

2010

Red Chilli De-Hydration Plant – Kunri, Sindh



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Executive Summary

Chilli (botanically known as *Capsicum annum* L.; *Capsicum frutescene* L.), also called red pepper belongs to the genus capsicum, under the solanaceae family. They are believed to have originated from South America. Chillies are referred to as chillies, Chile, hot peppers, bell peppers, red peppers, pod peppers, cayenne peppers, paprika, pimento, and capsicum in different parts of the world. However, in general the chillies are the smaller-sized, more pungent types, while the somewhat larger, mildly to moderately pungent types are capsicums. Chillies are valued principally for their high pungency and for their colour.

Red Chilli, a major crop of Pakistan, is not only an important ingredient in food but is also used for essence production. Chillies are one of the largest traded spices in the International market. The total current production of Red Chilli in Pakistan is 90,000 tonnes. In Sindh, Chillies are grown on an area of 38.4 thousand hectares with production of 53.7 thousand tonnes. The average yield of 1.7 tons per hectare contributes 1.5 per cent of the country's GDP. In Pakistan, Kunri, a small town of Umer Kot district is the home of Red Chillies. It contributes around 85% of Pakistan Red Chilli production and is known as one of the largest production centre for Red Chillis in Asia. The three major types of Chillis grown in the Chilli cluster of Kunri are: Maxi, Desi & Nageena.

This pre-feasibility study aims at providing critical information on business viability of putting up a Red Chilli De-hydration Plant in Sindh. Among other things, nature of the opportunity; ideal location for setting up the facility; estimated costs; potential returns; availability of human resource etc. are presented in an objective manner. The information contained in this paper provides a sound base for interested investors to build upon it a more detailed and comprehensive Business Plan.

1. Introduction

Red Chilli, a major crop of Pakistan, is not only an important ingredient in food but is also used for essence production. It is used in foods for pungency and red colour. Chillies are one of the largest traded spices in the International market. Pakistan is in the list of biggest producer of chillies after India, china, Mexico. Chilli is an important cash crop of the Sindh province, particularly in Kunri located in Umer Kot District. Production of red chilli in the province is 80,000 tonnes per annum, which accounts for around 86 per cent of the total red chilli production of Pakistan. Until fairly recently, this area was known as the chillies capital of the world

1.1. Uses of Chilli

The spice has innumerable uses for commercial, nutritional as well as medicinal. It is used for preparation of oleoresin that has great export potential and demand in the world market. Chillies are excellent source of Vitamin, A, B, C and E with minerals like molybdenum, manganese, RED CHILLIES foliate, potassium, thiamin, and copper. In addition, medically used as pain killer, Antibiotic as well as included in Ayurvedic medicines. The medicinal properties in chillies help to combat various disease like cancer, heart attack and Lung diseases.

1.2. Growing Conditions and Seasons

Chillies are a warm-climate crop, most Chilli cultivars grow well in areas where the average temperature is 30°C for at least four to five months of the year. The optimal temperature is between 24°C and 32°C. At lower temperatures growth becomes progressively poorer and despite being a warm season crop, at temperatures above 35°C coupled with dry winds, excessive flower drop may become a problem.

1.3. Opportunity Rationale

About 38 thousand hectare land are utilized for a production of around 85 to 90 thousand tonnes of chillies. Despite of huge area available and production capacity the important cash crop of Sindh has a declining per acre yield production. Furthermore, the imposition of sanctions is a result of meagre harvest and post harvest practices which lead to contamination of the product and loss of colour due to the long duration (10 to 12 days) required for drying, which is carried out in the open fields. A large proportion of production is lost post harvesting owing to such problems as rotting sprouting and weight loss. This is result of poor genetic material used and the inability to invest in drying technology.

The first priority policy should be to resolve the problem of post harvest losses by constructing yards for drying storage infrastructure which would improve the cost effectiveness of chilli growing and the warehousing facility to be strengthened in all chilli growing areas. This will also facilitate price stabilization besides restricting post harvest losses.

A loss of 15-20% occurs on various accounts during process and processing activity ranges from the very basic (e.g. shade drying on farms) to very capital intensive processes (e.g. milling, irradiation). The humid climate of Kunri is not particular suitable for shade drying and result in lower quality products. Drying machines would greatly improve the quality of dried chillies and disease free red chilli has huge potential international market.

2. MARKET ANALYSIS

Chilli is a cash crop, easy to handle and produce and have good value of money, some growers give Chillies preference then cotton producing. Chillies are mainly cultivated in the areas of MirpurKhas / Umerkot/ Kunri and fulfil 85 % demand of local market. Total area cultivated in Sindh for Red Chilli are about 40,000 hectares and get a production of about 6000 to 80,000 Tones, which is almost 85% of total Chilli production of the country. The average yield of Chillies in Sindh is about 1.7 tonnes per hectare.

