

**177. PROFILE ON THE PRODUCTION OF
METALLIC CONTAINERS**

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I. SUMMARY

This profile envisages the establishment of a plant for the production a of 14,000 units of metallic containers per annum that is 12,000 units of with capacity of 1m³ tank for household water storage and 2,000 units with capacity of 13,000 liter for transportation of fuel and water . Metallic container is a product of fabrication that consists of a metal cutting, forming and joining process used for household water storage and for transportation of fuel and water.

The demand for metallic containers is met through import and domestic production. The present (2012) unsatisfied demand for metallic containers is estimated at 3,796 tons. The unsatisfied demand for metallic containers is projected to reach 6,113 tons and 9,846 tons by the year 2017 and 2022, respectively.

The principal raw materials required are steel sheet, steel pipe and steel electrode which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 18.29 million. From the total investment cost the highest share (Birr 8.44 million or 46.15%) is accounted by fixed investment cost followed by initial working capital (Birr 7.92 million or 43.34%) and pre operation cost (Birr 1.92 million or 10.51%). From the total investment cost Birr 2.90 million or 15.86% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 19.14% and a net present value (NPV) of Birr 10.51 million discounted at 10%.

The project can create employment for 77 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 fuel transportation subsector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Metallic containers which are used for household water storage and for transportation of fuel and water are a product of fabrication that consists of a metal cutting, forming and joining process. Blanks for side-walls cut according to dimensions on a shearing machine. Blanks for cylindrical and oval shaped containers are rolled on a roll bending machine.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Metallic containers are manufactured by existing metal industries and workshops locally. However, there is no available data that indicates the level of local production. Hence, the unsatisfied demand for the product i.e. the demand met through import is considered. Accordingly, import of metallic containers during the period 2002--2011 is shown in Table 3.1.

Table 3.1
IMPORT OF METALLIC CONTAINERS (TONS)

Year	Quantity
2002	997
2003	470
2004	726
2005	686
2006	2,146
2007	1,936
2008	1,725
2009	2,229
2010	3,712
2011	3,550

Source: - Ethiopian Revenue and Customs Authority.

As can be seen from Table 3.1, import of metallic containers during the period 2002-2011 ranges from the lowest 470 tons (year 2003) to the highest 3,712 tons (year 2010) averaging at 1,818 tons. Though import of metallic containers fluctuates from year to year, a general growth trend can be observed. For example average import during the first five years of the data set (2002 – 2006) was 1,005 tons which has increased to 2,630 during the next five years (2007-2011) average. During the period under consideration (2002--2011) import of the products has registered an average annual growth rate of 31%.

For estimating the present unsatisfied demand for metallic containers it is assumed that the growth rate registered in import of the product during the recent five years (2007-2011) which is 20% will continue at least in the near future. Accordingly, by taking the average level of import during the recent three years (2009 -2011) as a base and applying a growth rate 20%, the present (2012) unsatisfied demand for metallic containers is estimated at 3,796 tons.

2. Demand Projection

The major end users of metallic containers are the manufacturing and construction sectors. Hence the demand for the product depends on the performance of the manufacturing and construction sectors. According to the government's "Growth and Transformation Plan (2011 – 2015)" during the plan period, the industrial sector, which includes the manufacturing and construction sectors, is expected to grow at an average annual growth rate of 20%.

However, in order to be conservative a growth rate of 10% which is slightly lower than the anticipated growth rate of GDP during the Growth and Transformation period (11.4%) is used to project the unsatisfied demand for metallic containers. Accordingly, using the estimated present unsatisfied demand as a base and applying a growth rate of 10% the projected unsatisfied demand for metallic containers is shown in Table 3.2.

Table 3.2**PROJECTED UNSATISFIED DEMAND FOR METALLIC CONTAINERS (TONS)**

Year	Projected Demand
2013	4,176
2014	4,593
2015	5,052
2016	5,558
2017	6,113
2018	6,725
2019	7,397
2020	8,137
2021	8,951
2022	9,846
2023	10,830
2024	11,913
2025	13,105

3. Pricing and distribution

The price of metallic containers varies according to capacity. For the purpose of this profile an average price of Birr 750 for 1 m³ capacity tank and Birr 16,000 for 13,000 liter capacity containers is adopted. Considering the nature of the products and the characteristics of the end users a combination both direct distribution to end users (for bulk purchasers) and indirect distribution (using agents) is selected as the most appropriate distribution channel.

