120. PROFILE ON THE PRODUCTION OF GUMMED PAPER

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I. SUMMARY

This profile envisages the establishment of a plant for the production of gummed paper with a capacity of 300 tons per annum. Gummed paper is used in sealing different sizes of primary and secondary packaging materials such as cartoons and printed materials. It is also used for postage and revenue stamp making process.

The demand for gummed paper is met entirely through import. The present (2012) demand for gummed paper is estimated at 225 tons. The demand for gummed paper is projected to reach 315 tons and 442 tons by the year 2017 and 2022, respectively.

The principal raw materials required are base paper and gum which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 22.50 million (See Table 7.1). From the total investment cost, the highest share (Birr 13.62 million or 60.54%) is accounted by initial working capital followed by fixed investment cost (Birr 6.97 million or 30.99%) and pre operation cost (Birr 1.91 million or 8.34%). From the total investment cost, Birr 2.24 million or 9.96% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 28.22% and a net present value (NPV) of Birr 25.69 million, discounted at 10%.

The project can create employment for 10 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 packaging and paper sub sectors and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Gummed paper usually known also as self-adhesive paper is a type of paper composed of a backing element (Kraft paper) in a long strip upon which an adhesive is applied so as to attach the carrier (paper) to some secondary surface. The attachment is made by activating the adhesive with solvent such as water and finger pressure.

This product is widely used in sealing different sizes of primary and secondary packaging materials such as cartoons and printed materials. It is also used for postage and revenue stamp making process.

Gummed paper tape is also a water activated tamper evident carton sealing tape which ensures pack integrity, providing security against pilferage, contamination and counterfeit products. It is even effective on dusty and partially filled cartons.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The demand for gummed paper is met through imports. It is mainly consumed by the manufacturing sector for packaging goods in cartoons and also for the manufacture of postage stamps, tax handsets or revenue stamps. The total imported volume of different types of paper and gummed paper are presented in Table 3.1.

Table 3.1

IMPORTED OF ALL TYPES OF PAPER AND GUMMED PAPER (TONS)

Year	All Types of Paper	Imported
2002	39,415	195
2003	28,440	151
2004	27,824	134
2005	43,413	168
2006	60,138	202
2007	68,187	168
2008	71,188	225
2009	107,817	241
2010	76,529	144
2011	70,985	210

Source: - *Ethiopian Revenues & Customs Authority.*

The import data on gummed paper indicates that the annual average quantity of imported gummed paper during the years (2002-2011) was 184 tons with an average annual growth rate of about 5%. However, the volume of import during the recent four years (2008-2011) has grown to an average amount of 205 tons with an average growth rate of about 12%. This shows growth in both quantity of imports and rate of growth during the recent years. On the other hand the import of all types of paper supplied to the local market during the past recent four years has grown by an average amount of about 7%. Hence, this average growth rate which is less than the average growth rate in the quantity of gummed paper during the same period is used to estimate the current (2012) effective demand for the product.

Accordingly, by taking year 2011 as a base the current effective demand for gummed paper is estimated at 225 tons.

2. Demand Projection

The future demand for gummed paper is influenced by the performance of the national economy in general and particularly by the performance of the manufacturing sector. According to the country's Growth and Transformation Plan, the expected growth in the manufacturing and agro-industries will result in more demand for suitable packaging materials. Hence, although the imported quantity of gummed paper has grown by an average rate of 12%, a conservative scenario which is the average growth rate of for all types of imported paper (7%), is used to estimate the future demand for the product. Hence, the projected demand for gummed paper is presented in Table 3.2.

Table 3.2

PROJECTED DEMAND FOR GUMMED PAPER (TONS)

Year	Projected Demand
2013	241
2014	257
2015	275
2016	295
2017	315
2018	337
2019	361
2020	386
2021	413
2022	442

3. Pricing and Distribution

Taking in to account the informed opinion of traders of the product and allowing a profit margin for distribution and retailing the ex-factory selling price is recommended to be Birr 225 per kg. The products will be distributed through the existing stationery and construction materials trading channels.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

According to market study, the demand for gummed paper grows to 241 tons and 442 tons by the year 2013 and 2022, respectively. It is, therefore, envisaged that a plant with an annual capacity of 300 tons shall be established. A total of 300 working days per annum and a single shift of eight hours per day is the basis of capacity determination.

2. Production Program

The envisaged plant will start operation in a single shift, 8 hours a day, and 300 days a year. Production can be scheduled to grow to full capacity in three consecutive years, starting at 75% of installed capacity in the first year, and raising the production to 85% in the second year. Full capacity production will then be attained in the third year and then after. Production output can be doubled or tripled by introducing a second or third shift in the daily production programme depending upon the market demand. Table 3.3 below depicts the proposed production program.

