184. PROFILE ON THE PRODUCTION OF SAW BLADES

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I. SUMMARY

This profile envisages the establishment of a plant for the production of saw blades with a capacity of 150 tons per annum. Saw blades are products that are used as cutting tools of wooden or similar soft objects after being mounted on a saw frame.

The demand for saw blades is met entirely through import. The present (2012) demand for saw blades is estimated at 198 tons. The demand for saw blades is projected to reach 320 tons and 515 tons by the year 2017 and 2022, respectively.

The principal raw material is required flat strips of carbon steel sheets which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 9.74 million. From the total investment cost the highest share (Birr 7.68 million or 78.82%) is accounted by fixed investment cost followed by pre operation cost (Birr 1.12 million or 11.55%) and initial working capital (Birr 937.61 thousand or 9.63%). From the total investment cost Birr 2.20 million or 22.59% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 20.11% and a net present value (NPV) of Birr 5.16 million discounted at 10%.

The project can create employment for 22 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 paper manufacturing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTIONS AND APPLICATIONS

Saw blades are products that are used as cutting tools of wooden or similar soft objects after being mounted on a saw frame. The supporting frame is usually bow shaped made of hallow section frames with adjustable length for saw mounting. The blades are made from flat strip of High carbon steel sheet. The common saw blade for normal manual usage by carpenters is

having a length of 610mm, a width of 18mm and a thickness of 0.8mm which is one model of this plant's products.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Since there is no domestic facility for manufacturing saw blades, the product is imported from overseas. Import of saw blades for the period 202 - 2011 is given in Table 3.1.

Table 3.1

IMPORT OF SAW BLADES (TONS)

Year	Quantity
2002	93
2003	90
2004	114
2005	99
2006	165
2007	166
2008	147
2009	190
2010	143
2011	179

Source: - Ethiopian Revenue and Customs Authority

As could be seen from Table 3.1, import data of the product show a general increasing trend with some fluctuations. For example the average import which was 101 tons during the period 2003 – 2005 has increased to 159 tons during the next three years average (2006 – 2008). Moreover, during the subsequent three years (2009 – 2011) the average import has further increased to 171 tons. During the period under consideration (2002 – 2011) import or apparent consumption of saw blades has registered an average annual growth rate of 11%.

For estimating the present effective demand for saw blades, it is assumed that the average growth rate exhibited by the products import or apparent consumption will continue at least in the near future. Accordingly, by taking the year 2011 level of supply as a base the present (2012) effective demand for saw blade is estimated at 198 tons.

2. Demand Projection

The construction and manufacturing sectors are the major end users of saw blade. Therefore, in order to project the demand for the product the following two scenarios are considered.

Scenario 1: GDP of the country is expected to grow at an average annual growth rate of 11.2% during the GTP period (2011 – 2015).

Scenario 2: The industrial sector, which includes the construction sector, is expected to grow at an average annual growth rate of 20% during the GTP period (2011 – 2015).

Since the demand for saw blade is highly affected by both factors i.e. performance of GDP and the construction sector, hence, the assumptions are valid. However, in order to be conservative a growth rate of 10% which is slightly lower than the expected growth rate of GDP during the GTP period is used to project the local demand for saw blade. Accordingly, the projected demand for saw blade estimated on the basis of the above assumption and using the estimated present demand as a base is presented in Table 3.2.

Table 3.2

PROJECTED DEMAND (TONS)

Year	Projected Demand
2013	218
2014	240
2015	264
2016	290
2017	320
2018	352
2019	387
2020	425
2021	468
2022	515
2023	566
2024	623
2025	685

3. Pricing and Distribution

The price for saw blade varies according to type. However, for the purpose of financial analysis the average CIF price per ton during 2011 which was Birr 42,490 is considered. Accordingly, allowing 30% for taxes, inland transport and other charges Birr 55,237 per ton is taken for sales revenue projection. The product will be distributed through spare part shops.

Considering the nature of the products and the characteristics of the end users a combination both direct distribution to end users (for bulk purchasers) and indirect distribution (using agents) is selected as the most appropriate distribution channel.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

By considering the market study and the available minimum economies of scale, a plant that has the manufacturing capacity of 150 tons per year is selected. The plant will operate for 300 days per annum on a single shift basis.

2. Production Program

Considering the production process involved, time required foe skill development and market penetration the plant is planned to operate at 75% of its installed capacity in the first year of operation. In the second and third year and then after it will increase to 85% and 100%, respectively as shown in Table 3.3.

