

**121. PROFILE ON THE PRODUCTION OF  
HAND MADE PAPER**

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## **I. SUMMARY**

This profile envisages the establishment of a plant for the production of hand paper with a capacity of 3,000 tons per annum. Hand paper is used for office stationary, writing pads, conference folders, computer printouts, drawing and documentation sheets, certificate and degree awards, for fancy products like – office table accessories, greeting cards, decorative wraps and carry bags. It also has some important industrial application like – filter paper for automobiles, insulating paper etc.

The demand for hand paper is met both from local production and import. The present (2012) demand for hand paper is estimated at 15,712 tones. The demand for hand paper is projected to reach 26,475 tons and 44,612 tons by the year 2017 and 2022, respectively.

The principal raw materials required are waste paper, old clothes and textile remains, agricultural waste, caustic soda, bleaching power, and chemicals and are locally available except bleaching powder that has to be imported.

The total investment cost of the project including working capital is estimated at Birr 21.32 million. From the total investment cost the highest share (Birr 11.93 million or 55.96%) is accounted by initial working capital followed by fixed investment cost (Birr 7.54 million or 35.40%) and pre operation cost (Birr 1.84 million or 8.63%). From the total investment cost Birr 2.56 million or 12% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 35.55% and a net present value (NPV) of Birr 30.58 million discounted at 10%.

The project can create employment for 25 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 the waste recycling and chemical subsectors and also generates income for the Government in terms of tax revenue and payroll tax.

## **II. PRODUCTION DESCRIPTION AND APPLICATION**

Paper is an essential commodity of everyday use. The application of paper and paper products whether it is handmade or other types is very wide in households, education, business and industrial sector. The product types range from highly priced special papers to cheaper low-grade varieties. Typical examples are duplicating papers, filing paper and different types of paper boards.

The manufacturing process of handmade paper is labor intensive and that is the main reason behind the naming of “handmade paper”. Hence, handmade paper project is an ideal one for countries like Ethiopia since the raw materials are domestically available and a number of projects could be established in rural areas.

The raw materials for handmade papers are waste paper, old clothes and textiles remains, and agricultural by-products.

Handmade paper is used for office stationary, writing pads, conference folders, computer printouts, drawing and documentation sheets, certificate and degree awards, for fancy products like – office table accessories, greeting cards, decorative wraps and carry bags. It also has some important industrial application like – filter paper for automobiles, insulating paper etc.

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

### **A. MARKET STUDY**

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

The demand for paper in general is increasing progressively with the growth of population, urbanization, education & expansion of other social and economic activities. Currently, paper & paper products including printing, writing, duplicating, packaging and for other industrial and economical use is supplied both from local production and imports. Currently, Ethiopian Pulp and Paper Share Company (EPPSC) and Anmol Products Ethiopia Private Limited Company are producers of paper for writing, printing and other purposes in the country. However, there are a number of medium and small scale industries that are engaged in paper converting. They

produce a wide range of paper & paper products either by taking the paper from the local paper manufacturers or by directly importing from abroad. Table 3.1 summarizes the structure of supply and apparent consumption of different types of paper and the share of local production and import during the period 2001 - 2011.

**Table 3.1**

**APPARENT CONSUMPTION OF PAPER FOR WRITING, PRINTING, PACKAGING  
AND OTHER PURPOSES (TONS)**

Year	Local		Import		Total Supply	Growth Rate
	Supply	% Share	Supply	% Share		
2001	9,906	20.1	39,415	79.9	49,321	
2002	8,410	22.8	28,440	77.2	36,850	-25.3
2003	8,253	22.9	27,824	77.1	36,077	-2.1
2004	12,685	22.6	43,413	77.4	56,098	55.5
2005	10,620	15.0	60,138	85.0	70,758	26.1
2006	11,435	14.4	68,187	85.6	79,622	12.5
2007	17,826	20.0	71,188	80.0	89,014	11.8
2008	19,066	15.0	107,817	85.0	126,883	42.5
2009	22,274	22.5	76,529	77.5	98,803	-22.1
2010	20,397	22.3	70,985	77.7	91,382	-7.5
2011	21,417	21.0	80,496	79.0	101,913	11.5

During the period 2001-2011, the maximum total supply (apparent consumption) of different types of paper to the local market was 126,883 tons (year 2008), while the minimum 36,077 tons was registered in year 2003. In 2002, total supply has decreased by about 25.3% as compared to 2001. But, the growth during 2004 was remarkable where a growth rate of 55.5% was registered compared to the previous year. In the remaining years, apparent consumption has been fluctuating between the two extremes, around a mean figure of 73,481 tons.

