

**PROFILE ON THE PRODUCTION OF GAUZE AND  
BANDAGE**

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## **I. SUMMARY**

This profile envisages the establishment of a plant for the production of gauze and bandage with a capacity of 600 tons per annum. Bandage is used to cover a wound hold dressing in place of immobilize an injured part and gauze is a loosely woven cotton fabric used to absorb fluid.

The demand for gauze and bandage is met through domestic production and imports. The present (2012) unsatisfied demand for gauze and bandage is estimated at 675 tons. The unsatisfied demand for gauze and bandage is projected to reach 1,087 tons and 1,750 tons by the year 2017 and 2022, respectively.

The principal raw materials required is half-bleached cotton yarn which is fully available locally from textile factories.

The total investment cost of the project including working capital is estimated at Birr 30.64 million. From the total investment cost the highest share (Birr 19.38 million or 62.24%) is accounted by fixed investment cost followed by initial working capital (Birr 7.96 million or 25.99%) and pre operation cost (Birr 3.29 million or 10.76%). From the total investment cost Birr 8.88 million or 28.98% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 24.96% and a net present value (NPV) of Birr 25.13 million discounted at 10%.

The project can create employment for 43 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with textile manufacturing subsector and forward linkage with the medical supplies sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

## **II. PRODUCT DESCRIPTION & APPLICATION**

Cotton gauze and bandage are medical articles made of cotton yarn. Bandages are single jersey fabrics produced as a network of vertical Knitted-Wales joined together by the connecting cross-bindings and used to cover a wound hold dressing in place of immobilize an injured part. Gauze is a loosely woven cotton fabric used to absorb fluid.

Cotton gauze and bandage are mainly used in hospitals, clinics and health centers. Gauze and Bandages are required for use in binding round a wound or injury. Gauze swabs are used for taking specimen from patients for testing infection and for other medical purposes.

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

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

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

Medical and health facilities such as hospitals, health centers, clinics, health posts and pharmacies constitute the major end users of gauze and bandage. The demand for the product is met through domestic production and imports. According to CSA, there were 14 drugs and medical supplies manufacturers in the country in 2010, of which 12 are in Addis Ababa. However, data on domestic production of drugs and medical supplies in general and gauze and bandage in particular is not readily available. Accordingly, import data is used in estimating the unsatisfied demand for the product (see Table 3.1).

**Table 3.1**  
**IMPORTS OF GAUZE AND BANDAGE**

<b>Year</b>	<b>Quantity</b>
2000	178.02
2001	274.01
2002	259.20
2003	200.20
2004	312.00
2005	148.60
2006	572.24
2007	386.00
2008	603.00
2009	673.00
2010	481.20
2011	654.00

*Source: Ethiopian Revenues & Customs Authority.*

The data on the import of gauze and bandage presented in Table 3.1 is characterized by some fluctuations. However, a general increasing trend is observed when the data set is scrutinized in

different periods. Accordingly, the imported quantity during the period 2001--2005 ranges from the lowest 146 tones to the highest 312 tones, with a mean figure of about 229 tones. A huge growth of import is registered during the following six years of 2006--2011. During this period the yearly average quantity imported has reached to a level of about 562 tones. Compared to the previous six years annual average it is higher than by 80% or has shown a yearly growth rate of 12%.

To determine the present unsatisfied demand for gauze and bandage, average import of the product during the period 2009--2011 is first assumed to reflect the demand for the year 2011. Then, the 12 % average annual growth rate of import in the past six years is applied to arrive at the current (year 2012) unsatisfied demand for the product. Thus, the current unsatisfied demand for the product is estimated at 675 tons.

## **2. Demand Projection**

As stated above, the demand for gauze and bandage is mainly influenced by the expansion of medical and health facilities, which in turn is influenced by population growth and income. The significant average annual growth in medical and health facilities in the country and trend of import are considered in projecting the future demand for gauze and bandage. Accordingly, by taking annual growth rate of 10%, which is below the observed trend of import and expansion of health facilities, the projected demand for the product is depicted in Table 3.2.

As could be observed from Table 3.2, the demand for gauze and bandage will increase from 743 tones in the year 2013 to 1196 tones and 1750 tones by the year 2018 and year 2022, respectively.

