52. ABSORBENT COTTON

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I. SUMMARY

This profile envisages the establishment of a plant for the production of Absorbent Cotton with a capacity of 15 tonnes per annum.

The present demand for the proposed product at country level and BGRS is estimated at 209.6 tonnes and 4.3 tonnes per annum, respectively. The national demand is expected to reach at 315.3 tonnes by the year 2010. By the year 2010 demand in BGRS is estimated to reach 6.4 tonnes.

The plant will create employment opportunities for 25 persons.

The total investment requirement is estimated at Birr 2.28 million, out of which Birr 1.49 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 13.5% and a net present value (NPV) of Birr 0.72 million, discounted at 8.5 %.

II. PRODUCT DESCRIPTION AND APPLICATION

Absorbent cotton is a cleared de-oiled and bleached cotton packed in different sizes. Since absorbent cotton is a material which comes in direct contact with the human body, its quality is very important and should satisfy the required pharmaceutical parameters.

Either virgin cotton or waste cotton can be used as raw material. Combed waste cotton is desirable in case of waste cotton. The fibre of absorbent cotton is very elastic. It consists of (98-99.5%) cellulose which has a diameter of 16.30 mm, and a length of 12-40mm.

Absorbent cotton is mainly used for sanitary purposes and surgical operations as well as for ordinary daily use. It is also usually needed by women during their menustration period that reoccurs at least once a month.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET TSUDY

1. Past Supply and Present Demand

Absorbent cotton is mostly used for medical purposes in hospitals, clinics and health stations. In addition, it is used in pharmacies, barbers shops, beauty salons and business organizations and households for various purposes. Currently, almost the entire requirement of absorbent cotton is met through import. However, the import quantity is not distinctly stated in the data of the Ethiopian Customs Authority.

In order to estimate the present demand data obtained on the requirement of health facilities has been utilized. Based on a study made by IPS, the average requirement of absorbent cotton for a hospital is about 27kgs per month. For clinics and health centers, the average requirement is about 3kgs and 1 kg, respectively.

According to CSA, 2003 Statistical Survey Report the type and number of health facilities in the country during 2002/2003 was as follows:-

- Hospitals…….119
- Clinics……3632
- Health centers… 451

Based on the above stated requirement, the monthly and annual requirement of absorbent cotton for the different health facilities is given in Table 3.1.

Table 3.1
MONTHLY AND ANNUAL REQUIREMENT OF ABSORBENT COTTON AT COUNTRY LEVEL

Type of Health Facility	No. of Health Facilities	Total Monthly Requirement (kg)	Total Annual Requirement (Kg)
Hospitals	119	3213	38556
Clinics	3632	10896	130752
Health Centers	451	451	5412
Total	4202	14560	174720

As could be seen from the above data, annual requirement of health facilities in 2002/2003 was about 174,720 kg. Assuming other users to require about 20% of the requirement of health facilities which is 34,944 kg, the total annual demand would come to about 209,664.

The demand share for BGRS is worked out based on the above methodology. According to CSA, the type and number of health facilities in BGRS in 2001/2002 was as follows:-

- Hospitals……2
- Clinics……..79
- Health centers…… 7
- Drug shops & rural drug vendors…….34

Based on the average annual requirement of the different types of health facilities stated above, the annual demand in BGRS is estimated as follows;-

- Hospitals……648 kg/annum
- Clinics……..2844 kg/annum
- Health centers……..84kg/annum

Total……3576 kg/annum

Assuming other users to require about 20% of the requirements of health facilities which is 715 kg, the total annual demand in BGRS would come to about 4,291 kg.

2. Projected Demand

The demand for absorbent cotton is directly related with the development and expansion of health facilities in the country. The regional governments such as the Benishangul Gumez have given high attention for expansion of health facilities due to the current low coverage. Hence, considering the population growth and the high attention given by the Federal and Regional Governments, the demand for absorbent cotton is assumed to grow by 6%, annually. Based on this assumption, the projected demand at country level and regional level is given in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR ABSORBENT COTTON AT NATIONAL AND REGIONAL LEVEL (TONNES)

Year	Demand at National Level	Demand at Regional Level
2004	222.3	4.5
2005	235.6	4.8
2006	249.8	5.1
2007	264.7	5.4
2008	280.6	5.7
2009	297.5	6.0
2010	315.3	6.4
2011	334.3	6.8
2012	354.3	7.2
2013	375.6	7.6
2014	398.1	8.1
2015	422.0	8.6

3. Pricing and Distribution

The retail price of absorbent cotton is Birr 40.00 per pack of 500 gramme or Birr 80/kg at Addis Ababa. Assuming a 30% margin for distributors, the recommended price for the envisaged project is Birr is 30.77 per pack of 500 gramme or Birr 61.54 per kg.

