

117. PROFILE ON THE PRODUCTION OF PENCIL

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I. SUMMARY

This profile envisages the establishment of a plant for the production of pencil with a capacity of 30,000 gross per annum. Pencil is lead material enclosed in wood or put in metal holder used for drawing or writing.

The demand for pencil is largely met through import. The present (2012) unsatisfied demand for pencil is estimated at 113,193,000 (91,618 gross). The unsatisfied demand for pencil is projected to reach 100,826 or KG or 116,930 Gross and 128,683 KG or 149,236 Gross by the year 2017 and 2022, respectively.

The principal raw materials required are wood, lead, glue, lacquer, ferrule, eraser tip and packing materials all of which except packing material have to be imported.

The total investment cost of the project including working capital is estimated at Birr 13.20 million. From the total investment cost the highest share (Birr 11.47 million or 86.93%) is accounted by fixed investment cost followed by pre operation cost (Birr 1.45 million or 11.04%) and initial working capital (Birr 268.82 thousand or 2.04%). From the total investment cost Birr 3.89 million or 29.52% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 21.01% and a net present value (NPV) of Birr 7.09 million discounted at 10%.

The project can create employment for 42 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 packaging material manufacturing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

A pencil is lead material enclosed in wood or put in metal holder used for drawing or writing. Pencil is a valuable item used by all levels of schools and in all business and government organization.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement for most types of pencils is largely met through import. In addition to import there is one domestic plant that produces pencils under the trade name of DOT. However, data on domestic production of pencil is not available. Apparently, the imported quantity in the past ten years is analyzed to arrive at the unsatisfied demand for pencils (see Table 3.1).

Table 3.1

IMPORT OF PENCILS & CRAYONS WITH LEADS ENCASED IN A RIGID SHEATH

Year	Quantity (kg)	Value (`000 Birr)
2002	22,272	487
2003	84,798	1,684
2004	55,209	1,107
2005	54,318	747
2006	46,280	1,182
2007	8,291	241
2008	47,962	961
2009	58,956	1,134
2010	123,521	4,875
2011	86,380	3,937

Source: - Ethiopian Revenues & Customs Authority.

As could be seen from Table 3.1 the imported quantity of pencils and crayons during the past ten years was highly erratic. The imported quantity in the year 2002 was only 22,272 kg and jumped suddenly to 84,798 kg in the following year of 2003. The increase in one year was by 3.8 times.

This did not stay long and fell to the range of about 46 to 55 thousand kg during the period 2004--2006. A sharp decline of import is especially registered during year 2007, where the quantity has been only 8,291 kg.

After a huge fall in the year 2007 the imported quantity has again started to increase at a higher rate in the successive three years of 2008--2010. The yearly average level of import during year 2008/09 has reached at about 53.5 thousand kg, which is more than six times higher compared to year 2007. By the year 2010 and 2011 the imported quantity increased to 123,521 kg and 86,380 kg, respectively with an average of about 105 thousand kg. Compared to the previous two years average it is almost double. Despite the huge fluctuations in the data set, the general trend of the supply from import in the recent four years was an increasing one.

The high fluctuations observed in the data set are believed to be due stock carry over's from periods in which import was very high to periods where import is low. So, periods with low import quantity were usually followed by a period of high import quantity and vice versa.

Due to the nature of the data the current unsatisfied demand for pencils and crayons is estimated by taking the recent four years average. Accordingly, current (year 2012) unsatisfied demand is estimated at 79,000 kg. The average weight of a single eraser tipped HP pencil is 6 grams or about 167 pencils equal to one kg. Based on this conversion factor the present unsatisfied demand for pencils in terms of number is estimated at 13,193,000 (91,618 gross).

