PROFILE ON THE PRODUCTION OF STEEL TUBES

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I. SUMMARY

This profile envisages the establishment of a plant for the production of welded steel tubes with a capacity of 7,200 tones per annum. Welded Steel tubes are predominantly manufactured in ranges characterized by small wall thickness and large outside diameters and are used for furniture and similar light structural elements.

The demand for steel tubes is met through both local production and import. The present (2012) unsatisfied demand for steel tubes is estimated at 56,773 tons. The unsatisfied demand for steel tubes is projected to reach 94,509 tons and 157,325 tons by the year 2017 and 2022, respectively.

The principal raw material required is carbon steel coil which has to be imported.

The total investment cost of the project including working capital is estimated at Birr 48.41 million. From the total investment cost the highest share (Birr 22.84 million or 47.18%) is accounted by initial working capital followed by fixed investment cost (Birr 21.69 million or 44.82%) and pre operation cost (Birr 3.87 million or 8.00%). From the total investment cost Birr 9.92 million or 20.49% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 22.61% and a net present value (NPV) of Birr 38.15 million discounted at 10%.

The project can create employment for 24 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 forward linkage with the furniture and manufacturing sub sectors and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Steel tubes are of two main types, welded and seamless. Welded tubes are predominantly manufactured in ranges characterized by small wall thickness and large outside diameters, while seamless tubes are produced mainly in the range extending from normal and very large wall thickness in the diameter up to approx. 660 mm. the steel tubes considered in this project are

circular, square and rectangular sections which are longitudinally welded by high frequency induction welding.

Welded steel pipes are longitudinally welded hollow structures with circular or rectangular/square cross sections. They are widely used for furniture and similar light structural elements. The galvanized versions could be used for water pipes. Since this project does not include galvanizing plant it doesn't produce galvanized pipes. However it could supply the welded tubes to a separate galvanizing factory.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The local demand for steel tubes is met through both local production and import. In order to estimate the present demand for the produces the unsatisfied demand i.e. the demand which is met through import is considered. Accordingly, the historical import of steel tubes during the period 2002 -2011 is given in Table 3.1.

Table 3.1

IMPORT OF STEEL TUBES (TONS)

Year	Quantity
2002	27,254
2003	39,741
2004	25,886
2005	49,999
2006	46,099
2007	41,953
2008	35,330
2009	65,539
2010	59,062
2011	29,215

Source: – *Ethiopian Revenue and Customs Authority.*

As can be seen from Table 3.1, import of steel tubes for the period 2002-2011 ranges from the lowest 25,886 tons (year 2004) to the highest 65,539 tons (year 2009) with annual average of about 42,008 tons. During the period under consideration, though import of steel tubes fluctuates from year to year, it has registered an average annual growth rate of 10.73%.

For estimating the present unsatisfied demand for steel tubes, it is assumed that the growth rate registered in import of the product will continue at least in the near future. Accordingly, by taking the average level of import during the recent three years (2009 -2011) as a base and applying a growth rate 10.73%, the present (2012) unsatisfied demand for steel tubes is estimated at 56,773 tons.

2. Demand Projection

The demand for steel tubes is a derived demand, which depends directly on the performance of its major end-users (i.e. the construction sector and the office and household furniture manufacturing sub-sector). On the other hand, the performance of the construction sector and office and household furniture-manufacturing sub-sector is dependant on a number of interrelated variables. Therefore, the variables that are essential in determining the magnitude and trend of demand for steel tubes are:

- The overall economic development level and performance,
- The pattern and growth trend of the construction and furniture industry, and
- Size of population and its growth rate.

According to the GTP, during the period 2010/11 – 2014/15 the annual average planned targets of growth for the industrial sector is 20%. However, in order to be conservative a growth rate of 10% is considered to project the demand for steel tubes. Accordingly, based on the above assumptions the projected unsatisfied demand for steel tubes is shown in Table 3.2.

