PROFILE ON THE PRODUCTION OF METALLIC SANITARY FIXTURES

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I. SUMMARY

This profile envisages the establishment of a plant for the production of metallic sanitary fixtures with a capacity of 600 tons per annum. Metallic sanitary fixtures are fixtures used in bath rooms and kitchens to control the flow of water in the same way as plastic sanitary fixtures.

The country`s requirement of metallic sanitary fixtures is met through import. The present (2012) demand for metallic sanitary fixtures is estimated at 1,577 tons. The demand for the product is projected to reach 2,540 tons and 5,446 tons by the years 2017 and 2025, respectively.

The principal raw materials required are aluminum alloy ingots/scraps, brass ingots and scrapes, steel roads, seals and gasket and electroplating chemicals, which all have to be imported.

The total investment cost of the project including working capital is estimated at Birr 13.55 million. From the total investment cost the highest share (Birr 9.29 million or 68.56%) is accounted by fixed investment cost followed by initial working capital (Birr 2.93 million or 21.65%) and pre operation cost (Birr 1.32 million or 9.79%). From the total investment cost Birr 2.33 million or 17.19% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 32.24% and a net present value (NPV) of Birr 16.82 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 forward linkage with the construction sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Metallic sanitary fixtures are fixtures used in bath rooms and kitchens usually made from copper or alloys of copper like brass or sometimes from stainless steel or from plated cast iron that serve to control the flow of water in the same way as plastic sanitary fixtures. Metallic sanitary fixtures made from stainless steel are very durable, resistant to corrosion, able to

withstand shock and vibration and light in weight. Metallic sanitary fixtures being easy to clean & sterilize, they are commonly used on bedside toiletries near hospital beds for patients. They are also fixed on mobile houses and offices in kitchens and toiletries as they are able to withstand vibrations .This project mainly considers the fixtures made from cast brass and aluminum ingots.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement of metallic sanitary ware is supplied through import. The quantity of the product imported annually during the period 2002 - 2011 is presented in Table 3.1.

Table 3.1

IMPORT OF METALLIC SANITARY WARE (TON)

Year	Import
2002	244
2003	411
2004	926
2005	593
2006	1,005
2007	1,379
2008	1,438
2009	1,888
2010	1,538
2011	1,306

Source: *Ethiopian Revenue and Customs Authority.*

As can be seen from Table 3.1, import of metallic sanitary ware fluctuates from year to year. However, a general growth trend can be observed. The yearly average quantity imported during the period 2003-2005 was around 643 tons. But during the period 2006 - 2008 and 2009 - 2011 the average amount supplied to the market has increased to about 1,274tons and 1,577 tons, respectively.

In estimating the present demand for the product it is assumed that the recent three years average (2008 – 2011) is a reasonable approximate of current level of demand. Accordingly, current (2012) demand is estimated at about 1,577 tones.

2. Demand Forecast

The demand for metallic sanitary ware is directly related with the growth in the construction sector in general and the housing construction sub sector in particular which in turn depends on the overall economic development of the country.

The construction sector of the country has undergone tremendous changes and development in recent years. The contribution of the construction sector to the GDP during the period 2001 – 2010 have been growing at annual average growth rate of 13 percent which is above the average annual growth rate of real GDP during the period under consideration (11.4 %), indicating a rise in the share of the construction sector within the overall economy. Moreover, during the GTP period (2010 – 2015), the construction sector is expected to grow at annual average growth rate of 20%.

On the other hand among the factors that influence the demand for metallic sanitary ware one of the critical factor is identified to be economic growth leading to growth of the construction sector. According to the government's "Growth and Transformation Plan" during the period 2010 – 2015 the GDP of the country is expected to grow at a minimum average annual growth rate of 11.2%.

Accordingly, based on the above discussion and in order to be conservative a growth rate of 10% which is slightly lower than the expected growth rate of the country's GDP during the GTP period (2011 – 2015) is used.

