PROFILE ON THE PRODUCTION OF BABY FOOD

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I. SUMMARY

This profile envisages the establishment of a plant for the production of baby food with a capacity of 2,000 tons per annum. Baby food is a supplementary food prepared for children in the early years for the purpose of relieving mothers from intensive breast-feeding and as a complementary feeding.

The country`s requirement of baby food is met through local production and import. The present (2012) demand for baby food is estimated at 59,289 tons. The demand for the product is projected to reach 72,132 tons and 87,759 tons by the years 2017 and 2022, respectively.

The principal raw materials required are sorghum or wheat flour, soya beans, chick peas, sweat potato, fruits and milk powder. All raw materials except milk powder, which will have to be imported, are available locally.

The total investment cost of the project including working capital is estimated at Birr 32.56 million. From the total investment cost the highest share (Birr 14.87 million or 45.69%) is accounted by working capital cost followed by fixed investment (Birr 14.64 million or 44.97%) and pre operation cost (Birr 3.04 million or 9.34%). From the total investment cost, Birr 7.84 million or 24.08% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 25.28% and a net present value (NPV) of Birr 30.34 million discounted at 10%.

The project can create employment for 55 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 agricultural sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Baby food is commonly known as infant food and is produced from pulses as well as other agricultural ingredients like soya bean, fruits and vegetables. Baby food is a supplementary food prepared for children in the early years for the purpose of relieving mothers from intensive breast-feeding and as a complementary feeding. The basic requirements for baby food are

sweetness, palatability and tenderness. In addition, carbohydrates and proteins are the major nutrients in the formulation of baby food. Prior to feeding, baby food is first diluted in water and then boiled to form a stew or soup and finally served with spoons for infants. Baby food is a resource based product that will substitute the import.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement for baby food is met by domestic production and through imports. Baby foods that are produced domestically are known as FAFA, DUBE, EDGET and MITIN. Some quantity of imported baby foods like NIDO, COAST, CERILAC, NAN, GUIGOZ and S-26 are available in super markets and general merchandizing shops. Domestic production of baby or infant food between 2001/02-2009/10 is presented in Table 3.1.

Table 3.1

DOMESTIC PRODUCTION OF BABY OR INFANT FOOD (TONS)

Year	Production
2000/01	11,693
2001/02	9,216
2002/03	15,379
2003/04	18,481
2004/05	12,828
2005/06	14,570
2006/07	11,924
2007/08	11,382
2008/09	10,990
2009/10	37,971

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

Table 3.1 shows that domestic production was around 11,700 tons at the beginning of 2000s and reached level of about 38, 000 tons by the close of the decade. However, there were fluctuations over the period. In this regard, production at the beginning was about 11,700 tons and the following year it fell to about 9,200 tons, and then grew for two consecutive years and reached about 18,500 tons by the year 2003/04. Similarly, production during the period 2004/05 –2008/09 ranged from the lowest 10,990 tons (2008/09) to the highest 14,570 tons in the year 2005/6. Finally, production increased by more than three times from the preceding year and registered maximum of the period (37,971 tons) in 2009/10. The huge increase during the year 2009/10 is due to the establishment of new factories such as HILINA Enriched Foods Processing Center. Assuming, there are no other projects implemented that produce infant food in the past two years, the current (year 2012) domestic production is taken as 38,000 tons.

To meet the unsatisfied demand Ethiopia also imports a variety of infant foods from a number of countries. The data source for import statistics i.e. Ethiopian Revenue and Customs Authority classifies import of baby foods under the following headings.

- 18069010 - chocolate, for infant or invalid use;
- 19011000 - preparations for infant use, of flour;
- 19021110 - uncooked pasta for infants;
- 19021910 - not cooked pasta, for infant food;
- 19053110 - infant foods or invalid foods;
- 19053190 - other infant or invalid foods; and
- 21069010 - infant foods, flavored or colored syrups.

For the purpose of this study, only HS code of 1901 and 1905, which include only preparations for infant use, of flour and other infant or invalid foods are taken. A summary of the above three types of infant foods imported during the period 2001 – 2011 is presented in Table 3.2.