2.1. *Structure and Distribution of Chilli Cluster*

The following types of chilli growers are operating in Sindh:

- Small Growers
- Medium-sized commercial growers
- Commercial farmers putting a small portion of their land under chilli production as a diversification strategy or cash crop
- Community gardens and developmental projects
- Chillies are seen as a cash crop of high potential for the following reasons:
 - Kunri's growing conditions reasonably well suited to chilli production
 - Relatively rapid period from planting to harvest
 - Less susceptible to loss through grazing than some crops as animals do not like the taste of chillies
 - Reduced concerns regarding theft
 - The product is physically difficult to steal because of its numerous fruits
 - It is not a food staple
 - As a result, there are reduced costs for fencing, security etc

As a cash crop, the production volumes and area of land under production are highly variable. Depending on market prices for chillies and other cash crops, farmers will use different amounts of land for chilli production.

While it is therefore difficult to develop an accurate assessment of the number of chilli growers in Sindh, it is estimated that the number of small chilli growers is increasing and may be in the order of hundreds if not thousands. The vast majority of these growers are growing on land of less than 10 acres and very few commercial growers cultivate more than 50 acres.

2.2. Details of red chilli producing areas and total production

Province	Area in Hectares				Production in Tonnes			
	2003-2004	2004-2005	2005-2006	2006-2007	2003-2004	2004-2005	2005-2006	2006-2007
Sindh	46,917	40,449	54,229	36,684	82,156	77,716	105,570	53,171
Punjab	6,400	5,223	7,025	4,752	10,828	8,546	11,609	5,847
Balochistan	2,082	2,333	2,493	1,687	2,973	3,372	4,581	2,307
NWFP	392	719	853	577	437	840	1,141	575
Pakistan	55,791	48,724	64,600	43,700	96,394	90,474	122,900	61,900

In Sindh chillies are of three types:

- **Talhari:** Winter chillies grown for table purpose
- **Ghotki:** mostly table chillies grown in summer, but are also dried to get red chillies
- The major chillies grown for powder purpose is Dandicut grown in Mirpurkhas

The recommended planting season of chillies is 15th March onward, however, the growers tend to plant crop in February in southern Mirpurkhas. The crop from Kunri, district Mirpurkhas arrives in the market in the first week in august, that form Tando Allahyar in former Hyderabad comes to the market at around 15th August.

In Kunri, chilli arrive form 1st August to 15th September with a quantity of 1000 to 1500 bags per day and price ranging from Rs. 2500 to Rs. 3000 per 40 kg. Its second arrival starts from 16th September to 30th November with a larger quantity from 10,000 to 120,000 bags each day and price reduced to Rs. 1000 to Rs. 1500 per 40 kg bag. Normally the sowing is done in February – March and plucking in August – November. The chilli plant lasts for one season only. It is plucked 3 to 4 times in the season. The dandicut chillies retain flavour for about six months. This is mostly because of poor post harvest handling and improper technique of drying used by farmers and traders otherwise the flavour may remain for longer period,

2.3. Reasons for declining yield

There are number of reasons for decline in yield but major problems includes mal-cultural practices, dieses during post harvest stages, non availability of standard seeds etc. One of the critical problems which have hampered Pakistan’s export drastically is level of aflatoxin in the red Chilli crop of Pakistan due to which Pakistani Red Chilli has faced an entry ban in the EU. Aflatoxins are naturally occurring mycotoxins that are produced by many species of *Aspergillus*; but most notably *Aspergillus flavus* and

Aspergillus parasticius. Aflatoxins are toxic and carcinogenic to both animals and humans. After entering the body, aflatoxins are metabolized by the liver to intermediate reactive, aflatoxins M1, an epoxide.

2.4. Contamination Conditions

Aspergillus is common and widespread in nature and are most often found when crops are exposed to a high humidity environment over a long period of time or are damaged in stressful conditions such as drought. The native habitat of *Aspergillus* is in soil, decaying vegetation, hay, and grains undergoing microbiological deterioration and it invade all types of organic substrates wherever the conditions are favourable for its growth. Favourable conditions include high moisture content (at least 7%) and high temperature.

It is envisaged to certify the chillies sample of the grower's free from aflatoxins enabling their export. Moreover the grower should be given the new technology to overcome the problem of such particular fungus effecting their exports e.g. usage of dehydration plant and dryers are the key technologies in the field of agriculture, as it is established through survey and laboratory experiment that if chillies are dried immediately and completely after picking the chances are rare to suffer the aflatoxin problem in the crop. Pakistani dandicut chillies are more exposed to aflatoxic due to its exposed area from the head.

The other problem area Pakistani Chilli growers are facing is the presence of phytophthora root rot, and bud mite. These diseases can also be handled by the use of modern practice during pre harvest and post harvest stages.

Once Pakistani Red Chilli resolves this issue, the export figure may drastically change in upward direction.

2.5. International Market & Trade overview

Developed countries apply tight phytosanitary regulations, especially on bacterial contamination on processed spices, and ban certain fumigants. Universal spices of sub-continent Chillies are valued as a spice for their pungent taste and red colour.