**Table 3.2**  
**PROJECTED DEMAND OF GAUZE AND BANDAGE (TONS)**

<b>Year</b>	<b>Quantity</b>
2013	743

2014	817
2015	898
2016	988
2017	1,087
2018	1,196
2019	1,315
2020	1,447
2021	1,592
2022	1,750

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

Based on the Customs data for 2011 (the latest data available), the CIF price of gauze and bandage was Birr 59,037 per ton. Allowing 25% for import duty and other clearing expenses, the factory gate price for the envisaged plant is estimated at Birr 73,796 per ton.

The envisaged plant can use the existing drug and medical supplies distribution and trading organizations to distribute its product.

### **B. PLANT CAPACITY AND PRODUCTION PROGRAM**

#### **1. Plant Capacity**

The annual rated capacity of the plant will be 600 tons per 300 working days a year, 8 hours of single shift per day.

#### **2. Production Program**

The plant will operate at 75% of its rated capacity in the first year, 85% in the second year and at full capacity starting from the third year and thereafter (see Table 3.3).

**Table 3.3**  
**PRODUCTION PROGRAM**

Description	Unit	Production Year		
		1	2	3
Gauze & Bandage	tons	450	510	600
Capacity Utilization	%	75	80	100

#### IV. RAW MATERIALS AND INPUTS

##### A. RAW & AUXILIARY MATERIALS

The main material required for the production of cotton gauze and bandage is half-bleached cotton yarn. The raw material is fully available locally from textile factories. The estimated annual cost of material and inputs at 100% capacity utilization is given in Table 4.1.

**Table 4.1**

##### **ESTIMATED ANNUAL COST OF MATERIALS INPUTS**

Sr. No.	Description	Qty	Cost (000 Birr )		
			Foreign	Local	Total
1	Cotton yarn (tons)	690		31,050.00	31,050.00
2	Miscellaneous Materials	L.S	221.76	79.20	300.96
	<b>Total</b>	-	-		<b>31,350.96</b>

##### B. UTILITIES

Utilities required are electricity and water. Water is mainly needed for human consumption and general purpose. The annual quantities and cost of utilities at full capacity operation are shown in Table 4.2.

**Table 4.2**

##### **ANNUAL UTILITIES REQUIREMENT & COST**

<b>Sr. No</b>	<b>Description</b>	<b>Qty</b>	<b>Cost (000 Birr)</b>
1	Electric Power (kWh)	140,000	79.02
2	Water (m <sup>3</sup> )	1,200	12.00
	<b>Total</b>		<b>91.02</b>

## **VI TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**

#### **1. Production Process**

Knitting is the first process for the production of gauze, bandage and wadding by looping fine spun cotton yarn on knitting machine. One complete turn of the yarn over the needle is called stitch. The width of the fabric varies with the stitch length. A constant knitting width is ensured by the use of elastic yarn.

Cotton gauze from a feed roll is reeled into rolls of normal commercial length and simultaneously cut to bandages of any given width. The cut edges of the gauze are embossed by the embossing rollers, thus preventing the pulling out of warp threads during use of the bandages.

Prior to folding, the gauze passes through stainless steel expander. A maximum of 3 ply folding is obtained in each folding station. The folded gauze is wound up on cardboard or plastic sleeves, which were cut to the width of the folder gauze.

The cotton wool ribbon which has previously been formed is converted to ordinary and perforated zigzag cotton wool. In the case of perforated zigzag cotton wool, the multiple gauze is transversely precut at its folding edges, thus being divided into portions.

The two rolls of gauze are guided from un-winded via directing rollers of stainless steel, into the gauze feeding station of the swab folding unit. Therein, each tack of gauze is pulled off and



folded on both sides according to the size of the finished swabs. A smooth and even feeding of the gauze into the cutting station is effected by a rubber coated pressure roller. The gauze in the cutting stations is measured and cut. After cutting to the required length for the finished swab, the material is passed into the longitudinal folding station. Here, the gauze is folded three times in the length direction. After passing this section, the folded swab is guided by means of a conveyor belt into the cross-folding station. In this station, the swab is cross-folded once or twice to the desired size. Finally, the finished products of gauze, bandage of swabs will be packed for dispatch.

