

**166. PROFILE ON THE PRODUCTION OF DOOR
LOCKS**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of door locks with a capacity of 1,600 tons per annum. Door locks are devices on the door of houses or vehicles used to lock doors by the internal mechanisms of the devices.

The demand for door locks is entirely met through import. The present (2012) demand for door locks is estimated at 1,203 tones. The demand for door locks is projected to reach 1,937 tones and 3,120 tones by the year 2017 and 2022, respectively.

The principal raw materials required are various sizes of sheet metal sections, aluminum or brass ingots electro plating chemicals springs and crews/bolts all of which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 26.54 million. From the total investment cost the highest share (Birr 13.69 million or 51.58%) is accounted by fixed investment cost followed by initial working capital (Birr 10.34 million or 38.96%) and pre operation cost (Birr 2.51 million or 9.46%). From the total investment cost Birr 6.80 million or 25.62% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 24.45% and a net present value (NPV) of Birr 20.51 million discounted at 10%.

The project can create employment for 44 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 and automotive sub sectors and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTIONS AND APPLICATIONS

Door locks are devices on the door of houses or vehicles used to lock doors by the internal mechanisms of the devices. Door locks have handles made by casting of aluminum alloy or brass ingots or other shapes made from steel. The external visible surface of the door locks is given decorative and shiny appearance. The interior parts are mostly made by steel press work. Some of the parts are plated with nickel to avoid rust.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement of door locks and keys is supplied through import. The quantity of the product imported annually during the period 2002 - 2011 is presented in Table 3.1.

Table 3.1
IMPORT OF DOOR LOCKS AND KEYS (ton)

Year	Total
2002	601
2003	790
2004	1,568
2005	983
2006	1,019
2007	918
2008	1,079
2009	1,496
2010	1,418
2011	1,103

Source: Ethiopian Revenue and Customs Authority

As can be seen from Table 3.1 door locks and keys fluctuate from year to year. However, a general growth trend can be observed. The yearly average quantity imported during the first five years in the data set (2002-2006) was around 992 tons. However, during the recent five years (2007-2011) the average amount supplied to the market has increased to about 1,203 tons. During the period under consideration (2002-2011) import of door locks and keys has registered an average annual growth rate of 12.81%.

In estimating the present demand for the product it is assumed that the recent five years average (2007-2011) is a reasonable approximate of current level of demand. Accordingly, current (2012) demand for door locks and keys is estimated at 1,203 tones.

2. Demand Forecast

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

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

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

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

Based on the above assumption and using the estimated present demand as a base the projected demand for door locks and keys is shown in Table 3.2.

Table 3.2**FORECASTED DEMAND FOR DOOR LOCKS AND KEYS (TON)**

Year	Projected Demand
2013	1,323
2014	1,455
2015	1,601
2016	1,761
2017	1,937
2018	2,131
2019	2,344
2020	2,578
2021	2,836
2022	3,120
2023	3,431
2024	3,775
2025	4,152

3. Pricing and Distribution

The current retail price of door locks range from Birr 90 to Birr 120 per pieces. Allowing margin for distributors and retailers, the recommended factory gate price for the envisaged plant is Birr 70 per pieces.

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

B. PLANT CAPACITY AND PRODUCTION PROGRAMME**1. Plant capacity**

Based on the market demand and available technologies the selected plant capacity is 1,600 tons of door locks per annum, on a single shift.

2. Production Program

The plant is assumed to operate at 75% of its installed capacity in the first year of operation. In the second year it will increase to 85% and 100% capacity utilization will be attained during the third year and then after (see Table 3.3).

Table 3.3
ANNUAL PRODUCTION PROGRAM

Type of product	Year 1	Year 2	Year 3
Door locks(Tons)	1,200	1,360	1,600
Capacity %	75	85	100

IV. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The selected product requires various sizes of sheet metal sections, aluminum or brass ingots electro plating chemicals, springs and crews/bolts as main raw materials. All the raw materials will be imported. The annual required raw materials and their cost are indicated in Table 4.1.

