89. PROFILE ON THE PRODUCTION OF SWITCHES, PLUGS, SOCKETS, PUSH BUTTONS AND LAMP SHED

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I. SUMMARY

This profile envisages the establishment of a plant for the production of switches, plugs, sockets, push buttons and lamp sheds with a capacity of 3 million pieces of per annum. Switches, plugs, sockets, push buttons and lamp shed are electrical devices used to connect electrical operated equipments to electrical power.

Since there are no local producers of switches, plugs, sockets, push buttons and lamp sheds the demand for the products is entirely met through import. The present (2012) demand for the products is estimated at 2,086 tones per annum. The demand is projected to reach 4,472 tones and 7,201 tones by the year 2020 and year 2025, respectively.

The major raw materials required by the project are thermosetting plastics and electroplated metal which have to be imported from abroad.

The total investment cost of the project including working capital is estimated at Birr 49.75 million. From the total investment cost, the highest share (Birr 40.12 million or 80.64%) is accounted by fixed investment cost followed by initial working capital (Birr 5.41 million or 10.89%) and pre operation cost (Birr 4.12 million or 8.47%). From the total investment cost, Birr 25.17 million or 50.58% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 24.59% and a net present value (NPV) of Birr 36.54 million, discounted at 10%.

The project can create employment opportunities for 78 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 by supplying the inputs required by the sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Switches, plugs, sockets, push buttons and lamp shed are electrical devices used to connect electrical operated equipments to electrical power. After electrical wiring system installation is performed there should be outlets for different electrical equipments and appliances. These outlets should transfer the electric power to the equipments safely with simple plugging. Plugs and sockets cover the electrical wires from direct contact and give slots and protruding for easy connection.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Switches, plugs, sockets and lamp sheds are electrical devices used to connect electrical operated equipments to electrical power in buildings. As there is no local manufacturer of the products the demand for switches, plugs, sockets and lamp sheds is supplied through import. The amount of imports during the period 2002 -2011 is shown in Table 3.1.

Table 3.1

IMPORT OF SWITCHES, PLUGS, SOCKETS AND LAMP SHEDS (TONS)

Year	Import
2002	221
2003	631
2004	609
2005	601
2006	854
2007	1,442
2008	1,838
2009	1,925
2010	1,806
2011	1,665

Source: *- Ethiopian Revenues & Customs Authority.*

As can be seen from the Table 3.1, import of switches, plugs, sockets and lamp sheds shows a substantial growth though fluctuates slightly from year to year. The growth can be clearly seen when the data is arranged in three years interval.

During the period 2003 – 2005, the average import or apparent consumption of the products was 614 tons which has increased to an average of 1,378 tons during the subsequent three years (2006 – 2008). Moreover, during the period 2009 – 2011 the average apparent consumption has further increased to 1,799 tons. Thus, during the period 2006-2008 as compared to 2003 – 2005 import has increased by 124.54% and during the period 2009 – 2011 import has increased by 30.52% compared to the period 2006 – 2008.

During the period under reference (2002--2011), excluding year 2002, where import was exceptionally low, apparent consumption of the products has registered an annual average growth rate of 16%.

To estimate the present (2012) effective demand for the products the average of the most recent three years (2009 – 2011) is assumed to reflect the effective demand for year 2011. Moreover, the past growth trend in the apparent consumption of the product (16%) is assumed to continue at least in the near future. Accordingly, taking the average import of 2009 – 2011 as a base and applying 16% growth rate, the present effective demand for the products is estimated at 2,086 tones.

2. Demand Projection

The demand for switches, plugs, sockets and lamp sheds 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 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.

According to the GTP, during the period 2010/11 – 2014/15 the real GDP of the country (at a base case scenario) is expected to grow at an average annual growth rate of 11.2%. Moreover, during the same period the annual average planned targets of growth for the construction sector is 20%.

Accordingly, by considering the above factors the demand for switches, plugs, sockets and lamp sheds is conservatively assumed to grow at a rate of 10%. Projected demand is presented in Table 3.2.

Table 3.2

PROJECTED DEMAND (TONS)

Year	Projected Demand
2013	2,295
2014	2,524
2015	2,776
2016	3,054
2017	3,360
2018	3,695
2019	4,065
2020	4,472
2021	4,919
2022	5,411
2023	5,952
2024	6,547
2025	7,201

3. Pricing and Distribution

The sales price of switches, plugs, sockets and lamp shed varies according to capacity and design. For the purpose of financial analyses an average price of Birr 14 per pieces is adopted. The products can be distributed through the existing building material shops or by establishing own distribution centers at strategic locations.

B. PLANT CAPACITY AND PRODUCION PROGRAM

1. Plant Capacity

Considering the projection of the product demand from the market study, implementation period, and economic scale of production the capacity of the plant is set to be 3,000,000 pieces of those electrical items per year. And the envisaged plant will operate in two shifts eight hours per day for three hundred days within a year considering 13 holidays and 52 Sunday per year and assuming that maintenance activities will be performed during off hours and Sunday.

2. Production Program

The envisaged manufacturing plant will achieve its full production capacity in three years. The plant will start to operate at 70% of its capacity during the first year of operation. During the second and third year and then after it will operate at 85% and 100%, respectively. The details of capacity utilization and production program are shown in Table 3.3.

Table 3.3

PRODUCTION PROGRAM

Description	Production Year		
	1	2	3
Capacity utilization rate (%)	70	85	100
Production (pieces **)**	2,100,000	2,550,000	3,000,000

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw material for the manufacture of the electrical items mentioned are thermosetting plastics and electroplated metal and auxiliary raw materials such as nickel dip, zinc dip, degreasing mixtures and cleaning chemicals; all to be imported from abroad.

The raw material combination will vary depending on the type of electrical item to be produced. Annual cost of raw materials at full capacity operation is estimated at Birr 22.66 million. The description, annual requirement of those raw materials and their related cost is shown in Table 4.1.

Table 4.1

ANNUAL RAW MATERIAL REQUIREMENT & COST

Sr. No.	Description	Annual Consumption	UOM	Unit Cost (Birr/Ton)	Total Cost (`000 Birr)		
					LC	FC	Total (Birr)
1	Injection grade resin	90.0	ton	61,200	-	5,508.00	5,508.00
2	Sheet metal	3.0	ton	18,000	-	54.00	54.00
3	Nickel dip	18.0	ton	36,000	-	648.00	648.00
4	Zinc dip	13.5	ton	684,000	-	9,234.00	9,234.00
5	Decreasing mixtures	7.2	liter	270,000	-	1,944.00	1,944.00
6	Cleaning chemicals	7.0	liter	324,000	-	2,268.00	2,268.00
7	Screw	1.5	tone	32,400	-	48.60	48.60
Total FOB							**19,704.60**
4	Insurance, import duty, port handling cost, in land transport etc (15%)				2,955.69	-	2,955.69
Total Annual Cost					**2,955.69**	**19,704.60**	**22,660.29**

B. UTILITES

The major utilities required by the plant are electricity and water. Annual cost of utilities at full capacity operation is Birr 618 thousand. The annual consumption and the related cost are shown in Table 4.2.

Table 4.2

ANNUAL UTILITIES CONSUMPTION & COST

Sr. No.	Description	Annual Consumption	UOM	Unit Cost (Birr)	Cost (`000 Birr)
1	Electricity	925,000	kw	0.58	536.5
2	Water	8,150	m^3	10	81.5
Total Annual Cost					**618**

V. TECHNOLOGY AND ENGINNERING

A. TECHNOLOGY

1. Production Process

The production of those electrical items involves manufacturing process such as forming, machining stage, galvanizing stage, insulation and assembly are describes as follows:

- **Forming and Machining**

Here, the sheet metal components of the electrical items will undergo metal forming operations such as bending, piercing, blanking, machining and cutting to the desired shape and size as per the design specification using either mechanical, pneumatic, or hydraulic press machine.

- **Electro Plating**

After the desired shape and size of the sheet metal components are obtained, they will undergo to electroplating process in electroplating bath where either zinc or nickel will be platted over their surface to avoid rusting and to give good surface finish that lasts for long time.

- **Insulation**

In this step the electroplated metal components will be partially insulated with thermosetting plastic material and also the plastic components will be produced by with plastic injection machine as per the design requirement

- **Assembly and Finishing**

Here, the metal and plastic components of the electrical items will be assembled to produce the specific electrical item such as switch, sockets, and lamp shades And the electrical wire /conductor for sockets and lamp shade will be supplied as one raw material since the production of the conductor is by itself a large investment, so, the envisaged plant will create an integration with other industries

2. Environmental Impact Assessment

The production of switches, plugs, sockets, push buttons and lamp shed does not have an adverse environmental impact.

B. ENGINNERING

1. Machinery and Equipment

The list production and auxiliary machineries, machine tools and equipments with their associated cost required for the envisaged plant is shown in Table 5.1.

Table 5.1

MACHINERY AND EQUIPMENT REQUIREMENT & COST

Sr. No.	Description	Qty.	Unit Cost (Birr)	Total Cost (`000 Birr)		
				LC	FC	Total (Birr)
1	Hydraulic press	4	976,500	-	3,906.00	3,906.00
2	Shearing machine	4	1,134,000	-	4,536.00	4,536.00
3	Automatic eccentric press	2	441,000	-	882.00	882.00
4	C frame eccentric press	3	567,000	-	1,701.00	1,701.00
5	Injection molding machine	2	1,890,000	-	3,780.00	3,780.00
6	Milling machine	1	1,260,000	-	1,260.00	1,260.00
7	Surface grinder	1	2,205,000	-	2,205.00	2,205.00
8	Air compressor	1	630,000	-	630.00	630.00
9	Bench lathe	3	157,500	-	472.50	472.50
10	Tempering furnace	1	315,000	-	315.00	315.00
12	Electroplating device	2	850,500	-	1,701.00	1,701.00
13	Bench drill	1	630,000	-	630.00	630.00
14	Bench tap	3	126,000	-	378.00	378.00
15	Lathe	1	1,575,000	-	1,575.00	1,575.00
16	Spare parts and tools (5%)				1,198.58	1,198.58
Total Fob Price					**25,170.08**	**25,170.08**
11	Insurance, import duty, port handling cost, in land transport etc (15%)			3,775.5	-	3,775.51
Grand Total Cost				**3,775.5**	**25,170.08**	**28,945.59**

2. Land, Building and Civil Works

The total area of the project is 3,000 m^2, out of which 2,000 m^2 is a built-up area. The remaining area will be open for various logistic activities The production and administration offices will be constructed with in the factory build up area and the view could be arranged in such a way that the control will be in nearby offices. The total cost of building and civil work at the rate of Birr 5,000 per m^2 is estimated at Birr 10,000,000.

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 798,000 of which 10% or Birr 79,800 will be paid in advance. The remaining Birr 718,200 will be paid in equal installments with in 28 years i.e. Birr 25,650 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENTS

A. HUMAN RESOURCE REQUIREMENT

The total human resource of the project is 78 and the annual cost is estimated at Birr 1,477,440. The list of direct and indirect labor requirement and their monthly and annual cost is shown in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND LABOR COST

Sr. No.	Description	Reqd. No.	Monthly Salary (Birr)	Annual salary (`000 Birr)
1	Plant manager	1	8,000.00	96.0
2	Secretary	3	2,500.00	90.0
3	Administration and finance head	1	4,500.00	54.0
4	personnel	1	3,000.00	36.0
5	Accountant	1	2,500.00	30.0
6	Production head	1	3,000.00	36.0
7	Mechanic	2	1,600.00	38.4
8	Electrician	2	1,600.00	38.4
9	Sales Man	1	2,000.00	24.0
10	Production Foreman	2	2,000.00	48.0
11	Operators	37	1,200.00	532.8
12	Laborers	20	600.00	144.0
13	Store Keeper	1	1,200.00	14.4
14	Time Keeper	1	800.00	9.6
15	Cashier	1	1,500.00	18.0
16	Guards	3	600.00	21.6
Sub-total		**78**	**36,600.00**	**1,231.2**
17	Employment Benefits And Allowances 20%		7,320.00	246.2
Total Annual Labor Cost (Direct +Indirect)				**1,477.4**

B. TRAINING REQUIREMENT

Since it is a simple manufacturing process individual operators will be trained during machinery erection and commissioning so that the operators and mechanics will be hired two months before the project implementation. The total cost of training is included in the cost of machinery and equipment.

VII. FINANCIAL ANALYSIS

The financial analysis of the switches, plugs, sockets, push buttons and lamp shed 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 49.75 million (see Table 7.1). From the total investment cost, the highest share (Birr 40.12 million or 80.64%) is accounted by fixed investment cost followed by initial working capital (Birr 5.41 million or 10.89%) and pre operation cost (Birr 4.12 million or 8.47%). From the total investment cost, Birr 25.17 million or 50.58% 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	79.80		79.80	0.16
1.2	Building and civil work	10,000.00		10,000.00	20.10
1.3	Machinery and equipment	3,775.50	25,170.08	28,945.58	58.17
1.4	Vehicles	900.00		900.00	1.81
1.5	Office furniture and equipment	200.00		200.00	0.40
	Sub -total	**14,955.30**	**25,170.08**	**40,125.38**	**80.64**
2	**Pre operating cost ***				
2.1	Pre operating cost	960.00		960.00	1.93
2.2	Interest during construction	3,255.10		3,255.10	6.54
	Sub- total	**4,215.10**		**4,215.10**	**8.47**
3	**Working capital**	**5,416.11**		**5,416.11**	**10.89**
	Grand Total	**24,586.51**	**25,170.08**	**49,756.59**	**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 7.72 million. However, only the initial working capital of Birr 5.41 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 35.75 million (see Table 7.2). The cost of raw material account for 63.37% of the production cost. The other major components of the production cost are depreciation, financial cost and direct labor which account for 18.40%, 8.76% and 3.44%, respectively. The remaining 6.02 % is the share of utility, 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 FOUR)

Items	Cost (in 000 Birr)	%
Raw Material and Inputs	22,660.29	63.37
Utilities	618.00	1.73
Maintenance and repair	540.00	1.51
Labor direct	1,231.20	3.44
Labor overheads	246.20	0.69
Administration Costs	250.00	0.70
Land lease cost	-	-
Cost of marketing and distribution	500.00	1.40
Total Operating Costs	**26,045.69**	**72.84**
Depreciation	6,581.12	18.40
Cost of Finance	3,133.04	8.76
Total Production Cost	**35,759.84**	**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 4.43 million to Birr 10.85 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 88.75 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 18{,}074{,}709$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 43\%$$

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 4 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 24.59% indicating the viability of the project.

6. Net Present Value

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle, a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 10% discount rate is found to be Birr 36.54 million which is acceptable. For detail discounted cash flow see Appendix 7.A.5.

D. ECONOMIC AND SOCIAL BENEFITS

The project can create employment opportunities for 78 persons. The project will generate Birr 26.05 million in terms of tax revenue and also generates income for the Government in terms payroll tax. 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 by supplying the inputs required by the sector.

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	3,966	4,815	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665
Accounts receivable	1,532	1,851	2,170	2,170	2,173	2,173	2,173	2,173	2,173	2,173
Cash-in-hand	22	27	31	31	32	32	32	32	32	32
CURRENT ASSETS	**5,519**	**6,693**	**7,867**	**7,867**	**7,870**	**7,870**	**7,870**	**7,870**	**7,870**	**7,870**
Accounts payable	103	125	148	148	148	148	148	148	148	148
CURRENT LIABILITIES	**103**	**125**	**148**	**148**	**148**	**148**	**148**	**148**	**148**	**148**
TOTAL WORKING CAPITAL	**5,416**	**6,568**	**7,719**	**7,719**	**7,722**	**7,722**	**7,722**	**7,722**	**7,722**	**7,722**

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	15,862	19,261	22,660	22,660	22,660	22,660	22,660	22,660	22,660	22,660
Utilities	433	525	618	618	618	618	618	618	618	618
Maintenance and repair	378	459	540	540	540	540	540	540	540	540
Labour direct	862	1,047	1,231	1,231	1,231	1,231	1,231	1,231	1,231	1,231
Labour overheads	172	209	246	246	246	246	246	246	246	246
Administration Costs	175	213	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	26	26	26	26	26	26
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	**18,382**	**22,214**	**26,046**	**26,046**	**26,071**	**26,071**	**26,071**	**26,071**	**26,071**	**26,071**
Depreciation	6,581	6,581	6,581	6,581	6,581	420	420	420	420	420
Cost of Finance	0	3,581	3,133	2,685	2,238	1,790	1,343	895	448	0
Total Production Cost	**24,963**	**32,376**	**35,760**	**35,312**	**34,890**	**28,282**	**27,834**	**27,386**	**26,939**	**26,491**

Appendix 7.A.3
INCOME STATEMENT (in 000 Birr)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales revenue	29,400	35,700	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Less variable costs	17,882	21,714	25,546	25,546	25,546	25,546	25,546	25,546	25,546	25,546
VARIABLE MARGIN	**11,518**	**13,986**	**16,454**	**16,454**	**16,454**	**16,454**	**16,454**	**16,454**	**16,454**	**16,454**
in % of sales revenue	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Less fixed costs	7,081	7,081	7,081	7,081	7,107	946	946	946	946	946
OPERATIONAL MARGIN	**4,437**	**6,905**	**9,373**	**9,373**	**9,348**	**15,509**	**15,509**	**15,509**	**15,509**	**15,509**
in % of sales revenue	15.09	19.34	22.32	22.32	22.26	36.93	36.93	36.93	36.93	36.93
Financial costs		3,581	3,133	2,685	2,238	1,790	1,343	895	448	0
GROSS PROFIT	**4,437**	**3,324**	**6,240**	**6,688**	**7,110**	**13,718**	**14,166**	**14,614**	**15,061**	**15,509**
in % of sales revenue	15.09	9.31	14.86	15.92	16.93	32.66	33.73	34.79	35.86	36.93
Income tax	0	0	0	2,006	2,133	4,116	4,250	4,384	4,518	4,653
NET PROFIT	**4,437**	**3,324**	**6,240**	**4,681**	**4,977**	**9,603**	**9,916**	**10,229**	**10,543**	**10,856**
in % of sales revenue	15.09	9.31	14.86	11.15	11.85	22.86	23.61	24.36	25.10	25.85

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	**41,085**	**38,175**	**35,722**	**42,022**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**17,057**
Inflow funds	41,085	8,775	22	22	0	0	0	0	0	0	0	0
Inflow operation	0	29,400	35,700	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	17,057
TOTAL CASH OUTFLOW	**41,085**	**27,157**	**31,444**	**34,828**	**35,213**	**34,920**	**36,453**	**36,140**	**35,826**	**35,513**	**30,724**	**0**
Increase in fixed assets	41,085	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	5,519	1,174	1,174	0	2	0	0	0	0	0	0
Operating costs	0	17,882	21,714	25,546	25,546	25,571	25,571	25,571	25,571	25,571	25,571	0
Marketing cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	2,006	2,133	4,116	4,250	4,384	4,518	4,653	0
Financial costs	0	3,255	3,581	3,133	2,685	2,238	1,790	1,343	895	448	0	0
Loan repayment	0	0	4,476	4,476	4,476	4,476	4,476	4,476	4,476	4,476	0	0
SURPLUS (DEFICIT)	**0**	**11,018**	**4,278**	**7,194**	**6,787**	**7,080**	**5,547**	**5,860**	**6,174**	**6,487**	**11,276**	**17,057**
CUMULATIVE CASH BALANCE	**0**	**11,018**	**15,296**	**22,490**	**29,277**	**36,356**	**41,903**	**47,764**	**53,937**	**60,424**	**71,701**	**88,757**

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**	**29,400**	**35,700**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**42,000**	**17,057**
Inflow operation	0	29,400	35,700	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	17,057
TOTAL CASH OUTFLOW	**46,501**	**19,534**	**23,366**	**26,046**	**28,055**	**28,204**	**30,187**	**30,321**	**30,455**	**30,590**	**30,724**	**0**
Increase in fixed assets	41,085	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	5,416	1,152	1,152	0	2	0	0	0	0	0	0	0
Operating costs	0	17,882	21,714	25,546	25,546	25,571	25,571	25,571	25,571	25,571	25,571	0
Marketing cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax		0	0	0	2,006	2,133	4,116	4,250	4,384	4,518	4,653	0
NET CASH FLOW	**-46,501**	**9,866**	**12,334**	**15,954**	**13,945**	**13,796**	**11,813**	**11,679**	**11,545**	**11,410**	**11,276**	**17,057**
CUMULATIVE NET CASH FLOW	**-46,501**	**-36,635**	**-24,301**	**-8,346**	**5,599**	**19,395**	**31,208**	**42,887**	**54,432**	**65,842**	**77,118**	**94,175**
Net present value	-46,501	8,969	10,194	11,987	9,525	8,566	6,668	5,993	5,386	4,839	4,347	6,576
Cumulative net present value	-46,501	-37,532	-27,338	-15,352	-5,827	2,739	9,408	15,401	20,786	25,626	29,973	36,549

NET PRESENT VALUE	36,549
INTERNAL RATE OF RETURN	24.59%
PAYBACK	4 years