Table 3.3

PRODUCTION PROGRAM

Year	1	2	3
Capacity utilization [%]	75	85	100
Production (tons)	225	255	300

IV. RAW MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw materials required for the production of gummed paper are base paper and gum which have to be imported. The annual requirement of raw material and the corresponding cost are shown in Table 4.1.

Table 4.1

RAW MATERIALS REQUIREMENT AND COST AT FULL CAPACITY

Sr. No.	Description	Unit of Measure	Qty	Unit Price	Total cost, ['000 Birr]		
					LC	FC	TC
1	Base paper	Ton	315	150,000	7,087.5	47,250.0	54,337.5
2	Gum	Ton	120	25,000	450.0	3,000.0	3,450.0
3	Packing material	Ton	20	15,000	45.0	300.0	345.0
	Grand Total				**7,582.5**	**50,550.0**	**58,132.5**

B. UTILITIES

Utilities required for the plant is comprised of electricity and water. Annual cost of utilities is Birr 126,000. Required amount of utilities and corresponding cost at full production capacity is shown in Table 4.2.

Table 4.2
ANNUAL REQUIREMENT OF UTILITIES AND COST

Sr. No.	Description	Annual Consumption	UOM	Unit Cost (Birr)	Total Cost ("000 Birr)
1	Electricity	150,000	kWh	0.58	87.00
2	Water	3,900	m^3	10.00	39.00
Total Annual Cost					**126.00**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The process of making a gummed paper involves preparation of coating mixture in aqueous medium and its application to the base paper using a coating machine, drying and subsequently cutting the paper to make tapes of desired size and weight.

2. Environmental Impact

The production process of gummed paper does not have negative impact on the environment. Therefore, there is no need for additional investment for mitigation of the environmental impact.

B. ENGINEERING

1. Machinery and Equipment

The total cost of machinery and equipment is estimated at Birr 2.8 million, of which Birr 2.24 million is required in foreign currency. The list of machinery & equipment required are given in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT REQUIREMENT

Sr. No.	Description	Qty
1	Gum meting unit storage tanks	1
2	coating machine	1
3	slitting rewinding machine	1
4	baby boiler	1
5	flexographic bi-color printing machine	1
6	weighing scales	2

2. Land, Building and Civil Works

The total area required for plant site is estimated to be 800 m^2; of this the built-up area of the factory will be 600 m^2. Building cost is estimated to be Birr 5,000 per m^2, and the total building cost will, then, be Birr 3 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 m^2, 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 m^2, 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 m^2. 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 m^2 .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 m^2 (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor Price/m^2
Central Market District	1st	1686
	2nd	1535
	3rd	1323
	4th	1085
	5th	894
Transitional zone	1st	1035
	2nd	935
	3rd	809
	4th	685
	5th	555
Expansion zone	1st	355
	2nd	299
	3rd	217
	4th	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 m^2 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 criterions 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 m^2 is estimated at Birr 212,800 of which 10% or Birr 21,280 will be paid in advance. The remaining Birr 191,520 will be paid in equal installments with in 28 years i.e. Birr 6,840 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will be able to employ 10 persons. Annual salary requirement, including employee's benefit, will be Birr 192,960. The mix of production and administrative human resource required for the envisaged plant is shown in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND LABOUR COST

Sr. No.	Description	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr)
1	General manager/supervisor	1	3000	36000
2	Skilled operators	2	3600	43200
3	Unskilled operators	2	1600	19200
4	Clerk/cashier	1	1400	16800
5	Store keeper	1	1400	16800
6	guard	3	2400	28800
	Sub-total	**10**	**-**	**160800**
	Employee Benefit (25% of basic salary)	-	-	32160
	Total	**10**	**-**	**192,960**

B. TRAINING REQUIREMENT

Estimated cost of on-site training of this nature is about Birr 15,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the gummed paper 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 22.50 million (See Table 7.1). From the total investment cost, the highest share (Birr 13.62 million or