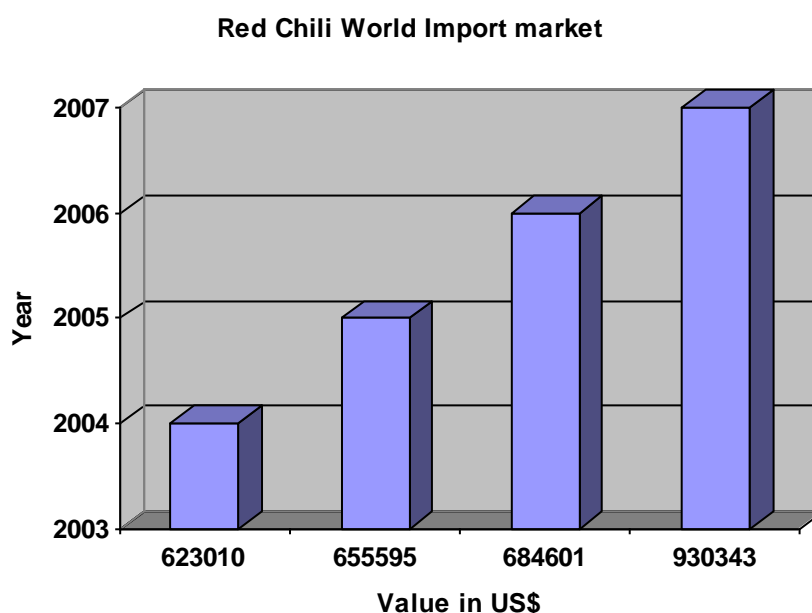
The largest producer of chillies in the world is India accounting for 1.8 million tonnes followed by China (1.4m tones), Mexico (0.8m tones) & Pakistan (0.7 m tones), however world Trade of Chillies is around 0.4 m tones. Apart from India, South Africa (South Africa, Malawi and Zimbabwe), China, Pakistan and Mexico are other major producing and exporting countries. These are mostly low or medium pungency varieties are famous in export market like Indian S4 chillies, Tientsin Chinese Chillies or Pakistan

Dandicut Chillies. Malawi, Zimbabwe and Uganda export limited quantities of the highly pungent East African Birdseye type, and China exports some high pungency types (Fukien).

Pakistan faces competition mainly from India and China though Pakistan offers Chillies at low prices in international markets than India. Imports of whole Chillies have fallen in the world market as exports of Chilli powder and oleoresin have grown. There are a number of factories in Pakistan, China, India and other exporting countries set up in collaboration with multinational spice companies, which are now able to produce Chilli powder to meet EC and ASTA hygiene standards.

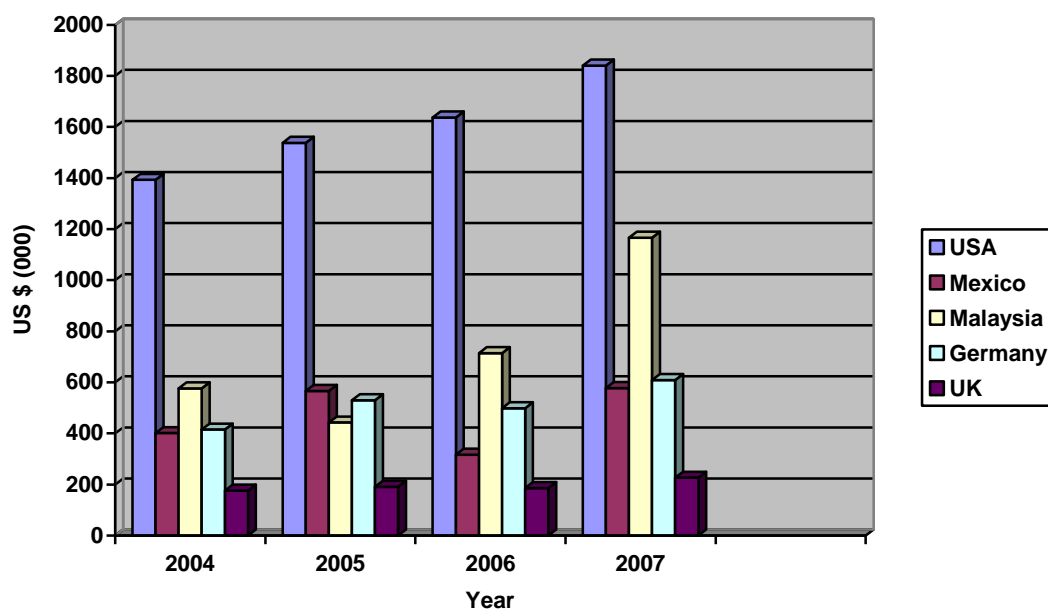
Among the European Union countries, UK is by far the most important importer of Chillies, reflecting its colonial heritage and large ethnic community, with the Netherlands the second largest importer. The world demand is expected to go up, consequently there expected to be a great scope for export of Chillies. Demand is growing for value added products using Chillies such as Chilli paste, curry powders and other sauces for the convenience food industry. Some of these are produced at origin but stringent hygiene and quality control level must be maintained. In the extraction industry, there is always demand for high capsaicin content (over 1%) Chillies, as this offers extractors a direct saving on unit costs of extraction. The best opportunities for new suppliers lie in production of selected varieties of high capsaicin Chillies for the extraction market, and in supplying niche retail markets for selected high colour high pungency whole Chillies.

The Capsicum international import market has been expanding over last 4 year average value growth is 15% while volume growth for 4 year growth was 30%. The market size in 2007 was \$ 930 million USA and Malaysia imports share was over 30%.



USA has been top buyer with consistent growth since decades, followed by Mexico, Malaysia, Germany and UK.

