

Pre-Feasibility Study for  
**FARMING OF EDIBLE OIL SEEDS,  
PRODUCTION OF EDIBLE OILS, PROCESSING  
AND MARKETING**

May, 2006



*Prepared by*  
**National Management Consultants (Pvt.) Ltd.**

Study Commissioned by  
**Employment & Research Section,  
Planning & Development Division,  
Government of Pakistan, Islamabad.**

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## **DISCLAIMER**

The purpose and scope of this Pre Feasibility Study is to introduce the Project and provide a general idea and information on the said Project including its marketing, technical, locational and financial aspects. All the information included in this Pre-Feasibility is based on data/information gathered from various secondary and primary sources and is based on certain assumptions. Although, due care and diligence has been taken in compiling this document, the contained information may vary due to any change in the environment.

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## ACRONYMS

EPB	Export Promotion Bureau
FBS	Federal Bureau of Statistics
GoP	Government of Pakistan
IRR	Internal Rate of Return
NMC	National Management Consultants (Pvt.) Ltd.
P&DD	Planning and Development Division
RoI	Return on Investment
SBP	State Bank of Pakistan
TPA	Ton per annum
PODB	Pakistan Edible Oilseed Development Board
PVMA	Pakistan Vanaspati Manufacturers Association
APSEA	All Pakistan Solvent Extractors Association

## EXECUTIVE SUMMARY

The Government of Pakistan intends to bring in private sector investment for commercial edible oil seeds farming and production of edible oil. This Pre-Feasibility on **“Farming of Oil Seeds, Production of Edible Oils and its Processing and Marketing”** covers various aspects including Need/Market assessment, Technical Evaluation of the Project, Governance and Management Structure and Financial Evaluation of the Project.

Pakistan is currently importing US\$550.0 million worth of edible oil per annum. At present the estimated consumption per capita is 16-18 Kg per annum, with the increase in disposable income, this intake is expected to increase.

Although Pakistan produces a number of oilseeds including: cotton seed, sunflower, rapeseed, canola etc., it has been found that Soya Bean is the most suitable oilseed for commercial farming on a large scale. The main reasons for the selection of soya bean include a high percentage of oil as compared to other varieties and a high protein content. Moreover it is internationally the most popular variety which will help in developing its export market

The site for farming the soya bean has been proposed in northern Sindh preferably Ghotki which has the most suitable climate for the crop. It is recommended that in the first phase the crop should be sown over 1,000 acres for test and trial. In the next phase the acreage is proposed to be increased to 10,000 acres and finally to 50,000 acres. Using state-of-the-art farming methods.

The latest technology plant will be used to process 90,000 tons per annum of soya bean at full production and to produce 20,000 tons per annum of soya bean oil.

The consolidated capital cost of the Project is US\$23.79 million which includes cost of farming establishment, of US\$22.29 million and that of Plant of US\$1.5 million. The payback period of the project is 1.8 to 2 years.

In the next step it is recommended that a detailed feasibility be prepared and help of the Federal and Provincial Governments obtained for help in Corporate Farming.

# **CHAPTER 1**

## **INTRODUCTION**

Dietary habits throughout the world, including Pakistan are changing fast. Low fat, low cholesterol edible oils are replacing unsaturated animal fats/ ghee as cooking agents. In addition to growing health awareness the increase in per capita income is contributing to the increased usage of oils/fats. Despite having an agrarian economy, Pakistan is unable to produce sufficient edible oil for domestic requirement. Substantial foreign exchange is spent on the import of edible oil annually at the average of about US\$550 million per year. Measures, therefore, need to be taken to make Pakistan self-sufficient in edible oils in the first phase and then to start exporting to world markets, as there is a large potential worldwide. In view of the above, the Government of Pakistan intends bringing in private investment for Commercial Edible Oil Seeds Farming, production of edible oils, processing and marketing of edible oil.

This Pre feasibility Study has been prepared keeping the above in mind.



## CHAPTER 2 NEED ASSESSMENT

### 2.1 REQUIREMENT OF EDIBLE OIL

The consumption of edible oil in Pakistan is steadily increasing with increased awareness among the population of harmful effects of animal fats on human health and the demographic changes with emphasis on expansion of urban population and visible change in eating habits of the city dwellers.

Presently, the per capita consumption of edible oil in Pakistan is 11kg. With 2000-01 as base year and population growth at 2.5% approximately, the requirement of edible oil in Pakistan is estimated to be 1.711 million tons in 2005 as can be observed from the table below:

**TABLE - 1  
REQUIREMENT OF EDIBLE OIL IN PAKISTAN**

<b>Year</b>	<b>Population (million)</b>	<b>Edible Oil (million Tons)</b>
2000-01	140.94	1.550
2001-02	144.47	1.590
2002-03	148.08	1.630
2003-04	151.78	1.670
2004-05	155.58	1.711

Source: Economic Survey of Pakistan and FBS

### 2.2 YEARLY PRODUCTION OF EDIBLE OIL IN PAKISTAN

Despite having agrarian economy, Pakistan's agriculture sector has not been able to meet even the partial requirement of edible oil seeds for further processing to extract edible oil locally and thus enabling the country to save precious foreign exchange used in importing edible oils. This state of affairs can be seen from the table given below:

**TABLE - 2**  
**ANNUAL PRODUCTION OF EDIBLE OIL SEEDS AND**  
**OIL IN PAKISTAN (based on 2004-05)**

<b>Crop</b>	<b>Area (Hectares)</b>	<b>Oilseeds (Tons)</b>	<b>Edible Oil (Tons)</b>
Cotton	2,961,060	3,639,929	436,791
Rapeseed	282,475	209,400	67,000
Sunflower	117,360	209,916	77,109
Canola	66,370	81,750	31,065
Other	9,715	11,600	7,000
<b>Total</b>	<b>3,436,980</b>	<b>4,152,595</b>	<b>(approx) 620,000</b>

Source: FBS

It may be seen from the above table that the total production of oilseeds in Pakistan is about 4 million tons, yielding approximately 0.62 million tons of edible oil.

As stated above there are various farm-related and industry-related problems in Pakistan, which have not been addressed by the policy makers. Some of the major problems in this regard are:

- Poor yields causing low returns
- No quality control on quality of seeds, poor soil nutrients, inadequate use of fertilizers, insecticides and pesticides.
- Lack of enough finances
- Lack of storage facilities of edible oil seeds.
- Poor condition of Bad farm to market roads.
- High Project cost on account of higher duties and various taxes and high cost of farm raw materials.
- Lack of technology inputs at all levels.
- Lack of infra structure both for farming and industrial sectors.
- Lack of entrepreneurship on account of lack of incentives in corporate farming and fiscal regime.

## 2.3 IMPORT BILL OF EDIBLE OIL

From the preceding discussion it is estimated that, on an average, the yearly import bill of Pakistan in respect of edible oil is around US \$ 550 million (approx) or Rs. 23 billions as may be seen from the table below:

**TABLE – 3**  
**ANNUAL IMPORT BILL OF EDIBLE OIL OF PAKISTAN**  
**(based on 2004-05)**

<b>Major Parameters per year</b>	<b>Quantity/ Amount</b>
Total requirement of Edible Oil	1.7 million tons
Production of Edible Oil	620,000 tons
Shortfall of Edible Oil	1,080,000 tons
Import bill of Edible Oil	US\$ 550 million (Rs. 33 billion)

Source: NMC estimates

## 2.4 CONCLUSION

In order to make up the shortfall in domestic production of edible oils following objective should be perused:

- Grow most suitable edible oil seeds with state-of-art equipment on large scale under Corporate Agriculture Farming regime / policy framework of Government of Pakistan.
- Planting to be done at 500/700 acres per day, using modern planters.
- Seeds should be best suited for climate and the area.
- Edible Oil production and processing facility should be integrated to the farming area to lift the edible oil seeds and benefit from economy of scales on account of unhindered availability of raw material.

## **CHAPTER 3**

### **TECHNICAL EVALUATION**

In this section, two aspects of edible oil production in Pakistan will be discussed and evaluated. These are:

- Farming of Edible Oil Seeds.
- Production and Processing of edible oils.

#### **3.1 FARMING OF EDIBLE OIL SEEDS**

##### **3.1.1 SELECTION CRITERIA**

It is known that the seeds of the largest crop of Pakistan i.e. cotton has very low oil content (11% only). Soybean is considered to be the best choice for cultivation in Pakistan on account of following reasons:

- It contains 22% oil as compared to 11% in cotton seed.
- Highly desirable dietary quality, having 42% protein content.
- It is the used world over as the most important oilseed crop, used in food industry for making flour, oils, margarine, cookies, biscuits , candies, milk, vegetable cheese, etc..
- It is used extensively for the cattle breeding and for dairy farming.
- It has vast potential in spring (Zaid Rabi) and Autumn (Kharif) crop Cultivation in Sindh and lower Punjab.
- It does not clash with major crops of cotton, wheat and rice.
- We can have two soybean crops alongwith one crop of wheat / year.

