025,913	722,474	303,439	4,334,842
	2,095,174	1,444,947	650,226	
14	982,564	722,474	260,091	3,612,368
15	939,216	722,474	216,742	2,889,895
	1,921,780	1,444,947	476,833	
16	895,867	722,474	173,394	2,167,421
17	852,519	722,474	130,045	1,444,947
	1,748,386	1,444,947	303,439	
18	809,171	722,474	86,697	722,474
19	765,822	722,474	43,348	0
	1,574,993	1,444,947	130,045	
	21,963,200	**13,727,000**	**8,236,200**	