Top 5 Leading Importers



List of top 20 buyers of red chilli with import value in last four years. This may support Pakistani exporters to search their market according to buyer potential

Importers	Imported value in 2004	Imported value in 2005	Imported value in 2006	Imported value in 2007
'United States of America	139303	153827	163728	184031
'Mexico	40119	56648	31653	57738
'Malaysia	57631	44282	71450	116639
'Germany	41517	53036	49881	60875
'United Kingdom	17564	19081	18580	22668
'Thailand	15299	17148	19467	27507
'Canada	11737	12770	18920	16289
'France	10031	11421	11633	14615
'Belgium	5522	6547	8058	11682
'Austria	10369	9996	10480	10515
'Indonesia	3012	3509	7167	9110
'Russian Federation	3632	3678	4234	5467

'Italy	5536	5222	4682	5668
'South Africa	5264	4662	5590	5665
'Singapore	6556	5570	6184	7416
'Australia	4676	5334	5587	7092
'Sweden	4956	4943	5205	6152
'Switzerland	3881	3976	4104	5297
'Ukraine	1609	2595	2891	2616
'Romania	1789	2144	3213	2453

The following list may help Pakistani exporters to choose potential customers as per growth trend of buyers and their share in red chilli world import market.

Top ten imports share/growth in world market

Importers	Annual growth in value between 2003-2007 %	Share in World Import %
USA	12	14.37
Germany	15	7.55
China	22	6.81
UK	13	4.45
Japan	13	4.43
France	13	4.36
Italy	14	3.65
Netherlands	18	3
Belgium	14	2.95
Spain	16	2.79

Pakistan stand at number 21 among world chilli exporters with US Dollar value of 4.96 Million in year 2008

Top 20 Exporters in \$ Value

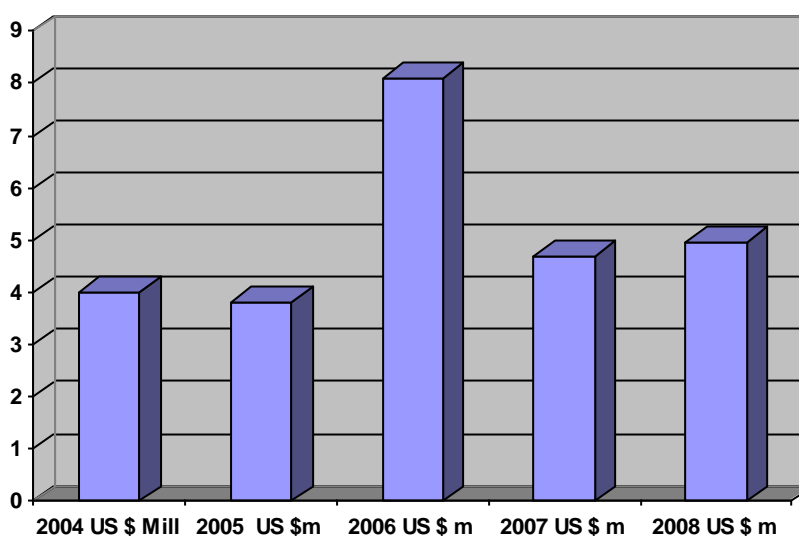
S. No	Exporters	Exported value in 2004	Exported value in 2005	Exported value in 2006	Exported value in 2007	Exported value in 2008
1	World	571416	606947	691577	867894	
2	China	154013	136374	140387	167366	242004
3	India	91029	88904	189091	276522	237978
4	Germany	18389	18209	21109	21935	26225
5	Brazil	17255	23077	11795	19479	19757
6	Tunisia	11372	9857	10327	16145	18856
7	Mexico	12728	18428	20066	15534	12559

8	Belgium	3867	4920	6316	8553	9755
9	Serbia	0	5392	5868	10807	8981
10	USA	15095	13820	11207	8868	8661
11	France	1854	2177	5196	6718	7747
12	Malaysia	7657	6377	6816	8552	7035
13	Austria	3494	3365	4650	5834	6960
14	Thailand	1823	2193	2396	14779	6110
15	Pakistan	3995	3811	8133	4709	4959
16	Italy	2346	2427	2721	3457	3905
17	South Africa	6427	5144	3350	3663	2715
18	Turkey	4832	3838	2593	2835	2692
19	UK	3709	2724	2867	2870	2429
20	Jamaica	2693	2789	1520	2195	2255
21	Colombia	3108	2598	2068	2107	1994

Pakistan’s 5 years export in US \$

2004	2005	2006	2007	2008
US \$ Mil	US \$ Mil	US \$ Mil	US \$ Mil	US \$ Mil
4	3.8	8.1	4.7	4.96

Pakistan's 5Years Export Trend Capsicum / Red Chilli



2.6. *International Best Practices*

The below mentioned strategies are essential for growing and post harvest handling of spices to ensure that the parameters that cannot be reconditioned, once the material has been dried for sale, are adequately addressed in the growing countries. These strategies are essential requirements by importing countries.