However, during the period under consideration the level of consumption has been increasing from year to year. For instance the average annual consumption for the product has increased by almost two fold during the period 2002-2006 and 2007-2011 from 55,881 tons to 101,599 tons.

Nevertheless, although the consumption level has shown an increasing trend over these years, the present demand for paper and paper products is conservatively assumed to be approximated by the recent four years (2008-2011) average. Thus present demand for the product is estimated to be about 104,745 tons. Assuming that only 15 per cent of the total demand is accounted by hand made paper, the present demand for hand made paper and paper products is about 15,712 tons.

## 2. Demand Projection

Demand for handmade paper is closely associated with the growth of population, urbanization, expansion of social & economic services, developments of the industrial sector and general economic growth. By considering the combined effect of the various influencing factors, demand for handmade paper products is forecasted using 11% annual average growth rate which is equivalent to the expected growth rate of the national economy during the GTP period. Details are shown in Table 3.2.

**Table 3.2**

**PROJECTED DEMAND FOR HAND MADE PAPER (TONS)**

<b>Year</b>	<b>Projected Demand</b>
2013	17,440
2014	19,358
2015	21,488
2016	23,852
2017	26,475
2018	29,388
2019	32,620
2020	36,208
2021	40,191
2022	44,612

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

The average factory gate price for domestically produced paper for packaging is Birr 19,960 per ton. Accordingly, a factory gate price of Birr 19,960 per ton is recommended for the envisaged factory. The suitable sales and distribution mechanism is through wholesale to stationery shops

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

### **1. Plant Capacity**

The proposed production capacity of the envisaged handmade paper manufacturing plant is 3,000 tons per annum. The plant is proposed will operate on single shift basis of 8 working hours and 250 days/annum.

### **2. Production Program**

The proposed production program of the envisaged plant starts operation with 70% in the first year and grows to 80%, 90% and 100% in second, third, and fourth year and years consecutively.

## **IV. MATERIALS AND INPUTS**

### **A. RAW MATERIALS**

The basic raw materials and inputs of the envisaged project are waste paper, old clothes and textile remains, agricultural waste, caustic soda, bleaching power, and chemicals. Most of these material inputs will be procured from domestic sources. The raw materials and related input requirements and cost at full capacity operation are set out as shown below in Table 4.1.

**Table 4.1**  
**ANNUALLY REQUIRED MATERIAL AND INPUT AND COST**

Sr. No.	Description	Qty, Tons	Cost (´000 Birr)		
			F.C	L.C	Total
1	Waste Paper	3,750	-	30,000	30,000
2	Textile cuttings	1,000	-	2,500	2,500
3	Agricultural Waste	1,250	-	3,750	3,750
4	Caustic Soda	250	-	3,750	3,750
5	Bleaching Powder	150	2,700	675.00	3,375
6	Other Chemicals	300	6,000	1,500	7,500
	<b>Total</b>		<b>8,700</b>	<b>42,175</b>	<b>50,875</b>

## B. UTILITIES

Electricity and water are the two most essential utilities required by the project. At full capacity the plant will require 30,000 kWh/year of electric power and 480 m<sup>3</sup>/year of water annually. The total cost of utilities is estimated at Birr 20.94 thousands. The detailed data of the required utilities and their related costs is shown on the Table 4.2 which is found below.

**Table 4.2**  
**THE ANNUAL UTILITIES REQUIREMENT AND COST**

No.	Description	Unit	Quantity	Unit Cost	Cost (Birr)		
					F.C.	L.C	Total
1	Electricity	kWh	27,500	0.58	-	16,140.00	16,140.00
2	Water	m <sup>3</sup>	480	10.00	-	4,800.00	4,800.00
	<b>Total</b>					20,940.00	20,940.00



## **V. TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**

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

The production of handmade paper involves the following process:

- Sorting and dusting the various raw materials (agricultural wastes, waste papers etc.);
- Chopping and milling the waste materials
- Blending the digested raw material inputs with caustic soda;
- Adding the various chemicals and coloring materials,
- Refining/ beating of the pulp;
- Moulding and form a wet sheet;
- Pressing the wet sheet and dry; and
- Polishing the dried paper and form sheets of paper as final output.

#### **2. Environmental Impact**

The project uses mostly wastes of paper, textile and agricultural products as a source of fiber. It is environmentally friendly.