## **2. Environmental Impact Assessment**

The production process involves knitting, embossing, cutting sterilizing and packing. Hence, there is no negative environmental impact that could be created by the envisaged plant.

## **B. ENGINEERING**

### **1. Machinery and Equipment**

Total cost of machinery and equipment is estimated at Birr 12.88 million out of which Birr 8.88 million will be required in foreign currency. The production equipment required by the plant and their estimated costs are given in Table 5.1.

**Table 5.1**

### **MACHINERY & EQUIPMENT REQUIREMENT & ESTIMATED COSTS**

Sr. No.	Description	Qty (No.)	Cost, ( 000 Birr)		
			F.C	L.C	Total
1	Knitting Machine	6	3276.90	655.78	3,932.68
2	Reeling Machine	4	2640.00	528.00	3,168.00
3	Gauze Wrapping Machine	2	211.86	42.50	254.36
4	Longitudinal Folding Machine	4	2,001.78	400.36	2,402.14
5	Gauze Swabs Folding machine	3	273.24	54.65	327.89
6	Gauze cutting/Slitting Machine	3	91.08	18.22	109.30
7	Gauze Swab Sterile Machine	3	321.75	64.35	386.10
8	Inspection Machine	2	66.00	13.20	79.20
Insurance, customs duty, inland transport, bank charge, etc.				2,220.65	
<b>Total</b>		-	<b>8,882.61</b>	<b>3,997.70</b>	<b>12,880.31</b>

## 2. Land, Building and Civil Works

The processing building does not require a special arrangement other than a steel structure covered with EGA sheet roof. The total area of land required is estimated to be 2,500 m<sup>2</sup>, out of which 900 m<sup>2</sup> will be built-up area. The cost of building and civil work at the rate of Birr 5,000 per square meter is estimated birr 4.5 million.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No. 721/2004) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious

and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%. The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5,000 m<sup>2</sup>, the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority. However, if the land request is above 5,000 m<sup>2</sup>, the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

Moreover, the Addis Ababa City Administration has recently adopted a new land lease floor price for plots in the city. The new prices will be used as a benchmark for plots that are going to be auctioned by the city government or transferred under the new "Urban Lands Lease Holding Proclamation."

The new regulation classified the city into three zones. The first Zone is Central Market District Zone, which is classified in five levels and the floor land lease price ranges from Birr 1,686 to

Birr 894 per m<sup>2</sup>. The rate for Central Market District Zone will be applicable in most areas of the city that are considered to be main business areas that entertain high level of business activities.

The second zone, Transitional Zone, will also have five levels and the floor land lease price ranges from Birr 1,035 to Birr 555 per m<sup>2</sup>. This zone includes places that are surrounding the city and are occupied by mainly residential units and industries.

The last and the third zone, Expansion Zone, is classified into four levels and covers areas that are considered to be in the outskirts of the city, where the city is expected to expand in the future. The floor land lease price in the Expansion Zone ranges from Birr 355 to Birr 191 per m<sup>2</sup> (see Table 5.2).

**Table 5.2**

**NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA**

<b>Zone</b>	<b>Level</b>	<b>Floor Price/m<sup>2</sup></b>
Central Market District	1 <sup>st</sup>	1686
	2 <sup>nd</sup>	1535
	3 <sup>rd</sup>	1323
	4 <sup>th</sup>	1085
	5 <sup>th</sup>	894
Transitional zone	1 <sup>st</sup>	1035
	2 <sup>nd</sup>	935
	3 <sup>rd</sup>	809
	4 <sup>th</sup>	685
	5 <sup>th</sup>	555
Expansion zone	1 <sup>st</sup>	355
	2 <sup>nd</sup>	299
	3 <sup>rd</sup>	217
	4 <sup>th</sup>	191

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all new manufacturing projects will be located in industrial zones located in expansion zones. Therefore, for the profile a land lease rate of Birr 266 per m<sup>2</sup> which is equivalent to the average floor price of plots located in expansion zone is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criteria are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.3 shows incentives for lease payment.

**Table 5.3**

**INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS**

<b>Scored Point</b>	<b>Grace Period</b>	<b>Payment Completion Period</b>	<b>Down Payment</b>
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile, the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The land lease period for industry is 60 years.

