PROFILE ON THE PRODUCTION OF JAM AND MARMALADE

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I. SUMMARY

This profile envisages the establishment of a plant for the production of jam and marmalade with a capacity of 300 tons per annum. Jam and marmalade are bread dressings served alone or together with margarine or fresh butter.

The country`s requirement of jam and marmalade is met through local production and import. The present (2012) demand for jam and marmalade is estimated at 780 tons. The demand for the product is projected to reach 1,200 tons and 1,846 tons by the years 2017 and 2022, respectively.

The principal raw materials required are fruits, sugar and citric acid. Fruits and sugar are locally available while citric acid has to be imported.

The total investment cost of the project including working capital is estimated at Birr 15.02 million. From the total investment cost the highest share (Birr 11.26 million or 74.95%) is accounted by fixed investment cost followed by initial working capital (Birr 2.08 million or 13.86%) and pre operation cost (Birr 1.68 million or 11.19%). From the total investment cost, Birr 6.37 million or 42.41% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 19.35% and a net present value (NPV) of Birr 6.80 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 horticulture farming sub sector and sugar producers and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Jam is a product made by boiling fruit and sugar to a thick consistency without preserving the shape of the fruit while marmalade is a soft clear translucent jelly holding a suspension pieces or slices of fruit and fruit rind. Jam and marmalade are bread dressings served alone or together

with margarine or fresh butter. The major consumers are pastries, households, hotels, schools and military camps. Jam and marmalade is a resource based product that can substitute import.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The supply of jam and marmalade is both from domestic production and through import. Upper Awash Agro Industry (Merti- Agro Processing Plant) is the known domestic producer of jam and marmalade in the country. The domestic production of jam and marmalade which is available for seven years from year 2001/02 to 2007/08 is shown in Table 3.1. Although data of recent years is not reported by CSA, domestically produced jam and marmalade still exist in the market.

Table 3.1

PRODUCTION OF JAM AND MARMALADE (TONS)

Year	Domestic Production
2001/02	1,172
2002/03	144
2003/04	108
2004/05	108
2005/06	108
2006/07	526
2007/08	611
2008/09*	-
2009/10*	-

*Not reported

Source: -CSA, Large and Medium Scale Manufacturing and Electricity Survey, Various Issues

A closer look at Table 3.1 reveals that during the period considered (2001/02-2007/08) domestic production has shown three distinct patterns. During the initial year of the data set, i.e. year 2001/02, the production level was the highest of all, which stood at 1,172 tons. During the second phase (2002/03--2005/06) production contracted sharply to an annual average of about 117 tons, which is almost one tenth of year 2001/02. In the third phase, i.e. year 2006/07- and 2007/08, it has rebounded to 526 tons and 611 tons, respectively, which is higher by about five fold compared to the previous four years average. Taking these situations into account, the year 2012 level of production was estimated by working out average of the last two years data. Accordingly, current domestic production is estimated to be at about 600 tons. Import of jam and marmalade for the years covering 2001--2011 is shown in Table 3.2.

Table 3.2

IMPORT OF JAM & MARMALADE (TONS)

Year	Import
2001	119
2002	126
2003	104
2004	145
2005	263
2006	191
2007	268
2008	290
2009	128
2010	324
2011	112

Source: - Ethiopian Revenue and Customs Authority

It can be observed from the table that although import of 2011 is lower than that of 2001, it has generally been growing over the period (by an average of 16.1%). But, there were also years of relative lower import levels (in 2003, 2004, and 2009). For this reason, the whole period was divided into three intervals (2001-2004, 2005-2008, and 2009-2011) and their respective averages calculated and finally aggregated. Accordingly, import of 2012 was estimated at 180 tons. This seems a fair estimate since it is almost similar to the recent three average level of import.

In order to estimate the current effective demand, the 2012 domestic production and import estimates were summed which resulted in a figure of 780 tons.

2. Demand Projection

The future demand for processed foods in general is mainly a function of urbanization, income, price and change in the consumption habits of the population. As income rises and urbanization progresses, there will be a shift towards more expensive but conveniently packed and available foods. Urban population is growing by more than 4% per annum in Ethiopia. Moreover, users of jam and marmalade like pastries are growing very rapidly currently in the country. The demand for jam and marmalade can, therefore, be expected to rise even much higher.

