

**126. PROFILE ON THE PRODUCTION OF  
DECORATION (WALL) PAPER**

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## **I. SUMMARY**

This profile envisages the establishment of a plant for the production of decoration (wall) paper with a capacity 150 tons per annum. Decoration (wall) paper is a nonwoven (paper) or woven (fabric) backing, decoratively printed for application to walls of a residence or business.

The demand for decoration (wall) paper is entirely met through import. The present (2012) demand for decoration (wall) paper is estimated at 98 tons. The demand for decoration (wall) paper is projected to reach 165 tons and 278 tons by the year 2017 and 2022, respectively.

The principal raw materials required are paper and ink which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 42.65 million. From the total investment cost the highest share (Birr 30.63 million or 71.83%) is accounted by fixed investment cost followed by initial working capital (Birr 8.08 million or 18.96%) and pre operation cost (Birr 3.92 million or 9.21%). From the total investment cost Birr 21.87 million or 51.28% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 18.12% and a net present value (NPV) of Birr 17.04 million discounted at 10%.

The project can create employment for 36 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 generate income for the Government in terms of tax revenue and payroll tax.

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

Wall paper is a nonwoven (paper) or woven (fabric) backing, decoratively printed for application to walls of a residence or business. Wall paper is not considered essential to the decoration of a structure; however, it has become a primary method by which to impart style, atmosphere, or color into a room. Wall paper plays an important role in any type of interior decorations.

### III. MARKET STUDY AND PLANT CAPACITY

#### A. MARKET STUDY

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

The demand for decorating wall paper is directly related to the need to cover and/or furnish wall spaces of buildings. The major end users are households, hotels, business enterprises and similar establishments. Decorated wall papers are supplied to the market through imports as presented in Table 3.1.

**Table 3.1**

#### **IMPORT OF WALL PAPER (TONS)**

<b>Year</b>	<b>Quantity</b>
2002	30
2003	30
2004	9
2005	11
2006	24
2007	14
2008	16
2009	33
2010	52
2011	75

*Source: - Ethiopian Revenues and Custom Authority.*

During the period under review the imported quantity of decorating wall paper was characterized by fluctuations during the years 2002-2007 and the annual average quantity of import was about 20 tons. However, consistent growth trend in the annual quantity of imported wall paper was observed during the recent four years (2008--2011). The yearly average imported quantity during the period 2008--2009 and 2010--2011 has increased to about 25 tons and 64 tons, respectively.

The average growth rate in the quantity of imported wall paper during the period under consideration (2002-2011) was about 28% and this average becomes about 69% during the recent four years (2008-2011) indicating a remarkable growth in the quantity of imported wall

paper. To determine the present effective demand for the product a growth rate of 30% is assumed to have a conservative estimate unlike the recently registered growth rate. Accordingly, by taking year 2011 as a base, the present effective demand for the product becomes about 98 tons.

## 2. Projected Demand

The demand for decorating wall paper is closely related to the growth of the national economy in general and the development in the housing construction sector in particular. The construction sector is one of the fast growing sectors in the national economy where the Gross Domestic Product (GDP) is growing at an average rate of about 11% during the last 7 years. Hence, this growth rate is used in the determination of the future demand for the product. Accordingly, the projected demand for decorating wall paper is presented in Table 3.2

**Table 3.2**

**PROJECTED DEMAND FOR DECORATING WALL PAPER (TONS)**

<b>Year</b>	<b>Quantity</b>
2013	109
2014	121
2015	134
2016	149
2017	165
2018	183
2019	203
2020	226
2021	251
2022	278
2023	308

Demand for decorating or wall paper will grow from 109 tons in the year 2013 to 183 tons and 308 tons by the year 2018 and year 2023, respectively.

## 3. Pricing and Distribution

Taking in to account the informed opinion of traders of the product and allowing a profit margin for distribution and retailing the ex-factory selling price is recommended to be Birr 285 per kg.

The products will be distributed through the existing construction materials trading channels.

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

### **1. Plant Capacity**

The market study indicates that, the demand for decorative wall paper increases from 109 tons in the year 2013 to 308 tons in the year 2023. The annual production capacity of the envisaged project is proposed to be 150 tons of wall paper based on the market study, minimum economies of scale and period required for the implementation of the project. The capacity is determined based on 300 working days per annum on a single shift basis.