Based on the above assumption and using the estimated present demand as a base the projected demand for wood screw and rivets is shown in Table 3.2.

Table 3.2

FORECASTED DEMAND (TONS)

Year	Projected Demand
2013	1,735
2014	1,909
2015	2,100
2016	2,310
2017	2,540
2018	2,795
2019	3,074
2020	3,381
2021	3,719
2022	4,091
2023	4,501
2024	4,951
2025	5,446

3. Pricing and Distribution

The prices of metallic sanitary ware vary according to the type. The average CIF price of the product in the recent two years (2010 and 2011) is Birr 25,125 per ton. Allowing 30% for import duty and other clearing expenses, the factory gate price of the envisaged plant is estimate at Birr 32,663 per ton.

Currently the product is distributed mainly through building materials shops. The envisage plant can also use the existing building materials shops or establish own distribution centers in major urban areas.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

By considering the market study and the available minimum economies of scale, a plant with a capacity to produce 600 tones of sanitary fixtures per annum on a single shift basis is selected.

2. Production Program

Considering the production process involved and the time required for technical skill development and market penetration the plant is assumed to reach at full capacity operation in the third year and then after. During the first and second years it will operate at 75% and 85% of its installed capacity (see Table 3.3).

Table 3.3

ANNUAL PRODUCTION PROGRAM

Type of product	Year 1	Year 2	Year 3
Sanitary fixtures(Ton)	450	510	600
Capacity %	75	85	100

IV. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The required raw materials for the production of metallic sanitary fixtures aluminum alloy ingots/scraps, brass ingots and scrapes, steel roads, seals and gasket and electroplating chemicals, which all have to be imported. The total cost of raw material is birr 12,088,000. The detail is listed on Table 4.1.

Table 4.1

ANNUAL RAW MATERIALS REQUIREMENT AND COST (in 000 Birr)

Sr. No.	Raw Materials	Annual input		Unit Cost		Total Cost
		Units	Quantity	F.C	L.C	Total
1	Aluminum alloy ingots/scraps	Tons	565	12	-	6,780
2	Brass ingots and scraps	Tons	32	60	-	1,920
3	Steel roads	Tons	10	25	-	250
4	Furnace oil	Mt.Cu.	300	14	-	720
5	Screws	Tons	o.6	1.0	-	0.6
6	Seals and Gaskets	Tons	1.0	2	-	2.0
7	Electroplating Chemicals	Kg.	4.0	100	-	400
	Total FOB	**-**	**-**	**10,073**	**-**	**10,073**
8	Duty, bank charge, inland transport etc (20% of FOB)	-	-	-	2,015	2,015
	Grand - Total			**10,073**	**2,015**	**12,088**

B. UTILITIES

Electricity and water are the major utilities required by the plant. Annual cost of utilities is estimated at Birr 72,456. The quantity required and corresponding cost at full capacity operation is in indicated in Table 4.2.

Table 4.2

ANNUAL UTILITY REQUIREMENTS AND COST

Sr. No.	Utility	Unit	Quantity	Cost (Birr)
1	Electricity	kWh.	100,000	57,956
2	Water	Meter cube	1,450	14,500
	Total			**72,456**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The brass castings are melted in the oil fired crucible furnace; they are molded in the permanent steel moulds to take the desired shapes of the products. The final products are machined on special purpose capstan and turning lathes. Thread is also formed on the proper parts of the fittings.

The handles and some parts of the fittings are also produced by the pressure die casting machine using aluminum ingots. The final shaped products are polished ready for electroplating. The plated products are assembled in each unit before packing.

2. Environmental Impact

The production process does not have an adverse negative impact on the environment. However the liquid discharge from the electroplating plant has to be treated before it is released to the municipal line. The smoke from the oil furnace is minimized by using efficient and well serviced chimney and burner in order not to discharge smoke in the neighborhood. The cost of effluent treatment system, chimney and burner is included in the cost of machinery and equipment. Moreover, the treating chemical for the discharge liquid is incorporated in the raw material cost.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is Birr 2,796,000 of which Birr 2,330,000 is required in foreign currency. The necessary machinery and equipment with their corresponding cost are given in Table 5.1.

