

# Pre-Feasibility Study Seed Oil Extraction Unit Cotton seed



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Government of Pakistan  
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## Table of Contents

1. INTRODUCTION TO SMEDA .....	1
2. PURPOSE OF THE DOCUMENT .....	1
3 PROJECT PROFILE.....	1
3.1 PROJECT BRIEF .....	1
3.2 HISTORICAL BACKGROUND .....	2
3.3 DEFINING THE PRODUCT .....	2
3.4 RAW MATERIAL .....	3
3.5 OPPORTUNITY RATIONALE .....	3
3.6 PROPOSED PRODUCT MIX .....	3
3.7 MARKET ENTRY TIMING .....	4
3.8 PROPOSED LOCATIONS .....	4
3.9 PROPOSED BUSINESS STATUS .....	4
3.10 PROJECT CAPACITY .....	4
3.11 VIABLE ECONOMICS SIZE .....	4
4. CRITICAL FACTORS IN DECISION MAKING .....	4
4.1 KEY SUCCESS FACTORS .....	4
4.2 OPPORTUNITIES .....	5
4.3 THREATS .....	5
5. MARKET ANALYSIS .....	5
5.1 TARGET CUSTOMER.....	5
5.2 GLOBAL MARKET .....	5
5.2.1 Major Producers .....	6
5.2.2 Major Exporters .....	6
5.2.3 Major Importers .....	7
5.3 NATIONAL MARKET .....	7
5.3.1 Demand & Supply.....	8
6. PRODUCTION PROCESS .....	8
6.1 DE-LINTING .....	9
6.2 WASHING .....	9
6.3 DRYING & WARMING.....	9
6.4 EXPPELLER .....	9
6.5 FILTER & SHAKER.....	9
6.6 PACKAGING & DISPATCHING .....	9
7. TECHNICAL PARAMETERS / ASSUMPTIONS.....	10
8. PROJECT INPUTS.....	11
8.1 EQUIPMENT REQUIREMENT.....	11
8.2 OFFICE EQUIPMENT REQUIREMENT .....	11
8.3 HUMAN RESOURCE REQUIREMENT .....	11
8.4 VEHICLE REQUIREMENT .....	12
8.5 LAND & BUILDING REQUIREMENT .....	12
8.6 FURNITURE & FIXTURE REQUIREMENT .....	12
9. PROJECT ECONOMICS .....	13

10. FINANCIAL ANALYSIS ..... 14

11. KEY ASSUMPTIONS ..... 18

## 1. INTRODUCTION TO SMEDA

The Small and Medium Enterprise Development Authority (SMEDA) was established with the objective to provide fresh impetus to the economy through the launch of an aggressive SME support program.

Since its inception in October 1998, SMEDA had adopted a sectoral SME development approach. A few priority sectors were selected on the criterion of SME presence. In depth research was conducted and comprehensive development plans were formulated after identification of impediments and retardants. The all-encompassing sectoral development strategy involved recommending changes in the regulatory environment by taking into consideration other important aspects including financial aspects, niche marketing, technology up gradation and human resource development.

SMEDA has so far successfully formulated strategies for sectors including, fruits and vegetables, marble and granite, gems and jewelry, marine fisheries, leather and footwear, textiles, surgical instruments, urban transport and dairy. Whereas the task of SME development at a broader scale still requires more coverage and enhanced reach in terms of SMEDA's areas of operation.

Along with the sectoral focus a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of viable business opportunities for potential SME investors. In order to facilitate these investors, SMEDA provides business guidance through its help desk services as well as development of project specific documents. These documents consist of information required to make well-researched investment decisions. Pre-feasibility studies and business plan development are some of the services provided to enhance the capacity of individual SMEs to exploit viable business opportunities in a better way.

This document is in the continuation of this effort to enable potential investors to make well-informed investment decisions.

## 2. PURPOSE OF THE DOCUMENT

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

## 3 PROJECT PROFILE

### 3.1 Project brief

The proposed project is about establishing a Seed Oil Extraction Unit. The main theme of the project is to use seeds of different commodities for economical purposes by extracting edible oil. In addition, the project would generate revenues by processing/selling seed residuals for different economical purposes.

The project may be utilize for seeds of different commodities such as Cotton, Canola, Sunflower, Coconut, Rapeseed/Mustard and Sesame etc. The selection of input commodity is the sole desire of the proprietor, however keeping in view the resource availability, cost & demand factors cottonseed is proposed for the said unit. The project would facilitate in employment generation both direct & indirect and result in utilization of seeds for more commercial purposes rather than its typical usage as animal feed. Moreover features like low cost & less complexity associated with such establishment make it more attractive project.

Currently the project is being designed / proposed for major cities having potential cotton production, whereas the project could also be proposed for cities where input requirements are available or in whole seller / trading cluster of seeds. Initially project focus would be domestic market, however on its maturity national market would be consider.

### 3.2 Historical Background

Cotton has been grown for its fiber for centuries in both the Eastern and Western Hemispheres. The oldest record of cotton textile was found in the Indus River Valley (now Pakistan) about 5000 years ago. Cotton fabrics have also been found in the remains of ancient civilizations of Egypt and Red Indian of the Southwestern United States. In ancient times, it is reported that the Hindus and the Chinese developed crude methods for obtaining oil from cottonseed, using the principle of the mortar and pestle. They used the oil in lamps and fed the remainder of the pressed seed to cattle. However the commercial use of cottonseed didn't develop beyond the crude stage.

The first commercial undertaking to crush cottonseed on a large scale was the establishment of a mill at Natchez, Mississippi in 1834. Several other mills were also established at Raleigh (North Carolina), Florence (Georgia) and Mobile (Alabama). In addition Egyptian cottonseed were begun to crush in Europe at small level in early 19<sup>th</sup> Century while in America the first cottonseed oil production was attempted in 1768.