Having considered the above factors, demand for jam and marmalade is forecasted to grow at a rate of 9% per annum. For the projection purpose domestic production is assumed to remain at 2012 estimated level i.e., 600 tons. The projected demand, domestic production and unsatisfied demand are shown Table 3.3.

Table 3.3

PROJECTED DEMAND FOR JAM & MARMALADE (TONS)

Year	Projected Demand	Domestic Production	Unsatisfied Demand
2013	850	600	250
2014	927	600	327
2015	1,010	600	410
2016	1,101	600	501
2017	1,200	600	600
2018	1,308	600	708
2019	1,426	600	826
2020	1,554	600	954
2021	1,694	600	1,094
2022	1,846	600	1,246

3. Pricing and Distribution

Currently, the retail price of 1 kg of marmalade is Birr 55. So, allowing a 25% margin for distributors an ex-factory price of Birr 44 per kg is proposed.

Suitable distribution system for jam and marmalade is one which relies on wholesalers, who in turn ensure proper distribution through retail channels (super markets and grocery shops).

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Based on the findings of the market study and considering the minimum economic scale of production, the envisaged plant is will have a capacity of 300 tons of jam and marmalade per annum. This production capacity is proposed on the basis of a single shift of 8 hours per day and 270 working days per year. The annual production, upon requirement, can be increased by increasing the operational shifts per day.

2. Production Program

Assuming that the plant will require enough time during the initial period of operation for market penetration and technical skill development, it will start operation at 80% of its installed capacity which will grow to 90% in the second year. Full capacity production will be attained in 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	Jam and marmalade	ton	240	270	300
2	Capacity utilization rate	%	80	90	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw materials required for production of jam and marmalade are fruits (orange, mandarin, lemon etc), sugar and citric acid. All the raw materials are locally available, except citric acid which needs to be imported.

Temperature has a marked effect on fruit quality. Fruits such as citrus, lemon, lime and grape are more suitable under high temperature regimes and orange and mandarin give better qualities relatively under lower temperature regime. Both of the required climatic conditions could be found in our country.

For the production of jam and marmalade, a guideline recipe which gives get 68% brix at finished product is given hereunder.

Guideline Recipe to get 68% Brix at Finished Product

Fruits	-	11 kg at 10% TSS
Sugar	-	9 kg
Citric acid	-	55 g

Based on a given production recipe to be used, the composition of the fruits in jam and marmalade can vary according to: test of the consumers concerning the consistency, the sweetness and acidity. The annual raw materials requirement at full capacity production of the envisaged plant and the corresponding estimated costs are depicted in Table 4.1.

Table 4.1

ANNUAL RAW MATERIALS REQUIREMENT AT FULL CAPACITY AND COST

Sr. No.	Description	Unit of Measure	Required Qty	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Fruits (mandarin, orange, lemon)	ton	450	9,000		4,050.0	4,050.0
2	Sugar	ton	135	14,000		1,890.0	1,890.0
3	Citric acid	kg	800	92	58.8	14.7	73.6
Total					**58.8**	**5,954.7**	**6,013.6**

The only auxiliary materials required for the envisaged plant are packing materials which comprise food grade coated cans and carton boxes. The carton boxes can be available from local carton factories, while food grade coated cans have to be imported. The annual requirement for auxiliary materials at full capacity production of the envisaged plant and the estimated costs are depicted in Table 4.2.

Table 4.2

ANNUAL AUXILIARY MATERIALS REQUIREMENT AT FULL CAPACITY AND COST

Sr. No.	Description	Unit of Measure	Required Qty	Unit Price, Birr/Unit	Cost,('000 Birr)		
					F.C.	L.C.	Total
1	Can, food grade coated	pc	300,000	4.20	1,008.0	252.0	1,260.0
2	Carton box	pc	15,030	7.00		105.2	105.2
Total					**1,008.0**	**357.2**	**1,365.2**

B. UTILITIES

The major utilities required for the envisaged plant are electric power, water and furnace oil. The annual requirement for power and utilities at full capacity operation of the plant and the estimated costs are given in Table 4.3.

Table 4.3

ANNUAL AND 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	34,800	0.58		20.18	20.18
2	Water	m3	24,000	10.00		240.00	240.00
3	Furnace oil	lt	60,000	14.67		880.20	880.20
Total						**1,140.38**	**1,140.38**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

There can be different applicable production processes in the preparation of jam and marmalade from fruits and different production recipes from fruit to fruit. The general processing steps for the production of jam and marmalade are as presented hereunder.