B. PLANT CAPACITY AND PRODUCTION PROGRAM**1. Plant Capacity**

The capacity of the envisaged plant will be 12,000 units of 1m³ capacity tank for household water storage and 2000 units of 13,000 liter capacity containers for transportation of fuel and

water. This weighs about 1,150 tons on the average which is approximately 25% of the share of the projected demand for the year 2014.

2. Production program

The determination of capacity build up is more dependent on market development than technology constraint. This is because the process technology of production is quite simple and skilled labor is readily available. Thus capacity utilization develops with expansion of the market.

- 75% of the capacity during the 1st year;
- 90% of the capacity during the 2nd year; and
- 100% of the capacity starting from the 3rd year.

IV. MATERIAL AND INPUTS

A. MATERIALS

The required raw materials are steel sheet, steel pipe and steel electrode. The auxiliary materials required by the plant are oxygen, acetylene gas and primary paint. The annual consumption of raw and auxiliary material is summarized in Table 4.1.

Table 4.1

RAW AND AUXILIARY MATERIAL REQUIREMENT AND RELATED COST

No.	Description	Qty	Cost in 000 birr		
			F.C	L.C	Total
1	Direct raw - materials				
	1.1 steel sheet	1250 ton	22,500	5,625	28,125
	1.2 steel pipe	9.2 ton	230	58	288
	1.3 steel electrode	212.3 ton	3,185	796	3,981
2	Auxiliary materials				
	2.1 Oxygen gas	250 m3		16	16
	2.2 Acetylene gas	150 m3		10	10
	2.3 Paint	5750 gal		978	978
	Total		25,915	7,482	33,397

B. UTILITIES

Utilities required for manufacturing of metallic containers are electricity, portable water and compressed air as shown in Table 4.2.

Table 4.2
ANNUAL REQUIREMENTS OF UTILITIES AND COST

NO.	Description	Annual Consumption	Unit	Unit Cost (Birr)	Total Cost ('000 Birr)
1	Electricity (kWh)	275,000	kWh	0.65	178.75
2	Water (M3)	15,000	m ³	10.00	150.00
3	Fuel oil (liters)	5,000	ltr	25.00	125.00
4	Oils and lubricants (kg)	120	kg	-	8.80
Total Annual Cost					462.55

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

Manufacturing of metallic containers consists of a metal cutting, forming and joining process. Blanks for side-walls cut according to dimensions on a shearing machine. Blanks for cylindrical and oval shaped containers are rolled on a roll bending machine. Side walls are aligned as per the design and welded together. Holes are cut using oxygen for pipe fitting. Finally the container are cleaned well and coated with a primary paint using a spray gun.

2. Environmental Impact

The production process of metallic containers consists of a metal cutting, forming and joining process. Hence, the production process does 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 metallic container is given in Table 5.1. Total cost of machinery and equipment is estimated at Birr 3.5 million, out of which Birr 2.91 million is required in foreign currency.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT

No	Description	Unit	Qty
1	Horizontal shearing machine	Pcs	02
2	Roll- bending machine	"	01
3	Welding machine	"	35
4	Hand grinding machine	"	40
5	Gas welding machine	set	04
6	Bench drilling machine	pcs	01
7	Mobile hoist	"	03
8	Compressor	"	01
9	Pipe cutter	"	01
10	Accessories for painting	Set	05
11	Accessories for welding	"	35
12	Hand pumps for pressure test	Pcs	05
13	Bench grinder	"	02
14	Pipe vice	"	02
15	Grinding and cutting tools(discs)	"	5000
16	Forklift	"	01

2. Land, Building and Civil Works

The total land required for the grinding wheel manufacturing plant is 1,500 m². The total built-up area is 750 m². The estimated total cost of building at the rate of Birr 5,000 per m² amounts to Birr 3.75million.