Table 5.1

REQUIRED MACHINERY AND EQUIPMENT AND COST (in 000 Birr)

Sr. No.	Machine	Qty.	Unit Cost		Total cost
			F.C	L.C	
1	Hot chamber Pressure die casting machine	1	290		290
2	Oil fired Crucible Furnace	1	185		185
3	Capstan lathe	1	190		190
4	Pillar Drilling machine	2	90		90
5	Fly wheel Press	1	20		20
6	Turning Lathe	1	180		180
7	Pipe threading machine	2	60		60
8	Polishing and tumbling barrel	1	50		50
9	Pedestal Grinding, buffing m/c	3	15		15
10	Moulds for various models	4	400		400
11	Dies for washer& Gaskets	3	300		300
12	Electroplating Plant	1	250		250
13	Material handling Equipments	1	50		50
14	Effluent treatment system	**Set**	250		250
	Total FOB		**2,330**		**2,330**
15	Duty, bank charge, inland transport etc (20% of FOB)			466	466
	Grand - Total		**2,330**	**466**	**2,796**

2. Land, Building and Civil Work

The total area of the plant, including provision for open space, is 1,000 m^2 out of which 750 m^2 is a built-up area. Therefore, the cost of building at a rate of Birr 5,000 per m^2 is estimated at 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 ayment
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 within 28 years i.e. Birr 8,550 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 REQUIREMENT

A. HUMAN RESOURCE AND REQUIREMENT

The plant requires a total of 22 workers. Annual cost of labor, including employees benefit is estimated at Birr 591,450. The required human resource required by type of job as well as monthly and annual salary is given in Table 6.1.

Table 6.1

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	8	2,000	192,000
10	Assistant Operators	1	1,500	18,000
11	Quality controller	1	1,500	18,000
12	Laborers	2	800	16,200
Sub- Total		**13**	**-**	**274,200**
Total				**495,000**
Employee's Benefit (25% Of Basic Salary)		-	-	96,450

Grand Total	**22**	**-**	**591,450**

B. TRAINING REQUIREMENT

On the job training of the operators would be enough for workers with technical back ground. But for the production of specific item new demonstration would be required which can be done by the level of the foreman. For two weeks training Birr 20,000 is required.

VII. FINANCIAL ANALYSIS

The financial analysis of the metallic sanitary fixtures 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 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 11.87 million (see Table 7.1). From the total investment cost the highest share (Birr 9.29 million or 7.72%) is accounted by fixed investment cost followed by initial working capital (Birr 2.93 million or 24.71%) and pre operation cost (Birr 1.22 million or 10.25%). From the total investment cost Birr 2.33 million or 19.62% 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	0.22
1.2	Building and civil work	3,750.00		3,750.00	31.58
1.3	Machinery and equipment	466.00	2,330.00	2,796.00	23.55
1.4	Vehicles	900.00		900.00	7.58
1.5	Office furniture and equipment	250.00		250.00	2.11
	Sub total	**5,392.60**	**2,330.00**	**7,722.60**	**65.04**
2	**Pre operating cost ***				
2.1	Pre operating cost	439.80		439.80	3.70
2.2	Interest during construction	776.75		776.75	6.54
	Sub total	**1,216.55**		**1,216.55**	**10.25**
3	**Working capital ****	**2,934.02**		**2,934.02**	**24.71**
	Grand Total	**9,543.17**	**2,330.00**	**11,873.17**	**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 4.21 million. However, only the initial working capital of Birr 2.93 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 15.89 million (see Table 7.2). The cost of raw material account for 76.07% of the production cost. The other major components of the production cost are depreciation, financial cost, administration cost, and labor, and cost of marketing and distribution which account for 6.31%, 4.70%, 3.15%, 4.72%, and 3.11%, respectively. The remaining 1.94% is the share of utility, repair and maintenance, and labor overhead. 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	12,088	76.07
Utilities	72	0.46
Maintenance and repair	140	0.88
Labor direct	495	3.11
Labor overheads	96	0.61
Administration Costs	500	3.15
Land lease cost	0	0.00
Cost of marketing and distribution	750	4.72
Total Operating Costs	**14,142**	**88.99**
Depreciation	1,002	6.31
Cost of Finance	748	4.70
Total Production Cost	**15,891**	**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 2.67 million to Birr 3.69 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 35.71 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.