Table 4.1
RAW & AUXILIARY MATERIALS AND COST

No	Raw Materials	Annual input		Unit Cost (000 Birr)	Total Cost (000 Birr)
		Units	Qty		
1	Sheet Metal	Ton	400	15	6,000
2	Sheet metal	“	390	30	11,700
2	Brass ingots	“	500	32	16,000
3	Aluminum alloy castings	“	300	30	9,000
4	Electro plating chemicals	“	3.2	100	320
5	Springs	“	1	5	5
6	Screws/bolts	“	2.2	4	9
7	paint	“	1	30	3
	Total				43,037

B. UTILITIES

Electricity and water are the major utilities required by the plant. Annual cost of utilities is Birr 3.96 million. The quantity required and cost is indicated in Table 4.2

Table 4.2
ANNUAL UTILITY REQUIREMENTS

No	Utility	Unit	Quantity	Cost(Birr)
1	Electricity	Kwh.	260,000	151,880
2	Water	Meter cube	1,000	10,000
3	Furnace oil	lit	200,000	3,800,000
	Total			3,961,880

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The production process of door locks involves the following steps;

- The brass ingots are melted and cast to form the handles and bushings. The product is ground and buffed to impart shiny and smooth surface;
- The Aluminum alloys are melted to form the handles and some internal parts of the lock; The products are trimmed and polished for smooth surface;
- The sheet metal parts are cut and fed to the press to form the covers and internal levers and key guides.
- The key and some parts of the handle are electroplated for decoration purposes.
- The finished parts are assembled and packed.

2. Environmental Impact

The production activity of the plant does not have a negative effect on the environment. All scraps to be created during production are recyclable.

B. ENGINEERING

1. Machinery and Equipment

The total cost of machinery and equipment is estimated at Birr 8.5 million of which Birr 6.8 million is required in foreign currency. The list of necessary machinery and equipment required for the production of door locks is shown in Table 5.1.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT

Sr. No.	Machine	Unit	Qty.
1	Mechanical press (50 ton capacity)	No	2
2	Mechanical press (20 ton capacity)	“	3
3	Mechanical press (10 ton capacity)	“	5
4	Sheet metal bending machine	“	1
5	Lathe machine	“	1
6	Treadle shearing machine	“	1
7	Oil Fired furnace set for brass	“	1
8	Hot Chamber die- casting machine	“	2
9	Belt and disc Sander	“	2
10	Bench drilling machine	“	1
11	Guillotine shearing machine	“	1
12	Surface grinding machine	“	1
13	Press die and jig	Sets	3
14	Moulds for handles	No	3
15	Key cutting machine	“	1
16	Spring making machine	“	1
17	Electroplating plant	“	1
18	Pedestal Grinding Machine	“	2
19	Portable grinding Machine	“	2

Sr. No.	Machine	Unit	Qty.
20	Portable Electric drill	“	2
21	Pillar drilling machine	Set	3
22	Hand Tool Sets	Set	3
23	Material Handling Equipment	set	3
24	Painting and compressor set	Set	1

2. Land Building and Civil Work

The total area required by the proposed plant is 1,500 m², out of which 800 m² is a built up area. The cost of building including civil work at the rate of Birr 5,000 per m² is estimated at Birr 4,000,000.

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 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 399,000 of which 10% or Birr 39,900 will be paid in advance. The remaining Birr 359,100 will be paid in equal installments with in 28 years i.e. Birr 12,825 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT**A. HUMAN RESOURCE REQUIREMENT**

The plant will create job opportunities for 44 persons of whom 35 are production workers. Annual cost of labor is estimated at Birr 1,153,200. The detail list of human resource with the corresponding salary is indicated in Table 6.1.

B. TRAINING REQUIREMENT

On the job training of the operators would be enough for workers with technical back ground. The production technology requires some manual skill on the production process. Thus frequent training is required in the plant. This requires an amount of Birr 20,000 for training to be conducted twice a year.