The distribution of absorbent cottons could be handled through the existing distributors of drug and medical supplies enterprises.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on demand projection shown in Table 3.2 of market study, the proposed plant will have an annual production capacity of 15 tonnes. The plant will operate three shifts for 24 hours a day, and for 300 days a year. The full capacity production is assumed to cover the demand of the region and partially cover the demands of neighbouring regions.

2. Production Programme

Due to technical reasons such as skill upgrading of the operators and acquaintance with the production machinery, it would be advisable and more appropriate to start production at lower capacity at the initial stage. Hence, it is suggested that the envisaged plant will go into full capacity utilization in three years time starting with 75% capacity in the first year, 85% during the second year and then to full (100%) capacity during the third year and thenafter.

Table 3.3
PRODUCTION PROGRAMME

Year	1	2	3-10
Capacity, utilization [%]	75	85	100
Annual production (Tonne)	11.25	12.75	15

IV. RAW MATERIALS AND INPUTS

A. RAW MATERIALS

The main raw material required is virgin cotton or waste cotton, which might possibly be supplied from the region itself or from neighbouring regions.

From the experience of operating textile industries in the country, there is a loss of upto 25% depending on the content of short fibre and foreign matters. Therefore, upto 1.25 tonnes of raw cotton is required to manufacture 1.0 tonne of finished goods. For the purpose of this project, 18.75 tonnes of cotton is required to manufacture 15 tonnes of absorbent cotton. Soda ash and Caustic Soda are other raw materials required, which can be procured from Oromia Regional State at Bulbula and Zeway.

Table 4.1
RAW MATERIALS REQUIREMENT AND COST

Sr. No.	Description	Qty. (tonnes)	Cost, ('000 Birr)
1	Raw ginned cotton	18.75	154.80
2	Soda ashs	0.5	3.0
3	Caustic soda	0.2	0.60
	Total		**158.40**

B. AUXILIARY MATERIALS

Auxiliary materials required for the plant consist of bleaching agent, wetting agent, chemicals, packing and labeling materials. Annual requirement of auxiliary materials at full production capacity is shown in Table 4.2 below.

Table 4.2
AUXILIARY MATERIALS REQUIREMENT AND COST

Sr. No.	Description	Qty. (Tonnes)	Cost, ['000 Birr]		
			LC	FC	TC
1	Bleaching agent	4	-	12.8	12.8
2	Wetting agent	Lumpsum		10	10
3	Other chemicals	Lumpsum	10.0	-	10
4	Packing & labeling materials	Lumpsum	20	-	20
	Grand Total		**30**	**22.8**	**52.8**

C. UTILITIES

Utilities required by the plant are water, electricity and furnace oil (fuel oil) to operate a boiler. The annual requirements and associated costs of utilities at full production capacity is given in Table 4.3 below.

Table 4.3
ANNUAL UTILITIES REQUIREMENT AND COST

Sr. No.	Description	Qty.	Cost, ('000 Birr)
1	Electricity	10,000	5.0
2	Water	6500m^3	16.25
3	Furnace oil	10m^3	22.00
	Total		**43.25**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The technology of manufacturing absorbent cotton involves opening, cleaning and bleaching that can be performed automatically or manually in which the facilities are made as simple as to keep the production cost low. In view of simplicity of operation and maintenance, the manual method is adopted in this profile.

Raw cotton is fed to opener and cleaner to free it from extraneous matter and to get the fibers loosened. Next, filling process is taken followed by bleaching them and hydro-extracting process for which dewatering is done. Then, opening and drying are carried out inorder to facilitate the subsequent carding process. The dried cotton is further loosened finally by the opening machine and tested and carded. Finally winding, cutting and packing is performed. Since the process uses hazardous chemicals like caustic soda and bleaching powder, a liquid waste treatment plant is necessary to control pollution of the environment.

2. Source of technology

The technology of absorbent cotton production is widely known in modern society. The production process is conventional and available in Europe, Asia and Far East. Following is the address of one of the suppliers of the technology.

Small and Medium Industry Promotion Corporation
South Korea
http//: www.smipc.or.kr.

Some of the equipment such as bleaching vessels, hydro-extractors and dryers could be manufactured locally by engineering industries like Mesfin Engineering and Maru Engineering.

B. ENGINEERING

1. Machinery & Equipment

The list of machinery and equipment required for the production of absorbent cotton with their corresponding cost is given Table 5.1.

