PROFILE ON THE PRODUCTION OF MACARONI AND PASTA

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I. SUMMARY

This profile envisages the establishment of a plant for the production of pasta and macaroni with a capacity of 3,000 tons per annum. Pasta and macaroni are food products made by extruding and drying unleavened dough of wheat flour.

The country`s requirement of pasta and macaroni is met through local production and import. The present (2012) demand for pasta and macaroni is estimated at 56,603 tons. The demand for the product is projected to reach 66,288 tons and 83,875 tons by the years 2016 and 2022, respectively.

The principal raw material required is semolina /flour sugar which is available locally.

The total investment cost of the project including working capital is estimated at Birr 72.23 million. From the total investment cost the highest share (Birr 56.35 million or 78.01%) is accounted by fixed investment cost followed by initial working capital (Birr 8.90 million or 12.32%) and pre operation cost (Birr 6.98 million or 9.67%). From the total investment cost Birr 32.21 million or 44.60% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 17.54% and a net present value (NPV) of Birr 26.43 million discounted at 10%.

The project can create employment for 61 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with the agro processing sub sector and forward linkage with the catering sector and also generate income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Pasta is a food product made by extruding and drying unleavened dough of wheat flour, and that forms the basis of much Italian cuisine, as well as Chinese, Japanese, Korean, and Southeast

Asian cuisines. Macaroni is a dried food product made from semolina and shaped in the form of slender tubes.

It is popularly believed that Marco Polo, the 13th Century Italian explorer, introduced pasta to Europe from China. Italian pastas, such as spaghetti and macaroni, are traditionally made from semolina flour derived from durum (extra – hard) wheat.

Pasta may be added to soups; boiled and served with a sauce; served cold with other ingredients in a salad; stuffed with meat, cheese or vegetables and then boiled and baked. There are dozens of varieties of Italian pasta, and they are usually named for their sizes and shapes. Pasta is a highly nutritious food. A 56 - gram (2 - oz) serving of pasta has less than 1 - gram (0.04 - oz) of fat, no sodium, no cholesterol, and about 210 calories.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The demand for Pasta and macaroni is met through both domestic production and import (see Tables 3.1&3.2). However, the most important component is that of production by domestic firms. Pasta and macaroni producing firms in Ethiopia are about 10 in number (Yifru 2011). Dire Dawa Food Complex, Kaliti Foods SC, and Kokeb Flour and Pasta Factory have been dominating the market. Domestic production of pasta and macaroni covering the period 2001/02--2009/10 is shown in Table 3.1.

Table 3.1

DOMESTIC PRODUCTION OF MACARONI AND PASTA (TONS)

Year	Production
2001/02	23,258
2002/03	30,239
2003/04	36,208
2004/05	40,258
2005/06	35,372
2006/07	38,908
2007/08	37,079
2008/09	28,151
2009/10	43,691

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

Table 3.1 reveals that the pattern of production of Macaroni and Pasta in Ethiopia is marked by three phases. A consistent growth trend is observed in the first phase i.e. 2001/02--2004/05. The production level which was 23,258 tons in the year 2001/02 has increased to 40,258 tons by the year 2004/05, registering an annual average growth rate of about 20%. During the second phase (2005/06--2008/09), production has gone down to a minimum level of 28,151 tons with a mean figure of 34,877 tons. A huge increase of domestic production was again registered in the last and recent year of 2009/10, which amounts to 43,691 tons. The fluctuations in the domestic production of pasta and macaroni is believed to be as a result of the availability of the main raw material i.e. wheat. Since the supply of wheat is improved in the recent years, at a minimum, domestic production assumed to remain at the level which was attained in the year 2009/10. Accordingly, the current domestic production of pasta and macaroni is estimated at 44,000 tons.

The country also imports considerable amount of macaroni and pasta as shown in Table 3.2.