$$\text{Brake Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 8{,}230{,}320$$

$$\text{Brake Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 28.24\%$$

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 3 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 32.24% 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 16.82 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 9.90 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 sector and also generates income for the Government in terms of payroll tax.

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	2,115.40	2,719.80	3,022.00	3,022.00	3,022.00	3,022.00	3,022.00	3,022.00	3,022.00	3,022.00
Accounts receivable	843.68	1,066.88	1,178.48	1,178.48	1,179.19	1,179.19	1,179.19	1,179.19	1,179.19	1,179.19
Cash-in-hand	11.97	15.39	17.10	17.10	17.22	17.22	17.22	17.22	17.22	17.22
CURRENT ASSETS	**2,971.05**	**3,802.07**	**4,217.58**	**4,217.58**	**4,218.41**	**4,218.41**	**4,218.41**	**4,218.41**	**4,218.41**	**4,218.41**
Accounts payable	37.03	47.61	52.90	52.90	52.90	52.90	52.90	52.90	52.90	52.90
CURRENT LIABILITIES	**37.03**	**47.61**	**52.90**	**52.90**	**52.90**	**52.90**	**52.90**	**52.90**	**52.90**	**52.90**
TOTAL WORKING CAPITAL	**2,934.02**	**3,754.46**	**4,164.68**	**4,164.68**	**4,165.51**	**4,165.51**	**4,165.51**	**4,165.51**	**4,165.51**	**4,165.51**

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	8,462	10,879	12,088	12,088	12,088	12,088	12,088	12,088	12,088	12,088
Utilities	51	65	72	72	72	72	72	72	72	72
Maintenance and repair	98	126	140	140	140	140	140	140	140	140
Labour direct	347	446	495	495	495	495	495	495	495	495
Labour overheads	68	87	96	96	96	96	96	96	96	96
Administration Costs	350	450	500	500	500	500	500	500	500	500
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	**10,124**	**12,803**	**14,142**	**14,142**	**14,150**	**14,150**	**14,150**	**14,150**	**14,150**	**14,150**
Depreciation	1,002	1,002	1,002	1,002	1,002	175	175	175	175	175
Cost of Finance	0	854	748	641	534	427	320	214	107	0
Total Production Cost	**11,126**	**14,659**	**15,891**	**15,785**	**15,686**	**14,752**	**14,646**	**14,539**	**14,432**	**14,325**