Table 3.2

PROJECTED UNSATISFIED DEMAND FOR STEEL TUBES (TONES)

Year	Projected Demand
2013	62,865
2014	69,611
2015	77,080
2016	85,351
2017	94,509
2018	104,650
2019	115,878
2020	128,312
2021	142,080
2022	157,325
2023	174,206
2024	192,899
2025	213,597

3. Pricing and Distribution

The current retail price of steel tubes is Birr 26/kg. Allowing a margin of 30% for distributors and retailers, the recommended factory gate price for the envisaged factory is Birr 20/kg.

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 PROGRAM

1. Plant Capacity

The maximum capacity of the plant in terms of line speed is 60 meters per minute. In terms of weight, production capacity reaches 3 tones per hour. Annual capacity would be 7,200 tones, based on single shift operation and 300 working days. The working days are set by deducting Sundays and public holidays in a year assuming maintenance works will be carried out during off-production hours.

2. Production Program

The plant will start operating at 60% of its installed capacity. From the second year of operation its capacity utilization will increases by 10% every year and reaches at 100% capacity in year 5 as shown in Table 3.3. The gradual capacity build up is envisaged considering the time required developing skill in operation and penetrating the market adequately.

Table 3.3

PRODUCTION PROGRAM

Year	Capacity Utilization	Production (Ton)
1	60%	4,320
2	70%	5,040
3	80%	5,760
4	90%	6,480
5	100%	7,200

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The raw material used is carbon steel coil, with internal and outer diameters of 630 mm and 1300 mm respectively, width of 65-345mm and thickness of 1-4mm. The unit cost of the coil is estimated to be Birr 13,147 per ton, of which about 85% will be in foreign currency. Annual requirement of steel coil at full capacity production would be 7,416 tons, and the corresponding cost is estimated at Birr 97,499,635 million.

B. UTILITIES

The total installed electric power of the plant is estimated to be 450kw. Annual consumption of electricity would be 810,000kwh (assuming 75% load factor). Annual bill would be Birr 468,018. The daily water requirement is 120 cubic meter. Water could be re-circulated after cooling. Assuming a circulation loss of 5%, the net annual water requirement would be 1,440 cubic meters, and the corresponding cost is Birr 14,400.

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The manufacture of welded tubes involves the continuous forming of steel sheet strip into an open seam tube, welding of the open seam edges with high frequency resistance heating and continuous pressure joining into welded tube, followed by reduction in tube diameter and then cutting into the desired length.

2. Environmental Impact Assessment

The envisaged project does not discharge or emit any pollutant to the environment and hence environmental friendly.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is estimated at Birr 11.902 million out of which Birr 9.92 million is required in foreign currency. The machinery and equipment required and the cost estimate are shown in Table 5.1.

Table 5.1

MACHINERY AND EQUIPMENT REQUIREMENTS AND COST

Sr. No.	Description	Qty.	Cost in '000 Birr		
			FC	LC	TC
1.	Slitting machine	1	1,672		1,672
2.	Entry equipment		326		326
	-Uncoiler	1			
	-Shearing machine	1			
	-Coil end joining fixture	1			
	-Hoop feeder	1			
	-Hoop exit guide roll	1			
3.	Tube Mill		3,586		3,586
	-Leveler	1			
	-Forming m/c	1			
	-Welding equipment	1			
	-Cooling system	1			
	-Sizing m/c	1			
	-Turks head	1			
4.	Cutting m/c	1	318	-	318
5.	D.C motor (125hp)	1	432	-	432
6.	Roll tooling	set	1,778	-	1,778
7.	Auxiliaries				
	-Jib crane (2T)	1	102	-	102
	-Compressor (15hp)	1	90	-	90
	-Maintenance workshop facilities	set	500	-	500
8.	Total Years spares	1	212	-	212
	Total FOB cost		-	-	-
	Freight and insurance		902	-	902
	CIF		-	-	-
	Inland Transport & other local costs			992	992
	Total landed cost		-	992	**992**
	Total		9918	1984	11902

2. Land, Building and Civil Works

The total land area required is 2,500 m^2. The total built-up area of the factory is estimated to be 15 meters by 105 meters or 1575 square meters. Building cost is estimated 7.87 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 665,000 of which 10% or Birr 66,500 will be paid in advance. The remaining Birr 598,500 will be paid in equal installments within 28 years i.e. Birr 21,375 annually.