- Fresh fruits after sorting on control belt and washed in a washing machine are brought to continuous boiling equipment, are then pulped and brought to storage tank.
- Weighing of the required amount of pulp and boiling with water is carried out when deemed necessary.
- Pectin which has previously been mixed with 5 times its weight in sugar taken from the recipe is added to the batch while stirring it very vigorously.
- The batch is boiled for about 2 minute to assure a complete dissolution of the components.
- Sugar is added while keeping the batch boiling.
- Boiling down is carried out quickly to the desired brix.
- Usually the citric acid is added to remove the forth.
- Filling the product hot into the previously cleaned container and seaming it is carried out.
- Finally, pasteurizing the cover by inverting the container for 3 minutes and labeling is carried out.

2. Environmental Impact

The envisaged plant does not have any pollutant emitted, except the washing water which has to be connected to a proper drainage line. Thus the project is environment friendly.

B. ENGINEERING

1. Machinery and Equipment

The major machinery and equipment required for the envisaged plant include conveyor, washing machine, pulp crusher, screen, boiling kettle, filling and labeling machine. The total cost of plant machinery and equipment is estimated at Birr 7,963,500, of which Birr 6,370,800 will be required in foreign currency. The list of plant machinery and equipment required for the envisaged plant along with the estimated costs is given in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measure	Required Qty.	Cost, ('000 Birr)		
				F.C.	L.C.	Total
1	Screw conveyor	set	1	509.6	127.4	637.0
2	Washing and sorting equipment	set	1	637.0	159.3	796.3
3	Pulp crusher	set	1	509.6	127.4	637.0
4	Screen	set	1	509.6	127.4	637.0
5	Pulp storage tank	set	2	574.1	143.5	717.6
6	Pasteurizer	set	1	445.9	111.5	557.4
7	Boiling kettle	set	1	445.9	111.5	557.4
8	Filling and labeling machine	set	1	573.3	143.3	716.6
9	Seaming machine	set	1	445.9	111.5	557.4
10	Boiler (steam generator)	set	1	573.3	143.3	716.6
11	Desecrator	set	1	445.9	111.5	557.4
12	Laboratory equipment (refraction meter, oven, thermo meter, pH meter and analytic balance)	set	1	700.7	175.2	875.9
Total				**6,370.8**	**1,592.7**	**7,963.5**

2. Land, Buildings and Civil Works

The total area of land required for the plant is 750 m^2, out of which 450 m^2 is built-up area. Hygiene requirements should be integrated in the construction of buildings. Total construction cost estimate at a rate of Birr 4,500 per m^2 is Birr 2.025 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 199,500 of which 10% or Birr 19,950 will be paid in advance. The remaining Birr 179,550 will be paid in equal installments with in 28 years i.e. Birr 6,413 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 plant is 25 persons. The human resource requirement and estimated annual labor costs including fringe benefits are given 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	Secretary	1	800	9,600
3	Personnel	1	800	9,600
4	Accountant	1	850	10,200
6	Salesman	1	800	9,600
7	Store keeper	1	800	9,600
8	Cashier	1	800	9,600
10	Production	1	2,500	30,000
11	Mechanic	1	800	9,600
12	Electrician	1	800	9,600
13	Operator	5	2,750	33,000
14	Production worker	6	2,700	32,400
15	Driver	1	750	9,000
16	Guard	3	1,200	14,400
Sub - total		**25**	**20,850**	**250,200**
Employees benefit, 20% of basic salary			**4,170**	**50,040**
Total			**25,020**	**300,240**

