15. PROFILE ON THE PRODUCTION OF MARGARINE

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I. SUMMARY

This profile envisages the establishment of a plant for the production of margarine with a capacity of 25,000 kg per annum. Margarine is widely used as a table spread in bakeries, pastries and as an ingredient in various food preparations, shortenings, basic input in baked products like bread, biscuit and the like.

The country`s requirement of margarine is met through import. The present (2012) demand for margarine is estimated at 670 tons. The demand for the products is projected to reach 898 tones and 1,092 tones by the year 2018 and year 2022, respectively.

The principal raw materials required are partially hydrogenated cotton seed oil, animal fats and skimmed milk which are available locally.

The total investment cost of the project including working capital is estimated at Birr 6.74 million. From the total investment cost the highest share (Birr 5.68 million or 84.23%) is accounted by fixed investment cost followed by pre operation cost (Birr 655.20 thousand or 9.71%) and initial working capital (Birr 408.56 thousand or 6.06%). From the total investment cost Birr 1.70 million or 25.29% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 21.14% and a net present value (NPV) of Birr 3.57 million, discounted at 10%.

The project can create employment for 25 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 backward linkage with the agro processing sub sector and forward linkage with the food processing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Margarine is butter - like product obtained by mixing animal and vegetable fats with or without milk. Margarine was originally marketed as an imitation butter. However, it now

has a recognized identity to its own. The proportion of the fat blend and other ingredients varies with the type of margarine and with the country of manufacture.

The product is widely used as a table spread in bakeries, pastries and as an ingredient in various food preparations, shortenings, basic input in baked products like bread, biscuit and the like.

Margarine is a resource based product that will substitute import.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

Due to absence of plants in the country that manufacture margarine the entire requirement is met through import and the yearly import is shown in Table 3.1.

Table 3.1

IMPORT OF MARGARINE (TONS)

Year	Import
2001	77
2002	59
2003	104
2004	70
2005	99
2006	423
2007	171
2008	379
2009	776
2010	339
2011	896

Source: -*Ethiopian Revenue and Customs Authority.*

Although import of margarine has shown fluctuation over the years considered, a general increasing trend is observed. This can be clearly seen when the data set is analyzed in to three years interval. The yearly average imported quantity which was about 90 tons during the period 2001--2003 has increased to annual average of about 198 tons during the period 2004-

-2006, which is more than double of the previous three years average. Similarly the yearly average quantity imported during the period 2007 –2009 has increased to 442 tons. During the recent two years i.e. 2009--2011 the yearly average has reached to a level of 618 tones. Generally, import of the product has been growing by more than 25% annually during the past ten years, which increased from 77 tons in the year 2001 to 896 by the year 2011.

In order to determine the current effective demand, the recent three years average has been used since imports fluctuated over the period of study. Accordingly, the present effective demand is estimated at 670 tons.

2. Demand Projection

The demand for margarine will grow as a result of urban population growth, rise in income and change in the eating habit of the population. By considering the growth rate of import over the past years, urban population growth of about 4% , and increasing income and anticipating change in eating habit, a 5% annual average growth is adopted to forecast the demand (see Table 3.2).

Table 3.2

PROJECTED DEMAND FOR MARGARINE (TONS)

Year	Forecasted
2013	704
2014	739
2015	776
2016	815
2017	856
2018	898
2019	943
2020	990
2021	1,040
2022	1,092

Demand for margarine will increase from 704 tones in the year 2013 to 898 tones and 1,092 tones by the year 2018 and year 2022, respectively.

3. Pricing and Distribution

The current average retail price of margarine is Birr 200 per kg. Accordingly, allowing 25% margin for intermediaries a factory gate price of Birr 160 per kg is adopted for the envisaged plant.

The product will find its market outlet through the food stores and groceries throughout the county.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Based on the projected demand for margarine and considering the economic scale of production the capacity of the envisaged plant is proposed to be 25,000 kgs of margarine per annum. This capacity is proposed on the basis of one shift of 8 hours per day and 300 working days per annum. The capacity, upon requirement, can be increased by increasing the number of shifts per day.

2. Production Program

It is assumed that the envisaged project, at the initial stage of the production period may require some time to capture a significant market share. Therefore, the envisaged plant has to start production at 80% of its installed capacity which will grow to 90% in the second year. Full capacity production shall be attained in the third year and onwards. Details of annual production capacity are shown in Table 3.3.

Table 3.3

ANNUAL PRODUCTION PROGRAM

Sr. No.	Description	Unit of Measure	Production Year		
			1st	2nd	3rd & Onwards
1	Margarine from animal fat	kg	20,000	22,500	25,000
2	Capacity utilization rate	%	80	90	100

IV. MATERIAL AND INPUTS

A. RAW MATERIALS

The major raw materials required for production of margarine can broadly be classified into three groups: fat, blend, aqueous phase and additives.