Table 3.2

IMPORT OF MACARONI AND PASTA (TONS)

Year	Import
2001	1,326.1
2002	832.3
2003	1,232.0
2004	1,514.2
2005	-
2006	3,854.7
2007	2,781.5
2008	3,158.3
2009	5,655.6
2010	7,201.8
2011	25,132.0

Source: *- Ethiopian Revenue and Customs Authority.*

As can be observed from Table 3.2, import of pasta and macaroni is characterized by fluctuation during 2001-2007. However, the import has registered a consistent growth starting 2008. Hence, the recent years import is found to be better in estimating the 2012 import level. Accordingly, the average of last three years' import i.e., 12,663.1 tons has been taken as an estimate of 2012 import.

When added to the domestic supply, aggregate supply will thus be about 56,663 tons. This figure has been taken as the present effective demand for macaroni and pasta.

2. Demand Projection

The demand for macaroni and pasta is dependent on size of urban population and per capita income growth. Since both are increasing, the resulting effect will be a multiplicative. Therefore, the demand for macaroni and pasta is projected at a growth rate of 4 %. Domestic

production is assumed to remain at the 2009/10 level. The total projected demand, existing supply and unsatisfied demand is presented in Table 3.3.

Table 3.3

PROJECTED DEMAND, DOMESTIC SUPPLY AND UNSATISFIED DEMAND FOR MACARONI AND PASTA (TONS)

Year	Total Projected Demand	Domestic Supply	Unsatisfied Demand
2013	58,930	44,000	14,930
2014	61,287	44,000	17,287
2015	63,738	44,000	19,738
2016	66,288	44,000	22,288
2017	68,939	44,000	24,939
2018	71,697	44,000	27,697
2019	74,565	44,000	30,565
2020	77,547	44,000	33,547
2021	80,649	44,000	36,649
2022	83,875	44,000	39,875

3. Pricing and Distribution

The current average retail prices of locally produced pasta and macaroni in the market are Birr 14.00 per 500 grams and Birr 16.00 per kg, respectively. This means the current retail price of pasta and macaroni per tone is Birr 28,000 and 16,000. Allowing 35% marketing expenses and profit margin for wholesalers and retailers, the recommended price for the new project is Birr 20,740 per ton of pasta and Birr 11,852 per ton of macaroni.

The new project can utilize the existing network of wholesalers and retailers for its distribution which include supermarkets and merchandise shops.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Based on the market study on the one hand and considering the minimum economic scale of production on the other, the envisaged plant will have a production capacity of 3,000 tons of pasta/macaroni per annum. This capacity is proposed on the basis of three shifts of 8 hours each per day and 300 working days per annum.

2. Production Program

Allotting enough time, during the initial stage, for market penetration and technical skill development, the plant will start production at 80% of its rated capacity which will grow to 90% in the second year. Full capacity production will be achieved in the third year and then after. Details of annual production program are shown in Table 3.3.

Table 3.3

ANNUAL PRODUCTION PROGRAM AT FULL CAPACITY OPERATION

Sr. No.	Description	Unit of Measure	Production Year		
			1st	2nd	3rd & Onwards
1	Pasta/macaroni	ton	1,800	2,025	2,250
2	Macaroni	ton	600	675	750
	Total	**ton**	**2,400**	**2,700**	**3,000**
3	Capacity utilization rate	%	80	90	100

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The principal raw materials required for production of pasta/macaroni are semolina /flour and water. Semolina is one of the three different outputs of durum (extra hard) wheat obtained by milling. Water is an input used to shape the dough and then removed during the drying process in the oven. Both semolina/flour and water are available locally from the flour factories and

from the municipal water supply system, respectively. The annual requirement for raw materials at full capacity operation of the plant and the estimated costs are given 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
	a) Long cut pasta line						
1	Wheat flour/semolina	ton	1,545	9,000.00		13,905.00	13,905.00
2	Water for process, die washing, etc.	m^3	804	5.00		4.02	4.02
	b) Short cut pasta (macaroni) line						
3	Wheat flour/semolina	ton	1,530	9,000.00		13,770.00	13,770.00
4	Water for process, die washing, etc.	m^3	796	5.00		3.98	3.98
Total						**27,683.00**	**27,683.00**