60.54%) is accounted by initial working capital followed by fixed investment cost (Birr 6.97 million or 30.99%) and pre operation cost (Birr 1.91 million or 8.34%). From the total investment cost, Birr 2.24 million or 9.96% 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	21.28		21.28	0.09
1.2	Building and civil work	3,000.00		3,000.00	13.34
1.3	Machinery and equipment	560.00	2,240.00	2,800.00	12.45
1.4	Vehicles	900.00		900.00	4.00
1.5	Office furniture and equipment	250.00		250.00	1.11
	Sub total	**4,731.28**	**2,240.00**	**6,971.28**	**30.99**
2	**Pre operating cost ***				
2.1	Pre operating cost	434.00		434.00	1.93
2.2	Interest during construction	1,471.70		1,471.70	6.54
	Sub total	**1,905.70**		**1,905.70**	**8.47**
3	**Working capital ****	**13,619.05**		**13,619.05**	**60.54**
	Grand Total	**20,256.04**	**2,240.00**	**22,496.04**	**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 19.49 million. However, only the initial working capital of Birr 13.61 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 61.47 million (see Table 7.2). The cost of raw material account for 94.56% of the production cost. The other major components of the production cost are depreciation, and financial cost, marketing and distribution, and administration cost which account for 1.58%, 2.30%, 0.57% and 0.33%, respectively. The remaining 0.66% is the share of utility, labor, repair and maintenance, labor overhead. 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	58,133	94.56
Utilities	126	0.20
Maintenance and repair	84	0.14
Labor direct	161	0.26
Labor overheads	32	0.05
Administration Costs	200	0.33
Land lease cost	0	0.00
Cost of marketing and distribution	350	0.57
Total Operating Costs	**59,086**	**96.11**
Depreciation	972	1.58
Cost of Finance	1,417	2.30
Total Production Cost	**61,474**	**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 4.36 million to Birr 5.78 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 61.39 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.

$$\text{Break- Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 28{,}350{,}000$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break- even Sales Value}}{\text{Sales revenue}} \times 100 = 15\%$$

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 28.22% 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 25.69 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 10 persons. The project will generate Birr 15.58 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 packaging and paper sub sectors and also generates income for the Government in terms of payroll tax.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

Appendix 7.A.1
NET WORKING CAPITAL (in 000 Birr)

Items	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total inventory	10,173.28	12,353.26	14,533.25	14,533.25	14,533.25	14,533.25	14,533.25	14,533.25	14,533.25	14,533.25
Accounts receivable	3,455.43	4,189.63	4,923.83	4,923.83	4,924.40	4,924.40	4,924.40	4,924.40	4,924.40	4,924.40
Cash-in-hand	4.64	5.63	6.63	6.63	6.72	6.72	6.72	6.72	6.72	6.72
CURRENT ASSETS	**13,633.35**	**16,548.53**	**19,463.71**	**19,463.71**	**19,464.37**	**19,464.37**	**19,464.37**	**19,464.37**	**19,464.37**	**19,464.37**
Accounts payable	14.29	17.35	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42
CURRENT LIABILITIES	**14.29**	**17.35**	**20.42**	**20.42**	**20.42**	**20.42**	**20.42**	**20.42**	**20.42**	**20.42**
TOTAL WORKING CAPITAL	**13,619.05**	**16,531.17**	**19,443.29**	**19,443.29**	**19,443.96**	**19,443.96**	**19,443.96**	**19,443.96**	**19,443.96**	**19,443.96**

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	40,693	49,413	58,133	58,133	58,133	58,133	58,133	58,133	58,133	58,133
Utilities	88	107	126	126	126	126	126	126	126	126
Maintenance and repair	59	71	84	84	84	84	84	84	84	84
Labour direct	113	137	161	161	161	161	161	161	161	161
Labour overheads	22	27	32	32	32	32	32	32	32	32
Administration Costs	140	170	200	200	200	200	200	200	200	200
Land lease cost	0	0	0	0	17	7	7	7	7	7
Cost of marketing and distribution	350	350	350	350	350	350	350	350	350	350
Total Operating Costs	**41,465**	**50,276**	**59,086**	**59,086**	**59,093**	**59,093**	**59,093**	**59,093**	**59,093**	**59,093**
Depreciation	972	972	972	972	972	145	145	145	145	145
Cost of Finance	0	1,619	1,417	1,214	1,012	809	607	405	202	0
Total Production Cost	**42,437**	**52,866**	**61,474**	**61,272**	**61,076**	**60,047**	**59,845**	**59,643**	**59,440**	**59,238**