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	13,717	17,636	19,596	19,596	19,596	19,596	19,596	19,596	19,596	19,596
Less variable costs	9,374	12,053	13,392	13,392	13,392	13,392	13,392	13,392	13,392	13,392
VARIABLE MARGIN	**4,343**	**5,583**	**6,204**	**6,204**	**6,204**	**6,204**	**6,204**	**6,204**	**6,204**	**6,204**
in % of sales revenue	31.66	31.66	31.66	31.66	31.66	31.66	31.66	31.66	31.66	31.66
Less fixed costs	1,752	1,752	1,752	1,752	1,761	934	934	934	934	934
OPERATIONAL MARGIN	**2,591**	**3,831**	**4,452**	**4,452**	**4,444**	**5,271**	**5,271**	**5,271**	**5,271**	**5,271**
in % of sales revenue	18.89	21.72	22.72	22.72	22.68	26.90	26.90	26.90	26.90	26.90
Financial costs		854	748	641	534	427	320	214	107	0
GROSS PROFIT	**2,591**	**2,977**	**3,705**	**3,811**	**3,910**	**4,844**	**4,950**	**5,057**	**5,164**	**5,271**
in % of sales revenue	18.89	16.88	18.90	19.45	19.95	24.72	25.26	25.81	26.35	26.90
Income (corporate) tax	0	0	0	1,143	1,173	1,453	1,485	1,517	1,549	1,581
NET PROFIT	**2,591**	**2,977**	**3,705**	**2,668**	**2,737**	**3,390**	**3,465**	**3,540**	**3,615**	**3,690**
in % of sales revenue	18.89	16.88	18.90	13.61	13.97	17.30	17.68	18.06	18.45	18.83

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	**8,162**	**17,465**	**17,647**	**19,601**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**7,219**
Inflow funds	8,162	3,748	11	5	0	0	0	0	0	0	0	0
Inflow operation	0	13,717	17,636	19,596	19,596	19,596	19,596	19,596	19,596	19,596	19,596	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,219
TOTAL CASH OUTFLOW	**8,162**	**13,872**	**15,556**	**16,373**	**16,994**	**16,926**	**17,099**	**17,024**	**16,949**	**16,874**	**15,731**	**0**
Increase in fixed assets	8,162	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	2,971	831	416	0	1	0	0	0	0	0	0
Operating costs	0	9,374	12,053	13,392	13,392	13,400	13,400	13,400	13,400	13,400	13,400	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	1,143	1,173	1,453	1,485	1,517	1,549	1,581	0
Financial costs	0	777	854	748	641	534	427	320	214	107	0	0
Loan repayment	0	0	1,068	1,068	1,068	1,068	1,068	1,068	1,068	1,068	0	0
SURPLUS (DEFICIT)	**0**	**3,593**	**2,091**	**3,228**	**2,602**	**2,670**	**2,497**	**2,572**	**2,647**	**2,722**	**3,865**	**7,219**
CUMULATIVE CASH BALANCE	**0**	**3,593**	**5,683**	**8,912**	**11,514**	**14,184**	**16,681**	**19,254**	**21,900**	**24,622**	**28,487**	**35,706**

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**	**13,717**	**17,636**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**19,596**	**7,219**
Inflow operation	0	13,717	17,636	19,596	19,596	19,596	19,596	19,596	19,596	19,596	19,596	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,219
TOTAL CASH OUTFLOW	**11,096**	**10,945**	**13,213**	**14,142**	**15,286**	**15,323**	**15,603**	**15,635**	**15,667**	**15,699**	**15,731**	**0**
Increase in fixed assets	8,162	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	2,934	820	410	0	1	0	0	0	0	0	0	0
Operating costs	0	9,374	12,053	13,392	13,392	13,400	13,400	13,400	13,400	13,400	13,400	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	1,143	1,173	1,453	1,485	1,517	1,549	1,581	0
NET CASH FLOW	**-11,096**	**2,772**	**4,423**	**5,454**	**4,310**	**4,273**	**3,993**	**3,961**	**3,929**	**3,897**	**3,865**	**7,219**
CUMULATIVE NET CASH FLOW	**-11,096**	**-8,324**	**-3,901**	**1,554**	**5,864**	**10,136**	**14,129**	**18,090**	**22,018**	**25,915**	**29,779**	**36,998**
Net present value	-11,096	2,520	3,656	4,098	2,944	2,653	2,254	2,032	1,833	1,653	1,490	2,783
Cumulative net present value	-11,096	-8,576	-4,921	-823	2,121	4,774	7,028	9,061	10,893	12,546	14,036	16,819

NET PRESENT VALUE	16,819
INTERNAL RATE OF RETURN	32.24%
NORMAL PAYBACK	3 years