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

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

To know land lease price, police and regulation of other regional state of the country updated information is available at Ethiopian Investment Agency's website www.eia.gov.et on the factor cost.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENTS

A. HUMAN RESOURCE REQUIREMENT

The total human resource requirement of the plant will be 24. Annual cost of labor is Birr 529,200. The human resource list and the labor costs are shown in Table 6.1.

B. TRAINING REQUIREMENT

All operators need basic training so that they can be acquainted to the operation. This can be done during the commissioning period of the plant. The cost of such training is estimated at Birr 150,000.

Table 6.1

HUMAN RESOURCE REQUIREMENT & LABOUR COST

Sr. No.	Job Position	Req. No.	Salary per Month	Salary per Year
	A. Administration			
1.	Manger	1	6,000	72,000
2.	Secretary	1	3,500	42,200
3.	Personnel	1	3,500	42,200
4.	Accountant	1	3,500	42,200
5.	Store keeper	1	1,500	18,000
6.	Cleaner/messenger	1	750	9,000
7.	Guard	2	1,500	18,000
	B. Production and maintenance			
1.	Engineer	1	4,500	54,000
2.	Supervisor	1	2,500	30,000
3.	Operators & Helpers	12	12,800	153,600
4.	Technicians	2	4,000	48,000
	Total	**24**	44,050	529,200

VII. FINANCIAL ANALYSIS

The financial analysis of the steel tubes 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 48.41 million (See Table 7.1). From the total investment cost the highest share (Birr 22.84 million or 47.18%) is accounted by initial working capital followed by fixed investment cost (Birr 21.69 million or 44.82%) and pre operation cost (Birr 3.87 million or 8.00%). From the total investment cost Birr 9.92 million or 20.49% 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	66.50		66.50	0.14
1.2	Building and civil work	7,875.00		7,875.00	16.27
1.3	Machinery and equipment	1,982.00	9,920.00	11,902.00	24.59
1.4	Vehicles	1,500.00		1,500.00	3.10
1.5	Office furniture and equipment	350.00		350.00	0.72
	Sub total	**11,773.50**	**9,920.00**	**21,693.50**	**44.82**
2	**Pre operating cost ***				
2.1	Pre operating cost	707.06		707.06	1.46
2.2	Interest during construction	3,166.73		3,166.73	6.54
	Sub total	**3,873.79**		**3,873.79**	**8.00**
3	**Working capital ****	**22,838.49**		**22,838.49**	**47.18**
	Grand Total	**38,485.79**	**9,920.00**	**48,405.79**	**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 32.73 million. However, only the initial working capital of Birr 22.83 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 106.37 million (see Table 7.2). The cost of raw material account for 92.18% of the production cost. The other major components of the production cost are financial cost, depreciation, direct labor, cost of marketing and distribution and utility, which account for 2.88%, 3.00%, 0.50%,0.33 and 0.46% respectively. The remaining 0.65% is the share of, repair and maintenance, labor overhead and administration cost. For detail production cost see Appendix 7.A.2.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY (year five)

Items	Cost (000 Birr)	%
Raw Material and Inputs	97,500	92.18
Utilities	482	0.46
Maintenance and repair	357	0.34
Labor direct	529	0.50
Labor overheads	132	0.12
Administration Costs	200	0.19
Land lease cost	0	0.00
Cost of marketing and distribution	350	0.33
Total Operating Costs	**99,550**	**94.12**
Depreciation	3,172	3.00
Cost of Finance	3,048	2.88
Total Production Cost	**106,371**	**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 6.91 million to Birr 10.69 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 102.60 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 48{,}384{,}000$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 22.01\%$$

