

# **1. PROFILE ON COTTON FARM**

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## **I. SUMMARY**

This profile envisages the establishment of a farm for the production of 6,000 tonnes of cotton per annum.

The present demand for proposed product is estimated at 38,707 tonnes and it is projected to reach at 110,437 tonnes by the year 2014.

The farm will create employment opportunities for 55 persons.

The total investment requirement is estimated at Birr 30.12 million, out of which Birr 5.48 million is required for the farm machinery & equipment.

The project is financially viable with an internal rate of return (IRR) of 23% and a net present value (NPV) of Birr 31.57 million, discounted at 10.5%.

## **II. PRODUCT DESCRIPTION AND APPLICATION**

Cotton lint is the most important vegetable fiber in the world to day and is woven into fabrics, either alone or combined with other fibers. The invention of the saw gin and the development of the factory system, together with the ease of production and adaptability to machine manufacture, caused a rapid expansion in the use of cotton, by 1890 it provided 78.6 per cent of the world's textiles, increasing to 84.2 per cent in the period 1924 – 1928.

The seeds yield a semi – drying edible oil which is used in large substitutes, as salad and cooking oil, and in margarine manufacturing. Low – grade oil is used in the manufacture of soap, lubricants, sulphonated oils and protective coatings. The residual seed cake, decorticated or undecorticated, is an important protein concentrate for livestock. Low-grade cake is used as manure.

### **III. MARKET STUDY AND FARM CAPACITY**

#### **A. MARKET STUDY**

##### **1. Past Supply and Present Demand**

There are three major groups of cotton producers, i.e, the small holder/peasant farms, large state farms and private commercial farms. Cotton produced by the state farms and private commercial farms is mainly used in the modern textile manufacturing sector and to some extent exported to foreign countries. On the other hand, cotton produced by peasant farms is for the large part used by the hand loom sector.

Generally, the demand for cotton is a derived demand determined by the production capacity of the spinning plants. According to the Ethiopian Textile Sector Study conducted by Chemonics International INC, annual cotton consumption of spinning plants in Ethiopia is 59,876 tonnes when operating at 100% rated capacity. But the actual consumption is much lower owing to under capacity operation by the textile factories which are facing stiff competition from legal and illegal imports of textile products.

According to data obtained from Statistical Abstract of the Central Statistical Authority (CSA), the annual average production of cotton ginning plants during the period 1997/98 2001/02 was 13,201 tonnes. Using conversion factor 0.35 to raw cotton, the annual average production is estimated to be 37,716 tonnes. On the other hand, Ethiopia exports to and imports cotton from the international market. Hence, in order to know the net domestic consumption of raw cotton, the average export and import in the past six years is necessary to consider. According to the Statistical Abstract of CSA, average import and export of lint cotton during the period 1997 to 2002 was 347 tonnes and 5,424 tonnes respectively. Using the conversion factor to raw cotton, the annual average of import and export amounts to 991 tonnes and 15,497 tonnes, respectively.

To arrive at the net domestic consumption, the formula, i.e., domestic production plus import and minus exports has been applied. Accordingly,  $(37,716+991)-15,497=23,210$

tonnes. This indicates that the domestic textile mills are operating at about 40% of their capacity.

By taking the present net domestic consumption (23,210 tonnes) and the average export (15,497 tonnes) in the past six years, the present demand for Ethiopian raw cotton is estimated at 38,707 tonnes.

## **2. Projected Demand**

The main factors that will determine the demand for cotton are the performance of the domestic textile mills and the wide export potential to the international market. With regard to the domestic textile mills, currently there are some favourable conditions. The United States and the European Union countries are opening their market to Ethiopian textile products. Moreover, the government is taking some measures to control the illegal trade which has been one of the main problems for the textile sector. Hence, the textile sector is believed to be one of the beneficiaries from these measures. Taking these factors into account, it may be conservatively assumed that the capacity utilization of the sector will reach about 80% in the coming five years with annual increase of 8%. After 5 years an annual growth of only 5% is assumed for new entrants. On the other hand, cotton has a wide export market, hence a 10% annual growth is assumed. Based on the above assumption, the forecasted demand for raw cotton is presented in Table 3.1.