2. Projected Demand

The demand for pencils is mainly associated with student population of the country. Education sector is given high priority by the government and a number of schools are opened in various parts of the country, including in the remote rural areas. Enhancement of quality and access at all levels of the education system is the major objective during the GTP period. With the expansion of education facilities and increase in the enrollment rate of the population the demand for pencils will grow substantially. For the purpose of this project the unsatisfied demand is conservatively forecasted to grow by 5% per annum. The projected demand for the product is shown in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR PENCIL

Year	Quantity (KG)	Quantity (Gross)
2013	82,950	96,199
2014	87,098	101,009
2015	91,452	106,059
2016	96,025	111,362
2017	100,826	116,930
2018	105,867	122,729
2019	111,161	128,916
2020	116,719	135,361
2021	122,555	142,130
2022	128,683	149,236

The unsatisfied demand for pencils will grow from 96,199 gross in the year 2013 to 122,729 gross and 149,236 gross by the year 2018 and year 2022, respectively.

3. Pricing and Distribution

The average retail price of locally produced eraser tipped HP pencil ranges from Birr 1.50 to Birr 1.75. Allowing 20% margin for wholesalers and retailers an average factory gate price of Birr 1.35 is proposed for sales revenue projection.

Distribution of the product could be undertaken through the existing wholesale and retail network of stationery materials enterprises.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

According to the market study, the unsatisfied demand for pencils will grow from 96,199 gross in the year 2013 to 122,729 gross and 149,236 gross by the year 2018 and year 2022, respectively. Taking in to account the demand projected, complexity of the technology required and the economic scale of production, the envisaged plant will have a capacity of 30,000 gross per annum (8 hours /day and 300 working days per year). Detailed annual production is as follows:

<u>Type Of Pencil</u>	<u>Production Capacity (Gross)</u>
Ordinary (9H-H,F, HB, B-6B)	20,000
Eraser Tipped (HB)	5,000
Colour (12 colours)	5,000

2. Production Programme

The envisaged plant is anticipated to operate at 70% and 80% of installed capacity in the first and second year, respectively. Full capacity production is expected to be achieved in the successive years. The low production level at the initial stage is planned to develop substantial market outlets for the product and to build up production capacity of new equipment.

IV. MATERIAL AND INPUTS

A. RAW MATERIALS

The major raw materials required are wood, lead, glue, lacquer, ferrule, eraser tip and packing materials. The annual raw material requirement is calculated on the bases of the final output. Thus, the total cost of material at full operation capacity of the plant is estimated to be Birr 901,300.00. The detail breakdown is shown in Table 4.1.

Table 4.1**RAW MATERIALS REQUIREMENT AND COST**

Sr. No.	Description	Unit of Measure	Qty.	Cost ('000 Birr)		
				FC	LC	Total
1	Pencil slat	Gross	15,000.00	468.75	-	468.75
2	Lacquer enamel	Tone	0.29	93.75	-	93.75
3	Black lead	Gross	12,880.00	161.00	-	161.00
4	Colored lead	Gross	2,580.00	32.00	-	32.00
5	Foil	Roll	55.00	0.321	-	0.321
6	Glue	Tone	0.83	103.75	-	103.75
7	Ferrule	Gross	2,575.00	0.6435	-	0.6435
8	Eraser	Gross	2,575.00	16.0875	-	16.0875
9	Packing material	Gross	-	-	25.00	25.00
Grand Total				876.302	25.00	901.30

B. UTILITIES

The major utilities of the project are electricity, and water. Annual cost of utilities is Birr 45,000. Annual requirement and cost of utilities is indicated in Table 4.2.

Table 4.2**UTILITIES REQUIREMENT AND COST**

Sr. No.	Description	Annual Consumption	Unit	Unit Cost (Birr)	Total Cost ('000 Birr)
1	Electricity	20,000	kwh	0.65	13.00
2	Water	3,200	m ³	10.00	32.00
Total Annual cost					45.00

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The pencil making plant consists of the following processes: making uncoated pencils, lacquering, stamping, attaching of eraser, final treatment, and packing

a) Wood working process

The pencil slat is shaved in to fixed size, and a semicircular groove is made on the surface with the grooving machine.

