

**PROFILE ON THE PRODUCTION OF BAKING
POWDER**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of baking powder with a capacity of 60 tons per annum. Baking powder is a chemical product used for dough leavening.

The country's requirement of baking powder is met through import. The present (2012) demand for baking powder is estimated at 586 tons. The demand for the product is projected to reach 1,096 tons and 1,664 tons by the year 2018 and year 2022, respectively.

The principal raw materials required are sodium acid pyrophosphate, sodium bicarbonate, and starch which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 4.09 million. From the total investment cost the highest share (Birr 2.79 million or 68.35%) is accounted fixed investment cost by followed by initial working capital (Birr 679.69 thousand or 16.63%) and pre operation cost (Birr 613.88 thousand or 15.02%). From the total investment cost Birr 743.40 thousand or 18.19% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 20.50% and a net present value (NPV) of Birr 2.26 million, discounted at 10%.

The project can create employment for 29 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 food processing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Modern baking powder is a chemical product used for dough leavening which consists of a mixture of sodium bicarbonate, one or more acid ingredients, and an inert ingredient which serves to keep the reactive components physically separated and minimizes premature reaction in

the dry mixture. Starch dried to 5--7% moisture content is usually used as the inert ingredient. Calcium sulfate and calcium carbonate are sometimes used as substitutes for part of the starch.

Out of the household baking powder in general use, the type containing sodium aluminum sulfate (SAS or soda alum) is most prevalent. A small amount of monocalcium phosphate monohydrate (MCP) is used in combination with the SAS. The MCP serves to perform gas cells during the makeup of the dough so that uniform and efficient expansion occurs in the oven. This is necessary since SAS is almost completely nonreactive until heat is applied which is known as double – acting baking powder.

Commercial baking powders often contain sodium acid pyrophosphate (SAPP), which is superior to SAS in stability and performance. Household baking powders are often used in biscuits and quick breads where the pyro flavor precludes the use of SAPP.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country`s requirement for baking powder has been entirely met through import from different origins. The historical import data for the past eleven years obtained from the Ethiopian Revenues & Customs Authority is depicted in Table 3.1.

Table 3.1
IMPORT OF BAKING POWDER AND CIF VALUE

Year	Quantity (Tons)	Value (‘000 Birr)
2001	94	939
2002	135	1,461
2003	109	1,044
2004	339	3,853
2005	122	1,200
2006	163	1,605
2007	253	2,784
2008	245	2,818
2009	318	4,607
2010	508	12,734
2011	640	21,143

Source: - *Ethiopian Revenue and Customs Authority.*

As could be seen from Table 3.1, the quantity of baking powder imported in the past eleven years has shown an increasing trend although there were minor fluctuations in the data set. The growth in the past consumption of baking powder can be clearly observed when the data set is analyzed on the averages of three years interval.

The yearly average level of import which was 112.6 tones during the years 2001--2003 has increased to 208 tons during the period 2004--2006. Similarly, the yearly average quantity imported during the period 2007--2009 has increased to 272 tons. A substantial growth of import is recorded during the recent two years of 2010--2011, which stood at annual average of 574 tons. Compared to the previous three years annual average it is higher by more than two fold. Generally, import of the product in the past eleven years has shown an annual average growth of about 25%

By looking to the above trend analysis, the average imported quantity of the recent three years i.e. 2009--2011, which is 489 tons, is taken as the effective demand for the year 2011. By applying a growth rate of 20%, less than the observed trend in the past, the current (year 2012) demand is estimated at 586 tons.

2. Demand Projection

Demand for baking powder depends on the growth of the targeted consumers and their disposable incomes. Moreover, new entrants to use the product will also have an effect on the demand for the product. At present, the product has been used by bakeries and urban dwellers. The past ten years delivery (2001-2010) showed an average annual increase of 25%. Nevertheless, this figure thought to be very high for future estimation. Therefore, the annual GDP increase, which is 11%, has been taken in projecting the future demand. Based on the above assumption, the projected future demand is shown in Table 3.2

Table 3.2

PROJECTED DEMAND OF BAKING POWDER (TONS)

Year	Projected Demand
2013	650
2014	722
2015	801
2016	890
2017	987
2018	1,096
2019	1,217
2020	1350
2021	1,499
2022	1,664

The demand for baking powder will increase from 650 tons in the year 2013 to 1,096 tons and 1,664 tons by the year 2018 and year 2022, respectively

3. Pricing and Distribution

The average CIF price of baking powder in the year 2011 was Birr 58.00 per kilogram. Allowing 30% for duty, handling cost and other import related costs a factory gate- price of Birr 75.40 per kilogram is recommended.