The major auxiliary materials required for the envisaged plant are packing materials which comprise carton box, printed polypropylene film, scotch tape, 25 kg polypropylene bag, and sewing thread for bags. The annual requirement for the auxiliary materials at full capacity production of both long cut and short cut pasta 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
	a) Long cut pasta line						
1	Carton box	pc	154,500	5.50		849.75	849.75
2	Printed polypropylene film	ft^2	8,652	52.50	363.38	90.84	454.23
3	Scotch tape	roll	2,627	22.84		60.00	60.00
	b) Short cut pasta (macaroni) line						
4	Carton box	pc	153,000	8.50		1,300.50	1,300.50
5	Printed polypropylene film	ft^2	12,546	87.50	878.22	219.55	1,097.77
6	Scotch tape	roll	5,049	22.84		115.31	115.31
7	Polypropylene bag, 25kg	pc	61,200	5.00		306.00	306.00
8	Thread for bag sewing	roll	240	38.00		9.12	9.120
Grand Total					**1,241.60**	**2,951.09**	**4,192.69**

B. UTILITIES

The major utilities required for the plant include electric power, water for general purpose, fuel oil and diesel oil for the process, and fuel and lubricants for plant machinery and equipment. The total annual requirement for 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	Cost (000 Birr)
1	Electric power	kWh	1,116,000	0.58	647.28
2	Water	m3	1,000	10.00	10.00
3	Fuel oil	lt	90,780	14.34	1,301.79
4	Diesel oil	lt	6,240	18.78	117.19
5	Fuel and lubricants	kg	lump sum		2,500.00
Total					**4,576.25**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The production of pasta/macaroni mainly involves mixing, kneading, extrusion, drying and packing. In preparing pasta dough, the semolina/ flour and water and in some cases egg emulsion and other ingredients are measured in a pre-determined ratio and put into a mixer where they are mixed into a consistency of wet sand i.e. a conglomeration of millions of tiny moist granules. The mixing is normally accomplished for 12-15 minutes and the mixture is usually made to have about 30% moisture. The quantity of water depends on the drying temperature employed in the manufacturing process.

In continuous press, mixing is effected under the application of vacuum. The presence of air bubbles in the pasta dough gives the product a chalky appearance and reduces its mechanical strength. At the end of mixer, the dough is received into a specially designed augur, which is mounted in tightly sealed cast housing. Here, the kneading of the dough, the feeding of the pasta/macaroni - forming die with the dough and the creation of pressure required for forcing the dough through the extrusion die opening is effected. The kneading operation is necessary to give uniform texture and color to the finished pasta/macaroni product. Most presses have kneading plate of perforated metal at the end of the screw. This breaks the dough into very small

streams and recombines it to work out any inequalities in the dough and filter out chunks of dry dough and extraneous matter so that it will not plug the die.

During extrusion, a considerable amount of heat is generated, for the reason of which extrusion cylinders are equipped with water - cooling jacket to dissipate heat and hold the extrusion temperature constant. For the best results, the pasta temperature should be held between 45^{o}C and 50^{o}C. After mixing and kneading, the most critical step in pasta manufacturing is the drying process. Drying is the elimination of a liquid; normally water, from a substance or a solid body, which aims at obtaining a hard product that, will retain its shape and is capable of being stored for an indefinite time without spoiling. To do this, the moisture content of pasta/macaroni should be lowered from 30% to 12%. But this apparently simple operation could lead to a moldy and sourly product if carried out too slowly, and could cause the product to crack if carried out too rapidly.

2. Environmental Impact

The pasta/macaroni plant does not have any pollutant emitted from the production process. Thus, the project is environment friendly.

B. ENGINEERING

1. Machinery and Equipment

The production machinery and equipment include those required for both the spaghetti (long cut pasta) and macaroni (short cut pasta) production lines. The pneumatic feeding line equipment, utility equipment and laboratory equipment are common for both production lines of the envisaged plant.