The grooved slat, which is half a pencil, is coated with glue and the leads are placed in the groove and then covered with the second slat. The resulting block is tightened with iron frames and dried in a drying chamber. The dried block is passed through a shaping machine that shapes the raw pencil.

b) Lacquering Process

The raw pencils are then lacquered in a painting machine, which is made to apply three to ten times of lacquer coating depending on the quality of finish required.

c) Final Treatment:

After the final coat of lacquer, the pencils are placed in heading and sizing machine which sands off excess wood and paint from the ends of the pencils and trims the pencils to their exact finished length.

The tipping process for making eraser tipped pencil consists of several steps. First, the pencils are sent to rounding-off and sharpening machine .The ferrule and the eraser are fitted to the

pencil and, with the aid of punching device, steel needles are plunged through the ferrule to pierce the ferrule to both pencil and eraser.

The manufacturer's brand name, the hardness number of lead, and any other required information is imprinted on the pencil by means a stamping machine.

The finished pencil are then inspected and graded, and then packed for dispatch.

2. Environmental impact

To overcome some environmental problems created on the production process and the wastes during production additional investment for environmental protection of about Birr 150,000.00 is estimated.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is estimated at Birr 4,872,150 of which Birr 3,897,722 is required in foreign currency. Table 5.1 shows the list of machinery and equipment required by the envisaged plant.

Table 5.1
MACHINERY AND EQUIPMENT REQUIREMENT AND COST

Sr. No	Description	Qty.
	I. Wood working Line	
2	Automatic gluing machine and connector	1
3	Oleo-hydraulic press	1
4	Clamping frame and plate	500 set
5	Automatic slut-end rough cutting machine and connector	1
6	Cutter grinder	1
7	Glue stirrer	1
8	Exhaust fan	1
	II. Painting Process	4
10	Lacquer stirrer	1
11	III. Final Treatment	1
12	Automatic triple hot foil stamping machine and connector	1
13	Automatic triple hot foil stamping machine and connector	1
14	Automatic eraser tipping machine	1
15	Exhaust fan	1
16	Foil cutter	

2. Building and Civil Works

The plant requires a total of 2,000 m² area of land out of which 1,200 m² is built-up area which includes processing area, raw material stock area, offices etc. Assuming construction rate of Birr 4500 per m², the total cost of construction is estimated to be Birr 5.4 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 5000 m² 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 m² 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 m². 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 m². 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 m² (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor price/m²
Central Market District	1 st	1686
	2 nd	1535
	3 rd	1323
	4 th	1085
	5 th	894
Transitional zone	1 st	1035
	2 nd	935
	3 rd	809
	4 th	685
	5 th	555
Expansion zone	1 st	355
	2 nd	299
	3 rd	217
	4 th	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 m² 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

Scored point	Grace period	Payment Completion Period	Down Payment
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 m² 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.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The envisaged plant will create job opportunities for about 42 workers, of these 30 of the employees are production workers while the remaining are administrative staff. Annual cost of labor is Birr 992,500. The detail is indicated in Table 6.1.

Table 6.1**HUMAN RESOURCE REQUIREMENT AND LABOUR COST**

Ser. No.	Job Title	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr)
A. Administration				
1	General Manager	1	5,000	60,000
2	Executive Secretary	1	2,000	24,000
3	Finance and Administration Head	1	3,600	43,200
4	Accountant	1	1,600	19,200
5	Store Man	1	1,200	14,400
6	Clerk	1	700	8,400
7	General Service	6	400	28,800
	Sub-Total	12	14,500	198,000
B. Production				
8	Engineer (Production & Technique)	1	3,600	43,200
9	Supervisor	1	1,600	19,200
10	Quality Control Staff	1	1,300	15,600
11	Technician	2	1,500	236,000
13	Skilled Workers	10	1,300	156,000
14	Assistant Skilled Workers	15	700	126,000
	Sub Total	30	10,000	596,000
	Worker's Benefit (25%)	-		198,500
	Grand Total	42		992,500

B. TRAINING REQUIREMENT

Imparting skill both on the Engineers and the skilled workers who will be directly involved in the plywood production is an essential task. Thus, on-job-training by the machinery supplier for about two weeks should be given locally. The training cost is estimated to be Birr 60,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the pencil 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	3 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 13.20 million (See Table 7.1). From the total investment cost the highest share (Birr 11.47 million or 86.93%) is accounted by fixed investment cost followed by pre operation cost (Birr 1.45 million or 11.04%) and initial working capital (Birr 268.82 thousand or 2.04%). From the total investment cost Birr 3.89 million or 29.52% is required in foreign currency.