- Mycotoxins
- Drying & Processing
- Heavy metals
- Pesticide
- Residues Allergens
- Undeclared colours, whether from the environment or added
- Processing aids

Standard Governing International Trade and Certification (WHO)

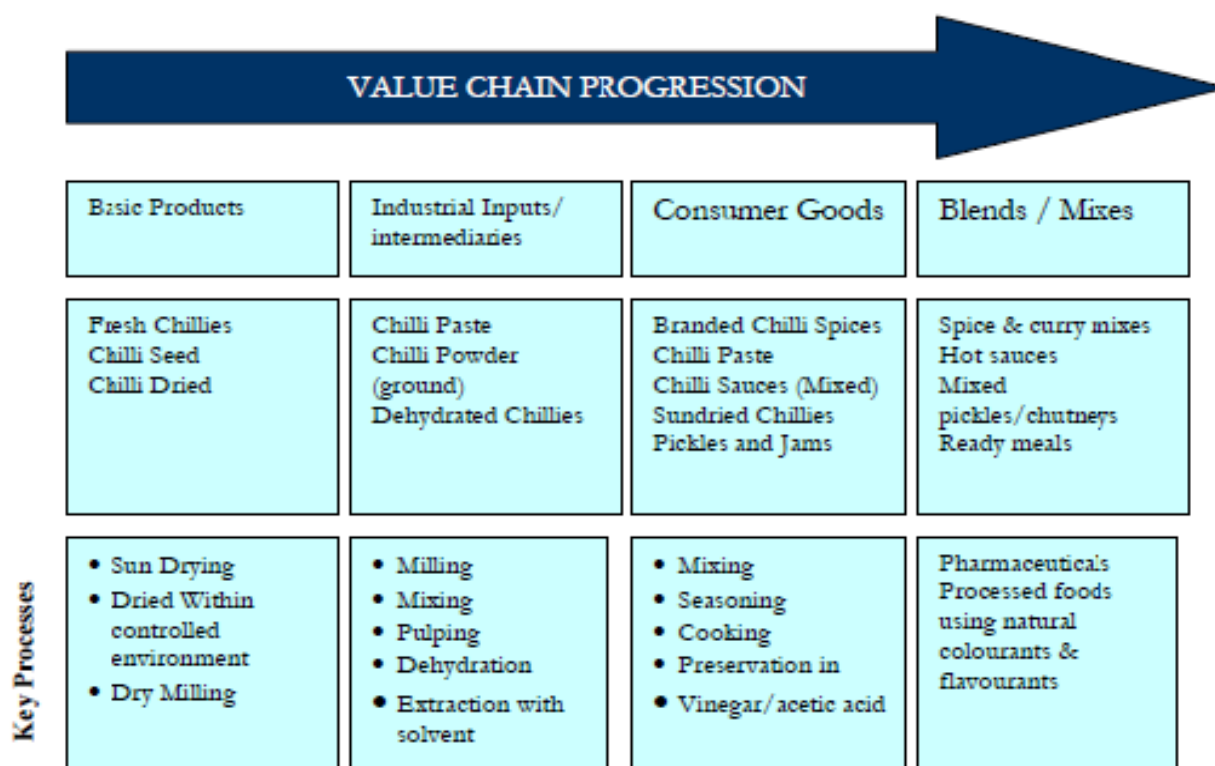
- General inspection on the identity of certain herbs & spices at macroscopic and microscopic levels.
- Inspection for any foreign substances or materials that could be accidentally mixed with the products.
- Inspection on moisture retained evaporated ratio or the drying loss, after the drying process. The evaporated moisture must not exceed the stated ratio.
- Inspection for contamination and other unclean substances.

EU

- The phytosanitary certificate is required for imported plant and agriculture products.

3. Value Chain Progression

A recent research has identified the following progressions in chilli products along the value chain¹:



The far right of the diagram extends into more general processing, primarily the food industry (for colourants and flavourants in products such as meats, margarines and sauces), and to a lesser degree the pharmaceutical and cosmetics industry), where multiple inputs are used and it becomes increasingly difficult to trace and measure the processing of chillies in particular. Furthermore, at this end of the value chain, competitiveness is far more related to factors other than chilli inputs. For example, they may require the availability of a range of other competitive inputs such as other spices, vegetables, natural extracts or chemicals.

¹ Sajjad Haider Consultants 2010

Role players in the chilli value chain include:

- Growers
- Distributors/exporters
- Processors
- Retailers
- Traders
- Regulators and support services
- Wholesalers

3.1. Chilli Costing Sheet

The following sheet explains the costing components of Chillies production.

Stages in Production		
Primary production	Average production per acre- Dry (kg/acre)	1600 – 2500
	Farm gate price – Dry (Rs/kg)	70
	Total gross farm revenue per hectare (Rs)	112,000 - 175,000
	Production Cost (Rs/acre)	
	Land Preparations Costs (Rs/acre)	4000-6000
	Seed Costs (Rs/acre)	500 - 900
	Watering Costs (Rs/acre)	2500 – 3500
	Fertilizer Costs (Rs/acre)	12,000 – 16,000
	Pesticides Costs (Rs/acre)	8000 – 12,000
	Chillie Picking Costs (Rs/acre)	15,000 – 18,000
	Drying, Transport, Brokerage & Storage Costs (Rs/acre)	20,000 – 28,000
	Total Production Costs (Rs/acre)	62,000 - 84,400

*Labour is provided by growers family, and therefore at zero cost

3.2. Harvesting Techniques

Most of the harvesting is done by hand. Though this is a labour intensive process, and contributes significantly to costs, harvesting by hand produces significantly higher yields, and better quality chillies. Harvesting machines tend to damage the crops, and harvesting by hand also allows each fruit to be harvested at the correct time. Harvest period can last two to three months.