Table 3.2

IMPORT OF BABY FOOD (TONS)

Year	Import
2001	180
2002	846
2003	1,202
2004	1,528
2005	1,906
2006	1,996
2007	2,037
2008	1,178
2009	759
2010	1,396
2011	1,754

Source: - *Ethiopian Revenue and Customs Authority.*

Table 3.2 shows that the annual level of import which was 180 tons in 2001 has grown to 1,754 tons by 2011. The table also reveals pattern of import has shown three marked phases during the period. In the first phase (2001-2007) import grew consistently (by an average of 30%). In the second phase (2008 & 2009) import fell sharply (by -38%) where as starting 2010 it has shown recovery. In view of the observed pattern, it was found necessary to consider the average of the three phases (average of averages) in estimating the 2012 import level. Accordingly, import of 2012 was estimated at 1,309 tons.

The level of malnutrition among children in Ethiopia is unacceptably high and is implicated as an underlying cause in more than half of all child deaths in Ethiopia (MoFED, MOH, and UN 2009). Improved child care and infant feeding practices are believed to be important interventions for reducing infant and young child malnutrition in Ethiopia. Complementary feeding practices are essential to meet the nutritional needs of children in the early years of life. In this regard, industrially processed complementary feeding provides an option (MoH 2004). This shows there is huge unmet need. Efforts which will translate the need into effective

demand have also been made in relation to meeting the Millennium Development Goals (MDGS). A USD 365 million joint program on children, food security and nutrition by Ministry of Finance and Economic Development, Federal Ministry of Health, the UN Resident Coordinator's Office, UNICEF, WFP, WHO and FAO was initiated in 2009 and expected to be scaled up after 2012. The program is targeting 156,000 under-two children and 96,500 pregnant and lactating women in the communities, as well as 14,640 under-five children with severe acute malnutrition and 10,360 malnourished pregnant/lactating women. Thus, it is appropriate to include demand emanating from the program in estimating the present effective demand. According to experts in the field about 200 gm of industrially processed baby food is recommended daily as supplement. Hence, for targeted beneficiaries in the program 19,980 tons will be needed annually.

To arrive at the present effective demand for baby or infant food ,the average level of import in the past years, which is 1,309 tons; the existing domestic production ,which is about 38,000 tons; and the amount required by the joint program on Children Food Security and Nutrition, which is 19,980 tons have been added. Accordingly, the present (2012) effective demand for baby food is estimated at 59,289 tons.

2. Demand Projection

The demand for industrially processed baby food is influenced mainly by the baby /infant population, income of household and urbanization. The urban population in Ethiopia is growing by more than 4%. Assuming there will be a modest growth of household income and urbanization and considering the Health Extension Program in Ethiopia and programs of Non Governmental Organizations which aims at improving infant feeding, a growth rate of 4 % is used in projecting the demand. Domestic production is assumed to remain at 38,000 tons (estimated level of production for 2012). The resulting total projected demand and the unsatisfied demand is shown in Table 3.3.

Table 3.3

PROJECTED DEMAND FOR BABY FOOD (TONS)

Year	Projected Demand	Existing Production	Unsatisfied Demand
2013	61,660	38,000	23,660
2014	64,126	38,000	26,126
2015	66,691	38,000	28,691
2016	69,358	38,000	31,358
2017	72,132	38,000	34,132
2018	75,017	38,000	37,017
2019	78,018	38,000	40,018
2020	81,139	38,000	43,139
2021	84,384	38,000	46,384
2022	87,759	38,000	49,759

3. Pricing and Distribution

The price of baby food varies from brand to brand. The retail price of the most common brand is Birr 100 per kg. By taking the current retail and allowing 40% for distributors and retailers the recommended factory gate price is Birr 60 per kg.

The envisaged plant can use the wholesale and retail networks, which includes department stores, merchandise shops and super markets to distribute its product.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Based on the unsatisfied demand projection for baby food in the market study and the minimum economic scale, the annual production capacity of the envisaged plant is proposed to be 2,000 tons per annum. This capacity is proposed on the basis of a single shift of 8 hours per day and 300 working days per annum. There is a possibility to double or triple the production by introducing additional shifts if an increase is observed in the market demand.