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

Sr. No	Cost Items	Local Cost	Foreign Cost	Total Cost	% Share
1	Fixed investment				
1.1	Land Lease	53.20		53.20	0.40
1.2	Building and civil work	5,400.00		5,400.00	40.90
1.3	Machinery and equipment	974.43	3,897.72	4,872.15	36.91
1.4	Vehicles	900.00		900.00	6.82
1.5	Office furniture and equipment	250.00		250.00	1.89
	Sub total	7,577.63	3,897.72	11,475.35	86.93
2	Pre operating cost *				
2.1	Pre operating cost	593.61		593.61	4.50
2.2	Interest during construction	863.64		863.64	6.54
	Sub total	1,457.25		1,457.25	11.04
3	Working capital **	268.82		268.82	2.04
	Grand Total	9,303.71	3,897.72	13,201.43	100

* *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 375.40 thousand. However, only the initial working capital of Birr 268.82 thousand 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 4.56 million (see Table 7.2). The cost of raw material account for 19.74% of the production cost. The other major components of the production cost are depreciation, financial cost and labour which account for 33.18%, 15.61% and 13.06% respectively. The remaining 18.41% is the share of utility, cost of marketing and distribution, repair and maintenance, labour overhead and administration cost. For detail production cost see Appendix 7.A.2.

Table 7.2**ANNUAL PRODUCTION COST AT FULL CAPACITY (year three)**

Items	Cost (000 Birr)	%
Raw Material and Inputs	901.00	19.74
Utilities	45.00	0.99
Maintenance and repair	146.00	3.20
Labour direct	596.00	13.06
Labour overheads	199.00	4.36
Administration Costs	150.00	3.29
Land lease cost	-	-
Cost of marketing and distribution	300.00	6.57
Total Operating Costs	2,337.00	51.21
Depreciation	1,514.15	33.18
Cost of Finance	712.51	15.61
Total Production Cost	4,563.66	100

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 842 thousand to Birr 2.26 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 19.07 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 2,787,914$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 48\%$$

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 5 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 21.01% 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 7.09 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 42 persons. The project will generate Birr 5.28 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 packaging material manufacturing sub sector and also generates other income for the Government.

Appendix 7.A
FINANCIAL ANALYSES SUPPORTING TABLES

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

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Raw Material and Inputs	631	721	811	901	901	901	901	901	901	901
Utilities	32	36	41	45	45	45	45	45	45	45
Maintenance and repair	102	117	131	146	146	146	146	146	146	146
Labour direct	417	477	536	596	596	596	596	596	596	596
Labour overheads	139	159	179	199	199	199	199	199	199	199
Administration Costs	105	120	135	150	150	150	150	150	150	150
Land lease cost	0	0	0	0	17	21	21	21	21	21
Cost of marketing and distribution	300	300	300	300	300	300	300	300	300	300
Total Operating Costs	1,726	1,930	2,133	2,337	2,358	2,358	2,358	2,358	2,358	2,358
Depreciation	1,514	1,514	1,514	1,514	1,514	241	241	241	241	241
Cost of Finance	0	950	831	713	594	475	356	238	119	0
Total Production Cost	3,240	4,394	4,479	4,564	4,466	3,074	2,956	2,837	2,718	2,599