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Table 3.3

PRODUCTION PROGRAM

	Year 1	**Year 2**	**Year 3**
Annual production(Ton)	113	128	150
Capacity %	75	85	100

I V. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The production of saw blades requires flat strips of carbon steel sheets with thickness of 0.6 mm or 0.8 mm, which has to be imported. The required raw materials and corresponding cost at full capacity operation are given in Table 4.1

Table 4.1

ANNUAL RAW MATERIALS REQUIREMENT AND COST

Sr. No	Type of Raw Materials	Quantity (Ton)	Cost (000 Birr)		
			F.C	L.C	Total
1	Carbon steel sheet strip (18x0.6 mm)	80	1,280.0	320.0	1,600.0
2	Carbon steel sheet strip (20x0.8 mm)	80	1,440.0	360.0	1,800.0
3	Packing Cartons/labeling	5		125.0	125.0
	Total		**2,720.0**	**805.0**	**3,525.0**

B. UTILITIES

Electricity and water are the major utilities required by the plant. Annual cost of utilities at full capacity operation is estimated is Birr 378,282. For details of utility requirement and cost see Table 4.2.

Table 4.2

ANNUAL UTILITY REQUIREMENTS AND COST

No.	Description	Unit	Qty	Unit Price (Birr)	Amount (Birr)		
					Foreign	**Local**	**Total**
1	Electric power	Kwh	600,000	0.58		348,282	348,282
2	Water	m^3	3,000	10.00		30,000	30,000
	Total					**378,282**	**378,282**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The saw blades are made from high carbon steel sheets. The steel sheet is imported in rolled steel sheet strips of desired width. The raw material is directly fed in the teeth punching machines where the teeth of required pitch are blanked out.

After the teeth are formed, the strips are cut into the proper length. Holes are then punched at each end of the blade using punching presses. The formed teeth is finally arranged to be in cutting position by setting machine. Sharpening of the teeth is done on the teeth grinding machine. After this stage the product is labeled and packed ready for market.

2. Environmental Impact

The manufacturing process of saw blades involves cutting of sheet metals to get the proper shape of the product. Thus, the plant does not have any negative impact on the environment.

B. ENGINEERING

1. Machinery and Equipment

The total cost of machinery and equipment is estimated at Birr 2.75 million of which Birr 2.20 million is required in foreign currency. The list of the necessary machinery and equipment for the envisaged saw blade manufacturing plant is given in Table 5.1.

Table 5.1

MACHINERY AND EQUIPMENT FOR SAW BLADE PLANT

Sr. No.	Machine	Qty.
1	Guillotine shearing Machine	1
2	Teeth Punching press	1
3	Teeth setting press	1
4	Teeth grinding Machine	1
5	Mechanical press	1`
6	Pedestal Grinding Machine	1
7	Pillar Drilling Machine	1
8	Portable Electric drill	2
9	Tool Sets	3
10	Material Handling equipment	1set
11	Teeth punching dies	1set
12	Paint/print/packing	1set

2. Land Building and Civil Work

The envisaged plant requires a total land area of 1,000 $m^{2,}$ of which 750 m^2 would be built-up area. Building construction cost at a rate of Birr 5,000/m^2 is estimated to be Birr 3.75 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^2, 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^2, 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^2. 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^2 .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^2 (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor price/m^2
Central Market District	1st	1686
	2nd	1535
	3rd	1323
	4th	1085
	5th	894
Transitional zone	1st	1035
	2nd	935
	3rd	809
	4th	685
	5th	555
Expansion zone	1st	355
	2nd	299
	3rd	217
	4th	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^2, 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 criterions 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 m^2 is estimated at Birr 266,000 of which 10% or Birr 26,600 will be paid in advance. The remaining Birr 239,400 will be paid in equal installments with in 28 years i.e. Birr 8,550 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will employ a total of 22 persons of whom 13 are technical personnel. Annual cost of labour, including employees benefit, is Birr 600,900. Details of human resource requirement and monthly and annual salary is shown in Table 6.1.

B. TRAINING REQUIREMENT

On the job demonstration of the operation of the machine would be enough for the operation of the machine for workers with technical Background. A cost of Birr15, 000 would be enough for training.