B. TRAINING REQUIREMENT

The production supervisor, 5 operators, one mechanic, and one electrician should be given a three weeks training on the production, maintenance and operation of machinery and quality control by the advanced technician of the machinery supplier during erection and commissioning. The total cost of training is estimated at Birr 150,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the jam and marmalade 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 15.02 million (see Table 7.1). From the total investment cost the highest share (Birr 11.26 million or 74.95%) is accounted by fixed investment cost followed by initial working capital (Birr 2.08 million or 13.86%) and pre operation cost (Birr 1.68 million or 11.19%). From the total investment cost, Birr 6.37 million or 42.41% 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	19.95		19.95	0.13
1.2	Building and civil work	2,025.00		2,025.00	13.48
1.3	Machinery and equipment	1,592.70	**6,370.80**	7,963.50	53.02
1.4	Vehicles	900.00		900.00	5.99
1.5	Office furniture and equipment	350.00		350.00	2.33
	Sub total	**4,887.65**	**6,370.80**	**11,258.45**	**74.95**
2	**Pre operating cost ***				
2.1	Pre operating cost	698.18		698.18	5.26
2.2	Interest during construction	982.68		982.68	6.54
	Sub total	**1,680.86**		**1,680.86**	**11.19**
3	**Working capital ****	**2,081.64**		**2,081.64**	**13.86**
	Grand Total	**8,650.15**	**6,370.80**	**15,020.95**	**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 2.63 million. However, only the initial working capital of Birr 2.08 million during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 12.38 million (see Table 7.2). The cost of raw material account for 59.59% of the production cost. The other major components of the production cost are depreciation, financial cost and utility, which account for 16.38%, 7.64% and 9.21% respectively. The remaining 7.13% is the share of labor, 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	7,378.80	59.59
Utilities	1,140.38	9.21
Maintenance and repair	238.91	1.93
Labour direct	250.20	2.02
Labour overheads	50.04	0.40
Administration Costs	100.00	0.81
Land lease cost	-	-
Cost of marketing and distribution	250.00	2.02
Total Operating Costs	**9,408.33**	**75.98**
Depreciation	2,028.34	16.38
Cost of Finance	945.83	7.64
Total Production Cost	**12,382.49**	**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 667 thousand to Birr 2.56 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 19.58 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.

$$\text{Break-Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 5{,}544{,}000$$

$$\text{Break-Even Capacity utilization} = \frac{\text{Break- even Sales Value}}{\text{Sales revenue}} \times 100 = 56.37\%$$

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 19.35% 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 6.80 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 5.71 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 horticulture farming sub sector and sugar producers 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	1,475.76	1,660.23	1,844.70	1,844.70	1,844.70	1,844.70	1,844.70	1,844.70	1,844.70	1,844.70
Accounts receivable	631.39	707.71	784.03	784.03	784.56	784.56	784.56	784.56	784.56	784.56
Cash-in-hand	7.10	7.99	8.88	8.88	8.97	8.97	8.97	8.97	8.97	8.97
CURRENT ASSETS	**2,114.25**	**2,375.93**	**2,637.60**	**2,637.60**	**2,638.23**	**2,638.23**	**2,638.23**	**2,638.23**	**2,638.23**	**2,638.23**
Accounts payable	32.61	36.68	40.76	40.76	40.76	40.76	40.76	40.76	40.76	40.76
CURRENT LIABILITIES	**32.61**	**36.68**	**40.76**	**40.76**	**40.76**	**40.76**	**40.76**	**40.76**	**40.76**	**40.76**
TOTAL WORKING CAPITAL	**2,081.64**	**2,339.24**	**2,596.85**	**2,596.85**	**2,597.47**	**2,597.47**	**2,597.47**	**2,597.47**	**2,597.47**	**2,597.47**

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	5,903	6,641	7,379	7,379	7,379	7,379	7,379	7,379	7,379	7,379
Utilities	912	1,026	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140
Maintenance and repair	191	215	239	239	239	239	239	239	239	239
Labour direct	200	225	250	250	250	250	250	250	250	250
Labour overheads	40	45	50	50	50	50	50	50	50	50
Administration Costs	80	90	100	100	100	100	100	100	100	100
Land lease cost	0	0	0	0	6.41	6.41	6.41	6.41	6.41	6.41
Cost of marketing and distribution	250	250	250	250	250	250	250	250	250	250
Total Operating Costs	**7,577**	**8,492**	**9,408**	**9,408**	**9,415**	**9,415**	**9,415**	**9,415**	**9,415**	**9,415**
Depreciation	2,028	2,028	2,028	2,028	2,028	116	116	116	116	116
Cost of Finance	0	1,081	946	811	676	540	405	270	135	0
Total Production Cost	**9,605**	**11,602**	**12,382**	**12,247**	**12,119**	**10,071**	**9,936**	**9,801**	**9,666**	**9,531**