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 22.61% 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 38.15 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 24 persons. The project will generate Birr 27.65 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 forward linkage with the construction and 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	17,062.50	21,937.50	24,375.00	24,375.00	24,375.00	24,375.00	24,375.00	24,375.00	24,375.00	24,375.00
Accounts receivable	5,815.83	7,469.17	8,295.83	8,295.83	8,297.61	8,297.61	8,297.61	8,297.61	8,297.61	8,297.61
Cash-in-hand	11.84	15.23	16.92	16.92	17.21	17.21	17.21	17.21	17.21	17.21
CURRENT ASSETS	**22,890.18**	**29,421.89**	**32,687.75**	**32,687.75**	**32,689.83**	**32,689.83**	**32,689.83**	**32,689.83**	**32,689.83**	**32,689.83**
Accounts payable	51.68	66.45	73.83	73.83	73.83	73.83	73.83	73.83	73.83	73.83
CURRENT LIABILITIES	**51.68**	**66.45**	**73.83**	**73.83**	**73.83**	**73.83**	**73.83**	**73.83**	**73.83**	**73.83**
TOTAL WORKING CAPITAL	**22,838.49**	**29,355.44**	**32,613.92**	**32,613.92**	**32,615.99**	**32,615.99**	**32,615.99**	**32,615.99**	**32,615.99**	**32,615.99**

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	68,250	87,750	97,500	97,500	97,500	97,500	97,500	97,500	97,500	97,500
Utilities	337	434	482	482	482	482	482	482	482	482
Maintenance and repair	250	321	357	357	357	357	357	357	357	357
Labour direct	370	476	529	529	529	529	529	529	529	529
Labour overheads	92	119	132	132	132	132	132	132	132	132
Administration Costs	140	180	200	200	200	200	200	200	200	200
Land lease cost	0	0	0	0	21	21	21	21	21	21
Cost of marketing and distribution	350	350	350	350	350	350	350	350	350	350
Total Operating Costs	**69,790**	**89,630**	**99,550**	**99,550**	**99,571**	**99,571**	**99,571**	**99,571**	**99,571**	**99,571**
Depreciation	3,172	3,172	3,172	3,172	3,172	350	350	350	350	350
Cost of Finance	0	3,483	3,048	2,613	2,177	1,742	1,306	871	435	0
Total Production Cost	**72,962**	**96,285**	**105,770**	**105,334**	**104,920**	**101,663**	**101,228**	**100,792**	**100,357**	**99,921**

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	80,640	103,680	115,200	115,200	115,200	115,200	115,200	115,200	115,200	115,200
Less variable costs	69,440	89,280	99,200	99,200	99,200	99,200	99,200	99,200	99,200	99,200
VARIABLE MARGIN	**11,200**	**14,400**	**16,000**	**16,000**	**16,000**	**16,000**	**16,000**	**16,000**	**16,000**	**16,000**
in % of sales revenue	13.89	13.89	13.89	13.89	13.89	13.89	13.89	13.89	13.89	13.89
Less fixed costs	3,522	3,522	3,522	3,522	3,543	721	721	721	721	721
OPERATIONAL MARGIN	**7,678**	**10,878**	**12,478**	**12,478**	**12,457**	**15,279**	**15,279**	**15,279**	**15,279**	**15,279**
in % of sales revenue	9.52	10.49	10.83	10.83	10.81	13.26	13.26	13.26	13.26	13.26
Financial costs		3,483	3,048	2,613	2,177	1,742	1,306	871	435	0
GROSS PROFIT	**7,678**	**7,395**	**9,430**	**9,866**	**10,280**	**13,537**	**13,972**	**14,408**	**14,843**	**15,279**
in % of sales revenue	9.52	7.13	8.19	8.56	8.92	11.75	12.13	12.51	12.88	13.26
Income (corporate) tax	0	0	0	2,960	3,084	4,061	4,192	4,322	4,453	4,584
NET PROFIT	**7,678**	**7,395**	**9,430**	**6,906**	**7,196**	**9,476**	**9,781**	**10,085**	**10,390**	**10,695**
in % of sales revenue	9.52	7.13	8.19	5.99	6.25	8.23	8.49	8.75	9.02	9.28