Baking powder is a consumer product which is demanded by most of the urban population and bakeries. The end users of the product are numerous and their geographical distribution is very wide. Hence, the envisaged plant should utilize experienced distributors in various parts of the country. The product will finally reach to the end users through retail outlets such as super markets and general merchandising shops.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

The envisaged plant will have the capacity to produce 60 tons of baking powder per annum. This production capacity is proposed on the basis of a single shift of 8 hours per day and 300 working days per annum. It is assumed that maintenance works will be carried out during off – production hours.

2. Production Program

Taking the technological condition of baking powder and the learning curve of production workers into account, the plant is proposed to start operation at 75% of the installed capacity which will grow to 85% in the second year. Full capacity production will be achieved in the third year and onwards. Details of annual production program 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	Baking powder	ton	45	51	60
2	Capacity utilization rate	%	75	85	100

IV. MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The main raw materials required for the envisaged plant consist of sodium acid pyro – phosphate, sodium bicarbonate, and starch used as filler. The annual requirement for raw materials at full capacity production of the plant and the estimated costs are given in Table 4.1.

Table 4.1
ANNUAL RAW MATERIALS REQUIREMENT AND COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Sodium acid pyrophosphate	ton	30	45,203.00	1,084.87	271.21	1,356.09
2	Sodium bicarbonate	kg	15	15,422.00	185.06	46.26	231.33
3	Starch (filler)	kg	15	22,867.00	274.40	68.60	343.00
Total					1,544.34	386.08	1,930.42

The auxiliary materials required for the envisaged project include packing materials which include polyethylene bags, coated metallic cans and glass packages as deemed necessary. The annual requirement for auxiliary materials at full capacity production and the estimated costs are shown in Table 4.2.

Table 4.2
ANNUAL AUXILIARY MATERIALS REQUIREMENT AND COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F. C.	L.C.	Total
1	Polyethylene bag	pc	120,000	3.15	302.40	75.60	378.00
2	Coated metallic can	pc	60,000	4.20	201.60	50.40	252.00
Total					504.00	126.00	630.00

B. UTILITIES

Utilities required for the plant are electric power and water. Annual cost of utilities is estimated at Birr 44,740. The annual utility requirement of the plant at full capacity operation and the estimated costs are given in Table 4.3.

Table 4.3
ANNUAL UTILITIES REQUIREMENT AND COST

Sr. No.	Description	Unit of Measure	Annual Requirement	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Electric power	kWh	60,000	0.579		34.74	34.74
2	Water	m ³	1,000	10.00		10.00	10.00
Total						44.74	44.74

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The production process of baking powder essentially involves blending which is a physical mixing of the various components in a large scale batch mixer. Sodium acid pyro – phosphate, sodium bicarbonate and starch are the major ingredients to be mixed in certain proportions. The order in which mixing occurs may have influence on the stability of the product. Rigid specifications for purity, granulation, and moisture content of the components must be adhered to if a uniform, stable, and reliable product is to be obtained. Variations in ingredients purity can alter the proper balance of acids to soda. Granulations is very critical, not only in terms of stability and uniformity of distribution of particles during blending, but also in the appearance of baked products, and speed of blending are essential to attain and

maintain proper distribution of particles The proper kind. The baking powder is usually packed in airtight metallic or fiber cans or small polyethylene bags.

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 total cost of machinery and equipment is Birr 929.3 thousand of which Birr 743.4 thousand is required in foreign currency. The list of plant machinery and equipment required for the envisaged project and their estimated costs are given in Table 5.1.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT AND COST

Sr. No.	Description	Unit of Measure	Required Qty	Cost, ('000 Birr)		
				F.C.	L.C.	Total
1	Sifter	set	1	96.64	24.16	120.80
2	Micro pulverizer, complete with motors and other accessories	set	1	104.08	26.02	130.10
3	Mixer, double shaft, 3 HP motor and other accessories	set	1	96.64	24.16	120.80
4	Electrical oven with 48 trays, cabinet model, thermostatic control & other accessories	set	1	118.94	29.74	148.68

Sr. No.	Description	Unit of Measure	Required Qty	Cost, ('000 Birr)		
				F.C.	L.C.	Total
5	Weighing machine platform type, 50 kg, table model	set	2	178.42	44.60	223.02
6	Polyethylene bag sealing machine	set	1	96.64	24.16	120.80
7	Miscellaneous equipment like trays, bins, etc.	set	1	52.04	13.01	65.05
Total				743.40	185.85	929.25

2. Land, Buildings and Civil Works

The total area of land required for the project is 500 m². The total built-up area is 250 m². This includes production hall, finished products and raw materials stores, offices and social facilities. The total cost of buildings and civil work at a unit cost of Birr 4,500 per m², is estimated at Birr 1.125 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 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/m ²
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 133,000 of which 10% or Birr 13,300 will be paid in advance. The remaining Birr 119,700 will be paid in equal installments with in 28 years i.e. Birr 4,275 annually.