**Table 3.1**  
**PROJECTED DEMAND FOR RAW COTTON (TONNES)**

<b>Year</b>	<b>Projected Domestic Demand</b>	<b>Projected Export Demand</b>	<b>Total Projected Demand</b>	<b>Total Domestic Production</b>	<b>Unsatisfied Demand</b>
2004	25531	17047	42578	37716	4862
2005	28084	18752	46836	37716	9120
2006	30893	20627	51520	37716	13804
2007	33982	22690	56672	37716	18956
2008	37380	24958	62338	37716	24956
2009	41118	27454	68572	37716	30856
2010	45230	30200	75430	37716	37714
2011	49753	33220	82973	37716	45257
2012	54728	36542	91270	37716	53554
2013	60200	40196	100,397	37716	62681
2014	66221	44216	110,437	37716	72721

According to Table 3.1, the unsatisfied demand for raw cotton will grow from 9,120 tonnes by the year 2005 to 37,714 tonnes and 72,721 tonnes by the year 2010 and 2014, respectively.

### **3. Pricing and Distribution**

The price of lint and raw cotton is determined mainly by the world market and the available supply in the domestic market. Considering the price of cotton for the past few years, an average farm-gate price of Birr 3.5/kg is recommended for the envisaged farm. The product will be sold directly to the existing textile mills or will be exported to foreign countries.

## **B. FARM CAPACITY AND FARMING PROGRAMME**

### **1. Farm Capacity**

The cotton farm is expected to produce about 6,000 tonnes of raw cotton on 2,000 hectares of land per annum. The productivity of the farm is assumed to be 3 tonnes per hectare in each production season.

## 2. Farming Programme

The cotton farm will start with 50 per cent production capacity at its initial stage and will reach to full capacity after five years. The different growth stages of the farm are indicated in Table 4.1.

**Table 4.1**  
**FARMING PROGRAMME**

Sr. No.	Year	Total Area ( ha.)	Yield /ha. (Tonnes)	Total Production (Tonnes)
1.	2005	1000	3	3000
2.	2006	1200	3	3600
3.	2007	1400	3	4200
4.	2008	1600	3	4800
5.	2009	1800	3	5400
6	2010	2000	3	6000
<b>Grand Total</b>		<b>900</b>	<b>3</b>	<b>27,000</b>

## IV. FARM MATERIALS AND AGRICULTURAL INPUTS

### A. FARM MATERIALS

Generally speaking, seeds of cotton fertilizers, chemicals and packing materials are some of the basic materials and inputs required for cotton production. The agricultural inputs and materials required and corresponding costs are shown in Table 4.1.

**Table 4.1**  
**FARM MATERIALS AND AGRICULTURAL INPUTS REQUIREMENT AND COSTS**

Sr. No	Description	Unit of Measure	Qty.	Cost (000' Birr)		
				LC	FC	Total
1	Seeds	Qt	604	120	300	420.00
2	Fertilizer	Qt	6000	600	1,800	2,400.00
3	Chemicals	Qt	60	150	450	600.00
4	Sacks	Pcs	6000	18	-	18.00
<b>Grand Total</b>		-	-	<b>888</b>	<b>2250</b>	<b>3438.00</b>

## B. UTILITIES

Electricity, water, fuel and lubricant are the utilities required by the envisaged cotton farm. The electric power is required for lighting and for operating electrical appliances. Fuel is required to run tractors, vehicles, generators and other machinery. The total costs of this utilities are shown in Table 4.2.

**Table 4.2**  
**UTILITIES REQUIREMENT AND COST**

Sr. No.	Description	Cost '000' Birr
1	Electricity (kWh)	99
2.	Water (m <sup>3</sup> )	376
3.	Fuel (lt)	79
4.	Lubricant grease and oil (kg)	79.73
	<b>Grand Total</b>	<b>1351.63</b>

## V. FARM OPERATION TECHNOLOGY AND ENGINEERING

### A. FARM OPERATION TECHNOLOGY

#### 1. Farming Process

##### 1.1. Land development

In cotton production, land development includes surveying, land clearing, leveling and irrigation system and access and farm roads construction. The machinery and equipment required for land development activities will be acquired on rental basis from other organizations.



## **1.2. Land Preparation, Sowing and Fertilization**

In general terms, land preparation in cotton production process comprises ploughing, discing and harrowing. land preparation is followed by sowing with fertilizer application. These operations will be undertaken by tractors and different equipment.