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 Comp. 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 REQUIREMENTS

A. HUMAN RESOURCE REQUIREMENT

The plant will require a total of 77 workers. Annual cost of labor, including employees benefit, is estimated at Birr 2,124,750. The detail human resource requirement and the annual salary is given in Table 6.1

Table 6.1
HUMAN RESOURCE REQUIREMENT AND COST (BIRR)

No.	Description	No. of employees	Monthly salary	Annual salary
1	Plant Manager	1	7,500	90,000
3	Secretary	1	2,500	30,000
4	Supervisor	1	5,000	60,000
5	Welder	30	54,000	648,000
6	Fitter machine operators	5	9,000	108,000
7	Painters	15	27,000	324,000
9	Production clerk	1	1,350	16,200
2	Personnel	1	3,500	42,000
10	Finance head	1	3,500	42,000
11	Payroll clerk	1	1,800	21,600
12	Cashier	1	1,800	21,600
13	Purchaser	1	2,500	30,000
14	Salesman	1	2,500	30,000
15	Store	1	2,500	30,000
16	Guard	4	5,000	60,000
17	Cleaner	6	6,000	72,000
18	Laborer	4	3,200	38,400
19	Forklift operator	2	3,000	36,000
	Total	77	141,650	1,699,800
	Employees benefit (25% of basic		35,413	424,950
	Grand Total		177,063	2,124,750

B. TRAINING REQUIREMENT

The supervisor and the skilled production personnel need to have a five day on-the-job training on how to operate and inspect the machines. Estimated cost of training amounts to Birr 50,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the metallic containers 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 18.29 million (See Table 7.1). From the total investment cost the highest share (Birr 8.44 million or 46.15%) is accounted by fixed investment cost followed by initial working capital (Birr 7.92 million or 43.34%) and pre operation cost (Birr 1.92 million or 10.51%). From the total investment cost Birr 2.90 million or 15.86% 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	0.22
1.2	Building and civil work	3,750.00		3,750.00	20.51
1.3	Machinery and equipment	600.00	2,900.00	3,500.00	19.14
1.4	Vehicles	900.00		900.00	4.92
1.5	Office furniture and equipment	250.00		250.00	1.37
	Sub total	5,539.90	2,900.00	8,439.90	46.15
2	Pre operating cost *				
2.1	Pre operating cost	725.00		725.00	3.96
2.2	Interest during construction	1,196.33		1,196.33	6.54
	Sub total	1,921.33		1,921.33	10.51
3	Working capital **	7,925.48		7,925.48	43.34
	Grand Total	15,386.70	2,900.00	18,286.70	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 11.34 million. However, only the initial working capital of Birr 7.92 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 39.26 million (see Table 7.2). The cost of raw material account for 85.06% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labor, and cost of marketing and distribution which account for 3.06%, 2.93%, 4.33%, and 1.27% respectively. The remaining 3.35% 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 three)**

Items	Cost (000 Birr)	%
Raw Material and Inputs	33,397	85.06
Utilities	463	1.18
Maintenance and repair	175	0.45
Labor direct	1,700	4.33
Labor overheads	425	1.08
Administration Costs	250	0.64
Land lease cost	0	0.00
Cost of marketing and distribution	500	1.27
Total Operating Costs	36,910	94.01
Depreciation	1,200	3.06
Cost of Finance	1,151	2.93
Total Production Cost	39,261	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 2.03 million to Birr 3.43 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 32.27 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 17,640,000$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 30.41\%$$

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 6 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 19.14% 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 10.51 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 77 persons. The project will generate Birr 8.65 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 fuel transportation subsector 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	23,378	30,057	33,397	33,397	33,397	33,397	33,397	33,397	33,397	33,397
Utilities	324	417	463	463	463	463	463	463	463	463
Maintenance and repair	123	158	175	175	175	175	175	175	175	175
Labour direct	1,190	1,530	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Labour overheads	298	383	425	425	425	425	425	425	425	425
Administration Costs	175	225	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	13	13	13	13	13	13
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	25,987	33,269	36,910	36,910	36,923	36,923	36,923	36,923	36,923	36,923
Depreciation	1,200	1,200	1,200	1,200	1,200	175	175	175	175	175
Cost of Finance	0	1,316	1,151	987	822	658	493	329	164	0
Total Production Cost	27,187	35,785	39,261	39,097	38,945	37,756	37,591	37,427	37,262	37,098