NB: The land issue in the above statement narrates or shows only Addis Ababa's city administration land lease price, policy and regulations.

Accordingly the project profile prepared based on the land lease price of Addis Ababa region.

To know land lease price, police and regulation of other regional state of the country updated information is available at Ethiopian Investment Agency's website www.eia.gov.et on the factor cost.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The total human resource required for the project is 29 persons. The human resource requirement along with the annual estimated labor cost including fringe benefits is presented in Table 6.1.

Table 6.1
HUMAN RESOURCE REQUIREMENT AND LABOR COST

Sr. No.	Job Title	Required No. of Persons	Salary, Birr	
			Monthly	Annual
1	Plant manager	1	4,500	54,000
2	Typist/clerk	1	650	7,800
3	Personnel	1	850	10,200
4	Financial manager	1	3,000	36,000
5	Accountant	1	800	9,600
6	Cashier	1	800	9,600
7	Salesman /Purchaser	2	1,600	19,200
8	Store keeper	1	800	9,600
9	Production and technical manager	1	3,200	38,400
10	Production supervisor	1	1,500	18,000
11	Quality controller/chemist	2	1,200	14,400
12	Mechanic	1	850	10,200
13	Electrician	1	850	10,200
14	Skilled worker	5	2,750	33,000
15	Unskilled worker	5	2,000	24,000
16	Driver	1	700	8,400
17	Guard	3	1,200	14,400
Sub - Total		29	27,250	327,000
Employees benefit, 20% of basic salary			5,450	65,400
Total			32,700	392,400

B. TRAINING REQUIREMENT

One production supervisor and 5 skilled workers should be given a one month on – the - job training by an advanced technician of the equipment supplier before start- up of operation. The total training cost is estimated at Birr 120,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the baking powder 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 4.09 million (See Table 7.1). From the total investment cost the highest share (Birr 2.79 million or 68.35%) is accounted fixed investment cost by followed by initial working capital (Birr 679.69 thousand or 16.63%) and pre operation cost (Birr 613.88 thousand or 15.02%). From the total investment cost Birr 743.40 thousand or 18.19% 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	39.90		39.90	0.98
1.2	Building and civil work	1,125.00		1,125.00	27.52
1.3	Machinery and equipment	185.85	743.40	929.25	22.73
1.4	Vehicles	450.00		450.00	11.01
1.5	Office furniture and equipment	250.00		250.00	6.12
	Sub total	2,050.75	743.40	2,794.15	68.35
2	Pre operating cost *				
2.1	Pre operating cost	346.46		790.00	19.33
2.2	Interest during construction	267.42		267.42	6.54
	Sub total	613.88		613.88	15.02
3	Working capital **	679.69		679.69	16.63
	Grand Total	3,344.32	743.40	4,087.72	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 913.5 thousand. However, only the initial working capital of Birr 713.33 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 4.07million (see Table 7.2). The cost of raw material account for 63.92% of the production cost. The other major components of the production cost are depreciation, labor and financial cost which account for 10.36%, 8.16% and 4.59%, respectively. The remaining 12.97% 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	2,560	63.92
Utilities	45	1.12
Maintenance and repair	46	1.16
Labor direct	327	8.16
Labor overheads	65	1.63
Administration Costs	100	2.50
Land lease cost	0	0.32
Cost of marketing and distribution	250	6.24
Total Operating Costs	3,394	85.05
Depreciation	415	10.36
Cost of Finance	257	4.59
Total Production Cost	4,067	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 346 thousand to Birr 733 thousand during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 6,303 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.

$$\text{Break -Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 1,900,080$$

$$\text{Break-Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales Value}} \times 100 = 48.20\%$$

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 5 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 20.50% 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 2.26 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 29 persons. The project will generate Birr 1.76 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 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	480.08	544.09	640.11	640.11	640.11	640.11	640.11	640.11	640.11	640.11
Accounts receivable	217.33	243.53	282.84	282.84	283.90	283.90	283.90	283.90	283.90	283.90
Cash-in-hand	5.61	6.36	7.48	7.48	7.66	7.66	7.66	7.66	7.66	7.66
CURRENT ASSETS	703.03	793.99	930.42	930.42	931.67	931.67	931.67	931.67	931.67	931.67
Accounts payable	23.34	26.45	31.12	31.12	31.12	31.12	31.12	31.12	31.12	31.12
CURRENT LIABILITIES	23.34	26.45	31.12	31.12	31.12	31.12	31.12	31.12	31.12	31.12
TOTAL WORKING CAPITAL	679.69	767.53	899.30	899.30	900.55	900.55	900.55	900.55	900.55	900.55

