

**153. PROFILE ON THE PRODUCTION OF AUTO-
RADIATOR, FUEL TANK AND SILENCERS**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of 118 tons of auto radiators; 124 tons of silencers; and 130 tons of fuel tanks per annum. Radiator is used in different models of automobile as engine cooling device; Fuel tanks serve to carry fuel in all vehicles with various indicators and safety devices attached to it; and Silencers serve to control the engine exhaust noise and to reduce smoke density coming out from the engine.

The demand for auto-radiator, fuel tank and silencers is met through import and domestic production. Accordingly, present (2012) effective demand for the products is estimated at 141 tons, 82 tons and 1,123 tons for of auto-radiator, silencers and fuel tank, respectively.

The principal raw materials required are steel, copper and brass sheet, copper tubes and other bought items such as gaskets, hoses, washers and screws which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 15.59 million. From the total investment cost the highest share (Birr 9.20 million or 59.04%) is accounted by fixed investment cost followed by initial working capital (Birr 4.56 million or 29.28%) and pre operation cost (Birr 1.82 million or 11.68%). From the total investment cost Birr 2.42 million or 15.55% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 31.72% and a net present value (NPV) of Birr 18.14 million discounted at 10%.

The project can create employment for 39 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 automotive sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

The plant produces three kinds of products i.e. radiator, fuel tank and silencer, that serve mostly in vehicle as replacement or new parts. Radiator is being used in different models of automobile as engine cooling device. Fuel tanks serve to carry fuel in all vehicles with various indicators and safety devices attached to it. Silencers serve to control the engine exhaust noise and to reduce smoke density coming out from the engine. The three products are mainly manufactured from

copper, brass and steel sheets of different thicknesses with various fitting devices attached to them.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply And Present Demand

Auto-radiator, fuel tank and silencers are manufactured by few of the existing metal industries locally. However, there is no available data that indicates the level of local production. Moreover, since the bulk of the products supply comes through import. Hence, for this project profile the demand for the products is estimated based on the trend in import. Accordingly, import of auto-radiator, fuel tank and silencers during the period 2002 – 2011 is shown in Table 3.1.

Table 3.1

IMPORT OF AUTO-RADIATOR, FUEL TANK AND SILENCERS (TONS)

Year	Auto Radiators	Silencers and Exhaust Pipes	Fuel Tank
2002	33	31	294
2003	62	49	53
2004	116	52	103
2005	44	47	235
2006	57	44	1,140
2007	107	96	715
2008	84	21	328
2009	117	80	847
2010	158	97	1,576
2011	148	69	947

Source: Ethiopian Revenue & Customs Authority.

As can be seen from Table 3.1, import of auto-radiator, fuel tank and silencers for the period 2002-2011 fluctuates from year to year. However, a general growth trend can be observed. The

average annual import of the products during the first five years in the data set (2002-2006) was 62 tons, 45 tons and 365 tons for of auto-radiator, silencers and fuel tank respectively. However, during the next five years (2007-2011) the average annual import for the products has increased to 123 tons, 73 tons and 883 tons for of auto-radiator, silencers and fuel tank respectively.

Considering the nature of the supply data the recent three years (2009-2011) average is assumed to fairly reflect the current demand for the product. Accordingly current effective demand for the products is estimated at 141 tons, 82 tons and 1,123 tons for of auto-radiator, silencers and fuel tank respectively.

2. Demand Projection

The road transport dependence for both passenger and freight traffic is increasing. The road construction being undertaken as pre-requisite for investment and development, guarantees a healthy and continuously growing auto component industry. Although the number of vehicles in the country has shown a higher growth rate in order to be conservative an annual average growth rate of 5% is used in projecting the future demand for auto-radiator, silencers and fuel tank (see Table 3.2).

Table 3.2

PROJECTED UNSATISFIED DEMAND FOR AUTO-RADIATOR, SILENCERS AND FUEL TANK (TONS)

Year	Auto radiator	Silencers & exhaust pipes	Fuel tank
2013	148	86	1,180
2014	155	90	1,239
2015	163	95	1,300
2016	171	100	1,366
2017	180	105	1,434
2018	189	110	1,505
2019	198	115	1,581
2020	208	121	1,660
2021	219	127	1,743
2022	229	134	1,830

3. Pricing and Distribution

Based on the CIF price of 2011 and adding 25% to account for duty and other import related expenses a factory gate price of Birr 94,000 per tone, Birr 54,000 per ton and Birr 71,000 per tone for auto radiators, silencers and fuel tanks is recommended as a factory gate price for the envisaged plant.