These all attempts were commercially proven as failure due to demand & market factors. Moreover during this phase, the whole seed was crushed without removing the linters and hulls. Much of the oil was taken up by the very absorbent linters and hulls resulting in low oil production and an oily feed residue. However, in 1860 with the invention of modern technology to separate the residuals (linters & hulls), crushing and ginning machinery a solid foundation of cottonseed mill industry was laid down that has been flourishing since now in all over the world.

### 3.3 Defining the Product

Cottonseed oil is also called as Banola oil. It is classified as vegetable oil that use as popular ingredient in many foods as cooking and salad oil. In appearance, cottonseed oil ranges from clear to a light gold color but the degree of color depends on refining. It has a mild, nut-like taste. One table spoon of cottonseed oil (13.6 g) serves 120 calories and 3.5 grams of saturated fats. Cottonseed oil is a good source of antioxidants and vitamin E. It also contains significant

quantities of vitamin K, which is vital for proper blood clotting. In addition, its features like low cholesterol and saturated fats classify it as healthy and nutritious diet.

### 3.4 Raw Material

The proposed raw material for the project is cottonseed. Cotton is both a food (cottonseed oil) and a fiber (cotton lint) crop. The cotton crop yields around 150kg of cottonseed for each 100 kg of cotton fiber produce. It is estimated that around five percent (5%) of the seed is set aside to plant the following year's crop. The remaining seed is used as raw material for oil extraction, feed or export purposes.

In a typical crushing operation, cottonseed will yield oil (160 kg/t), residual cake (hulls–260 kg/t and meal–455 kg/t) and linters (83.5 kg/t)<sup>1</sup>. However the different yields can be obtain subject to method and variety/kind of cottonseed use.

### 3.5 Opportunity Rationale

Cottonseed oil is rank 4<sup>th</sup> in world seed oil production followed by Soybean, Rapeseed/Mustard oil and sunflower<sup>2</sup> respectively. Consumers use it widely in commercial as well as in home applications. The oil is used in stir-fry dishes, snack foods, seafood, vegetables and different foods around the globe. It can be used in place of any vegetable oil. Generally it is used to make mayonnaise, sauces, salad dressing and marinades etc. It can be used for baked goods as well as for spreads on foods such as bread and muffins. In refined shape, cottonseed oil is nearly clear and provides very little taste, serving mainly as a catalyst for holding ingredients together. Cottonseed oil ranks high among healthier oils, including corn, sunflower and soybean oil.

In addition, the residues obtain from cottonseed processing in shape of residual cake (hulls & meal) and linters are widely used for diversified commercial purposes around the world. The residual cake is used as protein feed for animals and in organic fertilizers etc. The linters are used as a chemical cellulose source in personal care products, in batting for upholstered furniture and in high quality paper etc.

### 3.6 Proposed Product Mix

The proposed final product for the project will be crude seed oil that can sell to solvent oil mills for the purpose for producing edible oil. Additional by products obtain form the process are residual cake (hulls & meal), linters and raw soap which are widely demanded in diversified fields.

In addition to above products, the processing line may be extended in Oil/Ghee mill – Poultry feed mill – Soap factory and Candy factory. Although utilizing the proposed facility for such purposes is the sole desire of the entrepreneur, however the proposed prefeasibility is limited to

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<sup>1</sup> United States Department of Agriculture

<sup>2</sup> [www.cottonseed.com/publications/facts.asp](http://www.cottonseed.com/publications/facts.asp)

the scope of seedoil extraction only.

### 3.7 Market Entry Timing

The proposed project can be established any time due to the high demand. But keeping in view the harvesting season, the project is proposed to establish in any time, between November to December or bulk purchases of raw material could be made during harvest season to maximize the cost benefit. However, round the year processing will be done using store raw material.

### 3.8 Proposed Locations

The proposed location for the establishment of the unit will primarily be near cotton producing areas such as Multan, DG Khan, Rahim yar Khan, Sadiqabad and Sibi etc.

### 3.9 Proposed Business Status

The proposed legal structure of the business entity is either sole proprietorship or partnership. Although selection totally depends upon the choice of the entrepreneur, however the financial of this prefeasibility study is based on Sole Proprietorship.

### 3.10 Project Capacity

The capacity of the proposed project would be 480 tons of seeds on annual basis, assuming 300 working days a year.

### 3.11 Viable Economics Size

The total investment required for this project is Rs. 4.37 millions. This investment mainly covers capital costs of Rs. 4.04 millions and working capital requirement of Rs. 0.32 millions.

Table 1: Project Investment

Description	Amount (Rs)
Total Fixed Cost	4,046,000
Working Capital	325,090
Total	4,371,090

## 4. CRITICAL FACTORS IN DECISION MAKING

### 4.1 Key Success Factors

- Seed availability of different crops as input.
- Possible extensions of said plant in diversified fields for commercial purpose.
- Selection of proper location, equipment and staff would be required to run project successfully.
- Continuous efforts should be made for up-gradation of the processing techniques.
- To attract large number of customers the product must be processed on quality standards.



#### 4.2 Opportunities

- Escalating demand based on rapidly growing population.
- Availability of raw material.
- Availability of labor at low price.
- Established market & growing demand.

#### 4.3 Threats

- Price fluctuations and macroeconomic instability.
- High Competition.

### 5. MARKET ANALYSIS

#### 5.1 Target Customer

The target customers for the proposed product would primarily be solvent mills for oil and individuals, whole sellers & retailers for by products. Initially the project will be focusing on local market; however opportunity for expansion could be capitalize depending success & demand of product.