2. Production Program

With an assumption that the initial production years will be required for market penetration and technical capacity building by the envisaged plant, it is planned to start production at 70% of its installed capacity which will grow to 90% in the second year. Full capacity production will be attained in the third year and onwards. Details of the annual production program for the main and by – product (bran) 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	Baby food	ton	1,400	1,800	2,000
2	Bran	ton	112	144	160
3	Capacity utilization rate	%	70	90	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The major raw materials used for the production of baby food are sorghum or wheat flour, soya beans, chick peas, sweat potato, fruits, milk powder, etc. All raw materials except milk powder, which will be imported, are available locally. The total annual cost of raw materials is estimated at Birr 61,456,400.

Details of annual requirement for raw materials at 100% capacity utilization and the respective estimated costs are shown 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/Unit	Cost ('000 Birr)		Total
					F. C.	L.C.	
1	Sweet potato	ton	470	5,000	-	2,350.00	2,350.00
2	Wheat flour	ton	821	9,900	-	8,127.90	8,127.90
3	Beans	ton	312	14,000	-	4,368.00	4,368.00
4	Soya beans	ton	235	14,000	-	3,290.00	3,290.00
5	Chick peas	ton	253	13,500	-	3,415.50	3,415.50
6	Fruits	ton	70	12,000	-	840.00	840.00
7	Milk powder	ton	126	317,500	40,005.00		40,005.00
Total					**40,005.00**	**22,391.40**	**62,396.40**

The major auxiliary materials required for the plant are packing materials like 1 kg plastic bag, carton box and glue tape. Plastic bags and carton boxes can be available locally where as glue tape has to be imported. The finished product is packed in plastic bag of standard quality and repacked in a carton box. The annual requirement of the plant for auxiliary materials and the estimated costs are given 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	Plastic bag, 1 kg	000 pc	2,000	0.40		800	800
2	Carton box	000 pc	2,000	1.25		2,500	2,500
3	Glue tape	roll	10,000	10.00	80	20	100
Total					**80**	**3,320**	**3,400**

B. UTILITIES

The basic power required for the envisaged plant is an electric power which can be available from the national grid of EEPCo. The annual consumption of electric power at full capacity of the plant is 200,000 kWh.

The other utility required by the plant is water for the production process and general purpose. The annual requirement for water at full capacity production is 22,000 m^3. The total annual cost of power and utilities at full capacity production and the estimated costs are shown in Table 4.3.

Table 4.3

ANNUAL UTILITIES REQUIREMENT AT FULL CAPACITY AND COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr/Unit	Total
1	Electric power	kWh	200,000	0.58	116.0
2	Water	m^3	22,000	10.00	220.0
Total					**336.0**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The major operations involved in baby food production process include cleaning, roasting, milling, blending and packing. The raw materials are first conveyed from the silos to the cleaning machines (vibrating screens) with respective mesh sizes for the separation of course impurities and other extraneous matters. The material is then conveyed to different equipment such as destoners and scourers for further cleaning.

Beans and chick peas are usually roasted and then scoured. Finally, different materials are milled and mixed according to a predetermined ratio.

2. Environmental Impact

Since the envisaged plant does not have any pollutant emission, the project is environment friendly.

B. ENGINEERING

1. Machinery and Equipment

The total cost of plant machinery and equipment required for the envisaged project is estimated at Birr 9.8 million, out of which about Birr 7.84 million is needed in foreign currency. The list of machinery and equipment along with the estimated costs is given in Table 5.1.

Table 5.1

MACHINERY AND EQUIPMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measure	Required Qty.	Unit Price, Birr/Unit	Cost, ('000 Birr)		
					F.C.	L.C.	Total
1	Storage bin (silo)	set	5	137,200.00	548.80	137.20	686.00
2	Bucket elevator	set	12	81,666.67	784.00	196.00	980.00
3	Screw conveyor	set	7	98,000.00	548.80	137.20	686.00
4	Drum sieve	set	1	196,000.00	156.80	39.20	196.00
5	Magnetic separator	set	1	98,000.00	78.40	19.60	98.00
6	Destoner	set	1	980,000.00	784.00	196.00	980.00
7	Roaster	set	1	784,000.00	627.20	156.80	784.00
8	Scourer	set	1	588,000.00	470.40	117.60	588.00
9	Milling machine including sifters	set	1	1,666,000.00	1,332.80	333.20	1,666.00
10	Weigher	set	1	98,000.00	78.40	19.60	98.00
11	Aspirator	set	1	196,000.00	156.80	39.20	196.00
12	Dehydrator	set	1	784,000.00	627.20	156.80	784.00
13	Mixer	set	1	196,000.00	156.80	39.20	196.00
14	Rotary distributer	set	1	196,000.00	156.80	39.20	196.00
15	Packing machine	set	1	1,176,000.00	940.80	235.20	1,176.00
16	Laboratory equipment	set	1	490,000.00	392.00	98.00	490.00