##### **3.1.2 LOCATION AND SIZE OF PROJECT**

It is recommended that the project may be located in Northern Sindh in the districts of Ghotki, because the area has most suitable climate for Soyabean in the following sizes:

- 1,000 Acres initially for tests & trials.
- 10,000 Acres in the second phase.
- 50,000 Acres for ultimate plantation.

### **3.1.3 TECHNICAL ASPECTS**

The State-of-art farming technology for farming soyabean seeds necessitates determination of crop pattern, planting time, R&D activities, method of sowing etc. as described below:

#### **❑ CROP PATTERN**

- Soybean
- Wheat after Soybean
- Soybean after Wheat in Straw.

#### **❑ TIME OF PLANTING**

- Autumn crop – June  
(Suitable varieties: NAPC – 1, NARC-, William 82)  
- to be determined through tests
- SPRING CROP - Mid January to 1st week of February)  
(Suitable Varieties: NAPC – 1, NARC-, William 82)  
- to be determined through tests

#### **❑ R&D ACTIVITY TO SELECT MOST SUITABLE SEED**

Following R & D activities will determine the best variety of seed for the area:

- Small plots of 100 acres for each variety will be used for selection of best seed and maximum yield for the area.
- Soybean variety will be evaluated with the help of agronomic data of yield per acre; number of pods per plant; 100 seeds weight; days to flowering, maturity, plant heights; proteins and oil contents etc.
- Relationship of plant height and growth stages to yield, protein and oil content will be evaluated.

- Soil with high pH of 7.5-8.5 is expected with low organic range.
- Variety screening for resistance to rust, purple seed stain will be carried out.
- Fungicides will be tested for rust control.
- Effect of sun will be evaluated.
- Seed shriveled problem (contraction of seed into wrinkles) will also be examined.
- It is expected that for the evaluation of different varieties belonging to maturity group e.g. Williams and which and may do well in the proposed area as per their following qualities:

**TABLE - 4**  
**EVALUATION OF DIFFERENT SEEDS**

	<b>Yield (t/ha)</b>	<b>DTF</b>	<b>DTM</b>	<b>DTH</b>	<b>%SS</b>
WILLIAMS	1.55	39	142	153	55.0
CALL AND	1.71	42	159	162	78.0

- Legend: DTF = Days to flowers  
DTM = Days for 75% seeds to mature  
DTH = Days to Harvest  
SS = %age seed shriveled.

- First year planting date will be used to select the best date of planting for future.

#### □ **METHOD OF SOWING**

In order to obtain best results, following seeding and irrigation methods should be adopted:

- Seeding:
  - 40 kg / acre
  - depth 3 to 5 cm
  - 30-45 cm row spacing
  - population 120,000 – 130,000 plants / acre

- Irrigation
  - Three weeks after germination
  - Initiation of flowering
  - Pod filling Stage
  - Seed Development Stage

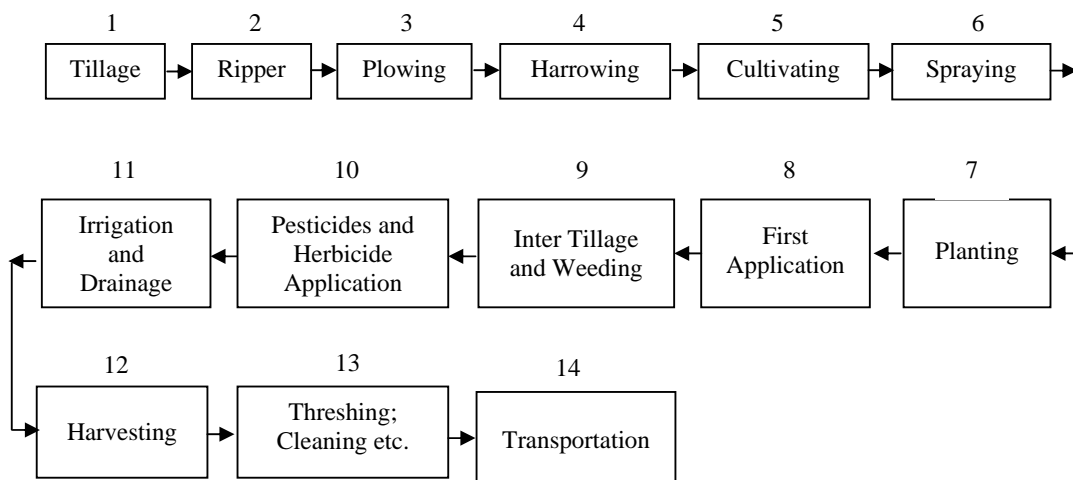
### 3.1.4 FIELD OPERATIONS

Major field operations comprise the following:

- |                |  |
|----------------|--|
| 1. Tillage     | 8. First Application                     |
| 2. Ripper      | 9. Inter Tillage and Weeding             |
| 3. Plowing     | 10. Pesticides and Herbicide Application |
| 4. Harrowing   | 11. Irrigation and Drainage              |
| 5. Cultivating | 12. Harvesting                           |
| 6. Spraying    | 13. Threshing; Cleaning etc.             |
| 7. Planting    | 14. Transportation                       |

Flow diagram of these operation is illustrated on the next page.

**FIGURE – 1**  
**FLOW DIAGRAM FOR SEED FARMING**



### 3.1.5 MEASURES TO OBTAIN MAXIMUM YIELD

In order to obtain maximum yield, major field operations and their timing etc. are summarised as under:

**TABLE - 5**  
**OBTAINING MAXIMUM YIELD**

• <b>Seed bed preparation</b>	3-4 ploughings with two planking.
• <b>Time of planting in Sindh</b> <u>Autumn (Kharif crop)</u> Mid – June to Mid – July <u>Spring (Zaid Rabi Crop)</u> Mid – January to 1st week of February	
• <b>Seed Rate</b>	100 – 120 kg ha -1
• <b>Planting method</b>	Planting with seed drill. Row to row distance spring 30 cm, kharif 45 cm, Plant to plant distance 3-5 cm
• <b>Fertilizer</b>	25:25:50 (NPK) kg ha-1 at the time of planting
• <b>Irrigation</b>	6 to 7 irrigations for spring and 3 to 4 irrigations for autumn crop (depending upon the rains).  Irrigation must be applied at the following stages: <ul style="list-style-type: none"> <li>• 3 or 4 weeks after germination</li> <li>• Initiation of flowering</li> <li>• Pod formation stage</li> <li>• Development of seed</li> </ul>
• <b>Weed Control</b>	<ul style="list-style-type: none"> <li>• After first irrigation</li> <li>• After second irrigation</li> </ul>
• <b>Harvesting and Storage</b>	<ul style="list-style-type: none"> <li>• When 90 – 95% pods mature</li> <li>• Store at about 8 to 10 percent moisture and 15°C temperature.</li> </ul>
• <b>Improved varieties</b>	<ul style="list-style-type: none"> <li>• NARC-1, NARC-2, Williams – 82, Ajmeri, Malakand-96, Kharif-93, Swat-84 and FS-85</li> </ul>
• <b>Crop rotation</b>	<ul style="list-style-type: none"> <li>• Rice-Soybean, Cotton – Soybean-Cotton (irrigated.), Wheat – Soybean – Wheat (rainfed)</li> </ul>



### **3.1.6 POST HARVEST TECHNOLOGY FOR PROCESSING SOYBEAN**

In order to determine the quality of the soybean crop advanced analyzing technology should be used as given below:

- Quality Soybean to be used for processing.
- Quality characterization to be measured.
- New technology e.g. near infrared technology in whole grain analyzers to be used.
- Laboratory to be set up equipped with state of art instruments to analyze soybean and its product e.g.
- Oil, protein, moisture, free fatty acid (FFA) level, foreign material and damage; important factors to decide the quality of soybeans. These should be tested and recorded for every shipment.

### **3.1.7 LABORATORY EQUIPMENT**

The main instruments needed for the various tests include:

- Near Infra Red whole grain analyzer with calibrations for Soybean testing
- Atomic Absorption for testing chemical constituents
- Inductively coupled plasma for testing various inorganic metals.
- Fat extractor for determination of oil content
- Fiber analyzer for determination of fiber
- Nitrogen Analyzer for determination of Crude Protein
- Sieve testing equipment for grade determination
- Titrators
- pH Meter for measurement of pH
- Digesters for sample preparation for wet chemistry
- Various glassware – such as beakers, tubes, etc.
- Computers and printers
- Weighing machines
- Microwave Ovens

### 3.1.8 MATERIALS REQUIRED

- Seeds
- Inoculants
- Herbicides
- Fertilizers
- Pesticides
- Misc.