#### 5.2 Global Market

Oilseed is widely used around the world and its consumption has been increasing dramatically fast due to the massive demand and increase in population. As per statistics provided by United States Department of Agriculture (USDA), Soybean is largest oil producing seed in world with 41 million tons of oil production in year 2010-11. Rapeseed/Mustard yields the 2<sup>nd</sup> largest production of oil followed by sunflower and cotton seed; 23 million tons, 11 million tons and 4 million tons respectively. Table 2 describes the world oil production of major seeds as below:

Figure 2: World Oil production of Major Seeds  
Unit: 1000 Tons

Commodity	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Oil, Soybean	36,532	37,825	35,910	38,867	41,290
Oil, Rapeseed/Mustard	17,128	18,425	20,491	22,341	23,292
Oil, Sunflower seed	10,695	10,025	11,995	11,701	11,645
Oil, Cottonseed	5,134	5,210	4,772	4,623	4,992
Oil, Coconut	3,217	3,531	3,527	3,615	3,676

Source: United States Department of Agriculture

### 5.2.1 Major Producers

As per statistics provided by United States Department of Agriculture (USDA), China is the leading producer of Cottonseed oil. In 2010-11 it produced 1.4 million tons out of total world production of 4.99 million tons. India is the second largest producer with a production of 1.15 million tons recorded in year 2010-11. Pakistan comparatively stands at 3<sup>rd</sup> Position, by contributing 0.530 million tons of cottonseed oil tons in the total world production<sup>3</sup>. However, none of the Asian giants contribute in the world export of cottonseed oil mainly due to the reason of high local demand.

Table3: Major Oil Producers of Cottonseed  
Unit: 1000 Tons

Rank	Country	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
1.	China	1,550	1,625	1,600	1,466	1,411
2.	India	942	1,062	1,030	1,045	1,150
3.	Pakistan	550	520	497	540	530
4.	Brazil	350	380	318	326	460
5.	United States	385	389	303	280	379
6.	Uzbekistan	310	313	249	224	221
7.	Turkey	212	166	116	93	110
8.	Australia	54	43	43	61	87
9.	Turkmenistan	71	75	79	75	85
10.	Argentina	44	37	33	47	66
World (Top & all)		5,134	5,210	4,772	4,623	4,992

Source: United States Department of Agriculture

### 5.2.2 Major Exporters

In relevance to statistical figure provided by USDA, United States is the leading exporter of cottonseed oil in year 2010-11. Brazil is the 2<sup>nd</sup> major exporter of cottonseed oil followed by Uzbekistan. The world export for the year 2010-11 was stood at 151 thousands tons. Table 4 describes the major exporters as follows.

Table 4: Major Oil Exporters of Cottonseed  
Unit: 1000 Tons

Rank	Country	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
1.	United States	63	85	87	43	75
2.	Brazil	18	20	7	0	20
3.	Uzbekistan	19	18	20	10	20
4.	Argentina	0	0	0	5	10
5.	Australia	0	0	8	9	10

<sup>3</sup> Whereas the Official production figure of cottonseed oil is around 352 thousand tons for the year 2010-11 as per Economic Survey of Pakistan 2010-11.

6.	Turkmenistan	2	2	2	1	6
7.	China	2	4	5	4	3
8.	South Africa	0	1	3	2	2
9.	Syria	11	15	11	8	2
10	Turkey	2	4	2	2	2
World (Top & all)		131	155	154	102	151

Source: United States Department of Agriculture

### 5.2.3 Major Importers

Canada is the leading importer of cottonseed oil in 2010-11. Mexico is 2<sup>nd</sup> major importer of cottonseed oil followed by Japan. Table 5 illustrates the major importers of the world as under:

Table 5: Major Oil Importers of Cottonseed  
Unit: 1000 Tons

Rank	Country	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
1.	Canada	23	18	14	16	15
2.	Mexico	9	5	7	7	14
3.	Japan	6	6	6	3	5
4.	South Africa	4	5	1	5	5
5.	Kyrgyzstan	4	3	4	4	4
6.	European Union	8	3	3	2	3
7.	Tajikistan	2	2	2	2	2
8.	Madagascar <sup>4</sup>	1	1	1	1	1
9.	Syria	1	1	1	1	1
10.	Zimbabwe	0	1	3	1	1
World (Top & all)		87	77	63	65	51

Source: United States Department of Agriculture

### 5.3 National Market

As per Economic Survey of Pakistan 2010-11, the major oilseed crops of Pakistan include sunflower, canola, rapeseed/mustard and cottonseed. The total seedoil produce in 2010-11 was 0.696 million tons, out of which 0.352 million tons of oil was contributed by cottonseed. Cottonseed is the major oilseed crop grown in Pakistan. It accounts for more than 50 percent of domestic seed oil production.