### **2. Production Program**

At the initial stage of the production period, the plant requires some years to penetrate the market and develop technical skill. Therefore, in the first and second year of production, the capacity utilization rate will be 70% and 90%, respectively. In the third year and then-after, full capacity production shall be attained. The production program is indicated in Table 3.3.

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

<b>Sr. No.</b>	<b>Product</b>	<b>Production Year</b>		
		<b>1</b>	<b>2</b>	<b>3-10</b>
1	Wall paper production (ton)	105	135	150
2	Capacity utilization rate (%)	70	90	100

## **IV. RAW MATERIAL AND INPUTS**

### **A. RAW AND AUXILIARY MATERIAL**

The principal raw materials required by the envisaged plant are paper and ink. Coating material, plates, and starch paste are materials used in small amount for the production of wall paper. All are imported. The total annual cost of raw and auxiliary materials is estimated at Birr

29,946,500. Table 4.1 shows the annual raw material requirement and cost of the project at full capacity production.

**Table 4.1**

**ANNUAL RAW MATERIAL REQUIREMENT & COST**

Sr. No.	Raw material	Unit	Qty	Cost ('000 Birr)		
				LC	FC	TC
1	Paper	Ton	155	-	23,250	23,250
2	PVC coating/laminate	Tons	4	-	540	540
3	Ink	Tons	7	-	1,050	1,050
4	plates	Pcs	200	-	16.5	16.5
5	Starch	Tons	3	90	-	90
6	Packing material	Lump sum		-	5,000	5,000
	<b>Total</b>			<b>90</b>	<b>29,856.5</b>	<b>29,946.5</b>

**B. UTILITIES**

The major utilities of the proposed plant are electricity and water. The total annual cost of utility is estimated at Birr 239,200. The annual utility requirement and cost are indicated in Table 4.2.

**Table 4.2**

**ANNUAL UTILITY REQUIREMENT & COST**

Sr. No.	Utility	Unit	Qty	Cost ('000 Birr)
1	Electricity	kWh	240,000	139.2
3	Water	m <sup>3</sup>	10,000	100.0
	<b>Total</b>			<b>239.2</b>

## **V. TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**

#### **1. Production Processes**

The major process steps of wall paper production are cutting, coating, printing, pre-pasting and packaging. Each of the processes are described below.

##### **➤ Cutting**

A roll of paper from the paper mill is cut into six sub-rolls which are 53 cm wide by 3,048 m long.

##### **➤ Coating**

Before the pattern is printed, the backing must be coated with a ground color. Ground wood sheets are coated with colored vinyl (PVC), which varies in thickness depending on the durability and strip ability of paper under production. Vinyl may also be laminated to backings for exceptional serviceability. Wood pulp sheets are coated with one or all of the following: kaolin clay for durability, titanium dioxide for opacity, and latex for ease in handling and color.

##### **➤ Printing**

There are four possible types of printing techniques. These are surface, gravure, screen and rotary printing. The envisaged profile adopts rotary printing since it is simple, fast high print quality and relatively automated.

Rotary printing process combines the mechanics of gravure printing with the precision of photographically produced stencils. Mesh stencils are wrapped around hollow tubes mounted within a machine. Ink continuously flows through the film-wrapped tubes and onto paper, imparting a tremendous amount of color (a maximum of 12 colors). This technique resembles the more expensive silk-screening, but it can print much more quickly--approximately 73.12 m of wallpaper per minute.

##### **➤ Pre-pasting**

Printed wallpaper is rolled with a wet cornstarch or wheat starch-based coating and then dried.



➤ **Packaging**

Residential-use wallpapers are cut down from 2,742 m rolls to 13.71 m rolls. Commercial-use rolls are generally packaged in 27, 41, and 55 m rolls. A printed label, run number, and hanging instructions are placed against each roll and shrink wrapped together. Rolls are stored in a warehouse until final shipment.

**2. Environmental Impact Assessment**

The selected technology is green that adopts utilization of nonhazardous inputs and prevention of waste of ink and dampening solution. Recycling of wastes is also done if they are created.. Hence there is no adverse impact on environment.

**B. ENGINEERING**

**1. Machinery & Equipment**

The total cost of machinery is estimated at Birr 26,250,000, of which Birr 21,875,000 is in foreign currency. The list of machinery and equipment is indicated in Table 5.1.