Grand Total		**7,840.00**	**1,960.00**	**9,800.00**

2. Land, Buildings and Civil Works

The total area of land required for the envisaged project is 1,500 m^2, out of which the 800 m^2 is a built - up area. The construction cost of buildings and civil works, at the rate of Birr 4,500 per m^2 and assuming a hollow concrete block wall, cement tiles floor and EGA sheet roof is estimated at Birr 3.6 million.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No 721/2004) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%.The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing

sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5,000 m^2, the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority. However, if the land request is above 5,000 m^2 the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

Moreover, the Addis Ababa City Administration has recently adopted a new land lease floor price for plots in the city. The new prices will be used as a benchmark for plots that are going to be auctioned by the city government or transferred under the new "Urban Lands Lease Holding Proclamation."

The new regulation classified the city into three zones. The first Zone is Central Market District Zone, which is classified in five levels and the floor land lease price ranges from Birr 1,686 to Birr 894 per m^2. The rate for Central Market District Zone will be applicable in most areas of the city that are considered to be main business areas that entertain high level of business activities.

The second zone, Transitional Zone, will also have five levels and the floor land lease price ranges from Birr 1,035 to Birr 555 per m^2 .This zone includes places that are surrounding the city and are occupied by mainly residential units and industries.

The last and the third zone, Expansion Zone, is classified into four levels and covers areas that are considered to be in the outskirts of the city, where the city is expected to expand in the future. The floor land lease price in the Expansion Zone ranges from Birr 355 to Birr 191 per m^2 (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor $_2$
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 399,000 of which 10% or Birr 39,900 will be paid in advance. The remaining Birr 359,100 will be paid in equal installments with in 28 years i.e. Birr 12,825 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

A total human resource of 55 persons is required for the envisaged project. The total annual labor cost including fringe benefits is estimated at Birr 1,015,200. The list of human resource required and estimated annual labor cost including fringe benefits is 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	General manager	1	5,500	66,000
2	Secretary	1	1,500	18,000
3	Marketing officer	1	3,000	36,000
4	Sales person	1	2,000	24,000
5	Purchaser	1	2,000	24,000

Sr. No.	Job Title	Required No. of Persons	Salary, Birr	
			Monthly	Annual
6	Accountant	1	2,500	30,000
7	Cashier	1	1,800	21,600
8	Personnel	1	2,000	24,000
9	Store keeper	1	2,000	24,000
10	Production and technical manager	1	5,000	60,000
11	Mechanic	2	5,000	60,000
12	Electrician	2	5,000	60,000
13	Quality controller (chemist)	2	7,000	84,000
14	Driver	2	2,000	24,000
15	Operator	16	12,800	153,600
16	Laborer	18	9,900	118,800
17	Guard	3	1,500	18,000
Sub- Total		**55**	**70,500**	**846,000**
Fringe benefits (20% Basic salary)			**14100**	**169,200**
Grand Total			**84,600**	**1,015,200**

B. TRAINING REQUIREMENT

Training shall be conducted during plant erection and commissioning by the supplier of machinery and equipment. The production and technical head, mechanics, electricians and quality control - chemist have to be trained for two weeks at the site by advanced technician of the supplier. These in turn can further train operators. The cost of training is estimated at Birr 60,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the baby food project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 year
Source of finance	30 % equity
	70 % loan
Tax holidays	5 years
Bank interest	10%
Discount cash flow	10%