The area and production of oilseed crops during 2009-10 and 2010-11 is given in Table 6 as follows:

<sup>4</sup> The Republic of Madagascar (older name Malagasy Republic, Malagasy: Repoblikan'i Madagasikara) is an island country located in the Indian Ocean off the southeastern coast of Africa

Table 6: Area and Production of Major Oilseed Crops

Crops	2009-10			2010-11 (P)		
	Area	Production		Area	Production	
	(000 Acres)	Seed (000 Tons)	Oil (000 Tons)	(000 Acres)	Seed (000 Tons)	Oil (000 Tons)
Cottonseed	7,591	3,240	389	6,450	2,934	352
Sunflower	872	513	195	1,108	643	244
Rapeseed/ Mustard	486	160	51	439	157	50
Canola	142	70	27	233	131	50
<b>Total</b>	<b>9,091</b>	<b>3,983</b>	<b>662</b>	<b>8,230</b>	<b>3,865</b>	<b>696</b>

P: Provisional (July – March) Source: Pakistan Oil Seed Development Board

### 5.3.1 Demand & Supply

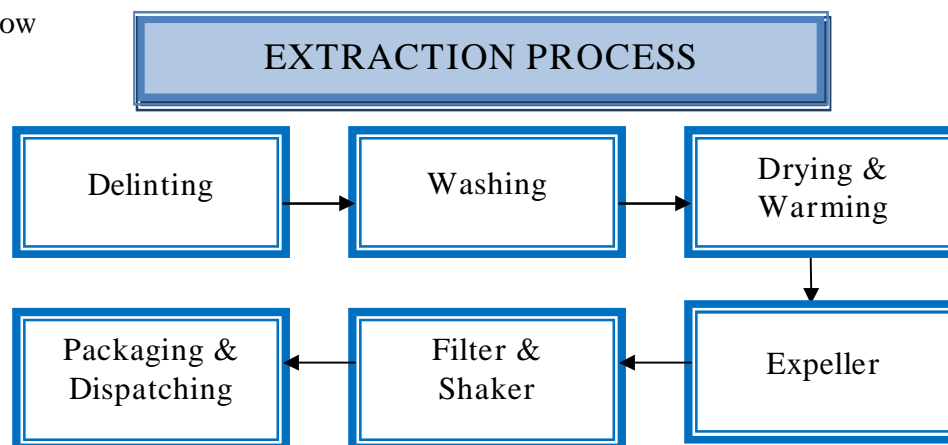
In 2005, the Government of Pakistan (GoP) liberalized the import of oilseeds, since then the crushing industry has been progressing remarkably. Pakistan is a net importer of oilseeds and edible oils. Domestic production of edible oils in year 2010-11 was 0.696 million tons that is limited to only 23 to 25 percent of total demand, while the remaining is ensured through imports. During the year 2010-11 (July- March), a quantity of 1.7 million tons edible oil/oilseeds worth US\$ 1.65 billion has been imported to fulfill the domestic demand.

Oilseed consumption is likely to be increase in coming years due to Pakistan’s high population growth rate. Total oilseed crush in 2011/12 is anticipated 20 percent higher than in 2010/11 because of anticipated higher production<sup>5</sup>.

## 6. PRODUCTION PROCESS

The process of seedoil extraction is primarily subjected to seed used, however the overall operation based on simple crushing principal. A glimpse over process is depicted as under:

Figure 1: Process flow



<sup>5</sup> Pakistan Oilseed and products Annual 2011, GAIN report # PK11003

A brief summary of the general operations is detailed under the following heads:

### 6.1 De-Linting

Delinting is done to remove the hairs/linters from the seed. Internationally delinting of seeds is done using specialized cutter. However acid delinting is normally practice in Pakistan due to cost saving and technological constraints. For the purpose of acid delinting 1kg of Sulphuric acid is used for around 10kg of seeds. Or delinted seeds can be purchase directly from the market for seedoil extraction.

### 6.2 Washing

Washing of seeds is done initially to remove dust particles, stones, chaff and other impurities. The impurities as Chaff left in the seed can absorb some of the oil and keep it from getting squeezed out of the expeller while dust and stone particle can damage the oil press screw or piston. Water tubs will be use for the said purpose where washing is done manually however mechanical lines are also available in the market.

### 6.3 Drying & Warming

Seeds are dry & warm in the second phase. Moist seed leads to low yields and can clog the screw, cage or a part of the press. A thumb rule is that the moisture content of the seed should be close to 10 percent whereas optimum heat range for seed oil extraction is from 100 to 160 degrees.

Mechanical drying is practice internationally using oven or double boiler etc. However in Pakistan, seeds are normally dried in sheds under natural sunlight and hence proposed for the said unit.

### 6.4 Expeller

Oil is extracted mechanically using expeller but ram press or even mortar & pestle can be used for the same purpose. Traditionally small hand made Presses/Expellers are used, however power-driven commercialize line are suggested for the plant.

### 6.5 Filter & Shaker

The extracted seed oil is filter and shake to improve its quality and appearance. Caustic soda & Bleach are normally used in Pakistan for the said purpose.

The remaining i.e. residual cake and left over raw ingredient (used in soap & paints etc.) are separated and sold in market for different purposes.

### 6.6 Packaging & Dispatching

The final product is packed using hygienically cleaned barrels and sold to solvent plants.

## 7. TECHNICAL PARAMETERS / ASSUMPTIONS

Technical parameters and assumptions are described as follows:

- Ø It is assumed that 4kg oil and 34kg residual cake is yield from 40kg of cottonseed. i.e. 100grams oil and 850grams residual cake is extracted from 1kg cottonseed. In addition, the raw ingredient (used in soap & paints etc.) is also produce during the process.
- Ø The Per KG, CoGS (Cost of Good Sold) is assumed as Rs.25/kg (including all costs) whereas the Selling Price is assumed as Rs. 35/Kg explain as follows:
  - Rs. 11.3 of Oil
  - Rs. 21.50 of Residual Cake
  - Rs. 2.50 of Soap
- Ø The Buying price for cottonseed is assumed at Rs. 25/kg (including all tax/tariffs). It is assumed that selling price for oil and residual cake is Rs. 113/kg and Rs. 25/kg respectively.
- Ø Careful processing techniques must be use to avoid any damages to oil.
- Ø It is crucial for the plant to use de linted and clean seeds for maximum yield. For the purpose of de linting Acid and Heat may be utilize or de linted seeds can be purchase directly from the market.
- Ø The project infrastructure must be design keeping in view the possible extension i.e. Oil/ghee industry, Poultry feed mills, Soap factory and Sweet/candy factory.
- Ø In case of utilizing different seeds, the processing line must be clean hygienically and used as per international industry standards.
- Ø The total output of line is directly subjected to input commodity.
- Ø The seedoil should be in accordance with quality health standards especially in case of using Bt cottonseeds. The Bt (*Bacillus thuringiensis*) is a genetically modified cotton seed and was developed to reduce the heavy reliance on pesticides. It naturally produces a chemical harmful only to a small fraction of insects such as larvae, worms, butterflies, beetles, and flies.