### **B. ENGINEERING**

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

The machinery and equipment required by the project will be procured from foreign sources. The cost of machinery and equipment including vehicle is estimated to be Birr 3.21 million out of which Birr 2.56 million is in foreign currency. The list of machinery and equipment is given in Table 5.1.

**Table 5.1****LIST OF MACHINERY AND EQUIPMENTS**

<b>No</b>	<b>Description</b>	<b>Qty</b>
1	Rag chopper size 315 mm to cut tailor cutting old rage or cotton and jute driven by HP motor	1
2	Jute waste and paddy grass cutter with leading oil and the chapping blades driven by 5 HP motor	1
3	Degeilor for rage or jute size 1200 mm x 1500 mm dia.	1
4	Hollander baiter roller with 30 HP motor switches and starter	1
5	Cylinder mould and vat to lift paper board more than 150 gsm upto 600 gsm with gravity flow tank	1
6	Auto vats to lift any standard size paper fabricated flow ms plate	1
7	Hydraulic press with single ram cylinder and pumping unit driven by 3 HP motor	1
8	Drying champer equip with electrical, heaters and exhaust fan	1 set
9	Calendaring machine	1
10	Paper cutting machine	1
11	Knife grinder	1
12	Platen printing equip	1 set
13	Cutting machine	1
14	Screen printing equip	1 set
15	Eyeleting machine	1
16	Greasing machine	1

**2. Land, Building and Civil Works**

The plant requires a total area of 1,500 m<sup>2</sup> for raw material store, chemicals store, production area, packing room, administration offices and open space for future. The built-up area is estimated to be 900 m<sup>2</sup>. Assuming unit construction cost rate of Birr 3,500 per m<sup>2</sup>, the total construction cost is estimated to be Birr 3,150,000.

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. HUMANRESOURCE AND TRAINING REQUIREMENT

### A. HUMANRESOURCE REQUIREMENT

The proposed project will create a job opportunity for 25 persons. The annual labor cost of the plant is estimated to be Birr 85,975. The list of labor together with the corresponding salary payments is presented in Table 6.1.

**Table 6.1**  
**LIST OF HUMANRESOURCE AND ANNUAL SALARY (BIRR)**

<b>Sr. No.</b>	<b>Job Title</b>	<b>No.</b>	<b>Monthly salary</b>	<b>Annual Salary</b>
1	Plant manager	1	8,000	8,000.00
2	Administrative manager	1	5,000	5,000.00
4	Secretaries	1	2,500	2,500.00
5	Purchaser	1	2,000	2,000.00
6	Sales staff	2	2,500	5,000.00
7	Accountant	1	3,000	3,000.00
9	Personnel clerk	1	1,680	1,680.00
10	Engineer/ mechanic	3	4,000	12,000.00
11	Production workers	8	3,000	24,000.00
12	Guards	4	1,000	4,000.00
13	Messengers	2	800	1,600.00
	Sub-Total	25		68,780.00
	Workers benefit			17,195.00
	<b>Total</b>			<b>85,975.00</b>

### B. TRAINING REQUIREMENT

The two technical staff will be given a technical training on production and quality control by the experts of the supplier for 3 weeks. The total cost of training is estimated at Birr 100,000

## VII. FINANCIAL ANALYSIS

The financial analysis of the hand paper making 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 21.32 million (See Table 7.1). From the total investment cost the highest share (Birr 11.93 million or 55.96%) is accounted by initial working capital followed by fixed investment cost (Birr 7.54 million or 35.40%) and pre operation cost (Birr 1.84 million or 8.63%). From the total investment cost Birr 2.56 million or 12% 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	0.19
1.2	Building and civil work	3,150.00		3,150.00	14.77
1.3	Machinery and equipment	650.00	2,560.00	3,210.00	15.05
1.4	Vehicles	900.00		900.00	4.22
1.5	Office furniture and equipment	250.00		250.00	1.17
	<b>Sub- total</b>	<b>4,989.90</b>	<b>2,560.00</b>	<b>7,549.90</b>	<b>35.40</b>
<b>2</b>	<b>Pre operating cost *</b>				
2.1	Pre operating cost	446.30		446.30	2.09
2.2	Interest during construction	1,395.08		1,395.08	6.54
	<b>Sub -total</b>	<b>1,841.38</b>		<b>1,841.38</b>	<b>8.63</b>
<b>3</b>	<b>Working capital **</b>	<b>11,933.50</b>		<b>11,933.50</b>	<b>55.96</b>
	<b>Grand Total</b>	<b>18,764.78</b>	<b>2,560.00</b>	<b>21,324.78</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 17.03 million. However, only the initial working capital of Birr 11.93 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 54.04 million (see Table 7.2). The cost of raw material account for 94.14% of the production cost. The other major components of the production cost are financial cost and depreciation which account for 2.13%, and 1.97% respectively. The remaining 1.76% is the share of direct labor, repair and maintenance, cost of marketing and distribution, administration cost, labor overhead and utility. For detail production cost see Appendix 7.A.2.



