24. PROFILE ON THE PRODUCTION OF LEMONADE

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I. SUMMARY

This profile envisages the establishment of a plant for the production of lemonade with a capacity of 4,995 hectoliters per annum. Lemonade, which is a lemon flavored soft drink, is relatively unknown in Ethiopia.

The present (2012) demand for lemonade is estimated at 440,000 hectoliters. The demand for the product is projected to reach 617,123 hectoliters and 865,547 hectoliters by the year 2017 and year 2022, respectively.

The principal raw materials required are sugar, citric acid, flavor & essence, food color, and sodium benzoate. Except sugar which is available locally the other raw materials have to be imported.

The total investment cost of the project including working capital is estimated at Birr 8.99 million (see Table 7.1). From the total investment cost the highest share (Birr 6.92 million or 76.96%) is accounted by fixed investment followed by pre operation cost (Birr 1.04 million or 11.60%) and initial working capital (Birr 1.03 million or 11.44%). From the total investment cost Birr 2.91 million or 32.41% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 25.20% and a net present value (NPV) of Birr 7.08 million, discounted at 10%.

The project can create employment for 30 persons. The project will create backward linkage with sugar industries and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Lemonade is an aerated and flavored soft drink which is composed of treated water, sweetening agents like sugar, sucrose, citric acid, lemon flavor, colour and preservatives. During the production process, these ingredients are mixed in a given ratio so that an appealing and refreshing soft drink can be produced. The sweetness and acid ratio varies with the type of

desired flavor and taste. Under the normal conditions, the colour used must be approved and be stable.

Lemonade, being one of the favorable soft drinks, is used by people of all ages in general and by the young generation in particular and extensively during summer to quench the thirst and to get refreshed - just for some relief and relaxation.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Lemonade, which is a lemon flavored soft drink, is relatively unknown in Ethiopia. However, the existence of a substantial soft-drinks market already in the country shows that there is a market potential for this product as well.

Demand for soft drinks in Ethiopia is met mainly through domestic production. Imported items are few and of insignificant volume while its distribution is limited in certain high level hotels and supermarkets and much of its consumption is confined to foreigners. The domestic suppliers were for a long time a few public sector companies, formerly called:

- Addis Soft Drinks
- Abay Mesk Soft Drinks,
- Dire Dawa Soft Drinks, and
- Gondar Soft Drinks.

Presently, all of them are privatized and their ownership belongs to Moha Soft Drinks Industry S.C, a franchised company of Pepsi-Cola International; and East African Bottling S.C, a franchised Company of Coca-Cola International. There was one additional private company named Summit Partners which had been manufacturing Schweppes Pineapple, Tonic and Canada Dry, under a franchise agreement with Cadbury-Schweppes. However, in 2003 it terminated producing Schweppes products and lately the plant was bought by MOHA Soft Drinks which

tremendously increased the production capacity and market share of MOHA Soft Drinks Industry S.C.

Table 3.1 shows the production volume of lemonade by all local producers in a ten years period of time (2001 - 2010).

Table 3.1
DOMESTIC PRODUCTION OF CARBONATED BEVERAGES

Year	Production (H.L)
2002/3	994,981
2003/4	1,052,348
2004/5	1,557,016
2005/6	2,061,683
2006/7	978,415
2007/8	2,077,684
2008/9	1,858,143
2009/10	3,224,072
20010/11	3,449,757

Source: - *CSA, Report on Medium & Large Scale Manufacturing and Electricity Industries Survey.*

Scrutiny of Table 3.1 above reveals that production of soft drink, which was about 1 million hectoliters in 2002/3, has surged up two fold to in four years time and reach about 2 million hectoliters in 2005/6. Though a slight decline is observed in the subsequent year, the previous period highest volume of production had been regained in 2007/8. Since 2008/9, wherein the national income has been registering a positive growth, the production of soft drinks has also increased with a mean annual growth rate of 26% to 3.4 million hectoliter in 2010/11.

The per capita consumption that derives from the recently attained level of production (3.4 million hector liters) is 4.6 liters of soft drink, which is low by any standard. Assuming that the past growth of production was a responses of a parallel growth in demand, the per capital consumption of 5.8 liter (0.058 hl) would reasonably represent effective demand, thus, the present demand for soft drink in Ethiopia would amount to 4.4 million hectoliters. Moreover,

assuming that lemonade can capture 10% of the soft drink market the present demand for lemonade is estimated at 440,000 hectoliters.