## 8. PROJECT INPUTS

### 8.1 Equipment Requirement

Table 8.1: Equipment & Machinery Details

Description	No	Total Price (PKR)
Seed oil Extraction Line*	1	440,000
Electrification, Installation & Transportation etc		160,000
Other accessories		100,000
Total		700,000

\*For details please check annexure

### 8.2 Office Equipment Requirement

Table 8.2: Office Equipment Details

Other Equipment Details	Qty	Cost/Unit	Total Cost (PKR)
Computer	1	25,000	25,000
Printer	1	10,000	10,000
Fax	1	12,000	12,000
Telephone Sets	2	1000x2=2,000	2,000
Total			49,000

### 8.3 Human Resource Requirement

Table 8.3: Human Resource Requirement Details

Description – HR Requirements	Nos	Salary per month	Salary per year
Manager	1	30,000	360,000
Plant Operator	1	15,000	180,000
Helpers	3	8,000	288,000
Guard	1	7,000	84,000
Sweeper	1	7,000	84,000
Driver	1	8,000	96,000
Total			1,092,000

Note: The staff salaries are estimated according to the market trends; however, the investor may set different pay scales.

#### 8.4 Vehicle Requirement

Table 8.4: Vehicle Requirement Details

Vehicle	Nos	Cost
Vehicle - Shehzor	1	900,000
Registration	3%	27,000
Total Cost		927,000

#### 8.5 Land & Building Requirement

Table 8.5: Land & Building Requirement Details

Description – Land & Building	Cost/Sq. Ft	Area in Sq. ft	Total Cost
Land	300	2,000	600,000
Office Building	1,000	200	200,000
Warehouse	1,000	700	700,000
Factory	1,000	700	700,000
Total			2,200,000

#### 8.6 Furniture & Fixture Requirement

Table 8.6: Furniture & Fixture Details

Description	Total Cost
Furniture & Carpeting Requirement	80,000



## 9. PROJECT ECONOMICS

Capital Investment	Rs. in actual
Land	600,000
Building/Infrastructure	1,600,000
Machinery & equipment	700,000
Furniture & fixtures	80,000
Office vehicles	927,000
Office equipment	49,000
Pre-operating costs	90,000
<b>Total Capital Costs</b>	<b>4,046,000</b>

Working Capital	Rs. in actual
Equipment spare part inventory	1,240
Raw material inventory	42,500
Upfront insurance payment	81,350
Cash	200,000
<b>Total Working Capital</b>	<b>325,090</b>
<b>TOTAL INVESTMENT</b>	<b>4,371,090</b>

Initial Financing	Rs. in actual
Debt	2,185,545
Equity	2,185,545

## 10. FINANCIAL ANALYSIS

Financial Evaluation										SMEDA
<b>Key Variables</b>										
Type of Machinery										...
Cost of One Machine									...	
Number of Machines									...	
Total Investment in Project										4,371,090
Equity	50%									2,185,545
Debt	50%									2,185,545
Lease	0%									-
Export-refinance	0%									-
Interest Rate										20%
Debt Tenure										5
Debt Payments per year										1
Total Number of Employees										...
Rs. in actuals										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Free Cash Flow to Equity (FCFE)	561,853	598,107	755,827	816,037	(253,110)	1,643,667	1,816,587	2,018,046	2,243,610	2,685,039
Free Cash Flow to Firm (FCFF)	1,245,666	1,130,963	1,315,433	1,407,743	205,736	1,665,294	1,839,157	2,041,750	2,268,674	4,477,962
Profit margin on sales	2%	3%	4%	4%	6%	5%	5%	5%	5%	5%
ROE	10%	19%	27%	31%	30%	30%	36%	41%	45%	49%
Times interest earned	1.90	3.25	5.30	8.37	20.52	116.95	154.69	218.20	344.28	720.89
	Equity		Project							
Internal Rate of Return (IRR)		37%								29%
Modified Internal Rate of Return (MIRR)*		24%								19%
Payback Period (yrs)		3.33								3.48
Net Present Value (NPV)	@ 25%	1,269,378	@ 18%							2,105,284
*Re-investment rate has been taken to be the interest on cash in bank, which in this case is 10%										