**Table 7.2****ANNUAL PRODUCTION COST AT FULL CAPACITY (YEAR FOUR)**

<b>Items</b>	<b>Cost ( 000 Birr)</b>	<b>%</b>
Raw Material and Inputs	50,875.00	94.14
Utilities	21.00	0.04
Maintenance and repair	96.00	0.18
Labor direct	69.00	0.13
Labor overheads	17.00	0.03
Administration Costs	250.00	0.46
Land lease cost	-	-
Cost of marketing and distribution	500.00	0.93
<b>Total Operating Costs</b>	<b>51,828.00</b>	<b>95.90</b>
Depreciation	1,062.26	1.97
Cost of Finance	1,150.94	2.13
<b>Total Production Cost</b>	<b>54,041.20</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 ranges from Birr 4.42 million to Birr 10.78 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 55.32 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 10,938,743$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 18\%$$

### 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 2 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 35.55% 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 30.59 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 25 persons. The project will generate Birr 14.80 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 the waste recycling and chemical subsectors and also generates 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	35,613	40,700	45,788	50,875	50,875	50,875	50,875	50,875	50,875	50,875
Utilities	15	17	19	21	21	21	21	21	21	21
Maintenance and repair	67	77	86	96	96	96	96	96	96	96
Labour direct	48	55	62	69	69	69	69	69	69	69
Labour overheads	12	14	15	17	17	17	17	17	17	17
Administration Costs	175	200	225	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	17	15	15	15	15	15
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
<b>Total Operating Costs</b>	<b>36,430</b>	<b>41,562</b>	<b>46,695</b>	<b>51,828</b>	<b>51,843</b>	<b>51,843</b>	<b>51,843</b>	<b>51,843</b>	<b>51,843</b>	<b>51,843</b>
Depreciation	1,062	1,062	1,062	1,062	1,062	151	151	151	151	151
Cost of Finance	0	1,535	1,343	1,151	959	767	575	384	192	0
<b>Total Production Cost</b>	<b>37,492</b>	<b>44,159</b>	<b>49,100</b>	<b>54,041</b>	<b>53,865</b>	<b>52,762</b>	<b>52,570</b>	<b>52,378</b>	<b>52,186</b>	<b>51,994</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	41,916	53,892	59,880	59,880	59,880	59,880	59,880	59,880	59,880	59,880
Less variable costs	35,930	41,062	46,195	51,328	51,328	51,328	51,328	51,328	51,328	51,328
<b>VARIABLE MARGIN</b>	<b>5,986</b>	<b>12,830</b>	<b>13,685</b>	<b>8,552</b>	<b>8,552</b>	<b>8,552</b>	<b>8,552</b>	<b>8,552</b>	<b>8,552</b>	<b>8,552</b>
in % of sales revenue	14.28	23.81	22.85	14.28	14.28	14.28	14.28	14.28	14.28	14.28
Less fixed costs	1,562	1,562	1,562	1,562	1,578	666	666	666	666	666
<b>OPERATIONAL MARGIN</b>	<b>4,424</b>	<b>11,267</b>	<b>12,123</b>	<b>6,990</b>	<b>6,974</b>	<b>7,886</b>	<b>7,886</b>	<b>7,886</b>	<b>7,886</b>	<b>7,886</b>
in % of sales revenue	10.55	20.91	20.24	11.67	11.65	13.17	13.17	13.17	13.17	13.17
Financial costs		1,535	1,343	1,151	959	767	575	384	192	0
<b>GROSS PROFIT</b>	<b>4,424</b>	<b>9,733</b>	<b>10,780</b>	<b>5,839</b>	<b>6,015</b>	<b>7,118</b>	<b>7,310</b>	<b>7,502</b>	<b>7,694</b>	<b>7,886</b>
in % of sales revenue	10.55	18.06	18.00	9.75	10.05	11.89	12.21	12.53	12.85	13.17
Income (corporate) tax	0	0	0	1,752	1,805	2,135	2,193	2,251	2,308	2,366
<b>NET PROFIT</b>	<b>4,424</b>	<b>9,733</b>	<b>10,780</b>	<b>4,087</b>	<b>4,211</b>	<b>4,983</b>	<b>5,117</b>	<b>5,251</b>	<b>5,386</b>	<b>5,520</b>
in % of sales revenue	10.55	18.06	18.00	6.83	7.03	8.32	8.55	8.77	8.99	9.22