### 3.1.9 MAJOR MACHINERY AND EQUIPMENT NEEDED

**TABLE - 6**  
**MACHINERY & EQUIPMENT**

<b>Name of Machinery &amp; Equipment</b>	<b>Quantity/ Unit</b>
• Ripper	02 Nos.
• Tractor 120 hp	02 Nos.
• Tractor 500 hp	02 Nos.
• Soil Finisher	02 Nos.
• Planter	02 Nos.
• Harvester	02 Nos.
• Plastic tank (5000 gal)	20 Nos.
• Global position Equipment	01 Unit
• Cultivators	02 Nos.
• Soil disc	02 Nos.
• Sprayer	02 Nos.
• Pivot Irrigation System	01 Unit
• Pump	20 Nos.
• Vehicles (Trucks)	20 Nos.
• Pumps	20 Nos.
• Plastic tank 5000 gal each	20 Nos.
• Global partitioning equipment	20 Nos.

### 3.2 PROCESSING OF SOYABEAN AND PRODUCTION OF SOYABEAN OIL

As discussed earlier, Soyabean after being designated as the miracle crop with 42% proteins and 22% oil has been recognized all over the world as a potential source of edible oil and nutritious food. Soya oil is one of the largest consumed oils in the world and its increasing consumer acceptance is due to improved

quality as a result of better refining techniques, health reasons and price advantage. Soyabean oil is used in making margarine, compound cooking fat. etc.. Some of the important characteristics of Soyabean oil are: iodine value 130 to 135/%, fatty acids 12 to 15% saturated; 25 to 30% oleic 50 to 55% linoleic.

It has high export market and its home market consumption is picking up as soya meal is preferred over others by poultry and cattle feed manufacturers.

### **3.2.1 TECHNOLOGY AND PROCESS**

Although extraction technology of vegetable oil is available in Pakistan even then to keep up with the latest advancement the world re-owned know-how suppliers in vegetable oil technology can be contacted. Process for the solvent extraction and rejoining of soya oil is as follows:

#### **□ MATERIAL PREPARATION**

The soyabean seeds are screened in shaker separator for removal of unwanted material and grading of soyabean seeds is carried out. The graded soyabean seeds are lifted by lift in feeder and put into the heater. In the multi-stage heater, the beans are heated to over 80°C with the help of steam. The heated beans are then cooled in a vertical cooler suddenly so as to loosen the husk from the kernel. These cooled seeds are then lifted by the second lift-n-feeder and put into the cracker, for cracking the hulls from the kernels and breaking the kernels. These kernels are conditioned in a flaker conditioner and are then fed into the flaker machine. Flakes are cooled for further removal of moisture through evaporator.

#### **□ EXTRACTION AND DESOLVENTISATON**

Food grade-n-Hexane is showered on material while it is percolated through the material which brings down the oil. The liquid is in miscellany form (mixture of solvent and oil). Hexane is evaporated with continuous steam passage on the material and is recovered for recirculation by condensation with cold water. The meal from toaster is passed to the finishing sector.

❑ **DISTILLATION AND RECOVERY**

Miscellany is heated with steam from 80° to 90°C and then flashed into preflasher enabling separation of Hexane. Miscellany is further heated from 100°C to 110°C and flashed into flasher for almost complete removal of hexane.

❑ **ABSORPTION**

Uncondensed solvent traces are recovered through the absorption system. Oil is passed through the heat exchanger to recover the last traces of solvent in the oil. The hot oil sprayed in the evaporator is cooled in a cooler.

❑ **FINISHING AND BAGGING**

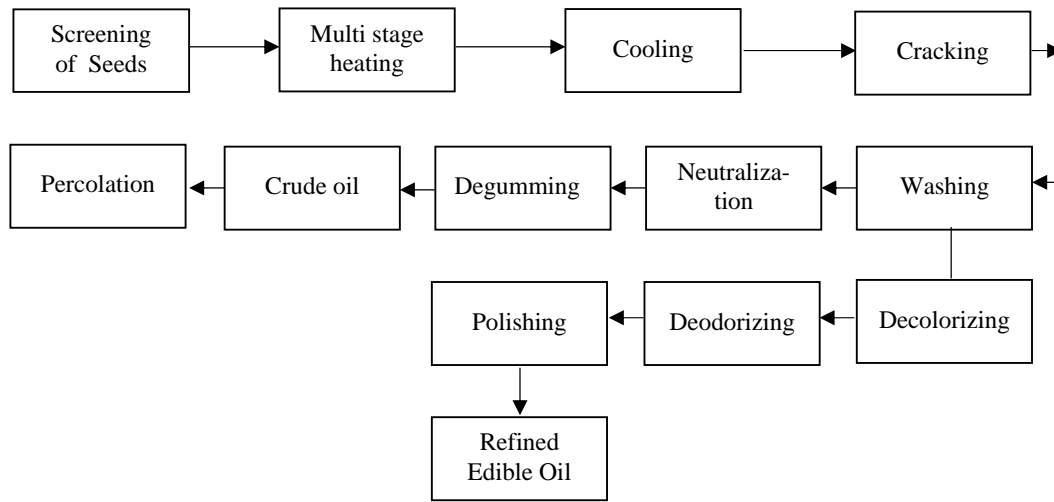
The hot extracted meal has to be cooled before bagging for easy handling of meal while bagging. The hot meal is cooled through a multi-storage vertical cooler. The cooled meal is then conveyed through a screw conveyor and bagged by bagging arrangement.

❑ **B. REFINING**

The crude oil manufactured from the raw materials mentioned in the above process is consumed as virgin oil. It becomes refined, edible oil only after going through the refining process, which includes vacuum deodorization.

The method of using solvent such as n-Hexane in the neutralization process and degumming process is quite modern and is applied to large scale plants.

**FIGURE -2**  
**PROCESS FLOW CHART**



### 3.2.2 PLANT CAPACITY

The proposed project is for a capacity to process 90,000 TPA of soyabean at full production to produce about 20,000 TPA of soyabean oil.

### 3.2.3 PLANT AND MACHINERY

#### A. SOLVENT EXTRACTOR PLANT

- Extractor plant proper
- Structure and process tanks
- Bulk oil storage tanks
- Material handling equipment
- Miscellaneous equipment etc.

#### B. REFINERY UNIT

- Centrifugal separators
- Mixers, pumps heater
- Strainers, flow meters
- Controller gauges

- Storage tanks and items
- Miscellaneous items and equipment etc.

### **C. OTHERS**

- Steam boiler and distribution system
- Electrical substation and power distribution system
- Water cooling and softening plant
- Oil packaging machine and equipment
- Laboratory equipment

### **3.2.4 RAW MATERIALS**

- Soya bean : 90,000 TPA

### **3.2.5 INFRASTRUCTURE AND FACILITIES**

- Land : 5 Acres
- Building : 5000 sq. mtrs
- Power : 600 KVA
- Water : 5000 cu. mtrs/day
- Steam : 10 kg/hr

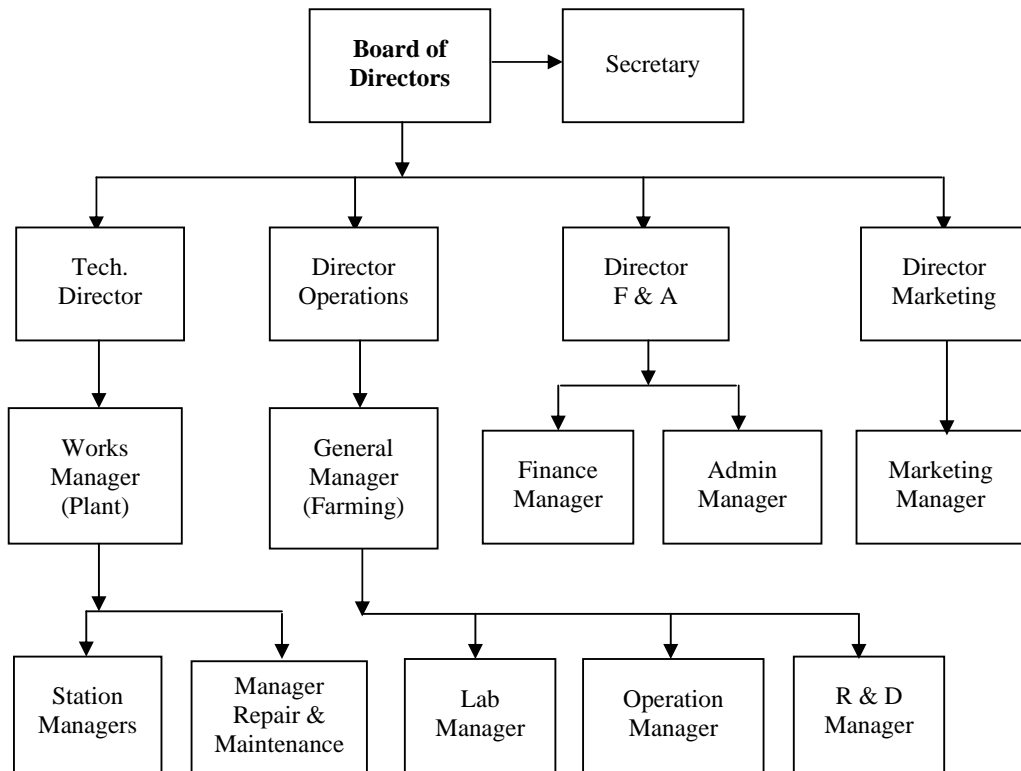
# CHAPTER 4

## GOVERNANCE AND MANAGEMENT STRUCTURE

### 4.1 GOVERNANCE

The Project (Farming Establishment and soyabean oil plant) will be managed by a Board of Directors to be headed by the Chairman and four (4) Directors as shown in the diagram below. The Board will be assisted by the General Manager (Farming) and Works Managers (Plant) as shown below:

**FIGURE - 3**  
**ORGANIZATIONAL CHART**



**FIGURE - 4  
ORGANIZATION STRUCTURE**

		FARMING													PLANT										COMMON										
		Chairman	Directors	Secretary	General Mangers	Manager Field Operation	Irrigation Technical	Water Management Expt.	Entomologist	Storekeeper W. Assistants	R&D Manager	Plant Pathologist	Soil Expert	Labour Manager	Labour Assistant	Works Manager	Station Managers	Foremen	Workshop Manager	Technicians/Mechanics	Electricians	Auto Electrician	Storekeepers + helpers	Welders	Quality Assurance Staff	Manager (Admin)	Manager (Finance)	Manager Marketing	Admin Staff	Accountants	Drivers	Security staff	Marketing Officers	Labours	TOTAL
Secretary	TECHNICAL (PLANT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10	15	1	10	4	2	3	5	4	-	-	-	-	-	-	-	-	-	55
Board		1	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Chairman	Operations (Farming)	-	-	-	1	1	1	1	2	1	1	1	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Director (4)	Finance & Adminstration	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	6	4	8	-	-	100	120
	Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	5	-	6
	TOTAL	1	6	1	1	1	1	1	2	1	1	1	1	3	1	10	15	1	10	4	2	3	5	4	4	1	1	1	6	4	8	0	5	100	203



## CHAPTER 5

### FINANCIAL EVALUATION

#### 5.1 INVESTMENT

Total investment required for the Project would be US\$ 2.4 Million including cost of farming edible oil seeds and their extraction as given in the Table below:

**TABLE -7**  
**TOTAL INVESTMENT REQUIRED**

(US\$)

Description	Amount
<b>FARMING OF SOYABEAN OIL SEEDS</b>	
Cost of Farm Machinery	3,340,000
Cost of Irrigation Equipment	18,950,000
Total Cost of Farming of Soyabean Oil Seeds (a)	22,290,000
<b>EXTRACTION OF SOYABEAN OIL</b>	
Total Cost of Extraction Plant (b)	1,500,000
<b>Total Capital Cost (a+b)</b>	<b>23,790,000</b>

#### 5.2 OPERATING RESULTS

The operating results of the Project can be seen from the summarized Profit and Loss Account for the next 5 years as given in the Table below:

**TABLE - 8**  
**PROFIT & LOSS ACCOUNT**

(US\$)

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	14,550,000	27,100,000	39,750,000	52,520,000	65,434,000
Less: Expenditure	3,667,500	5,880,000	8,178,000	10,555,800	12,782,760
Operating Profit	10,882,500	21,220,000	31,572,000	41,964,200	52,651,240
Less: Depreciation/ Amortization	4,608,000	4,608,000	4,608,000	4,608,000	4,608,000
<b>Net Profit before Tax</b>	<b>6,274,500</b>	<b>16,612,000</b>	<b>26,964,000</b>	<b>37,356,200</b>	<b>48,043,240</b>
<b>Less: Income Tax on Sales of Edible Oil</b>	<b>211,825</b>	<b>277,500</b>	<b>348,540</b>	<b>434,454</b>	<b>629,459</b>
<b>Net Profit</b>	<b>6,062,675</b>	<b>16,334,500</b>	<b>26,615,460</b>	<b>36,921,746</b>	<b>47,413,781</b>

### 5.3 FINANCIAL POSITION

The financial position of the Project is presented in the Projected Balance Sheet for 5 years in the Table below:

**TABLE – 9**  
**PROJECTED BALANCE SHEET**

(US\$)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<b>CAPITAL</b>						
Equity Contribution	23,790,000	23,790,000	23,790,000	23,790,000	23,790,000	23,790,000
Accumulated Profit & Loss	-	6,062,675	22,397,175	49,012,635	85,934,381	133,348,162
<b>Total Capital</b>	<b>23,790,000</b>	<b>29,852,675</b>	<b>46,187,175</b>	<b>72,802,635</b>	<b>109,724,381</b>	<b>157,138,162</b>
<b>LIABILITY</b>						
Long Term Liabilities	-	-	-	-	-	-
Tax Payable	-	211,825	277,500	348,540	434,454	629,459
<b>Total Liability</b>	<b>-</b>	<b>211,825</b>	<b>277,500</b>	<b>348,540</b>	<b>434,454</b>	<b>629,459</b>
<b>Total Equity &amp; Liability</b>	<b>23,790,000</b>	<b>30,064,500</b>	<b>46,464,675</b>	<b>73,151,175</b>	<b>110,158,835</b>	<b>157,767,621</b>
<b>ASSETS</b>						
Capital Investment	23,790,000	19,182,000	14,574,000	9,966,000	5,358,000	750,000
Cash & Cash Equivalent	-	10,882,500	31,890,675	63,185,175	104,800,835	157,017,621
<b>TOTAL ASSETS</b>	<b>23,790,000</b>	<b>30,064,500</b>	<b>46,464,675</b>	<b>73,151,175</b>	<b>110,158,835</b>	<b>157,767,621</b>

The financial position reveals that the position will remain satisfactory as almost all the ratios are excellent.

## 5.4 CASH FLOW

The Projected Cash Flow for 5 years is given in the Table below:

**TABLE - 10**  
**PROJECTED CASH FLOW**

(US\$)

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>EXPECTED CASH INFLOW</b>						
EQUITY CONTRIBUTION	23,790,000	-	-	-	-	-
OPERATING PROFIT	-	10,882,500	21,220,000	31,572,000	41,964,200	52,651,240
<b>TOTAL PROJECTED CASH INFLOW</b>	<b>23,790,000</b>	<b>10,882,500</b>	<b>21,220,000</b>	<b>31,572,000</b>	<b>41,964,200</b>	<b>52,651,240</b>
<b>EXPECTED CASH OUTFLOW</b>						
CAPITAL INVESTMENT	23,790,000	-	-	-	-	-
PAYMENT OF TAXES	-	-	211,825	277,500	348,540	434,454
<b>TOTAL PROJECTED CASH OUTFLOW</b>	<b>23,790,000</b>	<b>-</b>	<b>211,825</b>	<b>277,500</b>	<b>348,540</b>	<b>434,454</b>
<b>SUMMARY</b>						
EXPECTED CASH INFLOW	23,790,000	10,882,500	21,220,000	31,572,000	41,964,200	52,651,240
EXPECTED CASH OUTFLOW	23,790,000	-	211,825	277,500	348,540	434,454
<b>NET CASH FLOW</b>	<b>-</b>	<b>10,882,500</b>	<b>21,008,175</b>	<b>31,294,500</b>	<b>41,615,660</b>	<b>52,216,786</b>
<b>CUMULATIVE CASH FLOW</b>	<b>-</b>	<b>10,882,500</b>	<b>31,890,675</b>	<b>63,185,175</b>	<b>104,800,835</b>	<b>157,017,621</b>

The cash flow statements show that there is no problem of shortage of funds if the revenues are recovered regularly.

## 5.5 PAYBACK PERIOD

The payback period of the Project is 1 year and 8 months.