2. Projected Demand

The future demand for lemonade is a function of income, urban population growth and growth of catering and recreational establishments. After considering all the above factors, the demand for lemonade is forecasted to grow at a rate higher than the growth of the urban population in order to take account of effects of growth in income and other demand determining variables. Accordingly, an annual growth rate of 7% is deemed to be a reasonable growth rate to project future demand, with the result depicted in Table 3.2.

Table 3.2

PROJECTED DEMAND FOR LEMONADE (in HL)

Year	Projected Demand
2013	470,800
2014	503,756
2015	539,019
2016	576,750
2017	617,123
2018	660,321
2019	706,544
2020	756,002
2021	808,922
2022	865,547

3. Pricing and Distribution

The factory-gate price of soft drinks is Birr 18.5 per litter. This price could, therefore, be used as a reference to evaluate the financial viability and profitability of the envisaged plant. For the purpose of this project, a liter of lemonade will be sold at Birr 16.

Distribution of lemonade (soft drinks) is best undertaken through a commonly known channel structure at the top of which are territorially based agents, connected to a wide network of wholesalers and retailers.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

From the projected demand for lemonade shown in the market study, the unsatisfied demand constitutes 558,300 HL in Year 2013, which will increase to 887,200 HL in Year 2014. However, taking into consideration that the product is relatively unknown in Ethiopia, it is deemed necessary to install a plant with a minimum capacity until the product secures a reasonable market share. Hence the envisaged plant is planned to have a production capacity of 4,995 HL per annum, which is about 1,500,000 bottles of 333 cc each per annum. This capacity is set on the basis of 8 working hours per shift, one shift per day and 300 working days per annum.

2. Production Program

Considering the time required for development of skill in plant operation and market penetration, the plant will start operation at 80% of the installed capacity, which will grow to 90% in the second year. Full capacity production will be attained in the third year and onwards. While setting the production program, it is assumed that machinery repair and maintenance works will be carried out during off – production hours. Details of annual production program are given in Table 3.3.

Table 3.3

ANNUAL PRODUCTION PROGRAM

Sr. No.	Description	Unit of Measure	Production Year		
			1st	2nd	3rd & Onwards
1	Lemonade	HL	3,996	4,495.50	4,995
2	Capacity utilization rate	%	80	90	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw materials required for the envisaged plant are sugar, citric acid, flavor & essence, food color, and sodium benzoate. The annual requirement for raw materials at full capacity production of the plant along with the estimated costs is given in Table 4.1.

Table 4.1

ANNUAL RAW MATERIALS REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Sugar	kg	30,000	14.00		420.00	420.00
2	Citric acid	kg	300	92.00	19.32	8.28	27.60
3	Flavor and essence	kg	550	607.00	233.69	100.155	333.85
4	Food color	kg	230	455.00	73.25	31.39	104.65
5	Sodium benzoate	kg	160	107.00	11.98	5.136	17.12
6	Miscellaneous		lump sum		105.35	45.15	150.50
Total					**443.60**	**610.11**	**1,053.72**

The auxiliary materials required for the plant are disposable PET bottles (333 cc) and labels. The annual requirement for auxiliary materials at full capacity production of the plant and the estimated costs are given in Table 4.2.

Table 4.2

ANNUAL AUXILIARY MATERIALS REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Unit Of Measure	Qty.	Unit Price, B	Cost,('000 Birr)		
					F.C.	L.C.	Total
1	Pet bottle	pc	1,500,000	1.5	2,250		2,250
2	Label	pc	1,500,000	0.2		300	300
Total					**2,250**	**300**	**2,550**

B. UTILITIES

The utilities required for the plant are electric power and water for both the production process and general purpose. The annual requirement at full capacity production and the estimated costs are given in Table 4.3.

Table 4.3

ANNUAL UTILITIES REQUIREMENT AND COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Electric power	kWh	39,600	0.58		22.97	22.97
2	Water	m3	12,000	10.00		120.00	120.00
Total						**142.97**	**142.97**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

Sugar syrup first is prepared by dissolving sugar in water. Then citric acid, preservatives, flavors and other ingredients are mixed in definite proportion by agitating until these ingredients disperse and a homogeneous mix is obtained. The mix is then cooled to the desired temperature and the carbon dioxide gas is dissolved in it. Finally, the diluted mix is filled in glass bottles, sealed and packed in plastic crates.