The main accessories required for the envisaged pasta-macaroni plant include set of rectangular and round dies with bronze or Teflon interchangeable inserts, microprocessor die-washer, die soaking tanks and die storage shelves. The ancillary equipment are required for the thermal unit including superheated water generator with accessories, gas oil burner with accessories, automatic pressurization plants complete with loading pumps, safety devices, instruments and

accessories, water softening system, pumps for superheated water distribution, electric switchboard, etc.

As to the laboratory equipment are concerned, the main laboratory equipment required to perform different laboratory tests and inspections are pasta - macaroni cooking machine, muffle furnace, laboratory sifter with set of standard sieves sizes. The estimated costs of plant machinery and equipment required for the envisaged pasta-macaroni plant are 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	Semolina/flour feeding system	set	1	2,536.76	634.19	3,170.95
2	Long cut pasta line, with temporary storage facility, 215 kg/hr	set	1	4,122.24	1,030.56	5,152.80
3	Automatic long cut pasta packing unit equipment	set	1	3,170.95	792.74	3,963.69
4	Short cut pasta line, 215 kg/hr	set	1	3,805.15	951.28	4,756.43
5	Finished products storage unit equipment for short cut pasta	set	1	2,219.67	554.91	2,774.58
6	Automatic short cut pasta packing unit equipment	set	1	3,170.95	792.74	3,963.69
7	Semi-automatic weighing and bagging system	set	1	2,853.86	713.46	3,567.32
8	Accessories	set	1	2,219.67	554.91	2,774.58
9	Ancillary plants	set	1	2,853.86	713.46	3,567.32
10	Low tension distribution system	set	1	2,536.76	634.19	3,170.95
11	Connection materials	set	1	2,219.67	554.91	2,774.58
12	Laboratory equipment	set	1	505.70	126.42	632.13
13	Diesel generator	set	1		530.19	530.19
Grand Total				**32,215.28**	**8,584.01**	**40,799.30**

2. Land, Buildings and Civil Works

The total area of land required for the envisaged plant is 4,000 m^2 out of which 3,000 square meters is a built-up area.. The construction cost of buildings and civil works at a rate of Birr 4,500 per m^2 is estimated at Birr 13.5 million.

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

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

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

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

In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5000 m^2, the land lease request is evaluated and decided upon by the Industrial Zone Development and

Coordination Committee of the City's Investment Authority. However, if the land request is above 5,000 m^2 the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

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

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

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

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

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

Zone	Level	Floor price/m^2
Central Market District	1st	1686
	2nd	1535
	3rd	1323
	4th	1085
	5th	894
Transitional zone	1st	1035
	2nd	935
	3rd	809
	4th	685
	5th	555
Expansion zone	1st	355
	2nd	299
	3rd	217
	4th	191

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all new manufacturing projects will be located in industrial zones located in expansion zones. Therefore, for the profile a land lease rate of Birr 266 per m^2 which is equivalent to the average floor price of plots located in expansion zone is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criterions are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.3 shows incentives for lease payment.

Table 5.3

INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS

Scored Point	Grace Period	Payment Compl. Period	Down Payment
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile, the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The land lease period for industry is 60 years.

Accordingly, the total land lease cost at a rate of Birr 266 per m^2 is estimated at Birr 1,064,000 of which 10% or Birr 106,400 will be paid in advance. The remaining Birr 957,600 will be paid in equal installments with in 28 years i.e. Birr 34,200 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 requirement of the envisaged project is 61 persons. Details of the human resource requirement and estimated annual labor cost including fringe benefits are given in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND ESTIMATED COST