(US\$)

<b>Year of Operation</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
Net Profit	6,062,675	16,334,500	26,615,460	36,921,746	47,413,781
Add Depreciation & Amortization	4,608,000	4,608,000	4,608,000	4,608,000	4,608,000
<b>Total</b>	<b>10,670,675</b>	<b>20,942,500</b>	<b>31,223,460</b>	<b>41,529,746</b>	<b>52,021,781</b>

Investment : 23,790,000

Pay back period : 1.8 year

## 5.6 INTERNAL RATE OF RETURN

The IRR of the Project is 71% which shows good health of the Project

# ANNEXURE 1

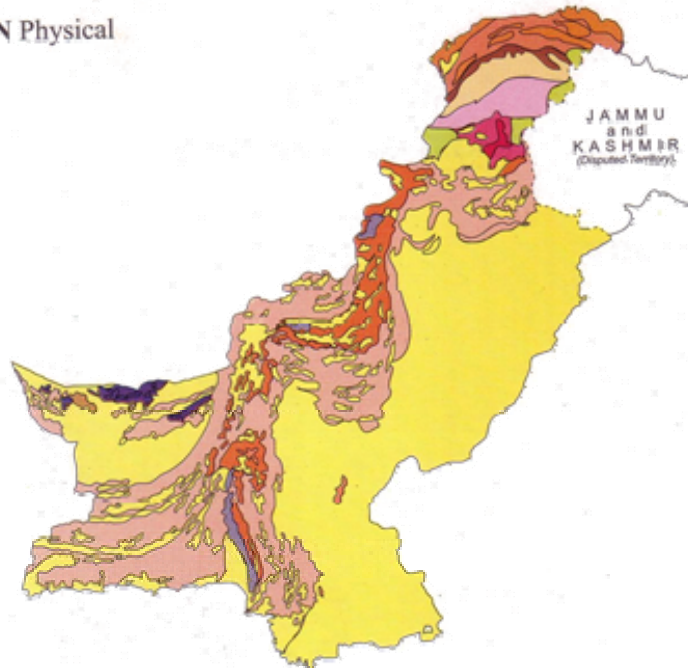
## PAKISTAN - A PROFILE

### INTRODUCTION



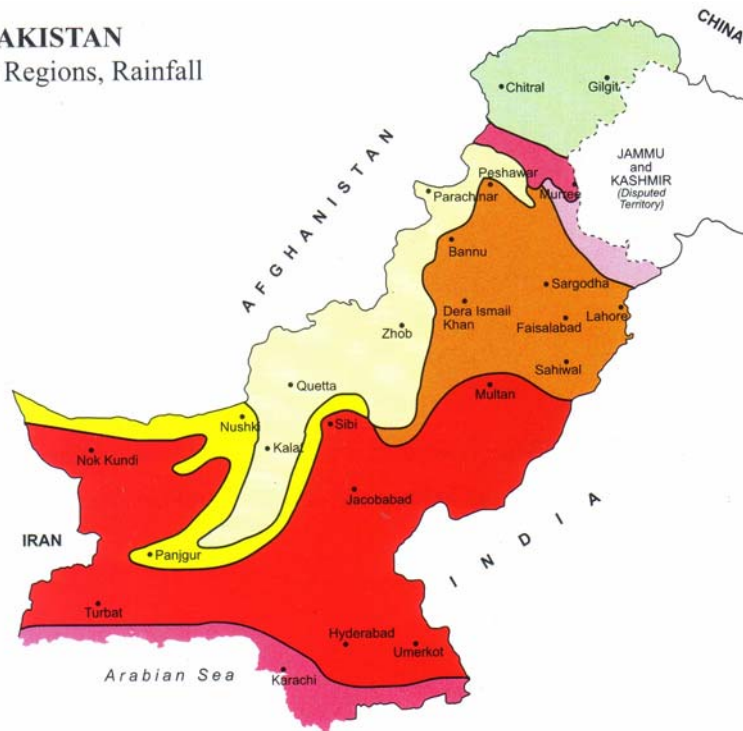
Pakistan is located in South Asia. It borders Iran to the southwest, Afghanistan to the northwest, China to the northeast and India to the east. The Arabian Sea marks Pakistan's southern boundary.

## PAKISTAN Physical



The total area of Pakistan is 796,095 square kilometers and the country is divided administratively into four provinces – Balochistan, North-West Frontier Province, Punjab and Sindh – and numerous federally administrated areas. The disputed territory of Azad Jammu & Kashmir lies to the north of Punjab.

## PAKISTAN Climatic Regions, Rainfall



Pakistan has a diverse array of landscapes spread among nine major ecological zones from north to south. It is home to some of the world's highest peaks including K-2 which at 8,611 meters above sea level is the world's second highest peak. Intermountain valleys make up much of the North-West Frontier Province, while the province of Balochistan in the west is covered mostly by rugged plateaus. In the east, irrigated plains along the Indus River cover much of Punjab and Sindh. In addition, both Punjab and Sindh have deserts, Thal, Cholistan and Thar deserts respectively.

Most of Pakistan has a generally dry climate and receives less than 250 mm of rain per year. The average annual temperature is around 27°C, but temperatures vary with elevation from -30°C to -10°C during cold months in the mountainous and northern areas of Pakistan to 50°C in the warmest months in parts of Punjab, Sindh and the Balochistan Plateau. Mid-November to February is dry and cool; March and April bring sunny spring, May to July is hot, with 25 to 50% relative humidity; Monsoons start in July and continue till September; October- November is the dry and colourful autumn season.

Pakistan had an estimated population in 2005 of 160 million, 40% of this population was less than 15 years of age. The major cities of Pakistan and their estimated populations are; Karachi (16.0 million), Lahore (8.0 million), Faisalabad (6.0 million), Rawalpindi (5.0 million), Multan (4.5 million), Hyderabad (3.0 million), Gujranwala (1.8 million) Peshawar (1.6) and Quetta (0.85). Islamabad, the Capital of the country, has a population of around 750,000.

According to the 1973 Constitution, Pakistan is governed under a federal parliamentary system with the President as head of state and a Prime Minister as head of government. The legislature, or parliament, consists of the Lower House (National Assembly) and the Upper House or Senate. Members of the National Assembly are directly elected for five-year terms.

Executive power lies with the President and the Prime Minister. The Prime Minister is an elected member of the National Assembly and is the leader of the majority party in the

National Assembly. An electoral college consisting of members of the national and provincial legislatures elects the president for a five-year term.

After the events of 9/11, Pakistan has become a key US ally in the war against terror. This alignment is totally in-line with the views of the majority of Pakistanis who practice and preach a moderate version of Islam. The Government of Pakistan fully realizes the need for promoting Islam as a modern progressive religion. The Government has chosen the difficult option of fighting the war against terror by clamping down on Taliban and Al-Qaeda remnants along the border with Afghanistan. The people of Pakistan fully support the Government in its efforts to promote the true face of Islam.

The US Government fully backs and supports Pakistan in this war against terror. US Aid which was stopped after the 1998 Nuclear Test has been restored and Pakistan will receive US\$ 3.0 billion over the next 5 years, divided equally between economic and military aid.

Pakistan follows a very active policy of regional alliances for trade and economic development. It is an active member of the South Asian Association for Regional Cooperation (SAARC) which groups Pakistan, India, Bangladesh, Sri Lanka, Nepal, Bhutan and the Maldives. It is also an active member of the Economic Cooperation Organization (ECO) comprising of Turkey, Iran, Pakistan, Afghanistan, and the six Central Asian Republics. Pakistan has an observer status at the Gulf Cooperation Council (GCC) as well as ASEAN and Shanghai Cooperation Organization. Being a member of WTO it conforms to most of the international trade regimes.

## **ECONOMY**

Pakistan's economy has made significant progress in the last six years. This has been possible because of the Government's policy of initiating growth through domestic and foreign direct investment. The GDP growth rate has increased from 1.8% per annum in 2001 to 8.4% per annum in 2005. Despite the devastating earthquake in October 2005, the economy is expected to grow at over 6.6% in 2006. Pakistan's GDP in 2005 was



estimated at US\$ 385.2 billion and its per capita GDP was US\$ 2,400. The Country's credit rating has been upgraded by Moody's from Caa1 in 2002 to Ba3 i.e. "stable" in 2006.

Pakistan has over 3.5 million laborers working in various countries of the Middle East. In addition, Pakistani technical and professional manpower is engaged in lucrative pursuits in USA, UK, Canada, Malaysia, etc. These non-resident Pakistanis annually send over US\$ 4.0 billion in foreign remittances.

The Government of Pakistan's policy of encouraging Foreign Direct Investment (FDI) has seen it grow from a mere US\$ 376.0 million in 1999 to more than US\$ 1.5 billion in 2005 which is expected to grow to over US\$ 3.0 billion in 2006.

In addition to Foreign Direct Investment, low domestic interest rates have meant that there has been an upsurge in domestic investment; the weighted average rate of lending has fallen from 16% in 1999 to approximately 8% in 2005.

The Government's economic policy has seen foreign currency deposits rise from US\$ 1.7 Billion in 1999 to now US\$ 13.0 billion in 2006; this has led to both low rates of inflation and to a stable exchange rate.