2. Environmental Impact

The envisaged project does not have significant emission of pollutants. However, the necessary equipment for water treatment is included in the list of plant machinery and equipment and the corresponding cost estimate given. Thus, the envisaged project will not have any adverse impact on the environment.

B. ENGINEERING

1. Machinery and Equipment

The major plant machinery and equipment required include tank with agitator, vessel for syrup, filter, and storage tanks for syrup, water and ingredients, pump with drive motor, filling and sealing machine, etc. List plant machinery and equipment along with the estimated costs is given in Table 5.1.

Table 5.1

LIST OF MACHINERY & EQUIPMENT WITH ESTIMATED COST

Sr. No.	Description	Unit of Measure	Required Qty.	Cost, ('000 Birr)		
				F.C.	L.C.	Total
1	Tank with agitator, stainless steel	set	1	297.5	52.5	350.0
2	Syrup making vessel, mild steel with S, S. lining	set	1	119.0	21.0	140.0
3	Filter, S.S. construction	set	1	238.0	42.0	280.0
4	Syrup storage tank	set	1	119.0	21.0	140.0
5	Water tank	set	1	-	70.0	70.0
6	Ingredients storage tank	set	2	267.8	47.3	315.0
7	Pipes and valves	set	lump sum	119.0	21.0	140.0
8	Pumps with drive motors	set	3	327.3	57.8	385.0
9	Filling and sealing machine, automatic	set	1	446.3	78.8	525.0
10	Water treatment equipment	set	1	357.0	63.0	420.0
11	Carbonation unit with carbon dioxide gas cylinders	set	1	416.5	73.5	490.0
12	Miscellaneous ancillaries	set	1	208.3	36.8	245.0
Total				**2,915.5**	**584.5**	**3,500.0**

2. Land, Buildings and Civil Works

The plant requires a total land area of 800 square meters, out of which 500 square meters is built – up area. The built – up area includes processing area, raw materials stocking area, offices, etc. Assuming construction rate of Birr 4,500 per square meter, the total cost of construction is estimated at Birr 2.25 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 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

A total human resource of 30 persons is required for the envisaged project. The total annual labor cost including fringe benefits is estimated at Birr 561,600. Details of the human resource requirement and the estimated costs are given in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND LABOR COST

Sr. No.	Job Title	Req. No. of Persons	Salary, Birr	
			Monthly	Annual
1	Manager	1	5,000	60,000
2	Secretary	1	1,500	18,000
3	Accountant - clerk	1	2,500	30,000
4	Cashier	1	1,500	18,000
5	General service	6	3,000	36,000
6	Salesman /Purchaser	2	4,000	48,000
7	Store keeper	1	2,000	24,000
8	Production supervisor	1	4,000	48,000
9	Quality controller/chemist	1	3,000	36,000
10	Operator	4	4,000	48,000
11	Production worker	6	4,200	50,400
12	Driver	2	2,200	26,400
13	Guard	3	2,100	25,200
	Sub - total	**30**	**39,000**	**468,000**
	Employees benefit, 20% of basic salary		7,800	93,600
Total			**46,800**	**561,600**

B. TRAINING REQUIREMENT

Training shall be conducted during plant erection and commissioning by the technician of the machinery supplier. The quality control - chemist and 2 operators have to be given a two weeks on – the - job training. The cost of training is estimated at Birr 60,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the lemonade 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 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 8.99 million (see Table 7.1). From the total investment cost the highest share (Birr 6.92 million or 76.96%) is accounted by fixed investment followed by pre operation cost (Birr 1.04 million or 11.60%) and initial working capital (Birr 1.03 million or 11.44%). From the total investment cost Birr 2.91 million or 32.41% 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	0.24
1.2	Building and civil work	2,250.00		2,250.00	25.02
1.3	Machinery and equipment	584.50	2,915.50	3,500.00	38.92
1.4	Vehicles	900.00		900.00	10.01
1.5	Office furniture and equipment	250.00		250.00	2.78
	Sub total	**4,005.78**	**2,915.50**	**6,921.28**	**76.96**
2	**Pre operating cost ***				
2.1	Pre operating cost	455.00		455.00	5.06
2.2	Interest during construction	588.36		588.36	6.54
	Sub total	**1,043.36**		**1,043.36**	**11.60**
3	**Working capital ****	**1,028.89**		**1,028.89**	**11.44**
	Grand Total	**6,078.03**	**2,915.50**	**8,993.53**	**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 1.31 million. However, only the initial working capital of Birr 900.42 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 6.61 million (see Table 7.2). The cost of raw material account for 54.47% of the production cost. The other major components of the production cost are depreciation, financial cost and labor, which account for