Accordingly, the total land lease cost at a rate of Birr 266 per m<sup>2</sup> is estimated at Birr 532,000 of which 10% or Birr 53,200 will be paid in advance. The remaining Birr 478,800 will be paid in equal installments with in 28 years i.e. Birr 17,100 annually.

**NB:** The land issue in the above statement narrates or shows only Addis Ababa’s city administration land lease price, policy and regulations.

Accordingly the project profile prepared based on the land lease price of Addis Ababa region.

To know land lease price, police and regulation of other regional state of the country updated information is available at Ethiopian Investment Agency’s website [www.eia.gov.et](http://www.eia.gov.et) on the factor cost.

**VI. HUMAN RESOURCE AND TRAINING REQUIREMENT**

**A. HUMAN RESOURCE REQUIREMENT**

The total human resource requirement of the plant is 43 persons. The total annual labor cost, including employees benefit, is Birr 768,660 Details of human resource and estimated annual labor cost including fringe benefits are indicated in Table 6.1.

**Table 6.1**

**HUMAN RESOURCE REQUIREMENT AND ESTIMATED LABOR COST**

<b>Sr. No.</b>	<b>Job Title</b>	<b>No. of Persons</b>	<b>Monthly Salary, Birr</b>	<b>Annual salary</b>
1	General Manager	1	4,500	54,000
2	Secretary	1	1,800	21,600
3	Technical & Production Manager	1	3,500	42,000
4	Finance and Administration head	1	3,500	42,000
5	Sales person	1	2,000	24,000
6	Store keeper	1	1,800	21,600
7	Purchaser	1	1,600	19,200
8	Accountant/Cashier	1	1,800	21,600
9	Driver	2	1,200	28,800
10	Production	15	1,400	252,000
11	Laborers	13	600	93,600
12	General Service	5	800	48,000
	<b>Total</b>	43	24,500	<b>668,400</b>
	Employees' Benefit (15% of Basic Salary)	-		100,260
	<b>Grand Total</b>	-		<b>768,660</b>

**B. TRAINING REQUIREMENT**

The production supervisor and main operators should be given a one month on-the-job training by skilled technician of the equipment supplier during the time of commissioning. The total cost of such training is estimated at Birr 60,000.

## **VII. FINANCIAL ANALYSIS**

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

Construction period	1 year
Source of finance	30 % equity &70% loan
Tax holidays	5 years
Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	30 days
Work in progress	1 day
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

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

The total investment cost of the project including working capital is estimated at Birr 30.64 million (see Table 7.1). From the total investment cost the highest share (Birr 19.38 million or 63.24%) is accounted by fixed investment cost followed by initial working capital (Birr 7.96 million or 25.99%) and pre operation cost (Birr 3.29 million or 10.76%). From the total investment cost Birr 8.88 million or 28.98% is required in foreign currency.

**Table 7.1**

**INITIAL INVESTMENT COST ( '000 Birr)**

<b>Sr. No</b>	<b>Cost Items</b>	<b>Local Cost</b>	<b>Foreign Cost</b>	<b>Total Cost</b>	<b>% Share</b>
<b>1</b>	<b>Fixed investment</b>				
1.1	Land Lease	53.20		53.20	0.17
1.2	Building and civil work	4,500.00		4,500.00	14.68
1.3	Machinery and equipment	3,997.70	8,882.61	12,880.31	42.03
1.4	Vehicles	1,500.00		1,500.00	4.89
1.5	Office furniture and equipment	450.00		450.00	1.47
	<b>Sub total</b>	<b>10,500.90</b>	<b>8,882.61</b>	<b>19,383.51</b>	<b>63.24</b>
<b>2</b>	<b>Pre operating cost *</b>				
2.1	Pre operating cost	1,294.02		1,294.02	4.22
2.2	Interest during construction	2,005.04		2,005.04	6.54
	<b>Sub total</b>	<b>3,299.06</b>		<b>3,299.06</b>	<b>10.76</b>
<b>3</b>	<b>Working capital</b>	<b>7,965.96</b>		<b>7,965.96</b>	<b>25.99</b>
	<b>Grand Total</b>	<b>21,765.92</b>	<b>8,882.61</b>	<b>30,648.53</b>	<b>100</b>