With the Government of Pakistan targeting annual growth in the economy at 7.5% per annum in the next 5 years, Pakistan is the country of choice for foreign and domestic investors.

## **INFRASTRUCTURE**

The National Highway Authority (NHA) has the responsibility for 17 of Pakistan's major inter provincial links called the National Highway including the Motorways, which are access controlled and tolled highways. Total length of roads, under NHA, currently stands at 8845 Kms.

These roads account for only 3.5% of Pakistan's entire road network but cater for 80% of the commercial road traffic in the country. Improvement and extension of the existing network is, therefore, essential to develop remote areas and provide better connection between the economic centers of Pakistan. In addition a first class road network is essential if Pakistan is going to connect its all-weather Arabian Seaports with the landlocked Central Asian Republics and Western China. The Government has initiated work on the North-South Trade Corridor with planned investment of over US\$ 60 billion.

In order to further speed up the development of the road network, the Government is actively seeking the participation of the private sector to implement road projects on a Build-Operate-Transfer (BOT) basis. A number of projects are currently being implemented under the BOT concept and others are in the identification stage. These BOT projects cover the construction of new roads as well as the upgrading of existing roads.

Pakistan has about 1062 km of coastline on the Arabian Sea running from the Indian border to the Persian Gulf. The Karachi Port is the premier port of Pakistan and is managed by the Karachi Port Trust (KPT). Karachi port handles about 75% of the entire national cargo. It is a deep natural port with a 11 km long approach channel to provide safe navigation up to 75,000 DWT tankers, modern container vessels, bulk carriers and general cargo ships. The Karachi Port has 30 dry cargo berths including two Container Terminals and 3 liquid cargo-handling berths. KPT intends to cater for 12-meter draught ships, which are the most widely used container vessels. In order to facilitate accommodate and fast turnaround time of mother vessels, the KPT is offering to the private sector the opportunity to develop a terminal on BOT basis. In addition KPT has plans to develop a Cargo Village on 100 acres. This Cargo Village shall serve as a satellite to the port, integrating container, bulk and general cargo handling as well as providing processing plants for perishable exports. With direct connection to the National Highway Network, as well as National Railways Network the cargo village shall also alleviate the problem of upcountry trade with cost effective storage/handling services in the vicinity of the port. A master plan is under preparation and all the units within the

village shall be allocated to the private sector on BOT and Build-Operate-Own (BOO) basis within the next year.

Pakistan's second Sea Port, Port Qasim is located 50 kilometers to the South East of Karachi. It is the Country's first industrial and multi-purpose deep-sea-port. Currently it is handling 23% of Pakistan's sea trade. Port Qasim has attractions and advantages for investment both in port facilities and port-based industrial development. Port Qasim Authority from the very beginning has actively sought the help of the private sector in the development of its port structure. Some of the projects which have been completed with private sector involvement include; dedicated oil terminal developed in private sector on BOO basis at a cost of US\$ 87 million to cater for oil imports with a handling capacity of 9 million tons per annum, a container terminal developed by P&G Group, Australia, at a cost of US\$ 35 million on BOO basis, for chemicals imports a facility in collaboration with Vopak of Netherlands on BOT basis at a cost of US\$ 67 million. Some of the projects which the Port plans to develop with the private sector on the basis of BOT include; establishment of a second oil jetty, establishment of a dedicated coal and clinker/cement terminal and the establishment of a marine workshop and dry dock facilities.

To encourage industrial development the Port Qasim Authority has reserved 300 acres of land on a prime location in the Eastern Industrial Zone (EIZ) for allotment of plots to Overseas Pakistanis to induce and encourage foreign investment and provide them an opportunity to establish small size industries in Pakistan. Each plot is measuring 100 square yards at a very low cost on attractive terms and conditions. This is in addition to existing 1,200 acres of industrial zone which houses a number of auto assemblers such as Toyota, Suzuki, Chevrolet and the Textile City spread over 1,250 acres.

The Pakistan Merchant Marine Policy 2001, has deregulated the shipping sector and aims to attract investment; both local and foreign, public and private, by offering a range of incentives. The new policy in addition to offering duty-free import of ships, offers many new incentives to local and foreign investors including Income Tax exemption till 2020.

Pakistan's annual seaborne trade is about 45 million tons, just 5 per cent of which is carried by the national carrier Pakistan National Shipping Corporation (PNSC), the country's annual freight bill surpasses staggering \$ 1.5 billion which is causing a colossal drain on foreign exchange resources, the marine policy aims to reverse this situation to some extent.

The Shipping Policy aims to revive and augment national ship-building/capacity to meet 20 per cent ship construction requirements of the country merchant marine and entire requirements of support and ancillary crafts. The policy also aims to rejuvenate and expand the ship repair potential to undertake the entire range of repairs and maintenance of 50 per cent of Pakistani Flag ocean-going vessels and all ancillary sectors. The new Shipping Policy offers many financial incentives for potential investors. It offers tax exemptions and concessional tax measures backed by assurances. It also aims at simplifying the rules by deregulating the sector.

To begin with, ships and floating crafts — tugs, dredgers, survey vessels, and specialized crafts — purchased or bareboat chartered by a Pakistani entity flying the Pakistani flag will be exempt from all import duties and surcharges till 2020. The policy accords ship-building and ship-repair the status of an industry under the investment policy which is entitled to all incentives contained therein.

To attract foreign investment, all port and harbor authorities in Pakistan will allow all ships and floating crafts 10 per cent reduced berthing rates when the same are berthed for purposes of repair and maintenance. Under the Policy, ships and all floating crafts are considered bonafide collateral against which financing can be obtained from Banks and Financial Institutions subject to policy of the financial institution.

There are 42 airports in the country managed by the Civil Aviation Authority (CAA). Out of these, five airports; Lahore, Karachi, Islamabad, Peshawar and Quetta are international airports. The CAA is planning to develop a new international airport at Islamabad for

which land has been acquired and it is planned to fund the US\$ 250-300 million on BOT basis.

The Pakistan International Airlines (PIA) is the national flag carrier flying to 46 international and 36 local destinations. Other Pakistani airlines in the private sector include, Aero Asia, Air Blue, Shaheen Air International and Pearl Air. In addition to direct flights from most parts of the world, Pakistan can also be accessed through the regional hubs of most international airlines, which operate through airports in the Gulf countries.

The Pakistan Railways provides an important nation-wide mode of transportation in the public sector. It contributes to the country's economic development by catering to the needs of large-scale movement of freight as well as passenger traffic. Pakistan railway provides transport facility to over 70 million people and handles freight above 6 million tons annually.

The Pakistan Railways Network was based on a total of 11,515 track kilometers (including track on double line, yard & sidings) at the end of 2001-2002. This network consists of 10,960 kilometers of broad-gauge and 555 kilometers of meter gauge.

Pakistan Railways has launched modernization activity with rehabilitation and improvement plan both for its infrastructure and rolling stock including prime mover. The ongoing schemes worth over US\$ 500 million are progressing satisfactorily and have brought a radical improvement in service. The railways is gearing up to the challenge of providing improved connectivity to Iran, India, and link the upcoming Gwadar Port to Afghanistan and onward to Turkmenistan.

Pakistan Telecommunication Limited (PTCL) dominated Pakistan's telecommunications market for the fixed-line services. Today the Pakistan Telecommunication Authority (PTA) has the role of a regulatory body and is responsible for implementing the telecom deregulation policy. For a long time, Pakistan lagged behind in the region as far as

telecom access is concerned. With cellular mobile revolution taking place, Pakistan's tele-density currently stands at 10.37%, with gross subscribers base of fixed (5.05 million) as well as mobile subscribers (10.54 million) touching 15.59 million for a population of 160.0 million.

The Telecomm Sector has attracted the largest FDI in Pakistan with approximately US\$ 1.5 billion having been invested in 2005.

At the moment there are six companies providing mobile phone services in Pakistan, with the largest of them, Mobilink (owned by Orascom Telecom) with nearly 50% of the market share, other foreign players include MCE, Telenor and Warid.

In addition Wateen Telecom, a subsidiary of UAE-based Al Warid Telecom, has launched a US\$ 75.0 million project to lay an optic fiber optic backbone across the Country. The first segment of the project of 800 kms would stretch from Karachi to Rahimyar Khan and would be further linked with the rest of the country up to Peshawar through 63 cities. When completed the backbone would be 5,000 kilometers, long spanning the length and the breadth of Pakistan and would facilitate both the corporate and residential segments, providing voice and high-speed data services on a converged wireless network.

Pakistan in 2005 had 70 operational providers of internet services across 1,900 cities and towns of the Country catering to about 2 million subscribers. In addition the Government has reduced bandwidth rates for high speed board band internet connections and the number of subscribers in this category is expected to grow to 200,000 by end of 2006.