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	29,400	37,800	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Less variable costs	25,487	32,769	36,410	36,410	36,410	36,410	36,410	36,410	36,410	36,410
VARIABLE MARGIN	3,913	5,031	5,590	5,590	5,590	5,590	5,590	5,590	5,590	5,590
in % of sales revenue	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
Less fixed costs	1,700	1,700	1,700	1,700	1,713	688	688	688	688	688
OPERATIONAL MARGIN	2,213	3,331	3,890	3,890	3,877	4,902	4,902	4,902	4,902	4,902
in % of sales revenue	7.53	8.81	9.26	9.26	9.23	11.67	11.67	11.67	11.67	11.67
Financial costs		1,316	1,151	987	822	658	493	329	164	0
GROSS PROFIT	2,213	2,015	2,739	2,903	3,055	4,244	4,409	4,573	4,738	4,902
in % of sales revenue	7.53	5.33	6.52	6.91	7.27	10.11	10.50	10.89	11.28	11.67
Income (corporate) tax	0	0	0	871	916	1,273	1,323	1,372	1,421	1,471
NET PROFIT	2,213	2,015	2,739	2,032	2,138	2,971	3,086	3,201	3,316	3,432
in % of sales revenue	7.53	5.33	6.52	4.84	5.09	7.07	7.35	7.62	7.90	8.17

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	9,165	38,631	37,831	42,016	42,000	42,000	42,000	42,000	42,000	42,000	42,000	14,792
Inflow funds	9,165	9,231	31	16	0	0	0	0	0	0	0	0
Inflow operation	0	29,400	37,800	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	14,792
TOTAL CASH OUTFLOW	9,165	35,218	38,514	40,848	40,413	40,308	40,499	40,384	40,269	40,154	38,393	0
Increase in fixed assets	9,165	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	8,035	2,284	1,142	0	1	0	0	0	0	0	0
Operating costs	0	25,487	32,769	36,410	36,410	36,423	36,423	36,423	36,423	36,423	36,423	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	871	916	1,273	1,323	1,372	1,421	1,471	0
Financial costs	0	1,196	1,316	1,151	987	822	658	493	329	164	0	0
Loan repayment	0	0	1,645	1,645	1,645	1,645	1,645	1,645	1,645	1,645	0	0
SURPLUS (DEFICIT)	0	3,413	-682	1,167	1,587	1,692	1,501	1,616	1,731	1,846	3,607	14,792
CUMULATIVE CASH BALANCE	0	3,413	2,731	3,898	5,485	7,177	8,678	10,294	12,026	13,872	17,479	32,270

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	37,800	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	14,792
Inflow operation	0	29,400	37,800	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	14,792
TOTAL CASH OUTFLOW	17,090	28,240	34,395	36,910	37,782	37,839	38,196	38,245	38,295	38,344	38,393	0
Increase in fixed assets	9,165	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	7,925	2,253	1,126	0	1	0	0	0	0	0	0	0
Operating costs	0	25,487	32,769	36,410	36,410	36,423	36,423	36,423	36,423	36,423	36,423	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	871	916	1,273	1,323	1,372	1,421	1,471	0
NET CASH FLOW	-17,090	1,160	3,405	5,090	4,218	4,161	3,804	3,755	3,705	3,656	3,607	14,792
CUMULATIVE NET CASH FLOW	-17,090	15,930	-12,525	-7,435	-3,217	943	4,747	8,502	12,207	15,863	19,470	34,261
Net present value	-17,090	1,055	2,814	3,824	2,881	2,584	2,147	1,927	1,729	1,550	1,390	5,703
Cumulative net present value	-17,090	16,035	-13,222	-9,397	-6,517	-3,933	-1,786	141	1,869	3,420	4,810	10,513

NET PRESENT VALUE 10,513
INTERNAL RATE OF RETURN 19.14%
NORMAL PAYBACK 6 years