Table 6.1**HUMAN RESOURCE REQUIREMENT AND COST**

Sr. No.	Description	No.	Salary (Birr)	
			Monthly	Annual
A. ADMINISTRATION				
1	Plant Manager	1	5,000	60,000
2	Secretary	1	2,500	30,000
3	Accountant	1	2,500	30,000
4	Salesman/purchaser	1	2,500	30,000
5	Clerk	1	1,500	18,000
6	Cashier	1	2,000	24,000
7	General Service	3	800	28,800
SUB TOTAL		9		220,800
B. PRODUCTION				
8	Foreman/	1	2,500	30,000
9	Machinery Operators	25	2,000	600,000
10	Assistant Operators	4	1,500	72,000
11	Machinist technicians	2	2,000	48,000
12	Quality controller	1	1,500	18,000
13	Laborers	2	800	19,200
SUB TOTAL		35	-	787,200
TOTAL				1,008,000
EMPLOYEE'S BENEFIT (25% OF BASIC SALARY)		-	-	145,200
TOTAL		44	-	1,153,200

VII. FINANCIAL ANALYSIS

The financial analysis of the door locks 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 26.54 million (See Table 7.1). From the total investment cost the highest share (Birr 13.69 million or 51.58%) is accounted by fixed investment cost followed by initial working capital (Birr 10.34 million or 38.96%) and pre operation cost (Birr 2.51 million or 9.46%). From the total investment cost Birr 6.80 million or 25.62% is required in foreign currency.

Table 7.1**INITIAL INVESTMENT COST ('000 Birr)**

Sr. No	Cost Items	Local Cost	Foreign Cost	Total Cost	% Share
1	Fixed investment				
1.1	Land Lease	39.90		39.90	0.15
1.2	Building and civil work	4,000.00		4,000.00	15.07
1.3	Machinery and equipment	1,700.00	6,800.00	8,500.00	32.03
1.4	Vehicles	900.00		900.00	3.39
1.5	Office furniture and equipment	250.00		250.00	0.94
	Sub total	6,889.90	6,800.00	13,689.90	51.58
2	Pre operating cost *				
2.1	Pre operating cost	775.00		775.00	2.92
2.2	Interest during construction	1,736.32		1,736.32	6.54
	Sub total	2,511.32		2,511.32	9.46
3	Working capital **	10,339.66		10,339.66	38.96
	Grand Total	19,740.88	6,800.00	26,540.88	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 14.83 million. However, only the initial working capital of Birr 10.33 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 52.78 million (see Table 7.2). The cost of raw material account for 81.54% of the production cost. The other major components of the production cost are financial cost, depreciation, utility and labor, which account for 2.71%, 4.21%, 7.51% and 1.91% respectively. The remaining 2.12% is the share of cost of marketing and distribution, 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	43,037	81.54
Utilities	3,962	7.51
Maintenance and repair	425	0.81
Labour direct	1,008	1.91
Labour overheads	145	0.27
Administration Costs	200	0.38
Land lease cost	0	0.00
Cost of marketing and distribution	350	0.66
Total Operating Costs	49,127	93.08
Depreciation	2,220	4.21
Cost of Finance	1,432	2.71
Total Production Cost	52,779	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 2.25 million to Birr 4.67 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 51.03 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 23,520,000$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 21.24\%$$

4. Pay-back Period

The pay-back period, also called pay – off period is defined as the period required for recovering the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project's initial investment will be fully recovered within 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 24.45% 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 20.51 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 44 persons. The project will generate Birr 11.30 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create forward linkage with the construction and automotive sub sectors and also generate 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	30,126	34,430	38,733	43,037	43,037	43,037	43,037	43,037	43,037	43,037
Utilities	2,773	3,170	3,566	3,962	3,962	3,962	3,962	3,962	3,962	3,962
Maintenance and repair	298	340	383	425	425	425	425	425	425	425
Labour direct	706	806	907	1,008	1,008	1,008	1,008	1,008	1,008	1,008
Labour overheads	102	116	131	145	145	145	145	145	145	145
Administration Costs	140	160	180	200	200	200	200	200	200	200
Land lease cost	0	0	0	0	13	13	13	13	13	13
Cost of marketing and distribution	350	350	350	350	350	350	350	350	350	350
Total Operating Costs	34,494	39,372	44,249	49,127	49,140	49,140	49,140	49,140	49,140	49,140
Depreciation	2,220	2,220	2,220	2,220	2,220	185	185	185	185	185
Cost of Finance	0	1,910	1,671	1,432	1,194	955	716	477	239	0
Total Production Cost	36,714	43,502	48,141	52,779	52,554	50,280	50,041	49,802	49,564	49,325