Statement Summaries										SMEDA
Income Statement										Rs. in actuals
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	14,280,000	16,632,000	19,311,600	21,242,760	23,367,036	25,703,740	28,274,114	31,101,525	34,211,677	37,632,845
Cost of goods sold	12,485,750	14,484,890	16,758,897	18,430,323	20,268,544	22,290,210	24,513,632	26,958,953	29,648,322	32,606,104
Gross Profit	1,794,250	2,147,110	2,552,703	2,812,437	3,098,492	3,413,530	3,760,481	4,142,572	4,563,355	5,026,741
General administration & selling expenses										
Administration expense	259,560	284,831	312,563	342,994	376,389	413,034	453,248	497,377	545,802	598,942
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	-	-	-	-	-	-	-	-	-	-
Travelling & Comm. expense (phone, fax, etc.)	50,400	55,307	60,692	66,601	73,085	80,201	88,009	96,578	105,981	116,299
Office vehicles running expense	92,700	101,970	112,167	123,384	135,722	149,294	164,224	180,646	198,711	218,582
Office expenses (stationary, etc.)	25,200	27,654	30,346	33,300	36,543	40,100	44,005	48,289	52,991	58,150
Promotional expense	14,280	16,632	19,312	21,243	23,367	25,704	28,274	31,102	34,212	37,633
Insurance expense	81,350	68,580	55,810	43,040	30,270	92,147	73,718	55,288	36,859	18,429
Professional fees (legal, audit, etc.)	71,400	83,160	96,558	106,214	116,835	128,519	141,371	155,508	171,058	188,164
Depreciation expense	348,300	348,300	348,300	348,300	348,300	461,489	461,489	461,489	461,489	461,489
Amortization expense	18,000	18,000	18,000	18,000	18,000	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	71,400	83,160	96,558	106,214	116,835	128,519	141,371	155,508	171,058	188,164
Subtotal	1,032,590	1,087,594	1,150,305	1,209,290	1,275,346	1,519,007	1,595,707	1,681,784	1,778,160	1,885,852
Operating Income	761,660	1,059,516	1,402,398	1,603,147	1,823,146	1,894,523	2,164,774	2,460,789	2,785,195	3,140,889
Other income	42,467	80,379	108,306	126,472	119,501	109,700	130,089	173,205	228,977	301,716
Gain / (loss) on sale of assets	-	-	-	-	370,800	-	-	-	-	-
Earnings Before Interest & Taxes	804,127	1,139,896	1,510,704	1,729,619	2,313,447	2,004,223	2,294,863	2,633,994	3,014,172	3,442,604
Interest expense	422,742	350,230	284,986	206,693	112,742	17,138	14,835	12,071	8,755	4,776
Earnings Before Tax	381,385	789,666	1,225,718	1,522,926	2,200,705	1,987,085	2,280,028	2,621,922	3,005,417	3,437,829
Tax	156,368	323,763	502,544	624,400	902,289	814,705	934,811	1,074,988	1,232,221	1,409,510
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>225,017</b>	<b>465,903</b>	<b>723,174</b>	<b>898,526</b>	<b>1,298,416</b>	<b>1,172,380</b>	<b>1,345,216</b>	<b>1,546,934</b>	<b>1,773,196</b>	<b>2,028,319</b>
Balance brought forward		112,509	289,206	506,190	702,358	2,000,774	1,586,577	1,465,897	1,506,415	1,639,806
Total profit available for appropriation	225,017	578,411	1,012,379	1,404,716	2,000,774	3,173,154	2,931,793	3,012,831	3,279,611	3,668,125
Dividend	112,509	289,206	506,190	702,358	-	1,586,577	1,465,897	1,506,415	1,639,806	1,834,062
Balance carried forward	112,509	289,206	506,190	702,358	2,000,774	1,586,577	1,465,897	1,506,415	1,639,806	1,834,062

Statement Summaries											SMEDA
Balance Sheet											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	Rs. in actuals										
<b>Assets</b>											
<b>Current assets</b>											
Cash & Bank	200,000	649,344	958,245	1,207,883	1,321,562	1,068,452	1,125,543	1,476,233	1,987,863	2,591,668	3,442,644
Accounts receivable	-	586,849	635,178	738,567	833,309	916,640	1,008,304	1,109,134	1,220,047	1,342,052	1,476,257
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	1,240	1,447	1,684	1,857	2,047	2,257	2,488	2,743	3,024	3,334	-
Raw material inventory	42,500	51,975	63,366	73,188	84,532	97,635	112,768	130,247	150,435	173,753	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	81,350	68,580	55,810	43,040	30,270	92,147	73,718	55,288	36,859	18,429	-
<b>Total Current Assets</b>	<b>325,090</b>	<b>1,358,195</b>	<b>1,714,284</b>	<b>2,064,534</b>	<b>2,271,720</b>	<b>2,177,130</b>	<b>2,322,820</b>	<b>2,773,645</b>	<b>3,398,229</b>	<b>4,129,236</b>	<b>4,918,902</b>
<b>Fixed assets</b>											
Land	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
Building/Infrastructure	1,600,000	1,520,000	1,440,000	1,360,000	1,280,000	1,200,000	1,120,000	1,040,000	960,000	880,000	800,000
Machinery & equipment	700,000	630,000	560,000	490,000	420,000	350,000	280,000	210,000	140,000	70,000	-
Furniture & fixtures	80,000	72,000	64,000	56,000	48,000	40,000	32,000	24,000	16,000	8,000	-
Office vehicles	927,000	741,600	556,200	370,800	185,400	1,492,943	1,194,354	895,766	597,177	298,589	-
Office equipment	49,000	44,100	39,200	34,300	29,400	24,500	19,600	14,700	9,800	4,900	-
<b>Total Fixed Assets</b>	<b>3,956,000</b>	<b>3,607,700</b>	<b>3,259,400</b>	<b>2,911,100</b>	<b>2,562,800</b>	<b>3,707,443</b>	<b>3,245,954</b>	<b>2,784,466</b>	<b>2,322,977</b>	<b>1,861,489</b>	<b>1,400,000</b>
<b>Intangible assets</b>											
Pre-operation costs	90,000	72,000	54,000	36,000	18,000	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
<b>Total Intangible Assets</b>	<b>90,000</b>	<b>72,000</b>	<b>54,000</b>	<b>36,000</b>	<b>18,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL ASSETS</b>	<b>4,371,090</b>	<b>5,037,895</b>	<b>5,027,684</b>	<b>5,011,634</b>	<b>4,852,520</b>	<b>5,884,573</b>	<b>5,568,774</b>	<b>5,558,111</b>	<b>5,721,206</b>	<b>5,990,725</b>	<b>6,318,902</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<b>Current liabilities</b>											
Accounts payable	-	845,192	984,503	1,142,934	1,257,408	1,383,374	1,521,987	1,674,521	1,842,380	2,027,106	2,213,604
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Liabilities</b>	<b>-</b>	<b>845,192</b>	<b>984,503</b>	<b>1,142,934</b>	<b>1,257,408</b>	<b>1,383,374</b>	<b>1,521,987</b>	<b>1,674,521</b>	<b>1,842,380</b>	<b>2,027,106</b>	<b>2,213,604</b>
<b>Other liabilities</b>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	143,500	143,500	143,500	143,500	143,500	114,800	86,100	57,400	28,700	-
Long term debt	2,185,545	1,751,150	1,424,930	1,033,466	563,708	85,690	74,175	60,357	43,776	23,878	-
<b>Total Long Term Liabilities</b>	<b>2,185,545</b>	<b>1,894,650</b>	<b>1,568,430</b>	<b>1,176,966</b>	<b>707,208</b>	<b>229,190</b>	<b>188,975</b>	<b>146,457</b>	<b>101,176</b>	<b>52,578</b>	<b>-</b>
<b>Shareholders' equity</b>											
Paid-up capital	2,185,545	2,185,545	2,185,545	2,185,545	2,185,545	2,271,235	2,271,235	2,271,235	2,271,235	2,271,235	2,271,235
Retained earnings	-	112,509	289,206	506,190	702,358	2,000,774	1,586,577	1,465,897	1,506,415	1,639,806	1,834,062
<b>Total Equity</b>	<b>2,185,545</b>	<b>2,298,053</b>	<b>2,474,750</b>	<b>2,691,734</b>	<b>2,887,903</b>	<b>4,272,009</b>	<b>3,857,812</b>	<b>3,737,132</b>	<b>3,777,651</b>	<b>3,911,041</b>	<b>4,105,298</b>
<b>TOTAL CAPITAL AND LIABILITY</b>	<b>4,371,090</b>	<b>5,037,895</b>	<b>5,027,684</b>	<b>5,011,634</b>	<b>4,852,520</b>	<b>5,884,573</b>	<b>5,568,774</b>	<b>5,558,111</b>	<b>5,721,206</b>	<b>5,990,725</b>	<b>6,318,902</b>
Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0											