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	**22,401**	**106,697**	**103,695**	**115,207**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**40,574**
Inflow funds	22,401	26,057	15	7	0	0	0	0	0	0	0	0
Inflow operation	0	80,640	103,680	115,200	115,200	115,200	115,200	115,200	115,200	115,200	115,200	0
Other income	0	0	0	0	0	0	0	0	0	0	0	40,574
TOTAL CASH OUTFLOW	**22,401**	**95,847**	**103,999**	**110,218**	**109,477**	**109,189**	**109,728**	**109,424**	**109,119**	**108,814**	**104,155**	**0**
Increase in fixed assets	22,401	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	22,890	6,532	3,266	0	2	0	0	0	0	0	0
Operating costs	0	69,440	89,280	99,200	99,200	99,221	99,221	99,221	99,221	99,221	99,221	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income tax	0	0	0	0	2,960	3,084	4,061	4,192	4,322	4,453	4,584	0
Financial costs	0	3,167	3,483	3,048	2,613	2,177	1,742	1,306	871	435	0	0
Loan repayment	0	0	4,354	4,354	4,354	4,354	4,354	4,354	4,354	4,354	0	0
SURPLUS (DEFICIT)	**0**	**10,850**	**-305**	**4,989**	**5,723**	**6,011**	**5,472**	**5,776**	**6,081**	**6,386**	**11,045**	**40,574**
CUMULATIVE CASH BALANCE	**0**	**10,850**	**10,545**	**15,535**	**21,258**	**27,269**	**32,741**	**38,517**	**44,599**	**50,985**	**62,030**	**102,604**

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**	**80,640**	**103,680**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**115,200**	**40,574**
Inflow operation	0	80,640	103,680	115,200	115,200	115,200	115,200	115,200	115,200	115,200	115,200	0
Other income	0	0	0	0	0	0	0	0	0	0	0	40,574
TOTAL CASH OUTFLOW	**45,239**	**76,307**	**92,888**	**99,550**	**102,512**	**102,655**	**103,632**	**103,763**	**103,894**	**104,024**	**104,155**	**0**
Increase in fixed assets	22,401	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	22,838	6,517	3,258	0	2	0	0	0	0	0	0	0
Operating costs	0	69,440	89,280	99,200	99,200	99,221	99,221	99,221	99,221	99,221	99,221	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income (corporate) tax		0	0	0	2,960	3,084	4,061	4,192	4,322	4,453	4,584	0
NET CASH FLOW	**-45,239**	**4,333**	**10,792**	**15,650**	**12,688**	**12,545**	**11,568**	**11,437**	**11,306**	**11,176**	**11,045**	**40,574**
CUMULATIVE NET CASH FLOW	**-45,239**	**-40,906**	**-30,114**	**-14,464**	**-1,776**	**10,768**	**22,336**	**33,773**	**45,079**	**56,255**	**67,300**	**107,874**
Net present value	-45,239	3,939	8,919	11,758	8,666	7,789	6,530	5,869	5,274	4,740	4,258	15,643
Cumulative net present value	-45,239	-41,300	-32,381	-20,623	-11,957	-4,168	2,362	8,231	13,505	18,245	22,503	38,146

NET PRESENT VALUE	38,146
INTERNAL RATE OF RETURN	22.61%
NORMAL PAYBACK	5 years