## **1.3. Pre-harvest Management**

The pre harvest managements are expected to include cultivation for weed control and soil fertility improvement, irrigation water application, insect pest and disease control. Cultivation is carried out by tractor driven cultivators, and water application and, pest and disease control will be performed manually using different equipment.

## **1.4. Post-harvest Management**

Post harvest management in cotton production process comprises decking, packing and transporting of products to stores or/and market. The activities such as picking, grading, packing and loading/unloosing are carried out by casual labour, manually and transporting will be handled by tractors from farm to stores and trucks from stores to clients.

## **2. Source of technology**

The machinery and equipment required by the envisaged farm could be supplied by Ries Engineering, Nazareth Tractor Assembly Plant, Tetrac Plc. etc. Furthermore, technologies such as fertilizers and improved seeds could be available by Governmental and Non-governmental inputs supplying organizations.

## B. ENGINEERING

### 1. Farm Machinery and Equipment

The Farm machinery and equipment required by the cotton farm and corresponding cost is given in Table 5.1.

**Table 5.1**  
**FARM MACHINERY AND EQUIPMENT REQUIREMENT AND**  
**CORRESPONDING COSTS**

Sr. No.	Description	Qty. No.	Cost '000 Birr		
			FC	LC	Total
1	Tractor 110 – 125 HP	5	1350	-	1350
2	Disc plough 5 – 6 narrow	5	300	-	300
3	Planter 6 rows	5	1000	-	1000
4	Cultivator	3	75	-	75
5	Sprayer	5	1250	-	1250
6	Ridger	5	200	-	200
7	Trailers	4	360	-	360
8	Workshop/set	1	50	-	50
9	Generator	1	155	-	155
	<b>FOB</b>	-	<b>4740</b>	-	<b>4740</b>
10	Inland cost			743.30	743.30
	<b>Grand Total</b>		<b>4740</b>	<b>743.0</b>	<b>5483.0</b>

### 2. Land, Building and Civil Works

The total land required for the cotton farm will be about 3,500 hectares. The land is expected to be allocated for cotton production, and residential houses, offices, stores, staff canteen, workshop and access roads constructions and the remaining will be left open for future development programme. Land lease rate in BGRS for rural land ranges from Birr 15 to Birr 30. Taking the maximum lease rate, the total land lease cost at the rate of Birr 30 per hectare and for 70 years of land holding is estimated at Birr 7.35

million. Even though the actual practice is to pay a certain portion in advance and the balance within a defined period in this profile it is assumed that the total land lease cost is paid in advance.

Building areas of the farm which includes stores, houses, offices recreation center and workshop is estimated to be 7,000 m<sup>2</sup> and its total construction costs will be about Birr 4.9 Million at the unit cost of Birr 700 per m<sup>2</sup>. Surveying, clearing, and leveling of farm land and main canal drainage, access and farm road, including hydraulic structures constructions will be among the civil work activities to be carried out for cotton production. The total cost is estimated about Birr 4.2 million.

### **3. Proposed Location**

The Location is proposed to be near perennial rivers with adequate land and suitable for irrigated cotton production. In this regard, Assosa zone could be one of the ideal location for the envisaged cotton farm. The other alternative location is Belojiganfoy in Kamashi zone.

## **VI. MANPOWER AND TRAINING REQUIREMENT**

### **A. MANPOWER REQUIREMENT**

The manpower required by the envisaged project is 55 persons. The detailed list of manpower & corresponding annual labour cost is indicated in Table 6.1.

**Table 6.1**  
**MANPOWER REQUIREMENT AND LABOUR COST OF**  
**PERMANENT STAFF**

<b>Sr. No.</b>	<b>Description</b>	<b>Req. No.</b>	<b>Monthly Salary, Birr</b>	<b>Annual Salary, Birr</b>
1	Farm Manager	1	2,250	27.0
2	Secretary	1	700	8.4
3	Agronomist	1	2,000	24.0
4	Plant Projection Inspector	1	1,500	18.0
5	Irrigation Engineer	1	2,000	24.0
6	Production supervisor	4	500	24.0
7	Accountant	1	800	9.6
8	Cashier	1	600	7.2
9	Purchaser	1	700	8.4
10	Salesperson	1	700	8.4
11	Tractor operator	10	500	60.0
12	Ass. Tractor operator	10	300	36.00
13	Chief mechanic	1	700	8.4
14	Assistant mechanics	2	500	12.0
15	Generator operator	1	300	3.6
16	Driver	3	500	18.0
17	Assistant driver	2	500	7.2
18	Office Boy	1	200	2.4
19	Generator	1	200	2.4
20	Guard	10	200	24.0
21	Store keeper	1	300	3.6
	<b>Total</b>	<b>55</b>		<b>336.6</b>
	Employees Benefit			84.15
	<b>Grand Total</b>	<b>55</b>		<b>420.75</b>
	Casual Labour			2720

## **B. TRAINING REQUIREMENT**

The project do not require any training.

