

**77. PROFILE ON THE PRODUCTION OF
CONVEYOR AND TRANSMISSION BELT OF
RUBBER**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of transmission belts with a capacity of 210,000 pieces or 1010 tons per annum. Transmission belts are used for power transmission purposes by connecting driving and driven pulleys of machinery.

The demand for transmission belts is entirely met through import. The present (2012) demand for transmission belts is estimated at 1,325 tons. The demand for transmission belts is projected to reach 2,133 tons and 3,435 tons by the year 2017 and 2022, respectively.

The principal raw materials required are natural and synthetic rubber, carbon black, cord (both nylon and polyester), activators, accelerator, vulcanizing agents and process aid all of which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 55.46 million. From the total investment cost, the highest share (Birr 31.30 million or 56.44%) is accounted by initial working capital followed by fixed investment cost (Birr 19.90 million or 35.89%) and pre operation cost (Birr 4.24 million or 7.66%). From the total investment cost, Birr 5.01 million or 9.04% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 32.02% and a net present value (NPV) of Birr 82.14 million, discounted at 10%.

The project can create employment for 46 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 manufacturing sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Transmission belts are used for power transmission purposes by connecting driving and driven pulleys of machinery. Transmission pulleys are widely used in industrial, agricultural, construction and other operations to transmit power. Of the various types of belts in use V- belt is considered for this project as it is the type (according to the market study) more in demand.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Since there is no plant in the country that produces transmission belt of rubber, the requirement of the country is entirely met through import. Import of transmission belt of rubber during the past six years is shown in Table 3.1.

Table 3.1
IMPORT OF TRANSMISSION BELT (TONS)

Year	Import
2002	425
2003	383
2004	529
2005	460
2006	834
2007	727
2008	882
2009	863
2010	1,723
2011	1,113

Source: - Ethiopian Custom and Revenues Authority.

Import of transmission belt of rubber during the past ten years has shown a general increasing trend although it is characterized by fluctuations. The yearly average import of the product during the years (2002-2004) and (2005-2007) was 446 tons and 674 tons respectively. This average has become 1,145 tons during the recent four years (2008-2011). The average growth rate of the quantity of imported transmission belt of rubber during the years 2002-2011 was about 19% and this average growth rate was about 21% during the last four years (2008-2011).

To determine the current (2012) demand, a 19% growth rate which is less than the average growth rate during the last four years (2008-2011) is applied by using the imported quantity during the year 2011 as a base. Accordingly, the current (2012) demand for transmission belt of rubber is set at 1,325 tons.

2. Demand Projection

Transmission belts are widely used in industrial, agricultural, construction and other operations as a source of motion, to efficiently transmit power, or to track relative movements. Hence, the demand for the product is expected to grow parallel with the development of these sectors. The industrial sector is expected to grow at about 20% during the Growth and Transformation (GTP) period. However, a conservative growth estimate of 10% is applied to project the future demand for the product (see Table 3.2).

Table 3.2
PROJECTED DEMAND FOR TRANSMISSION BELT (TONS)

Year	Project Demand
2013	1,457
2014	1,603
2015	1,763
2016	1,939
2017	2,133
2018	2,346
2019	2,581
2020	2,839
2021	3,123
2022	3,435

Demand for transmission belt of rubber will grow from 1,457 tons in the year 2013 to 1,939 tons and 2,581 tons by the year 2016 and year 2019, respectively. The demand will reach at 3,435 tons by the year 2022.

3. Pricing and Distribution

The average CIF price of transmission belt of rubber including subsequent inland costs which is Birr 172,110 per tone is recommended for sales revenue projection.

The product will find its market outlet through the existing industrial, agricultural, transport and related materials and equipments distributing channels.

B. PLANT CAPACITY & PRODUCTION PROGRAM

1. Plant Capacity

V-belt has all sorts of cross-section and circumferential length. Because of the combination of the two, the production tends to be small with great variety. In order to make a plant profitable, when designing it, due consideration should be given to the kind of product to be produced and the scale of production.

The production capacity of the envisaged plant is estimated to be 210,000 pieces (1010 tons) of V-belts of which B type 60 inch is the main product which the yearly production run time is 300 days with 8hrs per day arrangement.

2. Production Program

At the initial stage of production, the project may require some years to penetrate the market. Therefore, in the first and second year of production the capacity utilization rate will be 65% and 85%, respectively. In the third year and onwards, full capacity production shall be attained. Table 4.1 indicates the production program of the project.