Auto radiators and silencers can be distributed by using the existing motor vehicles spare parts distributing enterprise while fuel tanks are directly distributed to end users.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

A plant with a manufacturing capacity of 118 tons of auto radiators; 124 tons of silencers; and 130 tons of fuel tanks per annum is selected by considering the market size as well as the available technologies.

2. Production Program

The production program is worked out by considering the time required for market penetration and for skill development. Accordingly, the plant is assumed to start its operation at 75% of its rated full capacity and progressively increase to 85%, in the second year. It will attain 100% production at the third year and there after. The production programme is provided in Table 3.3.

Table3. 3

ANNUAL PRODUCTION PROGRAM

Type of Product	Year 1	Year 2	Year 3
Auto Radiators (Tons)	89	103	118
Silencers (Tons)	93	105	124
Fuel tanks (Tons)	98	111	130
Capacity %	75	85	100

IV. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The major raw materials required for the production of radiator, silencer and fuel tanks are steel, copper and brass sheet, copper tubes and other bought items such as gaskets, hoses, washers and screws that are bought out. Most of the raw materials requiring have to be imported. The required raw and auxiliary materials and their cost at full capacity operation are shown in Table 4.1.

Table 4.1

RAW MATERIAL REQUIREMENT AND COST

No	Raw Materials	quantity (ton)	Total Cost		
			F.C	L.C	Total
	<u>Auto Radiators</u>				
1	Copper sheets	50	2,200	550	2,750
2	Steel sheets	15	270	68	338
3	Brass sheets	55	2,200	550	2,750
4	Copper tubes	20	880	220	1,100
	<u>Silencers</u>			-	-
1	Cooper sheets	50	2,200	550	2,750
2	Steel sheets	60	1,080	270	1,350
	<u>Fuel Tankers</u>			-	-
1	Copper Sheets	120	5,280	1,320	6,600
2	Steel sheets	25	450	113	563
	<u>Others</u>			-	-
1	paints	10	150	38	188
2	Hoses, Gaskets, Washers, Screws	15	375	94	469
3	Flat bar	10	180	45	225
	Total		15,265	3,816	19,081

B. UTILITIES

Electricity and Water are the major utility required by the plant. Annual cost of utilities is Birr 60,890. Details of utility requirement and corresponding cost is indicated in Table 4.2

Table 4.2**ANNUAL UTILITIES REQUIREMENT & COST**

No	Utility	Unit	Quantity	Cost (Birr)
1	Electricity	Kwh.	83,000	48,140
2	Water	Meter cube	1,275	12,750
	Total			60,890

V. TECHNOLOGY AND ENGINEERING**A. TECHNOLOGY****1. Process Description**

The production of radiators involves manual, automatic and semi automatic machines. The process involved for each of the products is as shown below:-

Radiators

Sheet Cutting/ Slitting-----Hole Perforating-----Press Works----- Assembly----Testing.

Fuel Tanks

Sheet Cutting--- Sheet – Rolling, Pressing, Bending-----Welding----Assembling-----Painting

Silencers

Sheet Cutting-----Sheet Rolling, Pressing, Perforating-----Welding----Assembling--- Testing

2. Environmental Impact

The production activity of the plant does not have any negative impact on the environment.

B. ENGINEERING**1. Machinery and Equipment**

Total cost of machinery and equipment is Birr 3,033,000 of which Birr 2,426,400 is required in foreign currency. The list of necessary machinery and equipment and their cost is shown in Table 5.1.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT

Sr. No.	Machine	Description	Unit	Qty.
1	Sheet Metal Bending M/c	4x1500mm	Nos.	2
2	Guillotine Shearing Machine	4x1500mm	Nos.	3
3	Treadle sheering Machine	4x1500mm	Nos.	2
4	Manual Lever shear	4mm	Nos.	3
5	El sheet metal Roller	4mm	Nos.	1
6	D/action Mechanical press	150 Ton	Nos.	1
7	Mechanical Press	60Ton	Nos.	3
8	Fly wheel press	15Ton	Nos.	3
9	Gas welding Set	sets	Nos.	3
10	Arc welder m/c	1kva	Nos.	2
11	Spot welding machine	3kva	Nos.	2
12	Hydraulic Pipe bender	With dies	Nos.	2
13	Hand Tools m/c	sets	Nos.	3
14	Material handling Equipments	sets	Nos.	3
15	Painting Booth	set	Nos.	1