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	4,082	5,249	5,832	5,832	5,832	5,832	5,832	5,832	5,832	5,832
Less variable costs	1,426	1,630	1,833	2,037	2,037	2,037	2,037	2,037	2,037	2,037
VARIABLE MARGIN	2,656	3,619	3,999	3,795	3,795	3,795	3,795	3,795	3,795	3,795
in % of sales revenue	65.07	68.95	68.56	65.07	65.07	65.07	65.07	65.07	65.07	65.07
Less fixed costs	1,814	1,814	1,814	1,814	1,836	562	562	562	562	562
OPERATIONAL MARGIN	842	1,805	2,185	1,981	1,959	3,233	3,233	3,233	3,233	3,233
in % of sales revenue	20.63	34.39	37.46	33.97	33.60	55.43	55.43	55.43	55.43	55.43
Financial costs		950	831	713	594	475	356	238	119	0
GROSS PROFIT	842	855	1,353	1,268	1,366	2,758	2,876	2,995	3,114	3,233
in % of sales revenue	20.63	16.29	23.20	21.75	23.42	47.28	49.32	51.36	53.39	55.43
Income (corporate) tax	0	0	0	381	410	827	863	899	934	970
NET PROFIT	842	855	1,353	888	956	1,930	2,013	2,097	2,180	2,263
in % of sales revenue	20.63	16.29	23.20	15.22	16.39	33.10	34.52	35.95	37.38	38.80

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
TOTAL CASH INFLOW	12,069	5,258	5,255	5,838	5,832	5,832	5,832	5,832	5,832	5,832	5,832	4,532
Inflow funds	12,069	1,176	6	6	0	0	0	0	0	0	0	0
Inflow operation	0	4,082	5,249	5,832	5,832	5,832	5,832	5,832	5,832	5,832	5,832	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,532
TOTAL CASH OUTFLOW	12,069	2,902	4,108	4,193	4,659	4,551	4,848	4,765	4,682	4,599	3,328	0
Increase in fixed assets	12,069	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	312	41	41	41	2	0	0	0	0	0	0
Operating costs	0	1,426	1,630	1,833	2,037	2,058	2,058	2,058	2,058	2,058	2,058	0
Marketing and Distribution cost	0	300	300	300	300	300	300	300	300	300	300	0
Income tax	0	0	0	0	381	410	827	863	899	934	970	0
Financial costs	0	864	950	831	713	594	475	356	238	119	0	0
Loan repayment	0	0	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188	0	0
SURPLUS (DEFICIT)	0	2,356	1,147	1,645	1,173	1,281	984	1,067	1,150	1,233	2,504	4,532
CUMULATIVE CASH BALANCE	0	2,356	3,503	5,148	6,322	7,602	8,586	9,653	10,803	12,036	14,540	19,072

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
TOTAL CASH INFLOW	0	4,082	5,249	5,832	5,832	5,832	5,832	5,832	5,832	5,832	5,832	4,532
Inflow operation	0	4,082	5,249	5,832	5,832	5,832	5,832	5,832	5,832	5,832	5,832	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,532
TOTAL CASH OUTFLOW	12,338	1,761	1,964	2,168	2,720	2,768	3,186	3,221	3,257	3,293	3,328	0
Increase in fixed assets	12,069	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	269	35	35	35	2	0	0	0	0	0	0	0
Operating costs	0	1,426	1,630	1,833	2,037	2,058	2,058	2,058	2,058	2,058	2,058	0
Marketing and Distribution cost	0	300	300	300	300	300	300	300	300	300	300	0
Income (corporate) tax		0	0	0	381	410	827	863	899	934	970	0
NET CASH FLOW	-12,338	2,321	3,285	3,664	3,112	3,064	2,646	2,611	2,575	2,539	2,504	4,532
CUMULATIVE NET CASH FLOW	-12,338	10,017	-6,732	3,068	44	3,108	5,755	8,365	10,940	13,480	15,984	20,516
Net present value	-12,338	2,110	2,715	2,753	2,126	1,902	1,494	1,340	1,201	1,077	965	1,747
Cumulative net present value	-12,338	10,228	-7,513	4,760	-2,634	-732	762	2,101	3,303	4,380	5,345	7,092

NET PRESENT VALUE 7,092
INTERNAL RATE OF RETURN 21.01%
NORMAL PAYBACK 5 years