**Table 5.1**

**LIST OF MACHINERY & EQUIPMENT**

<b>Sr. No.</b>	<b>Machinery</b>	<b>No.</b>
1	High capacity computer with design software package	2
2	Color printer	1
3	CTP machine	1
4	Guillotine	2
5	Web Offset printing machine with coating	1
6	Rolling and packaging machine	1

## **2. Land, Building and Civil Work**

The total area of the project is 1,500 m<sup>2</sup> out of which 700 m<sup>2</sup> is a built-up area. Therefore, the cost of building and civil work is estimated at Birr 3.2 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 399,000 of which 10% or Birr 39,900 will be paid in advance. The remaining Birr 359,100 will be paid in equal installments with in 28 years i.e. Birr 12,825 annually.

**VI. HUMAN RESOURCE & TRAINING REQUIREMENT****A. HUMAN RESOURCE REQUIREMENT**

For a smooth operation of the plant a total of 36 persons are required. The total annual cost of labor is estimated at Birr 720,000. The list of human resource and labor cost are indicated in Table 6.1.

**Table 6.1****MANPOWER REQUIREMENT & COST**

<b>Sr. No.</b>	<b>Manpower</b>	<b>No.</b>	<b>Monthly Salary (Birr)</b>	<b>Annual Salary (Birr)</b>
1	General manager	1	8,000	96,000
2	Secretary	1	2,000	24,000
3	Sales and purchasing officer	2	5,000	60,000
4	Accountant	2	5000	60,000
5	Production head	1	5,000	60,000

<b>Sr. No.</b>	<b>Manpower</b>	<b>No.</b>	<b>Monthly Salary (Birr)</b>	<b>Annual Salary (Birr)</b>
6	Mechanic	2	3,000	36,000
7	Electrician	2	3,000	36,000
8	Chemist	3	4500	54,000
9	Operators	6	4500	54,000
10	Laborers	8	4,800	57,600
11	General service	8	3,200	38,400
	<b>Sub total</b>	<b>36</b>	<b>48,000</b>	<b>576,000</b>
	Benefit (25% BS)		12,000	144,000
	<b>Total</b>		<b>60,000</b>	<b>720,000</b>

## **B. TRAINING REQUIREMENT**

Training of labor force shall be carried out during plant erection by the experts of plant machinery supplier. The cost of training is estimated at Birr 60,000

## **VII. FINANCIAL ANALYSIS**

The financial analysis of the decorating wall paper 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
Raw material imported	120 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 42.65 million (see Table 7.1). From the total investment cost the highest share (Birr 30.63 million or 71.83%) is accounted by fixed investment cost followed by initial working capital (Birr 8.08 million or 18.96%) and pre operation cost (Birr 3.92 million or 9.21%). From the total investment cost Birr 21.87 million or 51.28% is required in foreign currency.

**Table 7.1**

### INITIAL INVESTMENT COST ( '000 Birr)

Sr. No.	Cost Items	Local Cost	Foreign Cost	Total Cost	% Share
<b>1</b>	<b>Fixed investment</b>				
1.1	Land Lease	39.90		39.90	0.09
1.2	Building and civil work	3,200.00		3,200.00	7.50
1.3	Machinery and equipment	4,375.00	21,875.00	26,250.00	61.54
1.4	Vehicles	900.00		900.00	2.11
1.5	Office furniture and equipment	250.00		250.00	0.59
	<b>Sub total</b>	<b>8,764.90</b>	<b>21,875.00</b>	<b>30,639.90</b>	<b>71.83</b>
<b>2</b>	<b>Pre operating cost *</b>				
2.1	Pre operating cost	1,137.50		1,137.50	2.67
2.2	Interest during construction	2,790.67		2,790.67	6.54
	<b>Sub total</b>	<b>3,928.17</b>		<b>3,928.17</b>	<b>9.21</b>
<b>3</b>	<b>Working capital **</b>	<b>8,089.27</b>		<b>8,089.27</b>	<b>18.96</b>
	<b>Grand Total</b>	<b>20,782.33</b>	<b>21,875.00</b>	<b>42,657.33</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 10.10 million. However, only the initial working capital of Birr 8.08 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 40.94 million (see Table 7.2). The cost of raw material account for 73.15% of the production cost. The other major