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	1,920	2,176	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560
Utilities	34	38	45	45	45	45	45	45	45	45
Maintenance and repair	35	39	46	46	46	46	46	46	46	46
Labour direct	245	278	327	327	327	327	327	327	327	327
Labour overheads	49	56	65	65	65	65	65	65	65	65
Administration Costs	75	85	100	100	100	100	100	100	100	100
Land lease cost	0	0	0	0	13	13	13	13	13	13
Cost of marketing and distribution	250	250	250	250	250	250	250	250	250	250
Total Operating Costs	2,608	2,922	3,394	3,394	3,407	3,407	3,407	3,407	3,407	3,407
Depreciation	415	415	415	415	415	70	70	70	70	70
Cost of Finance	0	294	257	221	184	147	110	74	37	0
Total Production Cost	3,023	3,632	4,067	4,030	4,006	3,624	3,587	3,550	3,514	3,477

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	3,393	3,845	4,524	4,524	4,524	4,524	4,524	4,524	4,524	4,524
Less variable costs	2,358	2,672	3,144	3,144	3,144	3,144	3,144	3,144	3,144	3,144
VARIABLE MARGIN	1,035	1,173	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380
in % of sales revenue	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50
Less fixed costs	665	665	665	665	678	333	333	333	333	333
OPERATIONAL MARGIN	370	508	715	715	702	1,047	1,047	1,047	1,047	1,047
in % of sales revenue	10.90	13.21	15.80	15.80	15.52	23.15	23.15	23.15	23.15	23.15
Financial costs		294	257	221	184	147	110	74	37	0
GROSS PROFIT	370	214	457	494	518	900	937	974	1,010	1,047
in % of sales revenue	10.90	5.56	10.11	10.92	11.45	19.90	20.71	21.52	22.33	23.15
Income (corporate) tax	0	0	0	148	155	270	281	292	303	314
NET PROFIT	370	214	457	346	363	630	656	682	707	733
in % of sales revenue	10.90	5.56	10.11	7.65	8.02	13.93	14.50	15.06	15.63	16.20

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	3,141	4,363	3,849	4,529	4,524	4,524	4,524	4,524	4,524	4,524	4,524	1,883
Inflow funds	3,141	970	3	5	0	0	0	0	0	0	0	0
Inflow operation	0	3,393	3,845	4,524	4,524	4,524	4,524	4,524	4,524	4,524	4,524	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,883
TOTAL CASH OUTFLOW	3,141	3,578	3,675	4,156	4,131	4,115	4,192	4,166	4,140	4,114	3,721	0
Increase in fixed assets	3,141	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	703	91	136	0	1	0	0	0	0	0	0
Operating costs	0	2,358	2,672	3,144	3,144	3,157	3,157	3,157	3,157	3,157	3,157	0
Marketing and Distribution cost	0	250	250	250	250	250	250	250	250	250	250	0
Income tax	0	0	0	0	148	155	270	281	292	303	314	0
Financial costs	0	267	294	257	221	184	147	110	74	37	0	0
Loan repayment	0	0	368	368	368	368	368	368	368	368	0	0
SURPLUS (DEFICIT)	0	785	173	373	393	409	332	358	384	410	803	1,883
CUMULATIVE CASH BALANCE	0	785	958	1,331	1,725	2,134	2,466	2,824	3,208	3,617	4,421	6,303

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	3,393	3,845	4,524	4,524	4,524	4,524	4,524	4,524	4,524	4,524	1,883
Inflow operation	0	3,393	3,845	4,524	4,524	4,524	4,524	4,524	4,524	4,524	4,524	0
Other income	0	0	0	0	0	0	0	0	0	0	0	1,883
TOTAL CASH OUTFLOW	3,820	2,696	3,054	3,394	3,544	3,562	3,677	3,688	3,699	3,710	3,721	0
Increase in fixed assets	3,141	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	680	88	132	0	1	0	0	0	0	0	0	0
Operating costs	0	2,358	2,672	3,144	3,144	3,157	3,157	3,157	3,157	3,157	3,157	0
Marketing and Distribution cost	0	250	250	250	250	250	250	250	250	250	250	0
Income (corporate) tax		0	0	0	148	155	270	281	292	303	314	0
NET CASH FLOW	-3,820	697	791	1,130	980	962	847	836	825	814	803	1,883
CUMULATIVE NET CASH FLOW	-3,820	-3,123	-2,332	-1,202	-222	740	1,587	2,423	3,249	4,063	4,866	6,748
Net present value	-3,820	634	654	849	670	597	478	429	385	345	310	726
Cumulative net present value	-3,820	-3,187	-2,533	-1,684	-1,014	-417	61	490	875	1,221	1,530	2,256

NET PRESENT VALUE 2,256
INTERNAL RATE OF RETURN 20.50%
NORMAL PAYBACK 5 years