\* *N.B Pre operating cost include project implementation cost such as installation, startup, commissioning, project engineering, project management etc and capitalized interest during construction.*

\*\* *The total working capital required at full capacity operation is Birr 10.59 million. However, only the initial working capital of Birr 7.96 million during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).*

**B. PRODUCTION COST**

The annual production cost at full operation capacity is estimated at Birr 39.39 million (see Table 7.2). The cost of raw material account for 79.58% of the production cost. The other major components of the production cost are depreciation, financial cost and labor which account for 8.53%, 4.90%, and 1.70% respectively. The remaining 5.29% is the share of marketing and distribution, utility, repair and maintenance, labor overhead and administration cost. For detail production cost see Appendix 7.A.2.



**Table 7.2**

**ANNUAL PRODUCTION COST AT FULL CAPACITY (year three)**

<b>Items</b>	<b>Cost ( 000 Birr)</b>	<b>%</b>
Raw Material and Inputs	31,351.00	79.58
Utilities	91.00	0.23
Maintenance and repair	644.00	1.63
Labor direct	668.00	1.70
Labor overheads	100.00	0.25
Administration Costs	250.00	0.63
Land lease cost	-	-
Cost of marketing and distribution	1,000.00	2.54
<b>Total Operating Costs</b>	<b>34,104.00</b>	<b>86.57</b>
Depreciation	3,359.87	8.53
Cost of Finance	1,929.86	4.90
<b>Total Production Cost</b>	<b>39,393.72</b>	<b>100</b>

**C. FINANCIAL EVALUATION**

**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 4.02 million to Birr 6.95 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 61.62 million. For profit and loss statement and cash flow projection see Appendix 7.A.3 and 7.A.4, respectively.

**2. Ratios**

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most

important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

### **3. Break-even Analysis**

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point for capacity utilization and sales value estimated by using income statement projection are computed as followed.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 17,276,369$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break-even Sales Value}}{\text{Sales revenue}} \times 100 = 39 \%$$

### **4. Pay-back Period**

The pay -back period, also called pay – off period is defined as the period required for recovering the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project’s initial investment will be fully recovered within 4 years.

### **5. Internal Rate of Return**

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or quality of an investment. A project is a good investment proposition if its IRR is greater than the rate of return that could be earned by alternate investments or putting the money in a bank account. Accordingly, the IRR of this project is computed to be 24.96% indicating the viability of the project.

## **6. Net Present Value**

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle, a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 10% discount rate is found to be Birr 25.13 million which is acceptable. For detail discounted cash flow see Appendix 7.A.5.

## **D. ECONOMIC AND SOCIAL BENEFITS**

The project can create employment for 43 persons. The project will generate Birr 14.07 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with textile subsector and forward linkage with the medical supplies sub sector and also generates other income for the Government.

## **Appendix 7.A**

### **FINANCIAL ANALYSES SUPPORTING TABLES**

**Appendix 7.A.1**  
**NET WORKING CAPITAL ( in 000 Birr)**

<b>Items</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>
Total inventory	5,878.31	6,662.09	7,837.75	7,837.75	7,837.75	7,837.75	7,837.75	7,837.75	7,837.75	7,837.75
Accounts receivable	2,152.33	2,428.20	2,842.00	2,842.00	2,843.43	2,843.43	2,843.43	2,843.43	2,843.43	2,843.43
Cash-in-hand	17.31	19.62	23.08	23.08	23.32	23.32	23.32	23.32	23.32	23.32
<b>CURRENT ASSETS</b>	<b>8,047.96</b>	<b>9,109.91</b>	<b>10,702.83</b>	<b>10,702.83</b>	<b>10,704.50</b>	<b>10,704.50</b>	<b>10,704.50</b>	<b>10,704.50</b>	<b>10,704.50</b>	<b>10,704.50</b>
Accounts payable	82.00	92.93	109.33	109.33	109.33	109.33	109.33	109.33	109.33	109.33
<b>CURRENT LIABILITIES</b>	<b>82.00</b>	<b>92.93</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>	<b>109.33</b>
<b>TOTAL WORKING CAPITAL</b>	<b>7,965.96</b>	<b>9,016.98</b>	<b>10,593.50</b>	<b>10,593.50</b>	<b>10,595.16</b>	<b>10,595.16</b>	<b>10,595.16</b>	<b>10,595.16</b>	<b>10,595.16</b>	<b>10,595.16</b>