## **VII. FINANCIAL ANALYSIS**

The financial analysis of the cotton farm project is based on the data provided in the previous chapters and the following assumptions:-

Construction period	2 years
Source of finance	30 % equity 70 % loan
Tax holidays	6 years
Bank interest	10.5%
Discounted cashflow	10.5%
Repair and maintenance	5 % of Farm machinery and equipment
Accounts receivable	30 days
Raw material, local	30 days
Raw materials, import	90 days
Work in progress	180 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

## **A. TOTAL INITIAL INVESTMENT COST**

The total initial investment cost of the project including working capital is estimated at Birr 30.12 million, out of which about 20% will be required in foreign currency. Details are indicated in Table 7.1.

**Table 7.1**  
**INITIAL INVESTMENT COST ('000 BIRR)**

<b>Sr. No.</b>	<b>Cost Items</b>	<b>Foreign Currency</b>	<b>Local Currency</b>	<b>Total</b>
1	Land	-	7,350.00	7,350.00
2.	Building and Civil Work	-	9,100.00	9,100.00
3.	Farm Machinery and Equipment	4740.00	743.00	5,483.00
4.	Office Furniture and Equipment	-	150.00	150.00
5.	Vehicle	-	750.00	750.00
6.	Pre-Farming Expenditure*	-	4,464.07	4,464.07
	<b>Total Investment cost</b>	<b>4740.00</b>	<b>25,557.57</b>	<b>27,297.57</b>
7	Working Capital	1,156.1	1,672.11	2,828.21
	<b>Grand Total</b>	<b>6,256.1</b>	<b>23,869.67</b>	<b>30,125.77</b>

## **B. FARMING COST**

The annual farming cost at full operating capacity of the farm is estimated at Birr 10.47 million (see Table 7.2). The material and utility cost accounts for 40 per cent while repair and maintenance take 2.34 per cent of the operation cost.

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\* *Pre-production expenditure include interest during construction (Birr 4.31 million) and costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

**Table 7.2**  
**ANNUAL PRODUCTION COST ('000 BIRR)**

Items	Year			
	3	4	7	10
Farm Material and Agricultural Inputs	1,719.00	2,062.68	3,094.2	3,438.00
Labour direct	100.98	121.17	181.76	201.96
Utilities	675.82	810.93	1,216.47	1,351.63
Casual labour	1,360.00	1,631.9	2,448.00	2,720.00
Maintenance and repair	137.09	164.50	246.76	274.18
Labour overheads	42.08	50.49	75.73	84.15
Administration cost	67.32	80.78	121.18	134.64
<b>Total Operating Costs</b>	<b>4,102.28</b>	<b>4,922.45</b>	<b>7,384.10</b>	<b>8,204.56</b>
Depreciation	1,303.35	1,303.35	1,303.35	1,123.35
Cost of Finance	2,502.41	2,349.12	1,785.74	1,025.60
<b>Total Production Cost</b>	<b>1,908.04</b>	<b>8,574.92</b>	<b>10,473.19</b>	<b>10,353.56</b>

## C. FINANCIAL EVALUATION

### 1. Profitability

According to the projected income statement, the project will start generating profit in the second year of operation. Important ratios such as the profit to total sales, net profit to equity (Return on equity) and net profit plus interest to total investment (return on total investment) will show an increasing trend throughout the operation life of the project.

The income statement and other profitability indicators show that the project is viable.

## 2. Break-even Analysis

The break-even point of the project is estimated by using income statement projection.

$$\text{Be} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 17\%$$

## 3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 6 years time.

## 4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 23% and the net present value at 10.5% discount rate is Birr 31.57million.

## D. ECONOMIC BENEFITS

The project can create employment for 55 persons. In addition to supply of the domestic needs, the project will generate Birr 31.33 million in terms of tax revenue. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such farm will have a foreign exchange saving effect to the country by substituting the current imports.