Table 4.1

PRODUCTION PROGRAMME

Product	Production Year		
	1	2	3 rd --10
V-belt (pcs)	136,500	178,500	210,000
V-Belt (tons)	656	858	1,010
Capacity Utilization Rate (%)	65	85	100

IV. MATERIALS AND INPUTS

A. RAW & AUXILIARY MATERIALS

The major raw & auxiliary materials for the production of transmission belt, which fabric is used as reinforcement, are natural and synthetic rubber, carbon black, cord (both nylon and polyester), activators, accelerator, vulcanizing agents and process aid. The rubber components may be delivered as master-batch so that the investment requirement for mixers and open mill calendar and some laboratory testing equipments will be excluded. Annual requirements of master batch, vulcanizing and accelerators, and reinforcement and stabilizing fabric are given in Table 4.2.

Table 4.2

RAW AND AUXILIARY MATERIAL REQUIREMENT AND COST

Sr. No.	Description	UOM	Qty.	Cost ('000 Birr)		
				FC	LC	Total
1	Master batch	Ton	599	104,825		104,825
2	Reinforcement fabric	Ton	416	37,440		37,440
3	Vulcanizing agent and accelerators	Ton	20	1,200		1,200
4	Others	Ton	5	325		325
Grand Total						143,790

B. UTILITIES

Major utilities of the project are electricity and water, and their annual requirement and cost is indicated in Table 4.2.

Table 4.2

UTILITIES REQUIRMENT AND COST

Utilities	Unit	Qty.	Cost ('000 Birr)
Electrical Energy	kWh	482,400	280
Water	m ³	1,240	12
Total			292

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process of Production

The process starts with a thin layer of cushion rubber sheet wound by a cord of fabrics with slight tension. The cover cloth which is a woven jacketing fabric rubberized by fractioning in a calendar is cut into strips and laid in the V grooves of the ring mould. The groove is then filled with the extruded strip of filler rubber compound. Trapezoidal section is formed at this stage. The ends are then joined together. The assembly is wrapped with nylon tape and the moulds are transferred to steam vulcanizing chamber which would result in the finished product.

Belts of larger sizes are made on adjustable belt presses where more than a single layer of cord fabric is used. A fabric cord coated with adhesive is cut to the desired width, and the strips are wound in layers over filler and the cover cloth is sealed. The belt is vulcanized in stages in hydraulic presses.

2. Environmental impact Assessment:

The envisaged plant does not have wastes that affect the environment. Therefore, it is environmentally friendly

B. ENGINEERING

1. Machinery & Equipment

The total cost of machinery is estimated at Birr 5.425 million, of which Birr 410,000 is in local currency. The list of machinery and equipment is indicated in Table 5.1.

Table 5.1**MACHINERY AND EQUIPMENT REQUIREMENT AND COST**

Sr. No.	Item	Qty.	Cost ('000 Birr)		
			FC	LC	Total
1	60" two roll mill	1	450		450
2	3 roll calendar(660Φx1700)	1	550		550
3	Extruder	1	480		480
4	Bias cutter	1	320		320
5	Case making machine	2	180		180
6	Skiving machine	5		100	100
7	Covering machine	5			0
8	Autoclave	5	950		950
9	Expanding drum	14	490		490
10	Long size belt making machine	3	195		195
11	Belt press	3	600		600
12	Ring mould	60	100	100	200
13	Flat mould	6		210	210
14	Electric boiler	1	700		700
	Total		5,015	410	5,425

2. Land, Building and Civil Works

The total area of the project is about 5,000 m², out of which the built-up area will be 2,500 m². Therefore, the total cost of building is estimated at Birr 12.5 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 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 1,330,000 of which 10% or Birr 133,000 will be paid in advance. The remaining Birr 1,197,000 will be paid in equal installments with in 28 years i.e. Birr 42,750 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will create job opportunities for a total of 46 persons. The overall pay roll and yearly benefit is estimated at Birr 1.307 million per annum. The human resource requirement with corresponding cost estimation is indicated in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIRMENT AND LABROR COST