2. Land, Building and Civil Work

Land is required to accommodate plant building, management offices, social building for workers, stores, internal roads, adequate space for expansion and other industry related activities. The total land area for the envisaged plant is estimated at 2,000 m². The built-up area is estimated at 1,000 m². At building rate of Birr 5,000 per m² the cost of building and civil works will be Birr 5 million

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No 721/2004) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%.The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided. However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 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 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 within 28 years i.e. Birr 8,550 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will create employment opportunities for a total of 39 persons. Annual labor cost, including employees benefit, is estimated at Birr 1,113,512. The human resource required by type of job and monthly and annual salary is given in Table 6.1.

B. TRAINING REQUIREMENT

On the job training of the operators would be enough for workers with technical back ground.

The cost of training is estimated at Birr 40,000.

Table 6.1

LIST OF HUMAN RESOURCE REQUIREMENT AND LABOR 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/	3	2,500	90,000
9	Machinery Operators	17	2,000	408,000
10	Assistant Operators	3	1,500	54,000
11	Machinist technicians	2	2,000	48,000
12	Quality controller.	3	1,500	54,000
13	Laborers	2	800	19,200
Sub -Total		30	-	673,200
Total				894,000
Employee's benefit (25% of basic salary)		-	-	219,512
Total		39	-	1,113,512

VII. FINANCIAL ANALYSIS

The financial analysis of the auto-radiator, fuel tank and silencers 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	5 years
Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	30 days
Raw material imported	120 days
Work in progress	1 day
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 15.59 million (see Table 7.1). From the total investment cost the highest share (Birr 9.21 million or 59.04%) is accounted by fixed investment cost followed by initial working capital (Birr 4.56 million or 29.28%) and pre operation cost (Birr 1.82 million or 11.68%). From the total investment cost Birr 2.42 million or 15.55% 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	0.17
1.2	Building and civil work	5,000.00		5,000.00	32.05
1.3	Machinery and equipment	606.20	2,426.80	3,033.00	19.44
1.4	Vehicles	900.00		900.00	5.77
1.5	Office furniture and equipment	250.00		250.00	1.60
	Sub total	6,782.80	2,426.80	9,209.60	59.04
2	Pre operating cost *				
2.1	Pre operating cost	801.65		801.65	5.14
2.2	Interest during construction	1,020.45		1,020.45	6.54
	Sub total	1,822.10		1,822.10	11.68
3	Working capital **	4,566.66		4,566.66	29.28
	Grand Total	13,171.56	2,426.80	15,598.36	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 6.49 million. However, only the initial working capital of Birr 4.56 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 23.46 million (see Table 7.2). The cost of raw material account for 81.33% of the production cost. The other major components of the production cost are depreciation, financial cost and direct labor, which account for 5.0%, 3.59% and 3.81%, respectively. The remaining 6.27% is the share of utility, repair and maintenance, labor overhead, cost of marketing and distribution and administration cost. For detail production cost see Appendix 7.A.2.

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

Items	Cost (000 Birr)	%
Raw Material and Inputs	19,081.00	81.33
Utilities	61.00	0.26
Maintenance and repair	91.00	0.39
Labor direct	894.00	3.81
Labor overheads	220.00	0.94
Administration Costs	350.00	1.49
Land lease cost	-	-
Cost of marketing and distribution	750.00	3.20
Total Operating Costs	21,447.00	91.42
Depreciation	1,171.93	5.00
Cost of Finance	841.87	3.59
Total Production Cost	23,460.80	100

C. FINANCIAL EVALUATION**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 2.53 million to Birr 3.73 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 39.84 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 8,214,951$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 30\%$$

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 31.72% 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 18.14 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 39 persons. The project will generate Birr 9.75 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 automotive sub sector and 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	13,357	15,265	17,173	19,081	19,081	19,081	19,081	19,081	19,081	19,081
Utilities	43	49	55	61	61	61	61	61	61	61
Maintenance and repair	64	73	82	91	91	91	91	91	91	91
Labour direct	626	715	805	894	894	894	894	894	894	894
Labour overheads	154	176	198	220	220	220	220	220	220	220
Administration Costs	245	280	315	350	350	350	350	350	350	350
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	15,238	17,308	19,377	21,447	21,456	21,456	21,456	21,456	21,456	21,456
Depreciation	1,172	1,172	1,172	1,172	1,172	225	225	225	225	225
Cost of Finance	0	1,122	982	842	702	561	421	281	140	0
Total Production Cost	16,410	19,602	21,531	23,461	23,329	22,242	22,101	21,961	21,821	21,681