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	10,560	11,880	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200
Less variable costs	7,327	8,242	9,158	9,158	9,158	9,158	9,158	9,158	9,158	9,158
VARIABLE MARGIN	**3,233**	**3,638**	**4,042**	**4,042**	**4,042**	**4,042**	**4,042**	**4,042**	**4,042**	**4,042**
in % of sales revenue	30.62	30.62	30.62	30.62	30.62	30.62	30.62	30.62	30.62	30.62
Less fixed costs	2,278	2,278	2,278	2,278	2,285	372	372	372	372	372
OPERATIONAL MARGIN	**955**	**1,359**	**1,763**	**1,763**	**1,757**	**3,669**	**3,669**	**3,669**	**3,669**	**3,669**
in % of sales revenue	9.04	11.44	13.36	13.36	13.31	27.80	27.80	27.80	27.80	27.80
Financial costs		1,081	946	811	676	540	405	270	135	0
GROSS PROFIT	**955**	**278**	**818**	**953**	**1,081**	**3,129**	**3,264**	**3,399**	**3,534**	**3,669**
in % of sales revenue	9.04	2.34	6.19	7.22	8.19	23.70	24.73	25.75	26.77	27.80
Income (corporate) tax	0	0	0	286	324	939	979	1,020	1,060	1,101
NET PROFIT	**955**	**278**	**818**	**667**	**757**	**2,190**	**2,285**	**2,379**	**2,474**	**2,568**
in % of sales revenue	9.04	2.34	6.19	5.05	5.73	16.59	17.31	18.03	18.74	19.46

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	**11,957**	**13,657**	**11,884**	**13,204**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**4,815**
Inflow funds	11,957	3,097	4	4	0	0	0	0	0	0	0	0
Inflow operation	0	10,560	11,880	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,815
TOTAL CASH OUTFLOW	**11,957**	**10,674**	**11,186**	**11,967**	**11,856**	**11,767**	**12,245**	**12,150**	**12,056**	**11,961**	**10,516**	**0**
Increase in fixed assets	11,957	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	2,114	262	262	0	1	0	0	0	0	0	0
Operating costs	0	7,327	8,242	9,158	9,158	9,165	9,165	9,165	9,165	9,165	9,165	0
Marketing and Distribution cost	0	250	250	250	250	250	250	250	250	250	250	0
Income tax	0	0	0	0	286	324	939	979	1,020	1,060	1,101	0
Financial costs	0	983	1,081	946	811	676	540	405	270	135	0	0
Loan repayment	0	0	1,351	1,351	1,351	1,351	1,351	1,351	1,351	1,351	0	0
SURPLUS (DEFICIT)	**0**	**2,983**	**698**	**1,237**	**1,344**	**1,433**	**955**	**1,050**	**1,144**	**1,239**	**2,684**	**4,815**
CUMULATIVE CASH BALANCE	**0**	**2,983**	**3,681**	**4,918**	**6,262**	**7,696**	**8,651**	**9,700**	**10,844**	**12,083**	**14,767**	**19,583**

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**	**10,560**	**11,880**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**13,200**	**4,815**
Inflow operation	0	10,560	11,880	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	0
Other income	0	0	0	0	0	0	0	0	0	0	0	4,815
TOTAL CASH OUTFLOW	**14,038**	**7,834**	**8,750**	**9,408**	**9,695**	**9,739**	**10,353**	**10,394**	**10,434**	**10,475**	**10,516**	**0**
Increase in fixed assets	11,957	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	2,082	258	258	0	1	0	0	0	0	0	0	0
Operating costs	0	7,327	8,242	9,158	9,158	9,165	9,165	9,165	9,165	9,165	9,165	0
Marketing and Distribution cost	0	250	250	250	250	250	250	250	250	250	250	0
Income (corporate) tax		0	0	0	286	324	939	979	1,020	1,060	1,101	0
NET CASH FLOW	**-14,038**	**2,726**	**3,130**	**3,792**	**3,505**	**3,461**	**2,847**	**2,806**	**2,766**	**2,725**	**2,684**	**4,815**
CUMULATIVE NET CASH FLOW	**-14,038**	**-11,313**	**-8,183**	**-4,391**	**-886**	**2,575**	**5,422**	**8,228**	**10,993**	**13,718**	**16,403**	**21,218**
Net present value	-14,038	2,478	2,587	2,849	2,394	2,149	1,607	1,440	1,290	1,156	1,035	1,856
Cumulative net present value	-14,038	-11,560	-8,974	-6,125	-3,731	-1,582	25	1,465	2,755	3,911	4,946	6,802

NET PRESENT VALUE	6,802
INTERNAL RATE OF RETURN	19.35%
NORMAL PAYBACK	6 years