Statement Summaries											SMEDA
Cash Flow Statement											
Rs. in actuals											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Operating activities</b>											
Net profit	-	225,017	465,903	723,174	898,526	1,298,416	1,172,380	1,345,216	1,546,934	1,773,196	2,028,319
Add: depreciation expense	-	348,300	348,300	348,300	348,300	348,300	461,489	461,489	461,489	461,489	461,489
amortization expense	-	18,000	18,000	18,000	18,000	18,000	-	-	-	-	-
Deferred income tax	-	143,500	-	-	-	-	(28,700)	(28,700)	(28,700)	(28,700)	(28,700)
Accounts receivable	-	(586,849)	(48,329)	(103,389)	(94,742)	(83,331)	(91,664)	(100,830)	(110,913)	(122,005)	(134,205)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	(1,240)	(207)	(237)	(173)	(190)	(210)	(231)	(255)	(281)	(310)	3,334
Raw material inventory	(42,500)	(9,475)	(11,391)	(9,822)	(11,344)	(13,102)	(15,133)	(17,479)	(20,188)	(23,317)	173,753
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(81,350)	12,770	12,770	12,770	12,770	(61,877)	18,429	18,429	18,429	18,429	18,429
Accounts payable	-	845,192	139,311	158,431	114,474	125,965	138,613	152,535	167,858	184,726	186,498
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by operations</b>	<b>(125,090)</b>	<b>996,248</b>	<b>924,327</b>	<b>1,147,291</b>	<b>1,285,794</b>	<b>1,632,161</b>	<b>1,655,183</b>	<b>1,830,405</b>	<b>2,034,628</b>	<b>2,263,508</b>	<b>2,708,917</b>
<b>Financing activities</b>											
Change in long term debt	2,185,545	(434,395)	(326,220)	(391,464)	(469,757)	(478,018)	(11,515)	(13,818)	(16,582)	(19,898)	(23,878)
Change in short term debt	-	-	-	-	-	-	-	-	-	-	-
Change in export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Add: land lease expense	-	-	-	-	-	-	-	-	-	-	-
Land lease payment	-	-	-	-	-	-	-	-	-	-	-
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	2,185,545	-	-	-	-	85,690	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by / (used for) financing :</b>	<b>4,371,090</b>	<b>(434,395)</b>	<b>(326,220)</b>	<b>(391,464)</b>	<b>(469,757)</b>	<b>(392,328)</b>	<b>(11,515)</b>	<b>(13,818)</b>	<b>(16,582)</b>	<b>(19,898)</b>	<b>(23,878)</b>
<b>Investing activities</b>											
Capital expenditure	(4,046,000)	-	-	-	-	(1,492,943)	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
<b>Cash (used for) / provided by investing :</b>	<b>(4,046,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,492,943)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>NET CASH</b>	<b>200,000</b>	<b>561,853</b>	<b>598,107</b>	<b>755,827</b>	<b>816,037</b>	<b>(253,110)</b>	<b>1,643,667</b>	<b>1,816,587</b>	<b>2,018,046</b>	<b>2,243,610</b>	<b>2,685,039</b>
Cash balance brought forward		200,000	649,344	958,245	1,207,883	1,321,562	1,068,452	1,125,543	1,476,233	1,987,863	2,591,668
Cash available for appropriation	200,000	761,853	1,247,451	1,714,072	2,023,920	1,068,452	2,712,120	2,942,129	3,494,279	4,231,473	5,276,707
Dividend	-	112,509	289,206	506,190	702,358	-	1,586,577	1,465,897	1,506,415	1,639,806	1,834,062
Cash carried forward	200,000	649,344	958,245	1,207,883	1,321,562	1,068,452	1,125,543	1,476,233	1,987,863	2,591,668	3,442,644