Table 6.1

LIST OF HUMAN RESOURCE REQUIREMENT AND ANNUAL SALARY

Sr. No.	Description	No.	Salary (Birr)	
			Monthly	Annual
A. ADMINISTRATION				
1	Plant Manager	1	5,000	60,000
2	Secretary	1	2,500	30,000
3	Accountant	1	2,500	30,000
4	Salesman/purchaser	1	2,500	30,000
5	Clerk	1	1,500	18,000
6	Cashier	1	2,000	24,000
7	General Service	3	800	28,800
SUB TOTAL		**9**		**220,800**
B. PRODUCTION				
8	Foreman/	1	2,500	30,000
9	Machinery Operators	5	2,000	120,000
10	Assistant Operators	2	1,500	36,000
11	Mechanics	2	2,000	48,000
12	Quality controller	1	1,500	18,000
13	Laborers	2	800	19,200
SUB TOTAL		**13**	**-**	**271,200**
TOTAL				**492,000**
Employee's benefit (25% of basic salary)		-	-	108,900
TOTAL		**22**	**-**	**600,900**

VII. FINANCIAL ANALYSIS

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

Construction period	1 year
Source of finance	30 % equity and 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 9.74 million (See Table 7.1). From the total investment cost the highest share (Birr 7.68 million or 78.82%) is accounted by fixed investment cost followed by pre operation cost (Birr 1.12 million or 11.55%) and initial working capital (Birr 937.61 thousand or 9.63%). From the total investment cost Birr 2.20 million or 22.59% 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	26.60		26.60	0.27
1.2	Building and civil work	3,750.00		3,750.00	38.51
1.3	Machinery and equipment	550.00	2,200.00	2,750.00	28.24
1.4	Vehicles	900.00		900.00	9.24
1.5	Office furniture and equipment	250.00		250.00	2.57
	Sub total	**5,476.60**	**2,200.00**	**7,676.60**	**78.82**
2	**Pre operating cost ***				
2.1	Pre operating cost	487.50		487.50	5.01
2.2	Interest during construction	637.12		637.12	6.54
	Sub total	**1,124.62**		**1,124.62**	**11.55**
3	**Working capital ****	**937.61**		**937.61**	**9.63**
	Grand Total	**7,538.83**	**2,200.00**	**9,738.83**	**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 1.35 million. However, only the initial working capital of Birr 937.61 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 7.26 million (see Table 7.2). The cost of raw material account for 48.57% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labour, utility, and cost of marketing and distribution which account for 13.81%, 8.45%, 5.21%, and 10.33%

respectively. The remaining 13.63% is the share of 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	3,525	48.57
Utilities	378	5.21
Maintenance and repair	138	1.90
Labour direct	492	6.78
Labour overheads	109	1.50
Administration Costs	250	3.44
Land lease cost	0	0.00
Cost of marketing and distribution	750	10.33
Total Operating Costs	**5,642**	**77.74**
Depreciation	1,003	13.81
Cost of Finance	613	8.45
Total Production Cost	**7,258**	**100.00**

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 781 thousand to Birr 1.72 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 14.60 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 3{,}480{,}120$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 51.64\%$$

4. Pay-back Period

The payback 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 20.11% 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 principal 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 5.16 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 22 persons. The project will generate Birr 4.12 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 paper manufacturing sub sector and also generates other income for the Government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

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

Items	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total inventory	616.88	793.13	881.25	881.25	881.25	881.25	881.25	881.25	881.25	881.25
Accounts receivable	347.87	429.40	470.17	470.17	470.88	470.88	470.88	470.88	470.88	470.88
Cash-in-hand	9.62	12.36	13.74	13.74	13.85	13.85	13.85	13.85	13.85	13.85
CURRENT ASSETS	**974.36**	**1,234.89**	**1,365.15**	**1,365.15**	**1,365.98**	**1,365.98**	**1,365.98**	**1,365.98**	**1,365.98**	**1,365.98**
Accounts payable	36.75	47.25	52.50	52.50	52.50	52.50	52.50	52.50	52.50	52.50
CURRENT LIABILITIES	**36.75**	**47.25**	**52.50**	**52.50**	**52.50**	**52.50**	**52.50**	**52.50**	**52.50**	**52.50**
TOTAL WORKING CAPITAL	**937.61**	**1,187.64**	**1,312.65**	**1,312.65**	**1,313.48**	**1,313.48**	**1,313.48**	**1,313.48**	**1,313.48**	**1,313.48**

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	2,468	3,173	3,525	3,525	3,525	3,525	3,525	3,525	3,525	3,525
Utilities	265	340	378	378	378	378	378	378	378	378
Maintenance and repair	97	124	138	138	138	138	138	138	138	138
Labour direct	344	443	492	492	492	492	492	492	492	492
Labour overheads	76	98	109	109	109	109	109	109	109	109
Administration Costs	175	225	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	9	9	9	9	9	9
Cost of marketing and distribution	750	750	750	750	750	750	750	750	750	750
Total Operating Costs	**4,174**	**5,153**	**5,642**	**5,642**	**5,651**	**5,651**	**5,651**	**5,651**	**5,651**	**5,651**
Depreciation	1,003	1,003	1,003	1,003	1,003	175	175	175	175	175
Cost of Finance	0	701	613	526	438	350	263	175	88	0
Total Production Cost	**5,177**	**6,856**	**7,258**	**7,170**	**7,091**	**6,176**	**6,088**	**6,001**	**5,913**	**5,826**