In this study, partially hydrogenated cotton seed oil and animal fats are major constituents of the fat blend. Animal fat which is a by - product of cattle meet processing plant is the other constituent the blend. Ripened or skimmed milk, salt, water and brine constitute of the aqueous phase are also among the required raw materials. Cotton seed oil can be found from the currently operating oil plants. Skimmed milk can be obtained from milk processing plants. Thus, all these raw materials are locally available.

Lecithin, antioxidant, flavoring agents, fat-soluble dye, vitamins and aroma ingredients are classified under the group of additives. Additives will be imported.

The annual requirement for raw materials and the estimated costs at full capacity operation of the envisaged plant are shown in Table 4.1.

Table 4.1

ANNUAL RAW MATERIALS REQUIREMENT AND ESTIMATED COSTS

Sr. No.	Description	Unit of Measure	Required Qty	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Hydrogenated oil and fat	kg	22,500	43.75		984.37	984.37
2	Skimmed milk	kg	4,250	12.00		51.00	51.00
3	Salt	kg	625	2.50		1.56	1.56
4	Additives	kg	1,125	42.00	37.80	9.45	47.25
Total					**37.80**	**1,046.38**	**1,084.18**

The only auxiliary material required is packing material that is food grade aluminum foil. The total annual cost of packing material at full capacity operation of the plant at lump sum is estimated at Birr 315,000, out of which Birr 252,000 will be required in foreign currency.

B. UTILITIES

The power and utilities required for the envisaged project include electric power, water and furnace oil. The annual power and utilities requirement at full capacity production of the plant and the estimated costs are indicated in Table 4.2.

Table 4.2

ANNUAL POWER AND UTILITIES REQUIREMENT AND ESTIMATED COSTS

Sr. No.	Description	Unit of Measure	Annual Req.	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Electric power	kWh	30,000	0.5778		17.33	17.33
2	Water	m^3	2,500	10.00		25.00	25.00
3	Furnace oil	lt	3,520	14.84		52.23	52.23
Total						**94.56**	**94.56**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The process of margarine production involves melting of raw oils and fats in the melting tanks, blending it with salt, water, lactic substances, vitamins, coloring agents, aroma and other ingredients in mixing tanks, emulsifying in the emulsifying tank, sterilizing in continuous sterilizing equipment, rapid cooling in continuous cooling and kneading machine, ageing the intermediate product for a while, forming into the prescribed shape and finally packing and dispatching.

2. Environmental Impact

The envisaged plant does not have any adverse impact on the environment. Thus the project is environment friendly.

B. ENGINEERING

1. Machinery and Equipment

The major plant machinery and equipment required for the project comprise tanks for melting, mixing, emulsifying and kneading of the ingredients; continuous sterilizing and cooling equipment; forming and packing machine and boiler for process steam generation. The total cost of machinery and equipment is estimated at Birr 2,131,979 of which Birr 1,705,583 will be required in foreign currency. List of the required plant machinery and equipment and their total estimated cost is shown in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measure	Req. Qty	Cost, ('000 Birr)		
				F.C.	L.C.	Total
1	Melting tanks	set	2	324.06	81.02	405.08
2	Mixing tank	set	1	153.50	38.38	191.88
3	Emulsifying tank	set	1	204.67	51.17	255.84
4	Continuous sterilization equipment	set	1	255.84	63.96	319.80
5	Continuous cooling and mixing	set	1	238.78	59.70	298.48
6	Forming and packing machine	set	1	255.84	63.96	319.80
7	Boiler	set	1	221.73	55.43	277.16
8	Other auxiliary equipment	set	1	51.17	12.79	63.96
Total				**1,705.58**	**426.396**	**2,131.98**

2. Land, Buildings and Civil Works

The total area of land required for the envisaged project is 900 m^2 out of which 350 m^2 will be a built - up area. The cost of buildings and civil works at a unit construction rate of Birr 4,500/ m^2 is estimated at Birr 1.575 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 5000 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 Compl. 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 239,400 of which 10% or Birr 23,940 will be paid in advance. The remaining Birr 239,400 will be paid in equal installments with in 28 years i.e. Birr 7,695 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The total human resource requirement of the envisaged project is 27 persons. The human resource requirement along with the estimated annual labor cost, including fringe benefits, is given in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND LABOUR LABOR COST