Accounts receivable	30 days
Raw material local	30 days
Work in progress	1 day
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 32.56 million (see Table 7.1). From the total investment cost the highest share (Birr 14.87 million or 45.69%) is accounted by working capital cost followed by fixed investment (Birr 14.64 million or 44.97%) and pre operation cost (Birr 3.04 million or 9.34%). From the total investment cost, Birr 7.84 million or 24.08% 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	0.12
1.2	Building and civil work	3,600.00		3,600.00	11.06
1.3	Machinery and equipment	1,960.00	**7,840.00**	9,800.00	30.10
1.4	Vehicles	900.00		900.00	2.76
1.5	Office furniture and equipment	300.00		300.00	0.92
	Sub total	**6,799.90**	**7,840.00**	**14,639.90**	**44.97**
2	**Pre operating cost ***				
2.1	Pre operating cost	912.50		912.50	2.80
2.2	Interest during construction	2,129.87		2,129.87	6.54
	Sub total	**3,042.37**		**3,042.37**	**9.34**
3	**Working capital ****	**14,874.31**		**14,874.31**	**45.69**
	Grand Total	**24,716.58**	**7,840.00**	**32,556.58**	**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 22.16 million. However, only the initial working capital of Birr 15.47 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 72.90 million (see Table 7.2). The cost of raw material account for 85.59% of the production cost. The other major components of the production cost are depreciation and financial cost, which account for 3.42% and 2.81%, respectively. The remaining 8.18% is the share of labor, 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	62,396	85.59
Utilities	3,400	4.66
Maintenance and repair	336	0.46
Labor direct	846	1.16
Labor overheads	129	0.18
Administration Costs	500	0.69
Land lease cost	0	0.00
Cost of marketing and distribution	750	1.03

Total Operating Costs	**68,357**	**93.76**
Depreciation	2,497	3.42
Cost of Finance	2,050	2.81
Total Production Cost	**72,904**	**100.00**

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax ranges from Birr 5.17 million to Birr 8.02 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 75.80 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.

Break- Even Sales Value = Fixed Cost + Financial Cost = Birr 33,600,000

Variable Margin ratio (%)

Break -Even Capacity utilization = Break- even Sales Value X 100 = 26.20%
Sales revenue

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 25.28% 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 30.34 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 55 persons. The project will generate Birr 20.82 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 agricultural 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	10,919.37	14,039.19	15,599.10	15,599.10	15,599.10	15,599.10	15,599.10	15,599.10	15,599.10	15,599.10
Accounts receivable	4,006.28	5,133.07	5,696.47	5,696.47	5,697.54	5,697.54	5,697.54	5,697.54	5,697.54	5,697.54
Cash-in-hand	17.61	22.64	25.16	25.16	25.33	25.33	25.33	25.33	25.33	25.33
CURRENT ASSETS	**14,943.26**	**19,194.90**	**21,320.72**	**21,320.72**	**21,321.97**	**21,321.97**	**21,321.97**	**21,321.97**	**21,321.97**	**21,321.97**
Accounts payable	68.95	88.65	98.50	98.50	98.50	98.50	98.50	98.50	98.50	98.50
CURRENT LIABILITIES	**68.95**	**88.65**	**98.50**	**98.50**	**98.50**	**98.50**	**98.50**	**98.50**	**98.50**	**98.50**
TOTAL WORKING CAPITAL	**14,874.31**	**19,106.25**	**21,222.22**	**21,222.22**	**21,223.47**	**21,223.47**	**21,223.47**	**21,223.47**	**21,223.47**	**21,223.47**

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	43,677	56,157	62,396	62,396	62,396	62,396	62,396	62,396	62,396	62,396
Utilities	2,380	3,060	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400
Maintenance and repair	235	302	336	336	336	336	336	336	336	336
Labour direct	592	761	846	846	846	846	846	846	846	846
Labour overheads	90	116	129	129	129	129	129	129	129	129
Administration Costs	350	450	500	500	500	500	500	500	500	500
Land lease cost	0	0	0	0	13	13	13	13	13	13
Cost of marketing and distribution	750	750	750	750	750	750	750	750	750	750
Total Operating Costs	**48,075**	**61,597**	**68,358**	**68,358**	**68,370**	**68,370**	**68,370**	**68,370**	**68,370**	**68,370**
Depreciation	2,497	2,497	2,497	2,497	2,497	174	174	174	174	174
Cost of Finance	0	2,343	2,050	1,757	1,464	1,171	879	586	293	0
Total Production Cost	**50,572**	**66,436**	**72,904**	**72,611**	**72,331**	**69,716**	**69,423**	**69,130**	**68,837**	**68,544**