3.3. Sales Channels

It appears that the majority of smaller growers sell their product in unprocessed form, primarily to the fresh produce market, but secondarily directly to “hawkers” or local communities. However, a few smaller producers grow on a contract basis. Statistics for the fresh produce markets show that around 85000 tons of chillies were traded at the Kunri market last year.

3.4. Prices

Interviews with growers revealed that In Kunri chilli arrives form 1 August to 15 September with a quantity of 1000 to 1500 bags per day and price ranging from Rs. 3000 to Rs. 4000 per 40 kg. Its second arrival starts from 16 September to 30 November with a larger quantity from 10000 to 120,000 bags each day and price reduced to Rs. 2000 to Rs. 3000 per 40 kg bag.

3.5. Processing Activity

Chillies are processed into a variety of products, which typically include:

- Industrial inputs and/or final products
 - Chilli powders (ground/crushed chillies)
 - Dehydrated/dried chillies
 - Chilli pastes

- Final consumer goods
 - Spice mixtures and seasonings
 - Curries
 - Hot sauces, table sauces, and other dressings
 - Pickles
 - Other products: ready meals, rubs, etc

The various processes used to create these products include:

- Basic processes
 - Outdoor shade drying
 - Drying in drying machines
 - Basic grinding
 - Pickling

- More advanced processes
 - Milling
 - Mixing
 - Extracting using solvents
 - Sauce manufacturing
 - Irradiating
 - Pulping
 - Dehydrating

The most common form of processing is drying, which is performed by the growers themselves. After harvesting, the chillies are simply placed outdoors. However, this type of drying has particular risks and disadvantages:

Pests and diseases - humidity and longer drying times make chillies more susceptible to pests and diseases such as aflatoxins.

Quality - longer drying times decrease quality through loss of colour

Another form of processing is machine drying. Simple drying machines would typically be owned and operated by growers; however this is not common in Sindh. Drying machines typically cost in the region of Rs. 2,000,000 to Rs. 3,000,000, and one machine can comfortably process 1 Ton/day of chillies. These driers can also be used for a variety of other crops. However there are limitations in the cost of operation and need for three-phase electricity, as well as the actual cost of the driers. While machine driers improve the quality of the processed product considerably, the scale of the vast majority of growers in Kunri is too small to make investment in driers viable.

4. The Project

4.1. Project Brief

This project aims to establish a Red Chilli De-Hydration Plant in **Kunri, Sindh** on 2 acres of leased land. All the calculations have been based on a setting up Red Chilli De-Hydration Plant to enhance the quality of Red Chilli and enhance the export quality.

4.2. Project Cost

Fixed Costs	Amount PKR
Machinery (Dehydrators)	4,931,000
Land & Building	2,000,000
Office Equipment & Furniture	500,000
Vehicles	700,000
Rent in Advance	-
Preliminary and Transportation Expenses	500,000
Total	8,631,000
Working Capital	
Utilities - Three Months	600,000
Salaries - Three Months	546,000
Raw Material Inventories - Three Month	97,416
Misc. Expenses - Three months	60,000
Total Project Cost	9,934,416
<i>Loan Finance</i>	<i>4,967,208</i>
<i>Equity Financing</i>	<i>4,967,208</i>
<i>Debt : Equity Ratio</i>	<i>50%</i>

NPV	8,460,202
IRR	56%
Payback (years)	1.60

4.3. Annual Assumptions on Recurring Basis²

Annual Assumptions on recurring basis	Amount PKR
Factory	
Plant and Machinery	4,931,000
Staff Salaries - Production	1,728,000
Machine maintenance cost(of machine cost)	1.5% for first 5 years and 2.5% after 5 years
Office and Store	
Selling & Admin Salaries per month	456,000
Combined Expenses	
Packaging Material (Rs / Kg)	0.5
Utilities Expenses/month	200,000
Rent per month	-
Bad Debt Expense	2%
Miscellaneous Expenses per month	20,000
Factory/Store and office construction and renov.	
Advance rent(6month deposit & 6 month rent)	
5 and 10 year factory and office renov. Cost	
Factory/Store and office furniture and fixture	500,000
Vehicle	700,000
Preliminary Expenses	500,000
Misc. Assumptions	
No. of working days per month	26
Days Receivable	45
Inventory Days	15
Payable Days	14
Debt / Equity	50/50
Finished goods inventory(1.5% of gross sale)monthly	
Financial Charges	15%
Working hrs	16hrs.
Business growth rate	10%

² Summary of Key Assumptions is provided in **Annex A**

4.4. Manpower Requirements

Designation	No.	Salary	Monthly	Annual
Production				
Plant Manager	1	25,000	25,000	300,000
Food Technologist	1	15,000	15,000	180,000
Boiler Man	2	12,000	24,000	288,000
Plant Mechanic / Engineer	1	10,000	10,000	120,000
Preparatory Line workers	5	5,000	25,000	300,000
Plant Operator	2	7,500	15,000	180,000
Unskilled labor	5	6,000	30,000	360,000
Production - Salaries			144,000	1,728,000
Admin Section				
Accounts Officer	1	10,000	10,000	120,000
Lab In charge	1	12,000	12,000	144,000
Guards	2	8,000	16,000	192,000
Admin Salaries			38,000	456,000

4.5. Machinery Requirement

List of Machinery and Equipment				
Sr. No.		Qty	Unit Price	Total Amount
1-	Sorting Conveyors (18 'X2')	1	150,000	150,000
2-	Washing Tanks (6'x2-1/2x2-1/2')	1	80,000	80,000
3-	Rotary Washing Machine-ss3 16	1	250,000	250,000
4-	Peeling Machine	1	80,000	80,000
5-	Chopping Machine-s.s	1	150,000	150,000
6-	Slicing	1	230,000	230,000
7-	Dicing Machine	1	325,000	325,000
8-	Blanching / Sulphiting Tank	1	45,000	45,000
9-	Steam Blancher, Trolley Load (3' x3' x6')M.S	1	65,000	65,000
10-	Twin Tunnel Dehydrator	1	800,000	800,000
	Trolley-Dehydrator	24	30,000	720,000
	Drying Trays Aluminum Frame	600	400	240,000
11-	Finishing Bins			
	Finishing Chambers (13'x3.5'x7')- Complete	1	150,000	150,000
	Drying Trays-Finishing Bin	40	400	16,000

	Trolleys-Finishing Bin-M.S	2	45,000	90,000
12-	Grinding Mill-S.S	1	200,000	200,000
13-	Threshing Machine	1	150,000	150,000
14-	Working Tables S.S (10'x4")	2	40,000	80,000
15-	Storage Vessels (10x4)	2	60,000	120,000
16-	Plate form Scale 200 M.T capacity	1	150,000	150,000
17-	Steam Jacketed Kettles S.S Capacity 100 Kg.	2	45,000	90,000
18-	Boiler (estimated)	1	40,000	40,000
19-	Laboratory Equipments etc.	1	300,000	300,000
20-	Storage Conveyors SS	1	150,000	150,000
21-	Rotto Sealer Machine	1	210,000	210,000
22-	Poly Sealer-Paddle	1	50,000	50,000
				4,931,000

5. Project Financials

5.1. Project Income Statement

Chillies Dehydration					
Projected Income Statement (Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	11,689,920	13,630,447	15,893,101	18,531,356	21,607,561
Cost of Sales	4,517,664	4,974,496	5,477,584	6,031,617	6,641,763
Packaging Material	389,664	433,696	482,704	537,249	597,958
Labor (Production Staff)	1,728,000	1,900,800	2,090,880	2,299,968	2,529,965
Utilities	2,400,000	2,640,000	2,904,000	3,194,400	3,513,840
Gross Profit	7,172,256	8,655,951	10,415,517	12,499,738	14,965,797
Gross Profit Margin	61%	64%	66%	67%	69%
General Administrative & Selling Expenses					
Salaries	456,000	501,600	551,760	606,936	667,630
Rent Expense	-	-	-	-	-
Office Miscellaneous Expenses	240,000	264,000	290,400	319,440	351,384
Amortization of Preliminary Expenses	100,000	100,000	100,000	100,000	100,000
Depreciation Expense	813,100	731,790	658,611	592,750	533,475
Maintenance Expense	123,275	123,275	123,275	123,275	123,275
Selling & Distribution	350,698	408,913	476,793	555,941	648,227
Subtotal	2,083,073	2,129,578	2,200,839	2,298,342	2,423,990
Operating Income	5,089,183	6,526,372	8,214,678	10,201,397	12,541,807
Financial Charges	848,637	737,252	604,079	444,854	254,483
Earnings Before Taxes	4,240,547	5,789,120	7,610,599	9,756,543	12,287,325
Tax	-	2,026,192	2,663,710	3,414,790	4,300,564
Net Profit	4,240,547	3,762,928	4,946,890	6,341,753	7,986,761

5.2. Project Balance Sheet

Chillies Dehydration						
Projected Balance Sheet (Rs.)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Assets						
<i>Current Assets</i>						
Cash & Bank Balance	1,206,000	5,429,215	8,837,940	12,923,823	17,978,998	22,929,008
Raw Material Inventory	97,416	107,158	117,873	129,661	142,627	156,889
Accounts Receivable	0	0	0	0	0	0
Prepaid Rent	0	0	0	0	0	0
Total Current Assets	1,303,416	5,536,373	8,955,813	13,053,484	18,121,625	23,085,897
<i>Fixed Assets</i>						
Plant Machinery & Facility	6,931,000	6,237,900	5,614,110	5,052,699	4,547,429	5,092,686
Furniture & Fixtures	500,000	450,000	405,000	364,500	328,050	295,245
Vehicle	700,000	630,000	567,000	510,300	459,270	413,343
Total Fixed Assets	8,131,000	7,317,900	6,586,110	5,927,499	5,334,749	5,801,274
<i>Intangible Assets</i>						
Preliminary and Transportation Expenses	500,000	400,000	300,000	200,000	100,000	0
Total Assets	9,934,416	13,254,273	15,841,923	19,180,983	23,556,374	28,887,171
Owner's Equity	4,967,208	8,807,755	12,070,683	16,217,572	21,559,325	28,046,086
Short-term Liabilities						
Account Payable	0	48,708	54,212	60,338	67,156	74,745
Long Term Liability	4,967,208	4,397,810	3,717,028	2,903,072	1,929,892	766,341
Total Equity & Liabilities	9,934,416	13,254,273	15,841,923	19,180,983	23,556,374	28,887,171