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	47,250	60,750	67,500	67,500	67,500	67,500	67,500	67,500	67,500	67,500
Less variable costs	41,115	49,926	58,736	58,736	58,736	58,736	58,736	58,736	58,736	58,736
VARIABLE MARGIN	**6,135**	**10,824**	**8,764**	**8,764**	**8,764**	**8,764**	**8,764**	**8,764**	**8,764**	**8,764**
in % of sales revenue	12.98	17.82	12.98	12.98	12.98	12.98	12.98	12.98	12.98	12.98
Less fixed costs	1,322	1,322	1,322	1,322	1,329	502	502	502	502	502
OPERATIONAL MARGIN	**4,813**	**9,503**	**7,442**	**7,442**	**7,435**	**8,262**	**8,262**	**8,262**	**8,262**	**8,262**
in % of sales revenue	10.19	15.64	11.03	11.03	11.02	12.24	12.24	12.24	12.24	12.24
Financial costs		1,619	1,417	1,214	1,012	809	607	405	202	0
GROSS PROFIT	**4,813**	**7,884**	**6,026**	**6,228**	**6,424**	**7,453**	**7,655**	**7,857**	**8,060**	**8,262**
in % of sales revenue	10.19	12.98	8.93	9.23	9.52	11.04	11.34	11.64	11.94	12.24
Income (corporate) tax	0	0	0	1,868	1,927	2,236	2,297	2,357	2,418	2,479
NET PROFIT	**4,813**	**7,884**	**6,026**	**4,360**	**4,496**	**5,217**	**5,359**	**5,500**	**5,642**	**5,784**
in % of sales revenue	10.19	12.98	8.93	6.46	6.66	7.73	7.94	8.15	8.36	8.57

Appendix 7.A.4

CASH FLOW FOR FINANCIAL MANAGEMENT (in 000 Birr)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
TOTAL CASH INFLOW	**7,405**	**62,355**	**60,753**	**67,503**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**22,737**
Inflow funds	7,405	15,105	3	3	0	0	0	0	0	0	0	0
Inflow operation	0	47,250	60,750	67,500	67,500	67,500	67,500	67,500	67,500	67,500	67,500	0
Other income	0	0	0	0	0	0	0	0	0	0	0	22,737
TOTAL CASH OUTFLOW	**7,405**	**56,570**	**56,833**	**65,441**	**64,192**	**64,056**	**64,162**	**64,020**	**63,878**	**63,737**	**61,571**	**0**
Increase in fixed assets	7,405	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	13,633	2,915	2,915	0	1	0	0	0	0	0	0
Operating costs	0	41,115	49,926	58,736	58,736	58,743	58,743	58,743	58,743	58,743	58,743	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income tax	0	0	0	0	1,868	1,927	2,236	2,297	2,357	2,418	2,479	0
Financial costs	0	1,472	1,619	1,417	1,214	1,012	809	607	405	202	0	0
Loan repayment	0	0	2,024	2,024	2,024	2,024	2,024	2,024	2,024	2,024	0	0
SURPLUS (DEFICIT)	**0**	**5,785**	**3,920**	**2,062**	**3,308**	**3,444**	**3,338**	**3,480**	**3,622**	**3,763**	**5,929**	**22,737**
CUMULATIVE CASH BALANCE	**0**	**5,785**	**9,705**	**11,766**	**15,074**	**18,518**	**21,857**	**25,337**	**28,958**	**32,721**	**38,650**	**61,387**

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**	**47,250**	**60,750**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**67,500**	**22,737**
Inflow operation	0	47,250	60,750	67,500	67,500	67,500	67,500	67,500	67,500	67,500	67,500	0
Other income	0	0	0	0	0	0	0	0	0	0	0	22,737
TOTAL CASH OUTFLOW	**21,024**	**44,377**	**53,188**	**59,086**	**60,955**	**61,020**	**61,329**	**61,389**	**61,450**	**61,511**	**61,571**	**0**
Increase in fixed assets	7,405	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	13,619	2,912	2,912	0	1	0	0	0	0	0	0	0
Operating costs	0	41,115	49,926	58,736	58,736	58,743	58,743	58,743	58,743	58,743	58,743	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income (corporate) tax		0	0	0	1,868	1,927	2,236	2,297	2,357	2,418	2,479	0
NET CASH FLOW	**-21,024**	**2,873**	**7,562**	**8,414**	**6,545**	**6,480**	**6,171**	**6,111**	**6,050**	**5,989**	**5,929**	**22,737**
CUMULATIVE NET CASH FLOW	**-21,024**	**-18,152**	**-10,589**	**-2,175**	**4,370**	**10,850**	**17,021**	**23,132**	**29,182**	**35,171**	**41,099**	**63,836**
Net present value	-21,024	2,612	6,250	6,322	4,470	4,024	3,484	3,136	2,822	2,540	2,286	8,766
Cumulative net present value	-21,024	-18,413	-12,163	-5,841	-1,371	2,652	6,136	9,272	12,094	14,634	16,920	25,686

NET PRESENT VALUE	25,686
INTERNAL RATE OF RETURN	28.22%
NORMAL PAYBACK	4 years