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	56,000	72,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Less variable costs	47,325	60,847	67,608	67,608	67,608	67,608	67,608	67,608	67,608	67,608
VARIABLE MARGIN	**8,675**	**11,153**	**12,392**	**12,392**	**12,392**	**12,392**	**12,392**	**12,392**	**12,392**	**12,392**
in % of sales revenue	15.49	15.49	15.49	15.49	15.49	15.49	15.49	15.49	15.49	15.49
Less fixed costs	3,247	3,247	3,247	3,247	3,259	937	937	937	937	937
OPERATIONAL MARGIN	**5,428**	**7,907**	**9,146**	**9,146**	**9,133**	**11,456**	**11,456**	**11,456**	**11,456**	**11,456**
in % of sales revenue	9.69	10.98	11.43	11.43	11.42	14.32	14.32	14.32	14.32	14.32
Financial costs		2,343	2,050	1,757	1,464	1,171	879	586	293	0
GROSS PROFIT	**5,428**	**5,564**	**7,096**	**7,389**	**7,669**	**10,284**	**10,577**	**10,870**	**11,163**	**11,456**
in % of sales revenue	9.69	7.73	8.87	9.24	9.59	12.86	13.22	13.59	13.95	14.32
Income (corporate) tax	0	0	0	2,217	2,301	3,085	3,173	3,261	3,349	3,437
NET PROFIT	**5,428**	**5,564**	**7,096**	**5,172**	**5,368**	**7,199**	**7,404**	**7,609**	**7,814**	**8,019**
in % of sales revenue	9.69	7.73	8.87	6.47	6.71	9.00	9.25	9.51	9.77	10.02

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	**15,552**	**73,073**	**72,020**	**80,010**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**25,553**
Inflow funds	15,552	17,073	20	10	0	0	0	0	0	0	0	0
Inflow operation	0	56,000	72,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	25,553
TOTAL CASH OUTFLOW	**15,552**	**65,148**	**71,120**	**75,462**	**75,260**	**75,065**	**75,556**	**75,351**	**75,146**	**74,941**	**71,807**	**0**
Increase in fixed assets	15,552	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	14,943	4,252	2,126	0	1	0	0	0	0	0	0
Operating costs	0	47,325	60,847	67,608	67,608	67,620	67,620	67,620	67,620	67,620	67,620	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	2,217	2,301	3,085	3,173	3,261	3,349	3,437	0
Financial costs	0	2,130	2,343	2,050	1,757	1,464	1,171	879	586	293	0	0
Loan repayment	0	0	2,929	2,929	2,929	2,929	2,929	2,929	2,929	2,929	0	0
SURPLUS (DEFICIT)	**0**	**7,925**	**900**	**4,548**	**4,740**	**4,935**	**4,444**	**4,649**	**4,854**	**5,059**	**8,193**	**25,553**
CUMULATIVE CASH BALANCE	**0**	**7,925**	**8,824**	**13,372**	**18,112**	**23,047**	**27,492**	**32,141**	**36,995**	**42,055**	**50,247**	**75,801**

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**	**56,000**	**72,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**80,000**	**25,553**
Inflow operation	0	56,000	72,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	0
Other income	0	0	0	0	0	0	0	0	0	0	0	25,553
TOTAL CASH OUTFLOW	**30,427**	**52,307**	**63,713**	**68,358**	**70,575**	**70,671**	**71,456**	**71,544**	**71,631**	**71,719**	**71,807**	**0**
Increase in fixed assets	15,552	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	14,874	4,232	2,116	0	1	0	0	0	0	0	0	0
Operating costs	0	47,325	60,847	67,608	67,608	67,620	67,620	67,620	67,620	67,620	67,620	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	2,217	2,301	3,085	3,173	3,261	3,349	3,437	0
NET CASH FLOW	**-30,427**	**3,693**	**8,287**	**11,642**	**9,425**	**9,329**	**8,544**	**8,456**	**8,369**	**8,281**	**8,193**	**25,553**
CUMULATIVE NET CASH FLOW	**-30,427**	**-26,734**	**-18,447**	**-6,804**	**2,620**	**11,949**	**20,493**	**28,950**	**37,319**	**45,599**	**53,792**	**79,345**
Net present value	-30,427	3,357	6,849	8,747	6,437	5,793	4,823	4,340	3,904	3,512	3,159	9,852
Cumulative net present value	-30,427	-27,070	-20,221	-11,474	-5,037	756	5,579	9,919	13,823	17,334	20,493	30,345

NET PRESENT VALUE	30,345
INTERNAL RATE OF RETURN	25.28%
NORMAL PAYBACK	4 years