Sr. No.	Description	Req. No.	Salary Monthly (Birr)	Annual Salary (Birr)
1	General Manager	1	8,000	96,000
2	Secretary	2	1800	43,200
3	Commercial Manager	1	5,000	60,000
4	Finance and Admin. Manager	1	5,000	60,000
5	Production & Technical Manager	1	6,000	72,000
6	Quality Assurance head	1	5,000	60,000
7	Accountant	2	2,500	60,000
8	Clerks	2	1,200	28,800
9	Forman	2	2,500	60,000
10	Operators-skilled	17	1,400	285,600
11	Assistant Operators	3	800	28,800
12	Laborers	2	600	14,400
13	Technical crew(mechanic and electrician)	4	2,000	96,000
14	laboratory staffs	2	2,200	52,800
15	supporting staffs	5	1,200	72,000
	Sub-total	46	45,200	1,089,600.00
	Benefit (20%)		9,040.00	217,920.00
	Grand Total		54,240.00	1,307,520.00

B. TRAINING REQUIRMENT

For the effective run of the technological process an adequate training has to be provided for the technical production manager and for skilled workers/operators. Such training can extend for two months time and the total cost of is estimated at Birr 100,000. The training can be conducted during the machinery erection and commissioning period via the technology provider engineers.

VII. FINANCIAL ANALYSIS

The financial analysis of the transmission belts 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%
Tax holidays	5 years
Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	30 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 55.46 million (see Table 7.1). From the total investment cost, the highest share (Birr 31.30 million or 56.44%) is accounted by initial working capital followed by fixed investment cost (Birr 19.90

million or 35.89%) and pre operation cost (Birr 4.24 million or 7.66%). From the total investment cost, Birr 5.01 million or 9.04% 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	133.00		133.00	0.24
1.2	Building and civil work	12,500.00		12,500.00	22.54
1.3	Machinery and equipment	410.00	5,015.00	5,425.00	9.78
1.4	Vehicles	1,500.00		1,500.00	2.70
1.5	Office furniture and equipment	350.00		350.00	0.63
	Sub- total	14,893.00	5,015.00	19,908.00	35.89
2	Pre operating cost *				
2.1	Pre operating cost	621.25		621.25	1.12
2.2	Interest during construction	3,628.40		3,628.40	6.54
	Sub -total	4,249.65		4,249.65	7.66
3	Working capital	31,304.98		31,304.98	56.44
	Grand Total	50,447.63	5,015.00	55,462.63	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 48.12 million. However, only the initial working capital of Birr 31.30 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 152.59 million (see Table 7.2). The cost of raw material account for 94.23% of the production cost. The other major components of the production cost are financial cost, depreciation and direct labor which account for 2.29%, 1.34% and 0.71%, respectively. The remaining 1.43% 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 (in 000 Birr)	%
Raw Material and Inputs	143,790.00	94.23
Utilities	292.00	0.19
Maintenance and repair	271.25	0.18
Labor direct	1,089.60	0.71
Labor overheads	217.92	0.14
Administration Costs	400.00	0.26
Land lease cost	-	-
Cost of marketing and distribution	1,000.00	0.66
Total Operating Costs	147,060.77	96.37
Depreciation	2,044.25	1.34
Cost of Finance	3,492.33	2.29
Total Production Cost	152,597.35	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 ranges from Birr 15 million to Birr 18.33 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 187.28 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 37,793,550$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 22\%$$

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 32.02% 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 82.14 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 46 persons. The project will generate Birr 50.96 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 agro-processing 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	93,464	122,222	143,790	143,790	143,790	143,790	143,790	143,790	143,790	143,790
Utilities	190	248	292	292	292	292	292	292	292	292
Maintenance and repair	176	231	271	271	271	271	271	271	271	271
Labour direct	708	926	1,090	1,090	1,090	1,090	1,090	1,090	1,090	1,090
Labour overheads	142	185	218	218	218	218	218	218	218	218
Administration Costs	260	340	400	400	400	400	400	400	400	400
Land lease cost	0	0	0	0	43	43	43	43	43	43
Cost of marketing and distribution	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total Operating Costs	95,940	125,152	147,061	147,061	147,104	147,104	147,104	147,104	147,104	147,104
Depreciation	2,044	2,044	2,044	2,044	2,044	535	535	535	535	535
Cost of Finance	0	3,991	3,492	2,993	2,495	1,996	1,497	998	499	0
Total Production Cost	97,984	131,187	152,597	152,098	151,642	149,634	149,135	148,636	148,137	147,639