Sr. No.	Job Title	Required No. of Persons	Salary, Birr	
			Monthly	Annual
1	General manager	1	5,000	60,000
2	Sales officer	1	900	10,800
3	Accountant	1	900	10,800
4	Cashier	1	900	10,800
5	Purchaser	1	800	9,600
6	Personnel	1	800	9,600
7	Store keeper	1	900	10,800
8	Production head	1	3,500	42,000
9	Mechanic	1	1,000	12,000
10	Electrician	1	1,000	12,000
11	Quality controller (chemist)	1	1,500	18,000
12	Driver	1	800	9,600
13	Operator	4	2,400	28,800
14	Laborer	6	2,400	28,800
15	Guard	3	1,200	14,400
Sub- total		**25**	**24,000**	**288,000**
Fringe benefits (20% Basic salary)			**4,800**	**57,600**
Total			**28,800**	**345,600**

B. TRAINING REQUIREMENT

Four operators should be given a two weeks on – the – job training by the advanced technician of the machinery supplier during plant erection and commissioning. The total training cost is estimated at Birr 150,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the margarine 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
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 6.74 million (See Table 7.1). From the total investment cost the highest share (Birr 5.68 million or 84.23%) is accounted by fixed investment cost followed by pre operation cost (Birr 655.20 thousand or 9.71%) and initial working capital (Birr 408.56 thousand or 6.06%). From the total investment cost Birr 1.70 million or 25.29% 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	23.94		23.94	0.35
1.2	Building and civil work	1,575.00		1,575.00	23.35
1.3	Machinery and equipment	426.40	1,705.58	2,131.98	31.61
1.4	Vehicles	1,500.00		1,500.00	22.24
1.5	Office furniture and equipment	450.00		450.00	6.67
	Sub total	**3,975.34**	**1,705.58**	**5,680.92**	**84.23**
2	**Pre operating cost ***				
2.1	Pre operating cost	213.96		213.96	3.17
2.2	Interest during construction	441.24		441.24	6.54
	Sub total	**655.20**		**655.20**	**9.71**
3	**Working capital ****	**408.56**		**408.56**	**6.06**
	Grand Total	**5,039.10**	**1,705.58**	**6,744.68**	**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 552.46 thousand. However, only the initial working capital of Birr 408.56 thousand 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 3.50 million (see Table 7.2). The cost of raw material account for 40.00% of the production cost. The other major components of the production cost are depreciation, financial cost and labor, which account for 25.08%, 12.14% and 8.23% respectively. The remaining 14.55% 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	%
Raw Material and Inputs	1,399.18	40.00
Utilities	94.57	2.70
Maintenance and repair	106.60	3.05
Labour direct	288.00	8.23
Labour overheads	57.60	1.65
Administration Costs	100.00	2.86
Land lease cost	-	-
Cost of marketing and destribution	150.00	4.29
Total Operating Costs	**2,195.95**	**62.78**
Depreciation	877.19	25.08
Cost of Finance	424.69	12.14
Total Production Cost	**3,497.83**	**100**

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 ranges from Birr 394 thousand to Birr 1.18 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 9.48 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 1{,}680{,}000$$

$$\text{Break- Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 52.57\ \%$$

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 21.14% 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 3.57 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 25 persons. The project will generate Birr 2.70 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 backward linkage with the agro processing sub sector and forward linkage with the food processing sub sector 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	279.84	314.82	349.80	349.80	349.80	349.80	349.80	349.80	349.80	349.80
Accounts receivable	148.90	165.95	183.00	183.00	183.64	183.64	183.64	183.64	183.64	183.64
Cash-in-hand	6.14	6.90	7.67	7.67	7.78	7.78	7.78	7.78	7.78	7.78
CURRENT ASSETS	**434.87**	**487.66**	**540.46**	**540.46**	**541.21**	**541.21**	**541.21**	**541.21**	**541.21**	**541.21**
Accounts payable	26.31	29.60	32.88	32.88	32.88	32.88	32.88	32.88	32.88	32.88
CURRENT LIABILITIES	**26.31**	**29.60**	**32.88**	**32.88**	**32.88**	**32.88**	**32.88**	**32.88**	**32.88**	**32.88**
TOTAL WORKING CAPITAL	**408.56**	**458.07**	**507.58**	**507.58**	**508.33**	**508.33**	**508.33**	**508.33**	**508.33**	**508.33**

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	1,119	1,259	1,399	1,399	1,399	1,399	1,399	1,399	1,399	1,399
Utilities	76	85	95	95	95	95	95	95	95	95
Maintenance and repair	85	96	107	107	107	107	107	107	107	107
Labour direct	230	259	288	288	288	288	288	288	288	288
Labour overheads	46	52	58	58	58	58	58	58	58	58
Administration Costs	80	90	100	100	100	100	100	100	100	100
Land lease cost	0	0	0	0	7.70	7.70	7.70	7.70	7.70	7.70
Cost of marketing and distribution	150	150	150	150	150	150	150	150	150	150
Total Operating Costs	**1,787**	**1,991**	**2,196**	**2,196**	**2,204**	**2,204**	**2,204**	**2,204**	**2,204**	**2,204**
Depreciation	877	877	877	877	877	108	108	108	108	108
Cost of Finance	0	485	425	364	303	243	182	121	61	0
Total Production Cost	**2,664**	**3,354**	**3,498**	**3,437**	**3,384**	**2,554**	**2,494**	**2,433**	**2,372**	**2,312**