## 11. KEY ASSUMPTIONS

Table 11-1 Cost of Goods Sold per Unit of Production

COGS 1 (Raw material per unit)	Rs. 25
COGS growth rate per annum	10%

Table 11-2 Production Related Assumptions

Production capacity per year (kg)	480,000
Sale price per unit in year 1	Rs. 35
Sale price growth rate per annum	10%
Production capacity utilization in first year	85%
Production capacity utilization growth rate	5%
Maximum production capacity utilization	95%

Table 11-3 Economic Related Assumptions

Inflation rate	10%
Wage growth rate	10%
Electricity Growth Rate	10%
Water Price Growth Rate	10%
GAS Price Growth Rate	10%

Table 11-4 Financing Assumptions

Interest rate on long term debt	20%
Project Debt Component	50%
Project Equity Component	50%
Required rate of return on equity	25%
WACC	17%

Table 11-5 Expense Assumptions

Administrative benefit expense	3%
Traveling expense	10%
Communication expense	10%
Office vehicle running expense	10%
Office expense	10%
Promotional Expense	0.1
Machinery & equipment insurance rate	5%
Office vehicle insurance rate	5%
Professional Fee (Legal, Audit etc)	0.5
Bad debt expense	2%

Table 11-6 Depreciation Rates

Building & Infrastructure	5%
Furniture & fixtures	10%
Machinery	10%
Office equipment	10%
Office Vehicle	20%

Table 11-7 Cash Flow Assumptions

Accounts Receivables Cycle (In Days)	15
Accounts Payable Cycle (In Days)	30
Initial cash on hand	Rs. 200,000
Raw material Inventory Purchase Cycle (In Days)	30

Annexure

**BROCHURE & QUOTATION**



# Quotation

## SMALL SIZE OIL EXPELLER PLANT



### INTRODUCTION:

Al-Ramay Small Size Gear System Oil Expeller is specially designed to obtain the highest possible level of production and oil yield at the lowest possible cost. Its chamber is fitted with the worms which are made of the most durable material. Al-Ramay Small Size Gear System Oil Expeller is being used, all over the Pakistan and many foreign countries, for crushing of all type seed in single pressing and for all other oil bearing seeds in the final pressing. We are manufacturing all kinds of Oil Expellers, Solvent Plants, Filter Presses, Pumps, Seed Worms, Seed Cleaners, Conveyors, Oil Shaker and Oil Store Tanks.

### DESIGN:

The two stands have been replaced by a steel fabricated structure. This ensures better alignment of the machine and the variations are reduced to a minimum. The chances of variations in thickness of cake are reduced to a minimum.

### GEAR BOX:

Al-Ramay Small Size Single Gear system model have been established to get minimum electricity usage. It is very easy for operate and control the machine. This reduces the noise in the machine and increase the lift of the gears changing of gears and pinions has also become an easier in this design.

### KETTLE:

The design of cooking kettle has also been changed for better cooking of the seed. The kettle shaft is derived with a pair of V-belts with special tightening arrangement. This prevents seepage of V-belts and this increases its life. The reduction gear to run the kettle has also been provided with an oil bath to increase its life.

### OUR SOLUTION TO EXCELLENCE:

Before final painting of the machines, the same are given a trial run by our expert engineers to ensure fool proof alignment and smooth running. All our machines are guaranteed against manufacturing defect to give a trouble free service.

### MARKET:

Edible oils have always a readymade market because the production of oil seeds and oil is lower than the market demands of the consumer.

### MANUFACTURING PROCESS

Bold varieties of ground nut kernels and gingelly seeds are taken and dried in the sun to remove excess moisture. The seeds are crushed in the expeller, filtered through the filter press and packed in tins or drums for sale. For coconut, the nuts are first cracked in to two halves and dried preferably in a solar drier. The copra obtained is subjected to oil extraction and filtration in the expeller and filter press. The filtered oil obtained is packed in tins or drums for sale. The deoiled cakes obtained after oil extraction of ground nut, gingelly and coconut can be used for incorporation into cattle feed. Alternatively de oiled gingelly or sesame and ground nut can be used in the manufacture candies in combination with sugar or jellies.

### PRODCUTION CAPACITY:

Feed Capacity (Approx)                      160-200 KG/Hour

*Note: Depend on the seed temperament and dryness.*

### PROJECT COST/ MACHNIARY & EQUIPMENT:

SR #	DESCRIPTION	QTY	RATE	AMOUNT
1	OIL EXPELLER	01	160000	160000
2	OIL FILTER	01	145000	145000
3	OIL SHAKER	01	55000	55000
4	OIL TANK	01	28000	28000
5	OTHER EQUIPMENT	01	52000	52000

**TOTAL MACHINARY COST:                      PKR 440,000/=**

Note: This cost is excluding of electric motors and fitting expense\*

## **OIL SEED:**

These are the oil seed types that can be crushed with this machine.

Rape Mustard	Canola	Cotton
Maize Ger	Sesame	Coconut
Peanut	Sunflower	Castor Etc.

## **POSSIBLE EXTENSION LINE:**

- ü Oil/ghee industry
- ü Poultry feed mills
- ü Soap factory
- ü Sweet/candy factory