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	112,990	147,756	173,831	173,831	173,831	173,831	173,831	173,831	173,831	173,831
Less variable costs	94,940	124,152	146,061	146,061	146,061	146,061	146,061	146,061	146,061	146,061
VARIABLE MARGIN	18,050	23,604	27,770	27,770	27,770	27,770	27,770	27,770	27,770	27,770
in % of sales revenue	15.98	15.98	15.98	15.98	15.98	15.98	15.98	15.98	15.98	15.98
Less fixed costs	3,044	3,044	3,044	3,044	3,087	1,578	1,578	1,578	1,578	1,578
OPERATIONAL MARGIN	15,006	20,560	24,726	24,726	24,683	26,192	26,192	26,192	26,192	26,192
in % of sales revenue	13.28	13.91	14.22	14.22	14.20	15.07	15.07	15.07	15.07	15.07
Financial costs		3,991	3,492	2,993	2,495	1,996	1,497	998	499	0
GROSS PROFIT	15,006	16,569	21,234	21,733	22,189	24,197	24,696	25,195	25,694	26,192
in % of sales revenue	13.28	11.21	12.22	12.50	12.76	13.92	14.21	14.49	14.78	15.07
Income (corporate) tax	0	0	0	6,520	6,657	7,259	7,409	7,558	7,708	7,858
NET PROFIT	15,006	16,569	21,234	15,213	15,532	16,938	17,287	17,636	17,986	18,335
in % of sales revenue	13.28	11.21	12.22	8.75	8.94	9.74	9.94	10.15	10.35	10.55

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	20,529	147,997	147,779	173,848	173,831	173,831	173,831	173,831	173,831	173,831	173,831	59,382
Inflow funds	20,529	35,007	23	17	0	0	0	0	0	0	0	0
Inflow operation	0	112,990	147,756	173,831	173,831	173,831	173,831	173,831	173,831	173,831	173,831	0
Other income	0	0	0	0	0	0	0	0	0	0	0	59,382
TOTAL CASH OUTFLOW	20,529	130,947	143,761	162,764	161,563	161,248	161,347	160,998	160,649	160,300	154,961	0
Increase in fixed assets	20,529	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	31,379	9,629	7,222	0	4	0	0	0	0	0	0
Operating costs	0	94,940	124,152	146,061	146,061	146,104	146,104	146,104	146,104	146,104	146,104	0
Marketing and Distribution cost	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0
Income tax	0	0	0	0	6,520	6,657	7,259	7,409	7,558	7,708	7,858	0
Financial costs	0	3,628	3,991	3,492	2,993	2,495	1,996	1,497	998	499	0	0
Loan repayment	0	0	4,989	4,989	4,989	4,989	4,989	4,989	4,989	4,989	0	0
SURPLUS (DEFICIT)	0	17,050	4,017	11,084	12,268	12,583	12,484	12,833	13,182	13,531	18,870	59,382
CUMULATIVE CASH BALANCE	0	17,050	21,068	32,152	44,420	57,003	69,487	82,320	95,502	109,033	127,903	187,285

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	112,990	147,756	173,831	173,831	173,831	173,831	173,831	173,831	173,831	173,831	59,382
Inflow operation	0	112,990	147,756	173,831	173,831	173,831	173,831	173,831	173,831	173,831	173,831	0
Other income	0	0	0	0	0	0	0	0	0	0	0	59,382
TOTAL CASH OUTFLOW	51,834	105,546	132,357	147,061	153,585	153,760	154,363	154,512	154,662	154,812	154,961	0
Increase in fixed assets	20,529	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	31,305	9,607	7,205	0	4	0	0	0	0	0	0	0
Operating costs	0	94,940	124,152	146,061	146,061	146,104	146,104	146,104	146,104	146,104	146,104	0
Marketing and Distribution cost	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0
Income (corporate) tax		0	0	0	6,520	6,657	7,259	7,409	7,558	7,708	7,858	0
NET CASH FLOW	-51,834	7,444	15,399	26,770	20,246	20,071	19,468	19,319	19,169	19,019	18,870	59,382
CUMULATIVE NET CASH FLOW	-51,834	-44,390	-28,991	-2,221	18,025	38,096	57,565	76,884	96,053	115,072	133,942	193,324
Net present value	-51,834	6,767	12,727	20,113	13,828	12,462	10,989	9,914	8,943	8,066	7,275	22,894
Cumulative net present value	-51,834	-45,067	-32,340	-12,228	1,601	14,063	25,053	34,966	43,909	51,975	59,250	82,144

NET PRESENT VALUE 82,144
INTERNAL RATE OF RETURN 32.02%
NORMAL PAYBACK 3 years