163. PROFILE ON THE PRODUCTION OF CUTLERY (KNIVES, FORKS & SPOONS)

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I. SUMMARY

This profile envisages the establishment of a plant for the production of cutlery with a capacity of 120,000 sets per annum. Cutlery is any hand implement used in preparing, serving, and especially eating food.

The demand for cutlery is met through import and domestic production. The present (2012) demand for cutlery is estimated at 580,113 sets. The demand for cutlery is projected to reach 776,322 sets and 1,038,893 sets by the year 2017 and 2022, respectively.

The principal raw materials required are stainless steel, sterling silver, and base metal (such as a high-quality copper alloy) which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 15.86 million. From the total investment cost the highest share (Birr 11.91 million or 75.09%) is accounted by fixed investment cost followed by initial working capital (Birr 2.17 million or 13.73%) and pre operation cost (Birr 1.77 million or 11.18%). From the total investment cost Birr 4.75 million or 29.96% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 30.83% and a net present value (NPV) of Birr 16.74 million discounted at 10%.

The project can create employment for 62 persons. The project will generate Birr 7.66 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 materials manufacturing subsector and forward linkage with catering and hospitality subsector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Cutlery refers to any hand implement used in preparing, serving, and especially eating food. The major items of cutlery are the knife, fork and spoon.

Cutlery items are used in hotels and restaurants, and in households. Though there are various types of cutlery items the study has been based only on knives, forks and spoons.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Present Supply and Demand

The study has been based on the imported types of knives, forks and spoons. These items are imported from various countries. The imported quantity of the mentioned cutlery items is given in Table 3.1.

Table 3.1

IMPORT OF KNIVES, FORKS AND SPOONS (SETS)

Year	Quantity
2000	118,103
2001	183,462
2002	266,897
2003	261,970
2004	212,317
2005	334,287
2006	378,443
2007	514,435
2008	335,408
2009	402,030
2010	626,158
2011	598,298
Total	4,231,808
Average	352,650

Source: - *Ethiopian Revenues & Customs Authority.*

As could be seen from table3.1, the import data in general shows an increasing trend although there have been some fluctuations. During the period 2000-2003 the import data ranged from the

lowest 118,103 sets to the highest 266,897 sets with an average figure of 207, 608 sets. During 2004 – 2007 the import figure ranges from the lowest import quantity of 212,317 sets to the highest 514,435 sets with an average figure of 359,871 sets. After a decline in 2008 there was an increasing trend in resent years in general. During 2009 – 2011 the figure ranges from the lowest import quantity of 402,030 sets to the highest 626,158w sets with an average quantity of 542,162 sets.

In order to determine the present demand, the average of the last three years (542,162 sets) has been assumed to indicate the current demand.

The growth rate of the last five years of the period (7%) has also been taken. Accordingly, the present effective demand for 2012 for the indicated cutlery items has been estimated at 580,113 sets.

2. Demand Projection

The demand for knives, spoons and forks is related with factors like the growth of hotels and restaurants, growth of urban population, etc. Taking into consideration these combined factors, the demand for the products is assumed to grow at an annual growth rate of 6% as given in table 3.2 below.

Table 3.2

PROJECTED DEMAND OF CUTLERY ITEMS (SETS)

Year	Quantity
2013	614,920
2014	651815
2015	690,924
2016	732,379
2017	776,322
2018	822,901
2019	872,275
2020	924,612
2021	980,088
2022	1,038,893
2023	1,101,227

3. Pricing and Distribution

The price of the items under consideration varies depending on the type, size and country of origin of the items. According to the Trade statistics, the average CIF price in 2011 was about Birr 110 per set. Assuming 30% for import duty and other clearing expenses, the factory gate price for the plant to be established is estimated to be Birr 143 per set.

With regard to distribution the product can be sold to enterprises like the Household and Furniture Enterprise and also directly to hotels, restaurant and households.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

According to the market study, and the economic scale of knives, forks and spoons manufacturing, taking about 25% share of the year 2014 the rated capacity of the plant is proposed to be 120,000 sets per annum.

The selected production capacity is based on 300 working days per annum, 3 shifts of eight hours each per day. The rest of calendar days are left for cleaning and maintenance.