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

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Sales revenue	39,200	50,400	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000
Less variable costs	34,144	39,022	43,899	48,777	48,777	48,777	48,777	48,777	48,777	48,777
VARIABLE MARGIN	5,056	11,378	12,101	7,223	7,223	7,223	7,223	7,223	7,223	7,223
in % of sales revenue	12.90	22.58	21.61	12.90	12.90	12.90	12.90	12.90	12.90	12.90
Less fixed costs	2,570	2,570	2,570	2,570	2,583	548	548	548	548	548
OPERATIONAL MARGIN	2,486	8,808	9,531	4,653	4,640	6,675	6,675	6,675	6,675	6,675
in % of sales revenue	6.34	17.48	17.02	8.31	8.29	11.92	11.92	11.92	11.92	11.92
Financial costs		1,910	1,671	1,432	1,194	955	716	477	239	0
GROSS PROFIT	2,486	6,898	7,859	3,221	3,446	5,720	5,959	6,198	6,436	6,675
in % of sales revenue	6.34	13.69	14.03	5.75	6.15	10.21	10.64	11.07	11.49	11.92
Income (corporate) tax	0	0	0	966	1,034	1,716	1,788	1,859	1,931	2,003
NET PROFIT	2,486	6,898	7,859	2,254	2,413	4,004	4,171	4,338	4,506	4,673
in % of sales revenue	6.34	13.69	14.03	4.03	4.31	7.15	7.45	7.75	8.05	8.34

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	14,465	51,360	50,412	56,012	56,000	56,000	56,000	56,000	56,000	56,000	56,000	18,936
Inflow funds	14,465	12,160	12	12	0	0	0	0	0	0	0	0
Inflow operation	0	39,200	50,400	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	18,936
TOTAL CASH OUTFLOW	14,465	46,653	45,154	49,793	55,398	53,756	54,198	54,031	53,864	53,697	51,142	0
Increase in fixed assets	14,465	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	10,423	1,485	1,485	1,485	1	0	0	0	0	0	0
Operating costs	0	34,144	39,022	43,899	48,777	48,790	48,790	48,790	48,790	48,790	48,790	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income tax	0	0	0	0	966	1,034	1,716	1,788	1,859	1,931	2,003	0
Financial costs	0	1,736	1,910	1,671	1,432	1,194	955	716	477	239	0	0
Loan repayment	0	0	2,387	2,387	2,387	2,387	2,387	2,387	2,387	2,387	0	0
SURPLUS (DEFICIT)	0	4,706	5,258	6,219	602	2,244	1,802	1,969	2,136	2,303	4,858	18,936
CUMULATIVE CASH BALANCE	0	4,706	9,964	16,183	16,785	19,029	20,831	22,800	24,936	27,239	32,096	51,032

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	39,200	50,400	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	18,936
Inflow operation	0	39,200	50,400	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	18,936
TOTAL CASH OUTFLOW	24,805	35,967	40,845	45,722	50,094	50,174	50,856	50,928	50,999	51,071	51,142	0
Increase in fixed assets	14,465	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	10,340	1,473	1,473	1,473	1	0	0	0	0	0	0	0
Operating costs	0	34,144	39,022	43,899	48,777	48,790	48,790	48,790	48,790	48,790	48,790	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income (corporate) tax		0	0	0	966	1,034	1,716	1,788	1,859	1,931	2,003	0
NET CASH FLOW	-24,805	3,233	9,555	10,278	5,906	5,826	5,144	5,072	5,001	4,929	4,858	18,936
CUMULATIVE NET CASH FLOW	-24,805	21,571	-12,016	-1,738	4,167	9,994	15,138	20,210	25,211	30,140	34,998	53,934
Net present value	-24,805	2,939	7,897	7,722	4,034	3,618	2,904	2,603	2,333	2,090	1,873	7,301
Cumulative net present value	-24,805	21,865	-13,968	-6,246	-2,213	1,405	4,309	6,912	9,244	11,335	13,208	20,508

NET PRESENT VALUE 20,508
INTERNAL RATE OF RETURN 24.45%
NORMAL PAYBACK 4 years