**Appendix 7.A.2**  
**PRODUCTION COST ( in 000 Birr)**

<b>Item</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>
Raw Material and Inputs	23,513	26,648	31,351	31,351	31,351	31,351	31,351	31,351	31,351	31,351
Utilities	68	77	91	91	91	91	91	91	91	91
Maintenance and repair	483	547	644	644	644	644	644	644	644	644
Labour direct	501	568	668	668	668	668	668	668	668	668
Labour overheads	75	85	100	100	100	100	100	100	100	100
Administration Costs	188	213	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	17	17	17	17	17	17
Cost of marketing and distribution	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Total Operating Costs</b>	<b>25,828</b>	<b>29,138</b>	<b>34,104</b>	<b>34,104</b>	<b>34,121</b>	<b>34,121</b>	<b>34,121</b>	<b>34,121</b>	<b>34,121</b>	<b>34,121</b>
Depreciation	3,360	3,360	3,360	3,360	3,360	225	225	225	225	225
Cost of Finance	0	2,206	1,930	1,654	1,378	1,103	827	551	276	0
<b>Total Production Cost</b>	<b>29,188</b>	<b>34,704</b>	<b>39,394</b>	<b>39,118</b>	<b>38,859</b>	<b>35,449</b>	<b>35,173</b>	<b>34,897</b>	<b>34,622</b>	<b>34,346</b>

**Appendix 7.A.3**

**INCOME STATEMENT ( in 000 Birr)**

<b>Item</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>
Sales revenue	33,208	35,422	44,278	44,278	44,278	44,278	44,278	44,278	44,278	44,278
Less variable costs	24,828	28,138	33,104	33,104	33,104	33,104	33,104	33,104	33,104	33,104
<b>VARIABLE MARGIN</b>	<b>8,380</b>	<b>7,284</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>	<b>11,174</b>
in % of sales revenue	25.23	20.56	25.24	25.24	25.24	25.24	25.24	25.24	25.24	25.24
Less fixed costs	4,360	4,360	4,360	4,360	4,377	1,242	1,242	1,242	1,242	1,242
<b>OPERATIONAL MARGIN</b>	<b>4,020</b>	<b>2,924</b>	<b>6,814</b>	<b>6,814</b>	<b>6,797</b>	<b>9,932</b>	<b>9,932</b>	<b>9,932</b>	<b>9,932</b>	<b>9,932</b>
in % of sales revenue	12.11	8.25	15.39	15.39	15.35	22.43	22.43	22.43	22.43	22.43
Financial costs		2,206	1,930	1,654	1,378	1,103	827	551	276	0
<b>GROSS PROFIT</b>	<b>4,020</b>	<b>718</b>	<b>4,884</b>	<b>5,160</b>	<b>5,419</b>	<b>8,829</b>	<b>9,105</b>	<b>9,381</b>	<b>9,656</b>	<b>9,932</b>
in % of sales revenue	12.11	2.03	11.03	11.65	12.24	19.94	20.56	21.19	21.81	22.43
Income (corporate) tax	0	0	0	0	0	2,649	2,731	2,814	2,897	2,980
<b>NET PROFIT</b>	<b>4,020</b>	<b>718</b>	<b>4,884</b>	<b>5,160</b>	<b>5,419</b>	<b>6,180</b>	<b>6,373</b>	<b>6,566</b>	<b>6,759</b>	<b>6,952</b>
in % of sales revenue	12.11	2.03	11.03	11.65	12.24	13.96	14.39	14.83	15.27	15.70