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	18,913	24,316	27,018	27,018	27,018	27,018	27,018	27,018	27,018	27,018
Less variable costs	14,488	16,558	18,627	20,697	20,697	20,697	20,697	20,697	20,697	20,697
VARIABLE MARGIN	4,425	7,758	8,391	6,321	6,321	6,321	6,321	6,321	6,321	6,321
in % of sales revenue	23.40	31.91	31.06	23.40	23.40	23.40	23.40	23.40	23.40	23.40
Less fixed costs	1,922	1,922	1,922	1,922	1,930	984	984	984	984	984
OPERATIONAL MARGIN	2,503	5,836	6,469	4,399	4,391	5,337	5,337	5,337	5,337	5,337
in % of sales revenue	13.24	24.00	23.94	16.28	16.25	19.76	19.76	19.76	19.76	19.76
Financial costs		1,122	982	842	702	561	421	281	140	0
GROSS PROFIT	2,503	4,714	5,487	3,557	3,689	4,776	4,917	5,057	5,197	5,337
in % of sales revenue	13.24	19.39	20.31	13.17	13.65	17.68	18.20	18.72	19.24	19.76
Income (corporate) tax	0	0	0	1,067	1,107	1,433	1,475	1,517	1,559	1,601
NET PROFIT	2,503	4,714	5,487	2,490	2,582	3,343	3,442	3,540	3,638	3,736
in % of sales revenue	13.24	19.39	20.31	9.22	9.56	12.37	12.74	13.10	13.47	13.83

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	10,011	24,558	24,324	27,026	27,018	27,018	27,018	27,018	27,018	27,018	27,018	10,545
Inflow funds	10,011	5,645	8	8	0	0	0	0	0	0	0	0
Inflow operation	0	18,913	24,316	27,018	27,018	27,018	27,018	27,018	27,018	27,018	27,018	0
Other income	0	0	0	0	0	0	0	0	0	0	0	10,545
TOTAL CASH OUTFLOW	10,011	20,882	20,485	22,414	25,411	24,668	24,853	24,755	24,656	24,558	23,057	0
Increase in fixed assets	10,011	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	4,624	652	652	652	1	0	0	0	0	0	0
Operating costs	0	14,488	16,558	18,627	20,697	20,706	20,706	20,706	20,706	20,706	20,706	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	1,067	1,107	1,433	1,475	1,517	1,559	1,601	0
Financial costs	0	1,020	1,122	982	842	702	561	421	281	140	0	0
Loan repayment	0	0	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	0	0
SURPLUS (DEFICIT)	0	3,675	3,839	4,612	1,607	2,350	2,165	2,263	2,362	2,460	3,961	10,545
CUMULATIVE CASH BALANCE	0	3,675	7,514	12,126	13,734	16,084	18,249	20,512	22,874	25,334	29,295	39,840

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	18,913	24,316	27,018	27,018	27,018	27,018	27,018	27,018	27,018	27,018	10,545
Inflow operation	0	18,913	24,316	27,018	27,018	27,018	27,018	27,018	27,018	27,018	27,018	0
Other income	0	0	0	0	0	0	0	0	0	0	0	10,545
TOTAL CASH OUTFLOW	14,578	15,881	17,951	20,021	22,515	22,562	22,888	22,931	22,973	23,015	23,057	0
Increase in fixed assets	10,011	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	4,567	643	643	643	1	0	0	0	0	0	0	0
Operating costs	0	14,488	16,558	18,627	20,697	20,706	20,706	20,706	20,706	20,706	20,706	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	1,067	1,107	1,433	1,475	1,517	1,559	1,601	0
NET CASH FLOW	-14,578	3,032	6,365	6,997	4,503	4,456	4,130	4,087	4,045	4,003	3,961	10,545
CUMULATIVE NET CASH FLOW	-14,578	11,546	-5,181	1,816	6,319	10,775	14,904	18,992	23,037	27,041	31,002	41,547
Net present value	-14,578	2,756	5,260	5,257	3,076	2,767	2,331	2,098	1,887	1,698	1,527	4,066
Cumulative net present value	-14,578	11,822	-6,562	-1,304	1,771	4,538	6,869	8,966	10,854	12,551	14,079	18,144

NET PRESENT VALUE 18,144
INTERNAL RATE OF
RETURN 31.72%
NORMAL PAYBACK 3 years