## **AGRICULTURE**

Agriculture accounts for nearly 23 percent of Pakistan's national income and employs 42 percent of its workforce. Nearly 68 percent of the population lives in rural areas and is directly or indirectly dependent on agriculture for their livelihood. Livestock is the single largest contributor 47 percent share in the national income. The major crops; cotton,

wheat, sugarcane and rice contribute 37 percent to agriculture while the minor crops like oilseed, spices, onion and pulses contribute another 12 percent.

Pakistan is the fifth largest producer of milk in the world. The per capita availability of milk at present is 185 liters, which is the highest among the South Asian countries. Milk production in Pakistan has seen a constant increase during the last two decades. The production has increased from 8.92 million metric tons in 1981 to 28 million metric tons in 2005. There is a large and untapped potential in the dairy industry. With a population of 160 million, a significant demand for dairy products exists in Pakistan. There is a need for establishing modern milk processing and packaging facilities based on advanced technology to convert abundantly available raw milk into high value added dairy products. In addition, with improved conditions for milk pasteurization, availability of chilled distribution facilities and consumer preference for the low cost pasteurized milk, the sector provides unique opportunity for investment in establishing pasteurized milk production plants.

There is also great scope for establishing related industries in the form of an efficient milk collection system and refrigeration & transportation facilities. The sector offers opportunity to foreign investors for establishing a joint venture for the production of dairy products, particularly dried milk and infant formula milk for which great demand exists in the neighboring countries like Afghanistan, Iran, UAE and Saudi Arabia.

Out of the 28 million tons of milk produced per annum in Pakistan, only 2.5 to 3 per cent reaches the dairy plants for processing into variety of dairy products. Pakistan's dairy industry produces Ultra Heat Treated (UHT) Milk, Pasteurized Milk, Dry Milk Powder, and Condensed milk. Other major milk products produced by the dairy industry include butter, yogurt, ice cream, cheese, cream and some butter oil. Approximately half of the 0.3 million tons of milk available to the industry is processed into UHT milk, 40 percent into powdered milk, and the remaining 10 percent into pasteurized milk, yogurt, cheese and butter etc. Major players in the sector include Nestle, Haleeb and Engro Foods.

Pakistan produced 1.1 million tons of beef, 740,000 kgs of mutton and 410,000 kgs of chicken meat in 2005; in addition it also produced approximately 5 billion eggs in 2005. Processed meat is exported to Saudi Arabia, UAE, Oman, Bahrain, Qatar and Kuwait in the Middle East and Malaysia in the Far East. Pakistan exports around 40,000 live animals and 2.83 million kg of meat to the Gulf.

Cotton is an important non-food crop and a significant source of foreign exchange earning. It accounted for 10.5 percent of the value added in agriculture and about 2.4 percent of the GDP in 2005. Pakistan in 2005 produced about 14.5 million bales of cotton.

Rice is a high value added cash crop and is also a major export item, it accounts for 5.7 percent of the total value added in agriculture and 1.3 percent of the GDP. Production of rice in 2005 was about 5 million tones. In 2005 rice became the second largest export from Pakistan when the country exported rice worth US\$ 934 million. In addition to high value Basmati rice, Pakistan also exports IRRI 6 parboiled rice and IRRI rice to Africa.

Sugarcane is an intensive cash crop and serves as the major raw material for production of white sugar and gur. Its share in the value added in agriculture is 3.6 percent and 0.8 percent in the GDP. The total sugarcane crop in 2005 was estimated at 45 million tones.

Wheat is the leading food grain of Pakistan, and being the staple diet of the people, it occupies a central position in agricultural policy. It contributes 13.8 percent to the value added in agriculture and 3.2 percent of the GDP. The size of the wheat crop in 2005 was estimated at 21.0 million tons.

In addition to the above, Pakistan also produces bajra, jowar, tobacco, barley, oilseed, pulses, potato, onion, chillies etc.



The Government of Pakistan has launched a plan to promote Corporate Agriculture Farming and has offered a number of incentives to develop the sector including the provision of land and other facilities.

## **MANUFACTURING**

In the post quota regime, total exports of textile increased from \$ 6.5 billion in 2004 to \$ 7.4 billion in 2005. Pakistan textiles are poised to achieve \$ 10 billion exports by June 2006. This growth is largely driven by the continuity of government policies, positive macroeconomic indicators, tariff rationalization, removal of sales tax on textile chain, deregulation, lower interest rates, increased market access, public-private partnership programs and the creation of a hassle free environment by the government.

The Government of Pakistan continues to take steps to further develop the textile sector focusing on bridging the skills gap promoting research and development activities, facilitating an increase in the number of women employees, outsourcing of specialized work and simplification of procedures. To facilitate value addition in the textile sector, world class departments in various disciplines related to textile industry are being set up in three universities. These departments will have linkages with corresponding foreign departments of high repute.

In the past 5 years, approximately US\$ 5.5 billion have been invested in the textile sector with the major investments being in spinning (\$ 2.6 billion), weaving (\$ 1.5 billion), and textile processing (\$ 600 million). A Rs.10 billion, Pakistan Textile City facility located on 1,250 acres of land near Karachi is in the process of being set-up. This will have its own desalination plant, effluent treatment plant, a self-power generation plant and all the other modern facilities required for industrial production. It is expected that the Textile City will lead to an increase in exports of US\$ 400 million and provide jobs to 60,000 workers

Pakistan's leather exports in 2005 were US\$ 883 million which is the second largest export sector after textiles. It is expected that exports will cross the US\$ 1 billion mark in

2006. Major exports include finished leather; both for garments and footwear, finished leather garments, leather work gloves, and other leather products. The major centers for the manufacture of leather and leather products are; Karachi, Lahore, Sialkot and Kasur, it is estimated that there are more than 700 tanneries operating in Pakistan employing more than 100,000 persons, in addition another 150,000 workers are employed in the value addition sectors. In order to promote the industry, the Government has zero-rated the sales tax on the leather sector and is working to ensure that the industry conforms to international waste management standards.

Pakistan's light engineering sector consists of twenty-eight sub-sectors including consumer durables and other industrial products. The surgical instrument manufacturing sector which forms part of light engineering sector is clustered around Sialkot and exports 95% of its production. There are about 2,500 large, medium and small sized units with the industry employing about 50,000 skilled and semi-skilled workers. The surgical goods sector produces both disposable and reusable instruments. The product range consists of more than 10,000 different items.

The cutlery industry which in 2005 exported goods worth approximately US\$ 31 million is mainly concentrated in the locality of Wazirababd, Nazimabad and Allahbad in Gujranwalla district. There are approximately 300 units and 25,000 people are directly or indirectly employed by the industry. The industry has great export potential and requires better marketing strategies.

The auto parts sector consists of more than 1,200 vendors who are supplying to about 84 Original Equipment Manufactures (OEM) massive capacity increase in Pakistan. The total investment in the vendor industry exceeds Rs.10 billion and employs more than 40,000 skilled and semi-skilled workers and also brings in more than US\$ 160 million in the form of export earnings.

With the local auto assemblers planning to increase production to 500,000 units by 2008 from the 2006 production figure of 170,000 units, the vendor industry is gearing up for.

Although the industry has made considerable progress on its own, the need is for joint collaboration with foreign companies which will not only bring production techniques but also help in marketing the production of the local vendor industry.

There are a total of 42 assemblers of motorcycles in Pakistan who between them manufacture 600,000 motorcycles a year, it is expected that the production will increase to 1 million units a year in the next two years. The main manufacturers of motorcycles in Pakistan are; Honda, Yamaha and Suzuki who between them command more than 80% of the domestic market

There are 11 Fertilizer units operating in Pakistan with an installed capacity of 6 million tones out of which nitrogenous fertilizer has a capacity of 4.9 million tons and phosphatic fertilizer has a capacity of 1 million tons. Wheat being the most important crop 45% of the total fertilizer consumption is in this Sector. Cotton consumes 21%, rice 10%, sugarcane 8% while the remaining 16% is consumed by other crops.

Out of a total of 24 cement plants, currently 22 units are operative, 17 companies being listed on the Karachi Stock Exchange. The country, at present, has an installed capacity of producing 17.55 million tons of cement per annum, mainly Portland cement. It is envisaged to increase installed capacity (also by expansion) to 28.21 million tons per annum by 2008. New projects as well as capacity increases in existing units should boost production capacity to about 7 million by 2007.

The demand for cement is expected to be robust, as the Government of Pakistan has initiated a massive reconstruction drive in the earthquake hit regions of Northern Pakistan and Azad Kashmir. In addition large quantities of cement will be required for the mega construction projects initiated by the Government of Pakistan including the construction of large dams and road projects. Also the industry has good prospects for exporting cement to Afghanistan where reconstruction work is on-going on in that Country.