2. Production Program

The production program is based on the time required for the adjustment of feedstock, labour and equipment to the technology selected. Accordingly capacity utilization is set as follows:

-70% of plant capacity during the 1st year;
-85% of plant capacity during the 2nd year; and
-100% of plant capacity during the 3rd year.

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The raw material of silverware is stainless steel, sterling silver, or, in the case of silver-plate, a base metal (such as a high-quality copper alloy) over which a layer of silver is electrically deposited.

Stainless steel is a combination of steel, chrome and nickel. The finest grade of metal used in producing quality lines is 18/8 stainless steel. This means that it contains 18 percent chrome, 8 percent nickel. Stainless steel is very popular because of its easy care, durability, and low price.

Table 4.1

ANNUAL CONSUMPTION OF RAW & AUXILIARY MATERIALS AND COST

Sr. No.	Description	Unit of Measure	Annual Con's	Cost in '000 Birr		
				FC	LC	TC
1.	Stainless steel	Tons	2,324	7,360	1,464	8,824
5.	HCI	Lt.	1,500	9	2	11
6.	Ammonium chloride	Tons	204	44	9	53
7.	Packing material			-	64	64
	Total			7,413	1,539	8,952

B. UTILITIES

Industrial water of 200 m^3 and electric power of 15,000 kWh are consumed in this plant per annum. The total cost of utilities is estimated to be Birr 8,667. Details of which are shown in Table 4.2.

Table 4.2

ANNUAL REQUIREMENT OF UTILITIES AND COST

Sr. No.	Description	Qty.	Unit Price (Birr)	Cost ('000 Birr)
1	Electricity (kWh)	15,000	0.5778	8.667
2	Water (m^3)	200	10.0	2.000
	Grand total			**10.667**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

Manufacturing of cutlery passes through the following steps.

Blanking

Production begins with rectangular, flat blanks of stainless steel, sterling silver, or in the case of plated flatware, an alloy. Large rolls are stamped in individual blanks, which are flat pieces, roughly the same shape as the piece to be produced

Rolling

Through a series of rolling operations, these blanks are graded or rolled to the correct thickness and shapes required by the manufacturer's flatware patterns. First the blanks are rolled crosswise from left to right, right to left, and lengthwise, then trimmed to outline. Each spoon, for instance, must be thick at the base of the handle to resist bending. This gives graded pieces the right balance and a good feel in the hand. Each piece is now in the form of a cleanly finished shape in the rough dimension of the utensil.

Annealing

Between operations, the blanks must pass through annealing ovens to soften the metal for further machine operations. The annealing, done under great heat, must be very accurately controlled so the final piece will be resistant to bending and to nicks and dents when in use. The last annealing is the most

Cutting to outline

The rolled blanks are placed in the cutout press by an operator, to remove the excess metal and to fashion the shape of the piece. This process is similar to cutting shapes from rolled dough. The shape of the piece is cut out of the metal and the excess metal is remelted and transformed back into sheets of metal to be used again. This trimming must ensure an accurate fit of the pieces into the dies when the design is applied.

Forming the pattern

The next step is the forming of the pattern. Each pattern has its own hardened steel dies—two dies for each piece, one with the pattern for the front of the piece, and the other with the pattern for the back of the piece. These are carefully set in the hammers by die setters. The operator quickly places a piece in place under the drop hammer, which descends with a hydraulic pressure of 200 tons. (The bases of the drop hammers are bedded in 160 cubic yards of cement.) The metal is squeezed into every tiny detail of the ornamentation in the die, embossing the pattern on the piece. The blow of the hammer hardens the piece for use in the home. Surplus metal around the outline of the piece is then removed by clipping presses.

Special steps — knife, spoon, and fork

Special steps are necessary for the creation of knives, spoons, forks, and hollowware pieces. To make the hollow handle for the knife, after two strips of metal are formed to shape, they are then soldered together, buffed and polished until the seam is no longer visible.

With the spoon, after the pattern has been embossed upon the front and back of the handle, the next step is the forming of the bowl. The forming is done again under the same powerful drop hammers from accurate steel dies. Each bowl requires two hammer blows. Surplus metal around

the outline of the spoon is removed by clipping presses. A small burr still remains to be removed at a later operation.