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	3,200	3,600	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Less variable costs	1,637	1,841	2,046	2,046	2,046	2,046	2,046	2,046	2,046	2,046
VARIABLE MARGIN	**1,563**	**1,759**	**1,954**	**1,954**	**1,954**	**1,954**	**1,954**	**1,954**	**1,954**	**1,954**
in % of sales revenue	48.85	48.85	48.85	48.85	48.85	48.85	48.85	48.85	48.85	48.85
Less fixed costs	1,027	1,027	1,027	1,027	1,035	266	266	266	266	266
OPERATIONAL MARGIN	**536**	**731**	**927**	**927**	**919**	**1,688**	**1,688**	**1,688**	**1,688**	**1,688**
in % of sales revenue	16.75	20.32	23.17	23.17	22.98	42.21	42.21	42.21	42.21	42.21
Financial costs		485	425	364	303	243	182	121	61	0
GROSS PROFIT	**536**	**246**	**502**	**563**	**616**	**1,446**	**1,506**	**1,567**	**1,628**	**1,688**
in % of sales revenue	16.75	6.84	12.55	14.07	15.40	36.14	37.66	39.18	40.69	42.21
Income (corporate) tax	0	0	0	169	185	434	452	470	488	507
NET PROFIT	**536**	**246**	**502**	**394**	**431**	**1,012**	**1,054**	**1,097**	**1,139**	**1,182**
in % of sales revenue	16.75	6.84	12.55	9.85	10.78	25.30	26.36	27.42	28.48	29.55

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	**5,895**	**4,076**	**3,603**	**4,003**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**1,919**
Inflow funds	5,895	876	3	3	0	0	0	0	0	0	0	0
Inflow operation	0	3,200	3,600	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,919
TOTAL CASH OUTFLOW	**5,895**	**2,663**	**3,136**	**3,280**	**3,336**	**3,299**	**3,487**	**3,444**	**3,402**	**3,359**	**2,710**	**0**
Increase in fixed assets	5,895	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	435	53	53	0	1	0	0	0	0	0	0
Operating costs	0	1,637	1,841	2,046	2,046	2,054	2,054	2,054	2,054	2,054	2,054	0
Marketing and Distribution cost	0	150	150	150	150	150	150	150	150	150	150	0
Income tax	0	0	0	0	169	185	434	452	470	488	507	0
Financial costs	0	441	485	425	364	303	243	182	121	61	0	0
Loan repayment	0	0	607	607	607	607	607	607	607	607	0	0
SURPLUS (DEFICIT)	**0**	**1,413**	**467**	**723**	**664**	**701**	**513**	**556**	**598**	**641**	**1,290**	**1,919**
CUMULATIVE CASH BALANCE	**0**	**1,413**	**1,880**	**2,603**	**3,268**	**3,969**	**4,482**	**5,038**	**5,636**	**6,277**	**7,566**	**9,485**

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**	**3,200**	**3,600**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**4,000**	**1,919**
Inflow operation	0	3,200	3,600	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,919
TOTAL CASH OUTFLOW	**6,303**	**1,836**	**2,041**	**2,196**	**2,366**	**2,388**	**2,637**	**2,656**	**2,674**	**2,692**	**2,710**	**0**
Increase in fixed assets	5,895	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	409	50	50	0	1	0	0	0	0	0	0	0
Operating costs	0	1,637	1,841	2,046	2,046	2,054	2,054	2,054	2,054	2,054	2,054	0
Marketing and Distribution cost	0	150	150	150	150	150	150	150	150	150	150	0
Income (corporate) tax		0	0	0	169	185	434	452	470	488	507	0
NET CASH FLOW	**-6,303**	**1,364**	**1,559**	**1,804**	**1,634**	**1,612**	**1,363**	**1,344**	**1,326**	**1,308**	**1,290**	**1,919**
CUMULATIVE NET CASH FLOW	**-6,303**	**-4,940**	**-3,381**	**-1,577**	**58**	**1,670**	**3,032**	**4,377**	**5,703**	**7,011**	**8,301**	**10,219**
Net present value	-6,303	1,240	1,289	1,355	1,116	1,001	769	690	619	555	497	740
Cumulative net present value	-6,303	-5,064	-3,775	-2,420	-1,303	-303	466	1,156	1,775	2,330	2,827	3,567

NET PRESENT VALUE	3,567
INTERNAL RATE OF RETURN	21.14%
NORMAL PAYBACK	6 years