Pakistan is the twelfth largest producer of sugar in the World; it ranks fourth in sugarcane production and holds seventh position in yield, which is about 50 tons per hectare.

The sugar industry has 76 units installed mostly in Punjab and Sindh. The total capacity of the industry is estimated at 5 million tones per annum. In order to provide incentives to the growers, the Government determines a support price keeping in mind the production costs and profits of other crops. The Government and the Industry are trying to increase cane yield to ensure an increase in the total production of sugar.

The demand for Steel has undergone a dramatic increase in 2005; the total consumption of steel in 2005 is estimated at 5 million tons as against a domestic production of only 3.2 million tones. The biggest producer of domestic steel is the Pakistan Steel Mills with a capacity of 1.1 million tones per annum. In addition to the Pakistan Steel Mills there are approximately 350 steel re-rolling mills in the country, which mainly cater to the needs of the construction industry.

The demand for steel is expected to further surpass production because of increased demand due to economic activity and construction of large dams and infrastructure projects in the Country. The Government is encouraging the private sector to come forward and invest in mini steel mills and in the mining sector. The Government in an effort to increase production, is in the process of privatizing major light and heavy engineering concerns.

## **OIL, GAS & ENERGY SECTOR**

The Pakistani economy is expected to grow at a rate of 7 to 8 percent over the next five years. In order to sustain the growth momentum a rise in levels of income and increased availability of goods and services, the country is following a policy to increase the supply of and the conservation of energy.

In 2005 the consumption of petroleum products in household and agriculture exhibited sharp decline to the tune of 16.8 and 16.2 percent, respectively. The decline in the use of

petroleum products was mainly on account of the availability of alternative and relatively cheaper fuels in the form of natural gas and LPG

Historically, the country is dependent on oil imports. The crude oil import for 2005 was about 8.3 million tons, equivalent of US\$ 2,606 million. The import of petroleum products import was 5.7 million tons, an equivalent of US\$ 1,998 million. The total annual import bill for the year 2005 was US\$ 4,604 million. Due to increase in international prices of crude oil, the import bill in 2006 is expected to be US\$ 5,500 million. Pakistan has five refineries, namely, National Refinery, Pakistan Refinery, Bosicor, Pak Arab Refinery and Attock Refinery; annual oil refining capacity is 12.82 million tons. In the downstream oil marketing business, the main players are; Pakistan State Oil (100% owned by the Government of Pakistan), Caltex, Shell and Total.

Pakistan has an interesting Geo-dynamic history of large and prospective basin (onshore and offshore) with sedimentary area of 827,268 sq. km. So far about 844 million barrels crude oil reserves have been discovered of which 535 million barrels have already been produced. A Prognostic potential of total endowment of hydrocarbons has been estimated as 27 billion barrels of oil. To date various national and international exploration and production companies, resulting in over 177 oil and gas discoveries, have drilled more than 620 exploratory wells. Indigenous production of crude oil during the year 2005 was 66,079 barrels per day. The main companies in the upstream chain include; BHP Petroleum, Lasmo Oil, Shell, OMV Pakistan etc.

Pakistan is among the most gas dependent economies of the world. Natural gas was first discovered in 1952 at Sui in Balochistan province that proved a most significant and the largest gas reservoir. After successful exploration and extraction, it was brought to service in 1955. This major discovery at Sui followed a number of medium and small size gas fields in other parts of the country.

So far about 52 TCF of gas reserves have been discovered of which 19 TCF have already been produced. Natural gas production during 2005 was about 3.7 billion cubic feet per

day. Pakistan has well developed and integrated infrastructure of transporting, distributing and utilizing natural gas with 9,063 km transmission and 67,942 km of distribution and service lines network, developed progressively over the last 50 years.

Natural gas sectoral consumption during 2005 was: power (43.7%), fertilizer (16.4%), cement industry (1.2%), general industry (19.5%), domestic (14.8%), commercial (2.3%) and Transport (CNG; 2.1%).

Gas importation projects envisage about 1500 to 2000 km long pipelines connecting regional gas supply sources such as Turkmenistan, Iran and Qatar to the domestic pipeline network bringing in more than 1.5 billion cubic feet gas per day. With further extension, the imported gas can also reach the Indian market.

Pakistan started using Compressed Natural Gas (CNG) as transport fuel through establishment of research and demonstration CNG refueling stations by the Hydrocarbon Development Institute of Pakistan (HDIP) at Karachi in 1982 and at Islamabad 1989. CNG is now fast emerging as an acceptable vehicular fuel in place of oil. Pakistan is third largest user of CNG in the world after Argentina and Brazil. As many as 835 CNG stations have been set up in the country by December 2006 and 200 stations were under construction. With 850,000 CNG vehicles on the road, the CNG sector has attracted Rs.20 billion investment while another Rs.2 billion is in the pipeline, providing 16,000 jobs.

Large diesel vehicles (buses and trucks) being the major consumer of HSD are now the next target for substitution by CNG for economic and environmental reasons. Meanwhile a private company has imported some CNG diesel dual-fuel buses for Karachi and plans are also underway for local manufacturing of these buses.

The total power generation capacity of Pakistan is 19,540-mw. In order to sustain a higher GDP growth rate of 7–8 percent, the Government is planning to increase its power generation capacity by 143,000-mw in the next 25 years, to 162,590-mw.

The 25-year Energy Security Plan (ESP 2005-2030) approved recently by the Government envisages increase in nuclear power generation by 8,400-mw to 8,800-mw by the year 2030 from current nuclear power of 400-mw. The ESP envisages the share of nuclear power to increase to 4.2 per cent of country's total energy mix from the current rate of 0.8 per cent. The current energy mix has (highest) 50 percent share of gas, 30 percent oil, 12.7 per cent hydel, 5.5 per cent coal, 0.8 per cent nuclear and zero percent renewable energy.

The additional 143,053-mw would include 8,400-mw of nuclear power, 26,200-mw hydel-power, 19,753-mw coal based energy, 9,520 mw renewable energy, 1,360-mw oil based and 77,820-mw gas based power production.

By the year 2010, the country would have an additional power of 7,880-mw and hence total capacity would reach 27,420-mw. This additional power would not include any new plant in the nuclear sector, but hydel generation would increase by 1,260-mw, coal based increase of 900-mw and renewable energy increase of 700-mw. A minor increase of 160-mw would take place in the oil-based generation while gas based power production would increase by 4,860 mw.

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## ANNEXURE II

### CORPORATE AGRICULTURE FARMING IN PAKISTAN

Pakistan is primarily an agriculture country where nearly 65% of the population lives in rural areas and is dependent on agriculture. More than 70% of the Country's exports are related to agriculture either directly or indirectly. Agriculture contributes 26% of the GDP and over 44% of the labor force is employed in agriculture.

The total area of agriculture land in Pakistan is 79.6 million hectares (MH) out of which cultivated area is 22 (MH) and out this irrigated land is 18 (MH) and rain fed is 4 (MH).

#### **The major merits of Pakistan's agriculture are:**

- 4 seasons, tropical weather
- Crop production throughout the year
- Largest canal irrigation network
- Vast tracts of land along Indus Basin - comprising 5 rivers
- Centuries old farming culture

#### **Pakistan is amongst the lowest cost producers due to:**

- Cost effective and hardworking agricultural manpower
- Low cost irrigation water
- Reasonable price of land
- Farm to market road network
- Competitive cost of inputs
- Major Crops production as follows:

Wheat	: 21 Mn tons
Cotton	: 11 Mn bales
Rice	: 5 Mn tons
Sugarcane	: 55 Mn tons
Fruits/Vegetables	: 10 Mn tons

**Pakistan's agriculture has a strategic location as it is located in food deficit region of:**

- Central Asian Republic (North)
- Middle East (South)
- Iran & Afghanistan (West)
- It is Principal gateway to CARs

**Investment policy for Corporate Agriculture Farming presently in vogue is briefly described below:**

- 60% foreign equity allowed
- Minimum \$ 0.3 foreign investment
- Remittance of 100% capital, profits, dividends allowed
- Credit and other facilities from local and foreign banks
- Local or foreign, private or public limited companies to invest in corporate farming may be listed on stock exchanges
- No ceiling on land holding
- State land can be purchased, or leased for 50 years through open auction, extendable for another 49 years
- All banks and financial institutions will earmark separate credit share for Corporate Agriculture Farming

**Fiscal incentives for CAF given by the government include:**

- 0% customs duty on import of agricultural machinery, equipment and implements
- Exemption of duty on transfer of land for CAF
- Tax relief; Initial depreciation allowance @ 50% of machinery cost.
- Dividends from corporate agriculture farms not subject to tax
- Farm income given more favorable treatment than income from other sources

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