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	5,800	7,457	8,286	8,286	8,286	8,286	8,286	8,286	8,286	8,286
Less variable costs	3,424	4,403	4,892	4,892	4,892	4,892	4,892	4,892	4,892	4,892
VARIABLE MARGIN	**2,376**	**3,054**	**3,394**	**3,394**	**3,394**	**3,394**	**3,394**	**3,394**	**3,394**	**3,394**
in % of sales revenue	40.96	40.96	40.96	40.96	40.96	40.96	40.96	40.96	40.96	40.96
Less fixed costs	1,753	1,753	1,753	1,753	1,761	934	934	934	934	934
OPERATIONAL MARGIN	**623**	**1,302**	**1,642**	**1,642**	**1,633**	**2,460**	**2,460**	**2,460**	**2,460**	**2,460**
in % of sales revenue	10.74	17.46	19.81	19.81	19.71	29.69	29.69	29.69	29.69	29.69
Financial costs		701	613	526	438	350	263	175	88	0
GROSS PROFIT	**623**	**601**	**1,028**	**1,116**	**1,195**	**2,110**	**2,198**	**2,285**	**2,373**	**2,460**
in % of sales revenue	10.74	8.06	12.41	13.47	14.42	25.47	26.52	27.58	28.64	29.69
Income (corporate) tax	0	0	0	335	358	633	659	686	712	738
NET PROFIT	**623**	**601**	**1,028**	**781**	**836**	**1,477**	**1,538**	**1,600**	**1,661**	**1,722**
in % of sales revenue	10.74	8.06	12.41	9.43	10.09	17.83	18.57	19.31	20.05	20.79

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	**8,164**	**7,411**	**7,468**	**8,291**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**4,227**
Inflow funds	8,164	1,611	11	5	0	0	0	0	0	0	0	0
Inflow operation	0	5,800	7,457	8,286	8,286	8,286	8,286	8,286	8,286	8,286	8,286	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,227
TOTAL CASH OUTFLOW	**8,164**	**5,786**	**6,990**	**7,262**	**7,378**	**7,324**	**7,510**	**7,449**	**7,387**	**7,326**	**6,389**	**0**
Increase in fixed assets	8,164	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	974	261	130	0	1	0	0	0	0	0	0
Operating costs	0	3,424	4,403	4,892	4,892	4,901	4,901	4,901	4,901	4,901	4,901	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	335	358	633	659	686	712	738	0
Financial costs	0	637	701	613	526	438	350	263	175	88	0	0
Loan repayment	0	0	876	876	876	876	876	876	876	876	0	0
SURPLUS (DEFICIT)	**0**	**1,626**	**477**	**1,030**	**908**	**962**	**776**	**837**	**899**	**960**	**1,897**	**4,227**
CUMULATIVE CASH BALANCE	**0**	**1,626**	**2,103**	**3,133**	**4,040**	**5,002**	**5,778**	**6,616**	**7,514**	**8,474**	**10,371**	**14,599**

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**	**5,800**	**7,457**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**8,286**	**4,227**
Inflow operation	0	5,800	7,457	8,286	8,286	8,286	8,286	8,286	8,286	8,286	8,286	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,227
TOTAL CASH OUTFLOW	**9,102**	**4,424**	**5,278**	**5,642**	**5,978**	**6,009**	**6,284**	**6,310**	**6,336**	**6,362**	**6,389**	**0**
Increase in fixed assets	8,164	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	938	250	125	0	1	0	0	0	0	0	0	0
Operating costs	0	3,424	4,403	4,892	4,892	4,901	4,901	4,901	4,901	4,901	4,901	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	335	358	633	659	686	712	738	0
NET CASH FLOW	**-9,102**	**1,376**	**2,179**	**2,644**	**2,308**	**2,277**	**2,002**	**1,976**	**1,950**	**1,924**	**1,897**	**4,227**
CUMULATIVE NET CASH FLOW	**-9,102**	**-7,726**	**-5,547**	**-2,903**	**-595**	**1,682**	**3,685**	**5,661**	**7,611**	**9,534**	**11,432**	**15,659**
Net present value	-9,102	1,251	1,801	1,986	1,577	1,414	1,130	1,014	910	816	731	1,630
Cumulative net present value	-9,102	-7,851	-6,050	-4,064	-2,487	-1,073	57	1,071	1,981	2,797	3,528	5,158

NET PRESENT VALUE	5,158
INTERNAL RATE OF RETURN	20.11%
NORMAL PAYBACK	5 years