Table 5.1
MACHINERY AND EQUIPMENT REQUIREMENT FOR THE PRODUCTION OF ABSORBENT COTTON AND COST

Sr. No.	Description	Qty.	Cost ['000 Birr]		
			LC	FC	TC
	A. Production Machinery & Equipment				
1	Opening and cleaning unit	1 set			
2	Filling unit	"			
3	Bleaching unit	"			
4	Hydro-extracting unit	"	150	1100	1250
5	Opening (for wet cotton)	"	(lumpsum)	(lumpsum)	(lumpsum)
6	Drying unit	"			
7	Opening unit (for dried cotton)	"			
8	Reserving unit	"			
9	Carding unit	"			
10	Winding and cutting	"			
11	Packing machine	"			
	Sub-total		**150**	**1100**	**1250**
	B. Auxiliary Equipment				
1	Air conditioning equipment	1 set	40.00	10.00	50.00
2	Boiler-1 tonne per hour;	1 set	30.00	150.00	180.00
3	Water treatment facilities for fresh water (12 tonne/day) softener	1 set	10.00	20.00	30.00
4	Testing equipment and tools	set As req	-	15.00	15.00
	Sub-total		**50**	**195.00**	**245**
	Grand Total		**200**	**1295**	**1495**

2. Land, Building and Civil works

The production building will be made by hollow blocks, both sides of the walls will be plastered, reinforced concrete floor lined with chemical resistant tiles and RHS truss EGA-Sheet roof. Taking into consideration on space for easy movement and possible future expansion, the total area of the project will be 1000 m^2. The lease value of land, at the rate of Birr 2.0 per m^2, and for 70 years will be Birr 140,000. Total built-up area will be 400 m^2, and at the rate of Birr 1000 per m^2 of building, investment on built-up area will be Birr 400,000. The total investment cost on land, building and civil works, assuming that the total land lease cost will be paid in advance, will then be Birr 540,000.

3. Proposed Location

The envisaged plant needs to be located near raw material source, and where electricity and water can be supplied without incurring extra costs. An appropriate location will be Assosa, where infrastructure is available and raw material can easily be procured.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The envisaged project requires a total of 25 employees. The details of manpower requirement and the estimated annual labour cost including employees' benefits are shown in Table 6.1 below.

Table 6.1
MANPOWER REQUIREMENT AND ANNUAL LABOUR EXPENDITURE

Sr. No.	Description	Req. No.	Salary, [Birr]	
			Monthly	Annually
1	General manager	1	1600	19200
2	Secretary	1	500	6000
8	Clerk	1	400	4800
9	Cashier	1	500	6,000
12	Store keeper	1	500	6,000
13	Quality control production head	1	800	9,600
14	Shift leader	3	600	21600
15	Operators	6	400	28800
16	Assistant operators	3	250	9000
18	Mechanic	1	700	8400
19	Electrician	1	700	8400
20	General services (inc.driver)	3	400	14400
21	Guard	2	200	4800
	Sub-total	**25**	**-**	**147000**
	Employees' benefits (25% of BS)	-	-	36750
	Total		**-**	**183750**

B. TRAINING REQUIREMENTS

The supervisor, skilled workers and quality control workers need at least two weeks training on the technology, maintenance and quality control. For the rest, on-the-job training will be sufficient on the start-up period. Training programme will be part of contractual agreement with machinery supplier and cost will be covered by the supplier.

VII. FINANCIAL ANALYSIS

The financial analysis of the Absorbent Cotton project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 years
Source of finance	30 % equity
	70 % loan
Tax holidays	3 years
Bank interest	7.5 %
Discounted cashflow	8.5 %
Repair and maintenance	3 % of the total plant and machinery
Accounts receivable	30 days
Raw material, local	30 days
Raw materials, import	90 days
Work in progress	5 days
Finished products	15 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 2.3 million, of which 56.7 per cent will be required in foreign currency. The major breakdown of the total initial investment cost is shown in Table 7.1

Table 7.1
INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total ('000 Birr)
1	Land lease value	140
2.	Building and Civil Work	400
3.	Plant Machinery and Equipment	1495
4.	Office Furniture and Equipment	35
5.	Vehicle	-
6.	Pre-production Expenditure*	158.1
7	Working Capital	56.9
	Total Investment cost	**2,285.1**
	Foreign share	**56.7%**

** N.B Pre-production expenditure includes interest during construction (Birr 123.1thousand), training (Birr 30 thousand), and (Birr 5 thousand) costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 0.77 million (see Table 7.2). The material and utility cost accounts for 29.6 per cent, while depreciation and financial cost take 38 per cent of the production cost.

Table 7.2
ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	211.21	24
Utilities	43.3	5.6
Maintenance and repair	50.0	6.5
Labour direct	85.8	11.2
Factory overheads *	12.5	1.6
Administration Cost **	103.0	13.4
Total Operating Costs	**505.75**	**62.3**
Depreciation	187.0	24.3
Cost of Finance	102.3	13.3
Total Production Cost	**795.03**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the 2nd year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the lifetime of the project.

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

* *Factory overhead cost includes salaries and wages of supervisors, insurance of factory workers, social costs on salaries of direct labour, etc.*

** *Administrative cost includes salaries and wages, insurance, social costs, materials and services used by administrative staff etc.*

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operates at full capacity (year 3) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 75\%$$

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 7 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 13.5% and the net present value at 8.5% discount rate is Birr 0.72 million.

D. ECONOMIC BENEFITS

The project can create employment for 25 persons. In addition to supply of the domestic needs, the project will generate Birr 56 thousand per annum in terms of tax revenue when it starts to operate at full capacity. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports.