

**176. PROFILE ON THE PRODUCTION OF
METAL ZIPPERS**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of metal zippers with a capacity of 140 tones per annum. A metallic zipper consists of two rows of metal teeth that can be pulled together to close something or pulled apart to open it. A metallic zipper is highly applicable in garment, footwear, leatherwear, upholstery industries.

The demand for metal zippers is met entirely through import. The present (2012) demand for metal zippers is estimated at 206 tons. The demand for metal zippers is projected to reach 276 tons and 369 tons by the year 2017 and 2022, respectively.

The principal raw materials required are aluminum wire, cord, bought out components such as slides, top and bottom attachments, sewing thread and tape which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 13.75 million. From the total investment cost the highest share (Birr 6.95 million or 50.55%) is accounted by fixed investment cost followed by initial working capital (Birr 5.09 million or 37.02%) and pre operation cost (Birr 1.71 million or 12.42%). From the total investment cost Birr 2.35 million or 17.10% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 30.38% and a net present value (NPV) of Birr 16.44 million discounted at 10%.

The project can create employment for 56 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with the textile manufacturing sub sector and forward linkage with the garment, shoe, and leatherwear manufacturing sub sectors and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Zippers are used for fastening clothes, bags, etc. A metallic zipper consists of two rows of metal teeth that can be pulled together to close something or pulled apart to open it. A metallic zipper is highly applicable in garment, footwear, leatherwear, upholstery industries. Metallic zipper can be closed or open-end type depending on the nature of application. They are also designated according to chain width standards. For the purpose of this profile, the closed end type with a medium chain width of 4.5-5.5 mm has been taken as a reference product

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Metallic zippers are among diverse accessories currently imported by garment and apparel industry in Ethiopia. They are used for manufacturing of garments. Therefore, the local demand for the product is influenced largely by the expansion of the local garment industry. Since there is no domestic facility for manufacturing metallic zippers, the products are imported from overseas. Import of metallic zippers from 2000 to 2011 is given in Table 3.1.

As could be seen from Table 3.1, import data of metallic zippers has a general increasing trend although fluctuations are observed in some of the years, especially during the period 2000--2006. The increasing trend could be clearly shown when the data set is analyzed in to four year intervals. During the initial four years of the data set i.e. 2000—2003 the imported quantity ranged from the lowest 59,245 kg to the highest 93,639 kg, with a mean figure of 74,140 kg. During the period 2004—2007 the imported quantity ranged from the lowest 110,876 kg to the highest 134,581 kg, with a yearly average of 126,455 kg. This indicates a growth of about 35% compared to the previous four years average.

Table 3.1
IMPORT OF METALLIC ZIPPERS (KG)

Year	Quantity
2000	59,245
2001	93,639
2002	76,126
2003	67,551
2004	134,581
2005	126,640
2006	110,876
2007	133,722
2008	163,658
2009	168,437
2010	234,170
2011	183,287

Source: - Ethiopian Revenues & Customs Authority

Similarly, imported quantity during the period 2008 to 2011 has increased substantially. During this period the lowest and the highest imported quantity was 163,658 kg and 234,170 kg, respectively, with a yearly mean figure of about 187,388 kg. Generally, during the past eleven years the imported quantity has increased from only 59,245 kg (year 2000) to about 200,000 kg (year 2010/11). Therefore, the total increase from year 2000 to year 2011 was about 3.4 times or an annual average growth rate of 11%.

To estimate the present (year 2012) demand first the average of the last four recent years which is 187,388 is taken as a base. Then, the annual average growth rate of last five years (10%) has also been considered. Accordingly, the present (year 2012) effective demand has been estimated at 206,127 kg of metallic zippers.

2. Demand Projection

The demand for metallic zippers is related with the expansion of the garment and leather goods production. Ethiopia has a good potential to expand the garment and the leather sector due to the availability of the basic raw materials. In addition, the government has given due attention to these sectors in its industrial policy. According to the resent information obtained from the Ethiopian Investment Agency, from August 9, 2009 to July 13, 2012 investment permits were issued to a total of 103 projects with a total capital of Birr 1.92 billion, and with a total number of 17,260 employees in the area of garment manufacturing industry. When the licensed projects become fully operational the local demand for zippers will increase considerably. Considering these favorable situations, the demand for metallic zippers is conservatively estimated to grow by an average rate of 6% per annum (see Table 3.2).

Table 3.2

PROJECTED DEMAND FOR METALLIC ZIPPERS (KG)

Year	Projected Demand
2013	218,494
2014	231,604
2015	245,500
2016	260,230
2017	275,844
2018	292,395
2019	309,938
2020	328,534
2021	348,247
2022	369,142
2023	391,290
2024	414,767
2025	439,656

Demand for metallic zippers is forecasted to grow from 218,494 kg in the year 2013 to 245,500 kg and 328,534 kg by the year 2015 and year 2020, respectively. Furthermore, the demand will reach at 439,656 kg by the year 2025.

3. Pricing and Distribution

Based on the average CIF price of the product during 2011, Birr 210 per kg has suggested for the purpose of financial analysis.

Metallic zippers can be directly sold to bulk purchasers such as garment industries. In addition, whole sale and retail channels can be used to reach the numerous consumers that require in small quantities.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

According to the market study above and minimum economies of scale, the envisaged plant will have a capacity of 140 tones of metallic zippers. The plant will operate single shift of eight hours a day and 300 days per annum.

2. Production Program

The plant is intended starting production at 70% of installed capacity in the first year. It will then raise its capacity to 85% in the second year, and finally to 100% in year three and thereafter.

IV. MATERIALS AND INPUTS

A. RAW & AUXILIARY MATERIALS

The raw material required by the plant for the manufacture of metallic zipper are aluminum wire, cord, bought out components such as slides, top and bottom attachments, sewing thread and tape. Annual requirement of raw and auxiliary materials is shown in Table 4.1.

Table 4.1
RAW MATERIALS REQUIREMENT AT FULL CAPACITY OPERATIONS

Sr. No.	Description	Qty. (tones)	Total cost ('000 Birr)		
			FC	LC	Total
1	Aluminum wire	87.8	5,619	1,405	7,024
2	Bought-Out components (top & bottom attachments, slide)	L.S	500	125	625
3	Cotton tape	5,550,000 meters		1,110	1,110
4	Zn-alloy GDZn A14-Cul	57.5	8,625	2,156	10,781
5	Cord	25	875	219	1,094
6	Sewing thread	5.23		654	654
	Total		15,619	5,669	21,288

B. UTILITIES

Inputs required by the plant consist of electricity, and water. Electricity is required for supplying power to all production equipment, and also to power sockets, lighting system and other auxiliary equipment of the plant.

For the plant operating single shift of eight hours a day, and 300 days a year, the total annual electrical energy requirement will be 450,600 KWh. The annual electricity bill will then be Birr 260,356.68

Water is required for cleaning, drinking and general purpose. The annual water requirement is estimated at 4,000 m³, and the corresponding expenditure is Birr 40,000. Thus, the total annual cost of utilities is estimated at about Birr 300,356.68

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The manufacturing of metallic zipper is started by forming the chain. After the chain forming operation, is sewn of zip chain to the cloth tape. Such unfinished slide fastener chain is wound on stainless steel. Zip chains surface polishing, rolling and waxing (an integrated process is carried out using one machine) operations are conducted.

After the coils are completed, cutting of zipper tape in to standard sizes will be done, the bottom metal stop is riveted. Then the slider-stops added and the top metal stop is riveted. The sliders are cast in zinc alloy by pressure molding machines, then treated in rotating drums & parts are polished. Finally after all the assembly process is completed inspection will be carried out and pass the product for packing.

2. Environmental Impact

The manufacturing process of metallic zipper does not have any negative impact on the environment.

B. ENGINEERING

1. Machinery and Equipment

Plant machinery and equipment required for metallic zipper plant is presented in Table 5.1. The total investment cost of plant machinery and equipment is estimated at Birr 3,173,175. Out of which Birr 2,350,500 will be required in foreign currency.

Table 5.1**LIST OF MACHINERY AND EQUIPMENT**

Sr. No.	Description	Qty.
1	Winding Machine	1
2	Zipper Chain Production Machine	1
3	Sewing Machines	3
4	Zipper polishing, rolling & waxing Machine	1
5	Magnetic cutting device	3
6	Bottom stop attaching Machine	3
7	Top stop attaching Machine	5
8	Open-end bottom stop casting Machine	2
9	Slider pressure casting Machine	3
10	Automatic slider assembly Machine	4
11	Slider enameling	2
12	Packing device	2

2. Land, Building and Civil Works

The envisaged plant will require a total land area of 1,000 m² including the production area, warehouse, laboratory & offices. The floor space required for the building of and other facilities will be about 500 m². The total estimated cost of building and civil works at the rate of Birr 5,000 per m² is about Birr 2,500,000.

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 m², 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 m², 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 m². 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 m². 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 m² (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor price/m²
Central Market District	1 st	1686
	2 nd	1535
	3 rd	1323
	4 th	1085
	5 th	894
Transitional zone	1 st	1035
	2 nd	935
	3 rd	809
	4 th	685
	5 th	555
Expansion zone	1 st	355
	2 nd	299
	3 rd	217
	4 th	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 m² 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 criteria 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 m² is estimated at Birr 266,000 of which 10% or Birr 26,600 will be paid in advance. The remaining Birr 239,400 will be paid in equal installments with in 28 years i.e. Birr 8,550 annually.

VI. HUMAN RESOURCE & TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will create job opportunities for a total of 56 persons. Annual cost of labor is Birr 1,264,500. The human resource required by type of job and the corresponding monthly and annual salaries are given in Table 6.1 below.

Table 6.1**LIST OF HUMAN RESOURCE REQUIREMENT AND COST**

Sr. No.	Description	No.	Salary (Birr)	
			Monthly	Annual
A. ADMINISTRATION				
1	Plant Manager	1	4,000	48,000
2	Head, Finance & Administration Department	1	3,500	42,000
3	Head, Production and Technical Department	1	3,500	42,000
4	Secretary	1	1,600	19,200
5	Accountant	1	2,000	24,000
6	Salesman	1	1,600	19,200
7	Clerk	1	1,200	14,400
8	Cashier	1	1,200	14,400
9	General Service	3	750	27,000
Sub -Total		11		250,200
B. PRODUCTION				
13	Forman	1	1,200	42,000
14	Machinery Operators	28	650	504,000
15	Assistant Operators	15	450	135,000
15	Mechanics	2	800	36,000
16	Quality controller	1	600	18,000
17	Laborers	4	200	26,400
Sub- Total		51	-	761,400
Employee's Benefit (25% Of Basic Salary)		-	-	252,900
Total		56	-	1,264,500

B. TRAINING REQUIREMENT

Training for production worker is required. It can be conducted during the erection period and the cost is embodied in the machinery cost as the training will be provided by the supplier

VII. FINANCIAL ANALYSIS

The financial analysis of the metal zippers 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 13.75 million (See Table 7.1). From the total investment cost the highest share (Birr 6.95 million or 50.55%) is accounted by fixed investment cost followed by initial working capital (Birr 5.09 million or 37.02%) and pre operation cost (Birr 1.71 million or 12.42%). From the total investment cost Birr 2.35 million or 17.10% 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	0.19
1.2	Building and civil work	2,500.00		2,500.00	18.19
1.3	Machinery and equipment	822.67	2,350.50	3,173.17	23.08
1.4	Vehicles	900.00		900.00	6.55
1.5	Office furniture and equipment	350.00		350.00	2.55
	Sub total	4,599.27	2,350.50	6,949.77	50.55
2	Pre operating cost *				
2.1	Pre operating cost	808.66		808.66	5.88
2.2	Interest during construction	899.37		899.37	6.54
	Sub total	1,708.03		1,708.03	12.42
3	Working capital **	5,089.75		5,089.75	37.02
	Grand Total	11,397.06	2,350.50	13,747.56	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 7.29 million. However, only the initial working capital of Birr 5.08 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 25.67 million (see Table 7.2). The cost of raw material account for 82.92% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labour, and cost of marketing and distribution which account for 4.33%, 3.37%, 2.96%, and 2.92% respectively. The remaining 3.50% is the share of utility, repair and maintenance, labour overhead and administration cost. For detail production cost see Appendix 7.A.2.

Table 7.2**ANNUAL PRODUCTION COST AT FULL CAPACITY (year three)**

Items	Cost (000 Birr)	%
Raw Material and Inputs	21,288	82.92
Utilities	300	1.17
Maintenance and repair	95	0.37
Labor direct	761	2.96
Labor overheads	253	0.99
Administration Costs	250	0.97
Land lease cost	0	0.00
Cost of marketing and distribution	750	2.92
Total Operating Costs	23,697	92.30
Depreciation	1,111	4.33
Cost of Finance	866	3.37
Total Production Cost	25,674	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 2.69 million to Birr 3.89 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 37.26 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 12,348,000$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 28.84\%$$

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 30.38% 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 16.44 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 56 persons. The project will generate Birr 10.31 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 textile manufacturing sub sector and forward linkage with the garment, shoe, and leatherwear manufacturing sub sectors also generates other income for the Government.

Appendix 7.A
FINANCIAL ANALYSES SUPPORTING TABLES

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	14,902	19,159	21,288	21,288	21,288	21,288	21,288	21,288	21,288	21,288
Utilities	210	270	300	300	300	300	300	300	300	300
Maintenance and repair	67	86	95	95	95	95	95	95	95	95
Labour direct	533	685	761	761	761	761	761	761	761	761
Labour overheads	177	228	253	253	253	253	253	253	253	253
Administration Costs	175	225	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	9	9	9	9	9	9
Cost of marketing and distribution	750	750	750	750	750	750	750	750	750	750
Total Operating Costs	16,813	21,402	23,697	23,697	23,706	23,706	23,706	23,706	23,706	23,706
Depreciation	1,111	1,111	1,111	1,111	1,111	135	135	135	135	135
Cost of Finance	0	989	866	742	618	495	371	247	124	0
Total Production Cost	17,924	23,503	25,674	25,550	25,435	24,335	24,212	24,088	23,964	23,841

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	20,580	26,460	29,400	29,400	29,400	29,400	29,400	29,400	29,400	29,400
Less variable costs	16,063	20,652	22,947	22,947	22,947	22,947	22,947	22,947	22,947	22,947
VARIABLE MARGIN	4,517	5,808	6,453	6,453	6,453	6,453	6,453	6,453	6,453	6,453
in % of sales revenue	21.95	21.95	21.95	21.95	21.95	21.95	21.95	21.95	21.95	21.95
Less fixed costs	1,861	1,861	1,861	1,861	1,870	894	894	894	894	894
OPERATIONAL MARGIN	2,656	3,946	4,592	4,592	4,583	5,559	5,559	5,559	5,559	5,559
in % of sales revenue	12.90	14.91	15.62	15.62	15.59	18.91	18.91	18.91	18.91	18.91
Financial costs		989	866	742	618	495	371	247	124	0
GROSS PROFIT	2,656	2,957	3,726	3,850	3,965	5,065	5,188	5,312	5,436	5,559
in % of sales revenue	12.90	11.18	12.67	13.09	13.49	17.23	17.65	18.07	18.49	18.91
Income (corporate) tax	0	0	0	1,155	1,189	1,519	1,557	1,594	1,631	1,668
NET PROFIT	2,656	2,957	3,726	2,695	2,775	3,545	3,632	3,718	3,805	3,892
in % of sales revenue	12.90	11.18	12.67	9.17	9.44	12.06	12.35	12.65	12.94	13.24

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	7,758	26,619	26,474	29,407	29,400	29,400	29,400	29,400	29,400	29,400	29,400	9,671
Inflow funds	7,758	6,039	14	7	0	0	0	0	0	0	0	0
Inflow operation	0	20,580	26,460	29,400	29,400	29,400	29,400	29,400	29,400	29,400	29,400	0
Other income	0	0	0	0	0	0	0	0	0	0	0	9,671
TOTAL CASH OUTFLOW	7,758	22,852	25,079	26,525	26,831	26,751	26,956	26,870	26,783	26,697	25,373	0
Increase in fixed assets	7,758	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	5,140	1,451	725	0	1	0	0	0	0	0	0
Operating costs	0	16,063	20,652	22,947	22,947	22,956	22,956	22,956	22,956	22,956	22,956	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	1,155	1,189	1,519	1,557	1,594	1,631	1,668	0
Financial costs	0	899	989	866	742	618	495	371	247	124	0	0
Loan repayment	0	0	1,237	1,237	1,237	1,237	1,237	1,237	1,237	1,237	0	0
SURPLUS (DEFICIT)	0	3,767	1,395	2,883	2,569	2,649	2,444	2,530	2,617	2,703	4,027	9,671
CUMULATIVE CASH BALANCE	0	3,767	5,162	8,045	10,615	13,264	15,707	18,238	20,855	23,558	27,585	37,256

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	20,580	26,460	29,400	29,400	29,400	29,400	29,400	29,400	29,400	29,400	9,671
Inflow operation	0	20,580	26,460	29,400	29,400	29,400	29,400	29,400	29,400	29,400	29,400	0
Other income	0	0	0	0	0	0	0	0	0	0	0	9,671
TOTAL CASH OUTFLOW	12,848	18,249	22,120	23,697	24,853	24,895	25,225	25,262	25,299	25,336	25,373	0
Increase in fixed assets	7,758	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	5,090	1,436	718	0	1	0	0	0	0	0	0	0
Operating costs	0	16,063	20,652	22,947	22,947	22,956	22,956	22,956	22,956	22,956	22,956	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	1,155	1,189	1,519	1,557	1,594	1,631	1,668	0
NET CASH FLOW	-12,848	2,331	4,340	5,703	4,547	4,505	4,175	4,138	4,101	4,064	4,027	9,671
CUMULATIVE NET CASH FLOW	-12,848	10,517	-6,178	-475	4,072	8,577	12,752	16,890	20,991	25,055	29,081	38,753
Net present value	-12,848	2,119	3,586	4,285	3,106	2,797	2,357	2,123	1,913	1,723	1,552	3,729
Cumulative net present value	-12,848	10,729	-7,143	-2,858	248	3,045	5,402	7,525	9,438	11,161	12,714	16,443

NET PRESENT VALUE 16,443
INTERNAL RATE OF RETURN 30.38%
NORMAL PAYBACK 3 years