5.3. Project Cash Flow Statement

Chillies Dehydration						
Projected Statement of Cash Flows (Rs.)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cash Flow From Operating Activities						
Net Profit	0	4,240,547	3,762,928	4,946,890	6,341,753	7,986,761
Add: Depreciation Expense	0	813,100	731,790	658,611	592,750	533,475
Amortization Expense	0	100,000	100,000	100,000	100,000	100,000
(Increase) / decrease in Receivables	-	0	0	0	0	0
(Increase) / decrease in Payables	-	48,708	5,504	6,126	6,818	7,589
(Increase) / decrease in RM Inventory	-	-9,742	-10,716	-11,787	-12,966	-14,263
Net Cash Flow From Operations	0	5,192,613	4,589,506	5,699,839	7,028,355	8,613,562
Cash Flow From Financing Activities						
Receipt of Long Term Debt	4,967,208					
Repayment of Long Term Debt		-569,398	-680,782	-813,956	-973,180	-1,163,552
Owner's Equity	4,967,208	-400,000	-500,000	-800,000	-1,000,000	-1,500,000
Net Cash Flow From Financing Activities	9,934,416	-969,398	-1,180,782	-1,613,956	-1,973,180	-2,663,552
Cash Flow From Investing Activities						
Capital Expenditure	-7,631,000					-1,000,000
Office Equipment & Furniture	-500,000					
Preliminary Operating Expenses	-500,000					
Security Deposit and Advance Rent	0					
Raw Material Inventory	-97,416					
Net Cash Flow From Investing Activities	-8,728,416	0	0	0	0	-1,000,000
NET CASH FLOW	1,206,000	4,223,215	3,408,724	4,085,884	5,055,175	4,950,010
Cash at the Beginning of the Period	0	1,206,000	5,429,215	8,837,940	12,923,823	17,978,998
Cash at the End of the Period	1,206,000	5,429,215	8,837,940	12,923,823	17,978,998	22,929,008

Annex A

Summary of Key Assumptions		
Sr. No.	PARTICULARS	TOTAL COST/DETAILS
1	Plant & machinery	4,931,000
2	Facility Construction Cost	2,000,000
3	Office Equipment & Furniture	500,000
4	Vehicles	700,000
5	Rent in Advance	-
6	Preliminary and Transportation Expenses	500,000
	Total Capital Cost	8,631,000
7	Utilities - Three Months	600,000
8	Salaries - Three Months	546,000
9	Raw Material Inventories - One Month	97,416
10	Misc. Expenses - Three months	60,000
	Total Working Capital	1,303,416
	Total Project Cost	9,934,416
PROJECT RETURNS AND OTHER FINANCIAL ASSUMPTIONS		
11	IRR	56%
12	NPV	8,460,202
13	Payback Period (Years)	1.60
14	Debt Equity Ratio	50%
15	Required return on equity	20%
16	Bank Rate	18%
17	WACC	19.00%
OTHER ASSUMPTIONS		
18	Depreciation	10%
19	Bed debts	2%

20	Selling & Distribution Expenses	3%
21	Wastage During production	1%
22	Repair & Maintenance	1.5% of the Total Plant Cost for Initial 5 Years and 2.5% after 5 Years
23	Increase in the Raw Material Cost (Annual)	5%
24	Increase in capacity utilisation (Annual)	10%
25	Increase in Staff Salaries	10%
26	Increase in Utilities Cost	10%
27	Increase in Rent Expenses	10%
28	Increase in Misc. Expenses	10%
29	Capacity Utilisation at the beginning of the period	
30	<i>Grinding Machine</i>	50%
31	<i>Packaging Machine</i>	8 Hours
32	Finished Goods Inventory at the End of the Year	15 Days
33	Accounts Receivable period	45 Days
34	Accounts Payable period	45 Days
35	Increase in Sales Price	10%

Annex B

Chillies Dehydration COST AND REVENUE SHEET

REVENUE CALCULATIONS

Production	Red Chillies(July to Jan)		Onions (Feb to Jun)
Dehydration Ratio		3 : 1	10 : 1
Rated capacity (Dried)		150 Kg / Hr	200
Estimated No. of Operating Hours		16 Hrs / Day	16
Estimated Optimal Production		2400 Kg / Day	3200
Expected Capacity Utilization (At the beginning of the project)		80%	80%
Annual Capacity Utilization Growth Rate		6%	6%
Expected Production at the beginning of the project	1,920	Kg / Day	2560
Provision for Wastage		1%	1%
Total Realised Production	1,901	Kg / Day	2534.4
Processing Charges / Kg		15	15
Revenue / Day (RS)	28,512		38016
Processing Days	210		150
Revenue Chillies (RS)	5,987,520		
Revenue Onions (Rs)			5702400
Total Dehydration Revenue	Rs. 11,689,920		

Important Contacts

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