16.42%, 8.56% and 7.07% respectively. The remaining 13.48% 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	3,603.72	54.47
Utilities	142.97	2.16
Maintenance and repair	105.00	1.59
Labour direct	468.00	7.07
Labour overheads	93.60	1.41
Administration Costs	200.00	3.02
Land lease cost	-	-
Cost of marketing and distribution	350.00	5.29
Total Operating Costs	**4,963.29**	**75.02**
Depreciation	1,086.00	16.42
Cost of Finance	566.30	8.56
Total Production Cost	**6,615.59**	**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 will grow from Birr 1.02 million to Birr 2.03 million during the life of the project. Moreover, at the end of the project life the accumulated net cash

flow amounts to Birr 17.02 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 3{,}356{,}640$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break- even Sales Value}}{\text{Sales revenue}} \times 100 = 42.50\ \%$$

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 25.20% 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 7.08 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 30 persons. The project will generate Birr 5.01 million in terms of tax revenue. The project will create backward linkage with sugar industries 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	720.74	810.84	900.93	900.93	900.93	900.93	900.93	900.93	900.93	900.93
Accounts receivable	336.72	375.16	413.61	413.61	414.18	414.18	414.18	414.18	414.18	414.18
Cash-in-hand	9.63	10.83	12.04	12.04	12.13	12.13	12.13	12.13	12.13	12.13
CURRENT ASSETS	**1,067.09**	**1,196.83**	**1,326.57**	**1,326.57**	**1,327.24**	**1,327.24**	**1,327.24**	**1,327.24**	**1,327.24**	**1,327.24**
Accounts payable	38.20	42.98	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75
CURRENT LIABILITIES	**38.20**	**42.98**	**47.75**	**47.75**	**47.75**	**47.75**	**47.75**	**47.75**	**47.75**	**47.75**
TOTAL WORKING CAPITAL	**1,028.89**	**1,153.86**	**1,278.82**	**1,278.82**	**1,279.49**	**1,279.49**	**1,279.49**	**1,279.49**	**1,279.49**	**1,279.49**

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	2,883	3,243	3,604	3,604	3,604	3,604	3,604	3,604	3,604	3,604
Utilities	114	129	143	143	143	143	143	143	143	143
Maintenance and repair	84	95	105	105	105	105	105	105	105	105
Labour direct	374	421	468	468	468	468	468	468	468	468
Labour overheads	75	84	94	94	94	94	94	94	94	94
Administration Costs	160	180	200	200	200	200	200	200	200	200
Land lease cost	0	0	0	0	7	7	7	7	7	7
Cost of marketing and distribution	350	350	350	350	350	350	350	350	350	350
Total Operating Costs	**4,041**	**4,502**	**4,963**	**4,963**	**4,970**	**4,970**	**4,970**	**4,970**	**4,970**	**4,970**
Depreciation	1,086	1,086	1,086	1,086	1,086	115	115	115	115	115
Cost of Finance	0	647	566	485	404	324	243	162	81	0
Total Production Cost	**5,127**	**6,235**	**6,616**	**6,535**	**6,461**	**5,409**	**5,328**	**5,247**	**5,166**	**5,085**