components of the production cost are depreciation and financial cost, which account for 14.19% and 6.56% respectively. The remaining 6.10% is the share of utility, repair and maintenance, labor, 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	29,947.00	73.15
Utilities	239.00	0.58
Maintenance and repair	788.00	1.92
Labor direct	576.00	1.41
Labor overheads	144.00	0.35
Administration Costs	250.00	0.61
Land lease cost	-	-
Cost of marketing and distribution	500.00	1.22
<b>Total Operating Costs</b>	<b>32,444.00</b>	<b>79.25</b>
Depreciation	5,810.50	14.19
Cost of Finance	2,686.02	6.56
<b>Total Production Cost</b>	<b>40,940.52</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 2.33 million to Birr 7.09 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 52.58 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 24,965,193$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 58 \%$$

## 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 6 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 18.12% 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 17.04 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 36 persons. The project will generate Birr 15.48 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 generate other income for the Government.

**Appendix 7.A**  
**FINANCIAL ANALYSES SUPPORTING TABLES**



**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	23,958	26,952	29,947	29,947	29,947	29,947	29,947	29,947	29,947	29,947
Utilities	191	215	239	239	239	239	239	239	239	239
Maintenance and repair	630	709	788	788	788	788	788	788	788	788
Labour direct	461	518	576	576	576	576	576	576	576	576
Labour overheads	115	130	144	144	144	144	144	144	144	144
Administration Costs	200	225	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	13	13	13	13	13	13
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
<b>Total Operating Costs</b>	<b>26,055</b>	<b>29,250</b>	<b>32,444</b>	<b>32,444</b>	<b>32,457</b>	<b>32,457</b>	<b>32,457</b>	<b>32,457</b>	<b>32,457</b>	<b>32,457</b>
Depreciation	5,811	5,811	5,811	5,811	5,811	153	153	153	153	153
Cost of Finance	0	3,070	2,686	2,302	1,919	1,535	1,151	767	384	0
<b>Total Production Cost</b>	<b>31,866</b>	<b>38,130</b>	<b>40,941</b>	<b>40,557</b>	<b>40,186</b>	<b>34,145</b>	<b>33,761</b>	<b>33,377</b>	<b>32,994</b>	<b>32,610</b>

**Appendix 7.A.3**  
**INCOME STATEMENT ( in 000 Birr)**

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Sales revenue	34,200	38,475	42,750	42,750	42,750	42,750	42,750	42,750	42,750	42,750
Less variable costs	25,555	28,750	31,944	31,944	31,944	31,944	31,944	31,944	31,944	31,944
<b>VARIABLE MARGIN</b>	<b>8,645</b>	<b>9,725</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>	<b>10,806</b>
in % of sales revenue	25.28	25.28	25.28	25.28	25.28	25.28	25.28	25.28	25.28	25.28
Less fixed costs	6,311	6,311	6,311	6,311	6,323	666	666	666	666	666
<b>OPERATIONAL MARGIN</b>	<b>2,334</b>	<b>3,415</b>	<b>4,496</b>	<b>4,496</b>	<b>4,483</b>	<b>10,140</b>	<b>10,140</b>	<b>10,140</b>	<b>10,140</b>	<b>10,140</b>
in % of sales revenue	6.83	8.88	10.52	10.52	10.49	23.72	23.72	23.72	23.72	23.72
Financial costs		3,070	2,686	2,302	1,919	1,535	1,151	767	384	0
<b>GROSS PROFIT</b>	<b>2,334</b>	<b>345</b>	<b>1,809</b>	<b>2,193</b>	<b>2,564</b>	<b>8,605</b>	<b>8,989</b>	<b>9,373</b>	<b>9,756</b>	<b>10,140</b>
in % of sales revenue	6.83	0.90	4.23	5.13	6.00	20.13	21.03	21.92	22.82	23.72
Income (corporate) tax	0	0	0	658	769	2,582	2,697	2,812	2,927	3,042
<b>NET PROFIT</b>	<b>2,334</b>	<b>345</b>	<b>1,809</b>	<b>1,535</b>	<b>1,795</b>	<b>6,024</b>	<b>6,292</b>	<b>6,561</b>	<b>6,830</b>	<b>7,098</b>
in % of sales revenue	6.83	0.90	4.23	3.59	4.20	14.09	14.72	15.35	15.98	16.60