**Appendix 7.A.4**  
**CASH FLOW FOR FINANCIAL MANAGEMENT ( 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>7,996</b>	<b>55,254</b>	<b>53,893</b>	<b>59,881</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>20,356</b>
Inflow funds	7,996	13,338	1	1	0	0	0	0	0	0	0	0
Inflow operation	0	41,916	53,892	59,880	59,880	59,880	59,880	59,880	59,880	59,880	59,880	0
Other income	0	0	0	0	0	0	0	0	0	0	0	20,356
<b>TOTAL CASH OUTFLOW</b>	<b>7,996</b>	<b>49,768</b>	<b>46,715</b>	<b>51,656</b>	<b>58,349</b>	<b>56,527</b>	<b>56,664</b>	<b>56,530</b>	<b>56,396</b>	<b>56,262</b>	<b>54,209</b>	<b>0</b>
Increase in fixed assets	7,996	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	11,943	1,700	1,700	1,700	1	0	0	0	0	0	0
Operating costs	0	35,930	41,062	46,195	51,328	51,343	51,343	51,343	51,343	51,343	51,343	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	1,752	1,805	2,135	2,193	2,251	2,308	2,366	0
Financial costs	0	1,395	1,535	1,343	1,151	959	767	575	384	192	0	0
Loan repayment	0	0	1,918	1,918	1,918	1,918	1,918	1,918	1,918	1,918	0	0
<b>SURPLUS (DEFICIT)</b>	<b>0</b>	<b>5,486</b>	<b>7,178</b>	<b>8,225</b>	<b>1,531</b>	<b>3,353</b>	<b>3,216</b>	<b>3,350</b>	<b>3,484</b>	<b>3,618</b>	<b>5,671</b>	<b>20,356</b>
<b>CUMULATIVE CASH BALANCE</b>	<b>0</b>	<b>5,486</b>	<b>12,664</b>	<b>20,889</b>	<b>22,420</b>	<b>25,773</b>	<b>28,989</b>	<b>32,339</b>	<b>35,823</b>	<b>39,441</b>	<b>45,112</b>	<b>65,469</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>41,916</b>	<b>53,892</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>59,880</b>	<b>20,356</b>
Inflow operation	0	41,916	53,892	59,880	59,880	59,880	59,880	59,880	59,880	59,880	59,880	0
Other income	0	0	0	0	0	0	0	0	0	0	0	20,356
<b>TOTAL CASH OUTFLOW</b>	<b>19,930</b>	<b>38,128</b>	<b>43,261</b>	<b>48,394</b>	<b>53,581</b>	<b>53,648</b>	<b>53,979</b>	<b>54,036</b>	<b>54,094</b>	<b>54,152</b>	<b>54,209</b>	<b>0</b>
Increase in fixed assets	7,996	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	11,934	1,699	1,699	1,699	1	0	0	0	0	0	0	0
Operating costs	0	35,930	41,062	46,195	51,328	51,343	51,343	51,343	51,343	51,343	51,343	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	1,752	1,805	2,135	2,193	2,251	2,308	2,366	0
<b>NET CASH FLOW</b>	<b>-19,930</b>	<b>3,788</b>	<b>10,631</b>	<b>11,486</b>	<b>6,299</b>	<b>6,232</b>	<b>5,901</b>	<b>5,844</b>	<b>5,786</b>	<b>5,728</b>	<b>5,671</b>	<b>20,356</b>
<b>CUMULATIVE NET CASH FLOW</b>	<b>-19,930</b>	<b>16,142</b>	<b>-5,511</b>	<b>5,975</b>	<b>12,273</b>	<b>18,506</b>	<b>24,407</b>	<b>30,250</b>	<b>36,036</b>	<b>41,765</b>	<b>47,436</b>	<b>67,792</b>
Net present value	-19,930	3,443	8,786	8,630	4,302	3,870	3,331	2,999	2,699	2,429	2,186	7,848
Cumulative net present value	-19,930	16,486	-7,701	929	5,231	9,101	12,432	15,430	18,130	20,559	22,745	30,594

NET PRESENT VALUE                    30,594  
INTERNAL RATE OF RETURN            35.55%  
NORMAL PAYBACK                        2 years