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	5,594	7,193	7,992	7,992	7,992	7,992	7,992	7,992	7,992	7,992
Less variable costs	3,691	4,152	4,613	4,613	4,613	4,613	4,613	4,613	4,613	4,613
VARIABLE MARGIN	**1,903**	**3,041**	**3,379**	**3,379**	**3,379**	**3,379**	**3,379**	**3,379**	**3,379**	**3,379**
in % of sales revenue	34.03	42.28	42.28	42.28	42.28	42.28	42.28	42.28	42.28	42.28
Less fixed costs	1,436	1,436	1,436	1,436	1,443	472	472	472	472	472
OPERATIONAL MARGIN	**467**	**1,605**	**1,943**	**1,943**	**1,936**	**2,907**	**2,907**	**2,907**	**2,907**	**2,907**
in % of sales revenue	8.35	22.31	24.31	24.31	24.22	36.37	36.37	36.37	36.37	36.37
Financial costs		647	566	485	404	324	243	162	81	0
GROSS PROFIT	**467**	**958**	**1,376**	**1,457**	**1,531**	**2,583**	**2,664**	**2,745**	**2,826**	**2,907**
in % of sales revenue	8.35	13.32	17.22	18.23	19.16	32.32	33.34	34.35	35.36	36.37
Income (corporate) tax	0	0	0	437	459	775	799	824	848	872
NET PROFIT	**467**	**958**	**1,376**	**1,020**	**1,072**	**1,808**	**1,865**	**1,922**	**1,978**	**2,035**
in % of sales revenue	8.35	13.32	17.22	12.76	13.41	22.63	23.33	24.04	24.75	25.46

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	**7,376**	**7,249**	**7,198**	**7,997**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**3,239**
Inflow funds	7,376	1,655	5	5	0	0	0	0	0	0	0	0
Inflow operation	0	5,594	7,193	7,992	7,992	7,992	7,992	7,992	7,992	7,992	7,992	0
Other income	0	0	0	0	0	0	0	0	0	0	0	3,239
TOTAL CASH OUTFLOW	**7,376**	**5,696**	**6,088**	**6,468**	**6,695**	**6,644**	**6,878**	**6,821**	**6,764**	**6,708**	**5,842**	**0**
Increase in fixed assets	7,376	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	1,067	130	130	0	1	0	0	0	0	0	0
Operating costs	0	3,691	4,152	4,613	4,613	4,620	4,620	4,620	4,620	4,620	4,620	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income tax	0	0	0	0	437	459	775	799	824	848	872	0
Financial costs	0	588	647	566	485	404	324	243	162	81	0	0
Loan repayment	0	0	809	809	809	809	809	809	809	809	0	0
SURPLUS (DEFICIT)	**0**	**1,553**	**1,110**	**1,528**	**1,297**	**1,348**	**1,114**	**1,171**	**1,228**	**1,284**	**2,150**	**3,239**
CUMULATIVE CASH BALANCE	**0**	**1,553**	**2,663**	**4,192**	**5,489**	**6,837**	**7,951**	**9,122**	**10,350**	**11,634**	**13,784**	**17,023**

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**	**5,594**	**7,193**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**7,992**	**3,239**
Inflow operation	0	5,594	7,193	7,992	7,992	7,992	7,992	7,992	7,992	7,992	7,992	0
Other income	0	0	0	0	0	0	0	0	0	0	0	3,239
TOTAL CASH OUTFLOW	**8,405**	**4,166**	**4,627**	**4,963**	**5,401**	**5,430**	**5,745**	**5,769**	**5,794**	**5,818**	**5,842**	**0**
Increase in fixed assets	7,376	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	1,029	125	125	0	1	0	0	0	0	0	0	0
Operating costs	0	3,691	4,152	4,613	4,613	4,620	4,620	4,620	4,620	4,620	4,620	0
Marketing and Distribution cost	0	350	350	350	350	350	350	350	350	350	350	0
Income (corporate) tax		0	0	0	437	459	775	799	824	848	872	0
NET CASH FLOW	**-8,405**	**1,428**	**2,566**	**3,029**	**2,591**	**2,562**	**2,247**	**2,223**	**2,198**	**2,174**	**2,150**	**3,239**
CUMULATIVE NET CASH FLOW	**-8,405**	**-6,977**	**-4,411**	**-1,382**	**1,209**	**3,771**	**6,018**	**8,241**	**10,439**	**12,613**	**14,763**	**18,002**
Net present value	-8,405	1,299	2,121	2,276	1,770	1,591	1,268	1,141	1,026	922	829	1,249
Cumulative net present value	-8,405	-7,107	-4,986	-2,710	-941	650	1,919	3,059	4,085	5,007	5,836	7,084

NET PRESENT VALUE	7,084
INTERNAL RATE OF RETURN	25.20%
NORMAL PAYBACK	4 years