**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 IN FLOW</b>	<b>31,777</b>	<b>45,171</b>	<b>38,486</b>	<b>42,761</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>14,853</b>
Inflow funds	31,777	10,971	11	11	0	0	0	0	0	0	0	0
Inflow operation	0	34,200	38,475	42,750	42,750	42,750	42,750	42,750	42,750	42,750	42,750	0
Other income	0	0	0	0	0	0	0	0	0	0	0	14,853
<b>TOTAL CASH OUTFLOW</b>	<b>31,777</b>	<b>37,026</b>	<b>37,174</b>	<b>39,985</b>	<b>39,241</b>	<b>38,983</b>	<b>40,410</b>	<b>40,142</b>	<b>39,873</b>	<b>39,605</b>	<b>35,499</b>	<b>0</b>
Increase in fixed assets	31,777	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	8,180	1,017	1,017	0	1	0	0	0	0	0	0
Operating costs	0	25,555	28,750	31,944	31,944	31,957	31,957	31,957	31,957	31,957	31,957	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	658	769	2,582	2,697	2,812	2,927	3,042	0
Financial costs	0	2,791	3,070	2,686	2,302	1,919	1,535	1,151	767	384	0	0
Loan repayment	0	0	3,837	3,837	3,837	3,837	3,837	3,837	3,837	3,837	0	0
<b>SURPLUS (DEFICIT)</b>	<b>0</b>	<b>8,145</b>	<b>1,313</b>	<b>2,777</b>	<b>3,509</b>	<b>3,767</b>	<b>2,340</b>	<b>2,608</b>	<b>2,877</b>	<b>3,145</b>	<b>7,251</b>	<b>14,853</b>
<b>CUMULATIVE CASH BALANCE</b>	<b>0</b>	<b>8,145</b>	<b>9,457</b>	<b>12,234</b>	<b>15,743</b>	<b>19,510</b>	<b>21,849</b>	<b>24,457</b>	<b>27,334</b>	<b>30,480</b>	<b>37,731</b>	<b>52,584</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>34,200</b>	<b>38,475</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>42,750</b>	<b>14,853</b>
Inflow operation	0	34,200	38,475	42,750	42,750	42,750	42,750	42,750	42,750	42,750	42,750	0
Other income	0	0	0	0	0	0	0	0	0	0	0	14,853
<b>TOTAL CASH OUTFLOW</b>	<b>39,867</b>	<b>27,061</b>	<b>30,256</b>	<b>32,444</b>	<b>33,103</b>	<b>33,226</b>	<b>35,038</b>	<b>35,154</b>	<b>35,269</b>	<b>35,384</b>	<b>35,499</b>	<b>0</b>
Increase in fixed assets	31,777	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	8,089	1,006	1,006	0	1	0	0	0	0	0	0	0
Operating costs	0	25,555	28,750	31,944	31,944	31,957	31,957	31,957	31,957	31,957	31,957	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	658	769	2,582	2,697	2,812	2,927	3,042	0
<b>NET CASH FLOW</b>	<b>-39,867</b>	<b>7,139</b>	<b>8,219</b>	<b>10,306</b>	<b>9,647</b>	<b>9,524</b>	<b>7,712</b>	<b>7,596</b>	<b>7,481</b>	<b>7,366</b>	<b>7,251</b>	<b>14,853</b>
<b>CUMULATIVE NET CASH FLOW</b>	<b>-39,867</b>	<b>32,728</b>	<b>-24,508</b>	<b>14,202</b>	<b>-4,556</b>	<b>4,968</b>	<b>12,680</b>	<b>20,276</b>	<b>27,758</b>	<b>35,124</b>	<b>42,375</b>	<b>57,228</b>
Net present value	-39,867	6,490	6,793	7,743	6,589	5,914	4,353	3,898	3,490	3,124	2,796	5,726
Cumulative net present value	-39,867	33,377	-26,584	18,841	-12,252	-6,338	-1,985	1,913	5,403	8,527	11,323	17,049

NET PRESENT VALUE                    17,049  
INTERNAL RATE OF RETURN            18.12%  
NORMAL PAYBACK                        6 years