**Appendix 7.A.4**

**CASH FLOW FOR FINANCIAL MANAGEMENT ( in 000 Birr)**

<b>Item</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>	<b>Scrap</b>
<b>TOTAL CASH INFLOW</b>	<b>20,678</b>	<b>43,261</b>	<b>35,433</b>	<b>44,294</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>15,353</b>
Inflow funds	20,678	10,053	11	16	0	0	0	0	0	0	0	0
Inflow operation	0	33,208	35,422	44,278	44,278	44,278	44,278	44,278	44,278	44,278	44,278	0
Other income	0	0	0	0	0	0	0	0	0	0	0	15,353
<b>TOTAL CASH OUTFLOW</b>	<b>20,678</b>	<b>35,881</b>	<b>35,163</b>	<b>40,384</b>	<b>38,515</b>	<b>38,258</b>	<b>40,630</b>	<b>40,437</b>	<b>40,244</b>	<b>40,051</b>	<b>37,101</b>	<b>0</b>
Increase in fixed assets	20,678	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	8,048	1,062	1,593	0	2	0	0	0	0	0	0
Operating costs	0	24,828	28,138	33,104	33,104	33,121	33,121	33,121	33,121	33,121	33,121	0
Marketing and Distribution cost	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0
Income tax	0	0	0	0	0	0	2,649	2,731	2,814	2,897	2,980	0
Financial costs	0	2,005	2,206	1,930	1,654	1,378	1,103	827	551	276	0	0
Loan repayment	0	0	2,757	2,757	2,757	2,757	2,757	2,757	2,757	2,757	0	0
<b>SURPLUS (DEFICIT)</b>	<b>0</b>	<b>7,380</b>	<b>270</b>	<b>3,911</b>	<b>5,763</b>	<b>6,020</b>	<b>3,648</b>	<b>3,841</b>	<b>4,034</b>	<b>4,227</b>	<b>7,177</b>	<b>15,353</b>
<b>CUMULATIVE CASH BALANCE</b>	<b>0</b>	<b>7,380</b>	<b>7,650</b>	<b>11,561</b>	<b>17,324</b>	<b>23,344</b>	<b>26,992</b>	<b>30,833</b>	<b>34,868</b>	<b>39,095</b>	<b>46,273</b>	<b>61,626</b>



**Appendix 7.A.5**  
**DISCOUNTED CASH FLOW ( in 000 Birr)**

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
<b>TOTAL CASH INFLOW</b>	<b>0</b>	<b>33,208</b>	<b>35,422</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>44,278</b>	<b>15,353</b>
Inflow operation	0	33,208	35,422	44,278	44,278	44,278	44,278	44,278	44,278	44,278	44,278	0
Other income	0	0	0	0	0	0	0	0	0	0	0	15,353
<b>TOTAL CASH OUTFLOW</b>	<b>28,643</b>	<b>26,879</b>	<b>30,715</b>	<b>34,104</b>	<b>34,106</b>	<b>34,121</b>	<b>36,770</b>	<b>36,853</b>	<b>36,935</b>	<b>37,018</b>	<b>37,101</b>	<b>0</b>
Increase in fixed assets	20,678	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	7,966	1,051	1,577	0	2	0	0	0	0	0	0	0
Operating costs	0	24,828	28,138	33,104	33,104	33,121	33,121	33,121	33,121	33,121	33,121	0
Marketing and Distribution cost	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0
Income (corporate) tax		0	0	0	0	0	2,649	2,731	2,814	2,897	2,980	0
<b>NET CASH FLOW</b>	<b>-28,643</b>	<b>6,329</b>	<b>4,707</b>	<b>10,174</b>	<b>10,172</b>	<b>10,157</b>	<b>7,508</b>	<b>7,425</b>	<b>7,343</b>	<b>7,260</b>	<b>7,177</b>	<b>15,353</b>
<b>CUMULATIVE NET CASH FLOW</b>	<b>-28,643</b>	<b>22,315</b>	<b>-17,607</b>	<b>-7,433</b>	<b>2,739</b>	<b>12,896</b>	<b>20,404</b>	<b>27,829</b>	<b>35,172</b>	<b>42,432</b>	<b>49,610</b>	<b>64,963</b>
Net present value	-28,643	5,754	3,890	7,644	6,948	6,307	4,238	3,810	3,425	3,079	2,767	5,919
Cumulative net present value	-28,643	22,890	-19,000	11,356	-4,408	1,899	6,137	9,947	13,373	16,452	19,219	25,138

NET PRESENT VALUE                    25,138  
INTERNAL RATE OF RETURN            24.96%  
NORMAL PAYBACK                        4 years