The forming of fork tines is a similar process to that of the forming of the spoon's bowl, but the operation takes place before the pattern is applied to the handle. After a fork is cut to outline, it is pierced and tined: the tines are pieced out, and the small piece of metal that holds the tip of the tines together is removed in another operation after the pattern has been applied.

Silver plating

For the silver-plated pieces, the electroplating process is an additional step. The pieces are first prepared by being buffed so that the edges are smooth and the surfaces are free from small holes. When the buffing is completed, the pieces are given a thorough cleaning with as many as 12 different chemical solutions. Finally, they undergo electrolysis, in which a layer of silver is electrically deposited over the base metal.

Buffing and sand polishing

The knives, forks and spoons are now buffed, and then polished. Depending on the pattern, special finishing processes can give silver-plated and sterling silver pieces a bright, mirror-like finish, a soft, satiny glow, or a brushed or mirror finish.

Quality Control

Final inspection checks the pieces for chafes, scratches, rough spots between a fork's tines, discoloration, or any other flaws that might have occurred when the pieces were stamped, shaped and polished.

2. Environmental Impact

The production processes involved are blanking, rolling, annealing, plating, buffing and sand polishing which do not have any negative impact on the environment.

B. ENGINEERING

1. Machinery and Equipment

The list of machinery and equipment required for the manufacture of nails is given in Table 5.1. Total cost of machinery and equipment is estimated at Birr 5.713 million, out of which Birr 4.755 million is required in foreign currency.

Table 5.1

MACHINERY AND EQUIPMENT REQUIREMENTS AND COST

Sr. No.	Description	Qty.	Cost in '000 Birr		
			FC	LC	TC
1.	Presses	2	1,200	240	1,440
2.	Rolling equipment	4 series	1657.47	331.494	1,989
3.	Annealing furnaces	4 points	500	100	600
4.	Accessories	4 set	246	49	295
5.	Drop hammer presses	1 pc	600	120	720
6.	Galvanizing equipment	1	372	74	446
7.	Compressor	1	98	20	118
8.	Surface grinder	1	81	16	97
9.	Hard pallet truck	1	-	7	7
	Total		**4,755**	**958**	**5,713**

2. Land, Building and Civil Works

Land is required to accommodate plant building, management offices, social building for workers, stores, internal roads, adequate space for expansion and other industry related activities. The total land area for the envisaged plant is estimated at 2,000 m^2. The built-up area is estimated at 1,000 m^2. At building rate of Birr 5,000 per m^2 the cost of building and civil works will be Birr 5 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 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 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 REQUIREMENTS

A. HUMAN RESOURCE REQUIREMENT

Total human resource requirement, including skilled and unskilled labour is 62 persons. Correspondingly, total annual labour cost, including fringe benefits, is estimated at Birr 1,224,000. Table 6.1 below shows the list of human resource required and the estimated annual labour costs.

Table 6.1
HUMAN RESOURCE REQUIREMENT & COST

S.N	Job Position	Qty	Salary /month	Salary/ Year
	A. Production			
1.	Manger	1	5,000	60,000
2.	Production and maintenance supervisor	3	10,500	126,000
3.	Production clerk	1	850	10,200
4.	Operator	36	43,200	518,400
5.	Mechanic	6	7,800	93,600
6.	Labour	6	4,500	54,000
	B. Others			
1.	Stores, Finance ,administration	1	2,500	30,000
2.	and sales head			
3.	Salesman	1	1,200	14,400
4.	Secretary	1	1,200	14,400
5.	Cashier/ clerk	1	1,200	14,400
6.	Store clerk	1	950	11,400
7.	Security guard	2	1,000	12,000
8.	Messenger/ cleaner	1	450	5,400
9.	Driver	1	1,250	15,000
	Total	**62**	**81,600**	**1,224,000**

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.

VII. FINANCIAL ANALYSIS

The financial analysis of the cutlery (knives, forks & spoons) 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 15.86 million (See Table 7.1). From the total investment cost the highest share (Birr 11.91 million or 75.09%) is accounted by fixed investment cost followed by initial working capital (Birr 2.17 million or 13.73%) and pre operation cost (Birr 1.77 million or 11.18%). From the total investment cost Birr 4.75 million or 29.96% 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	0.34
1.2	Building and civil work	5,000.00		5,000.00	31.51
1.3	Machinery and equipment	958.00	4,755.00	5,713.00	36.00
1.4	Vehicles	900.00		900.00	5.67
1.5	Office furniture and equipment	250.00		250.00	1.58
	Sub total	**7,161.20**	**4,755.00**	**11,916.20**	**75.09**
2	**Pre operating cost ***				
2.1	Pre operating cost	735.65		735.65	4.64
2.2	Interest during construction	1,038.21		1,038.21	6.54
	Sub total	**1,773.86**		**1,773.86**	**11.18**
3	**Working capital ****	**2,179.71**		**2,179.71**	**13.73**
	Grand Total	**11,114.77**	**4,755.00**	**15,869.77**	**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 3.09 million. However, only the initial working capital of Birr 2.17 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 14.02 million (see Table 7.2). The cost of raw material account for 62.29% of the production cost. The other major components of the production cost are depreciation, direct labor and financial cost, which account for 12.09%, 8.73% and 6.11% respectively. The remaining 9.22% is the share of utility, repair and maintenance, labor overhead, cost of marketing and distribution 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	8,953.00	63.86
Utilities	11.00	0.08
Maintenance and repair	286.00	2.04
Labour direct	1,224.00	8.73
Labour overheads	245.00	1.75
Administration Costs	250.00	1.78
Land lease cost	-	-
Cost of marketing and distribution	500.00	3.57
Total Operating Costs	**11,469.00**	**81.80**
Depreciation	1,694.73	12.09
Cost of Finance	856.52	6.11
Total Production Cost	**14,020.25**	**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 2.13 million to Birr 3.81 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 36.55 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 6{,}083{,}277$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 35\%$$

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 30.83% 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 16.74 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 62 persons. The project will generate Birr 9.66 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 materials manufacturing subsector and forward linkage with catering and hospitality subsector and generate 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	1,566.78	1,790.60	2,014.43	2,238.25	2,238.25	2,238.25	2,238.25	2,238.25	2,238.25	2,238.25
Accounts receivable	681.53	772.93	864.34	955.75	957.18	957.18	957.18	957.18	957.18	957.18
Cash-in-hand	19.49	22.28	25.06	27.85	28.08	28.08	28.08	28.08	28.08	28.08
CURRENT ASSETS	**2,267.79**	**2,585.81**	**2,903.83**	**3,221.85**	**3,223.51**	**3,223.51**	**3,223.51**	**3,223.51**	**3,223.51**	**3,223.51**
Accounts payable	88.08	100.67	113.25	125.83	125.83	125.83	125.83	125.83	125.83	125.83
CURRENT LIABILITIES	**88.08**	**100.67**	**113.25**	**125.83**	**125.83**	**125.83**	**125.83**	**125.83**	**125.83**	**125.83**
TOTAL WORKING CAPITAL	**2,179.71**	**2,485.14**	**2,790.58**	**3,096.01**	**3,097.68**	**3,097.68**	**3,097.68**	**3,097.68**	**3,097.68**	**3,097.68**

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	6,267	7,162	8,058	8,953	8,953	8,953	8,953	8,953	8,953	8,953
Utilities	8	9	10	11	11	11	11	11	11	11
Maintenance and repair	200	229	257	286	286	286	286	286	286	286
Labour direct	857	979	1,102	1,224	1,224	1,224	1,224	1,224	1,224	1,224
Labour overheads	172	196	221	245	245	245	245	245	245	245
Administration Costs	175	200	225	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	17	17	17	17	17	17
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	**8,178**	**9,275**	**10,372**	**11,469**	**11,486**	**11,486**	**11,486**	**11,486**	**11,486**	**11,486**
Depreciation	1,695	1,695	1,695	1,695	1,695	225	225	225	225	225
Cost of Finance	0	1,142	999	857	714	571	428	286	143	0
Total Production Cost	**9,873**	**12,112**	**13,066**	**14,020**	**13,895**	**12,282**	**12,139**	**11,997**	**11,854**	**11,711**

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	12,012	15,444	17,160	17,160	17,160	17,160	17,160	17,160	17,160	17,160
Less variable costs	7,678	8,775	9,872	10,969	10,969	10,969	10,969	10,969	10,969	10,969
VARIABLE MARGIN	**4,334**	**6,669**	**7,288**	**6,191**	**6,191**	**6,191**	**6,191**	**6,191**	**6,191**	**6,191**
in % of sales revenue	36.08	43.18	42.47	36.08	36.08	36.08	36.08	36.08	36.08	36.08
Less fixed costs	2,195	2,195	2,195	2,195	2,212	742	742	742	742	742
OPERATIONAL MARGIN	**2,139**	**4,474**	**5,093**	**3,996**	**3,979**	**5,449**	**5,449**	**5,449**	**5,449**	**5,449**
in % of sales revenue	17.81	28.97	29.68	23.29	23.19	31.75	31.75	31.75	31.75	31.75
Financial costs		1,142	999	857	714	571	428	286	143	0
GROSS PROFIT	**2,139**	**3,332**	**4,094**	**3,140**	**3,265**	**4,878**	**5,021**	**5,163**	**5,306**	**5,449**
in % of sales revenue	17.81	21.57	23.86	18.30	19.03	28.43	29.26	30.09	30.92	31.75
Income (corporate) tax	0	0	0	942	980	1,463	1,506	1,549	1,592	1,635
NET PROFIT	**2,139**	**3,332**	**4,094**	**2,198**	**2,286**	**3,415**	**3,514**	**3,614**	**3,714**	**3,814**
in % of sales revenue	17.81	21.57	23.86	12.81	13.32	19.90	20.48	21.06	21.65	22.23

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	**12,652**	**15,318**	**15,457**	**17,173**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**7,189**
Inflow funds	12,652	3,306	13	13	0	0	0	0	0	0	0	0
Inflow operation	0	12,012	15,444	17,160	17,160	17,160	17,160	17,160	17,160	17,160	17,160	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,189
TOTAL CASH OUTFLOW	**12,652**	**11,484**	**12,163**	**13,117**	**15,013**	**14,609**	**14,948**	**14,848**	**14,748**	**14,648**	**13,121**	**0**
Increase in fixed assets	12,652	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	2,268	318	318	318	2	0	0	0	0	0	0
Operating costs	0	7,678	8,775	9,872	10,969	10,986	10,986	10,986	10,986	10,986	10,986	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	942	980	1,463	1,506	1,549	1,592	1,635	0
Financial costs	0	1,038	1,142	999	857	714	571	428	286	143	0	0
Loan repayment	0	0	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	0	0
SURPLUS (DEFICIT)	**0**	**3,834**	**3,294**	**4,056**	**2,147**	**2,551**	**2,212**	**2,312**	**2,412**	**2,512**	**4,039**	**7,189**
CUMULATIVE CASH BALANCE	**0**	**3,834**	**7,127**	**11,183**	**13,330**	**15,881**	**18,093**	**20,405**	**22,817**	**25,329**	**29,368**	**36,557**

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**	**12,012**	**15,444**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**17,160**	**7,189**
Inflow operation	0	12,012	15,444	17,160	17,160	17,160	17,160	17,160	17,160	17,160	17,160	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,189
TOTAL CASH OUTFLOW	**14,832**	**8,484**	**9,581**	**10,678**	**12,413**	**12,466**	**12,949**	**12,992**	**13,035**	**13,078**	**13,121**	**0**
Increase in fixed assets	12,652	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	2,180	305	305	305	2	0	0	0	0	0	0	0
Operating costs	0	7,678	8,775	9,872	10,969	10,986	10,986	10,986	10,986	10,986	10,986	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	942	980	1,463	1,506	1,549	1,592	1,635	0
NET CASH FLOW	**-14,832**	**3,528**	**5,863**	**6,482**	**4,747**	**4,694**	**4,211**	**4,168**	**4,125**	**4,082**	**4,039**	**7,189**
CUMULATIVE NET CASH FLOW	**-14,832**	**-11,303**	**-5,440**	**1,043**	**5,790**	**10,484**	**14,695**	**18,862**	**22,987**	**27,069**	**31,109**	**38,298**
Net present value	-14,832	3,208	4,846	4,870	3,243	2,915	2,377	2,139	1,924	1,731	1,557	2,772
Cumulative net present value	-14,832	-11,624	-6,778	-1,908	1,335	4,249	6,626	8,765	10,689	12,420	13,978	16,749

NET PRESENT VALUE	16,749
INTERNAL RATE OF RETURN	30.83%
NORMAL PAYBACK	3 years