Sr. No.	Job Title	Required No. of Persons	Salary, Birr	
			Monthly	Annual
1	Plant manager	1	5,000	60,000
2	Secretary	1	900	10,800
3	Personnel	1	1,000	12,000
4	Financial manager	1	3,500	42,000
5	Accountant - clerk	2	1,800	21,600
6	Cashier	1	900	10,800
7	Salesman /Purchaser	2	1,800	21,600
8	Store keeper	3	2,700	32,400
9	Technical and production manager	1	4,000	48,000
10	Quality controller/chemist	3	4,500	54,000
11	Production supervisor	1	1,200	14,400
12	Shift leader	3	3,000	36,000
13	Mechanic	3	3,000	36,000
14	Electrician	3	3,000	36,000
15	Operator	9	4,950	59,400
16	Production worker	15	6,000	72,000
17	Cleaner	6	2,400	28,800
18	Driver	1	800	9,600
19	Guard	4	1,600	19,200
Sub - total		**61**	**52,050**	**624,600**
Employees benefit, 20% of basic salary			**10,410**	**124,920**
Total			**62,460**	**749,520**

B. TRAINING REQUIREMENT

The production supervisor, 3 quality controllers, 3 shift leaders, 3 mechanics and 3 electricians should be given 3 weeks on - the - job training on production and quality control, and equipment maintenance by an advanced technician of the equipment supplier during the erection and commissioning. In addition, 9 production operators should be given two weeks on - the - job training on operation of equipment by the in - house skilled technical personnel. The total cost of training is estimated at Birr 198,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the pasta and macaroni 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 72.23 million (see Table 7.1). From the total investment cost the highest share (Birr 56.35 million or 78.01%) is accounted by fixed investment cost followed by initial working capital (Birr 8.90

million or 12.32%) and pre operation cost (Birr 6.98 million or 9.67%). From the total investment cost Birr 32.21 million or 44.60% 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	106.40		106.40	0.15
1.2	Building and civil work	13,500.00		13,500.00	18.69
1.3	Machinery and equipment	8,584.03	32,215.28	40,799.31	56.48
1.4	Vehicles	1,500.00		1,500.00	2.08
1.5	Office furniture and equipment	450.00		450.00	0.62
	Sub total	**24,140.43**	**32,215.28**	**56,355.71**	**78.01**
2	**Pre operating cost ***				
2.1	Pre operating cost	2,259.97		2,259.97	3.13
2.2	Interest during construction	4,725.86		4,725.86	6.54
	Sub total	**6,985.83**		**6,985.83**	**9.67**
3	**Working capital ****	**8,896.63**		**8,896.63**	**12.32**
	Grand Total	**40,022.90**	**32,215.28**	**72,238.18**	**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 11.30 million. However, only the initial working capital of Birr 8.89 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 53.22 million (see Table 7.2). The cost of raw material account for 59.89% of the production cost. The other major components of the production cost are depreciation, financial cost and utility, which account for

17.84%, 8.55% and 8.60%, respectively. The remaining 5.08% 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	31,875.69	59.89
Utilities	4,576.25	8.60
Maintenance and repair	1,223.98	2.30
Labour direct	624.60	1.17
Labour overheads	124.92	0.23
Administration Costs	250.00	0.47
Land lease cost	-	-
Cost of marketing and distribution	500.00	0.94
Total Operating Costs	**39,175.44**	**73.61**
Depreciation	9,496.86	17.84
Cost of Finance	4,548.64	8.55
Total Production Cost	**53,220.94**	**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 9.21 million to Birr 11.03 million during the life of the project. Moreover, at the end of the project life the accumulated net cash

flow amounts to Birr 84.11million. 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.

$$\text{Break- Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 23{,}332{,}260$$

$$\text{Break -Even Capacity utilization} = \frac{\text{Break -even Sales Value}}{\text{Sales revenue}} \times 100 = 59.23\%$$

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 17.54% 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 26.43 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 61 persons. The project will generate Birr 21.69 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward

linkage with the agro processing sub sector and forward linkage with the catering 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	6,375.14	7,570.48	7,968.92	7,968.92	7,968.92	7,968.92	7,968.92	7,968.92	7,968.92	7,968.92
Accounts receivable	2,620.03	3,103.47	3,264.62	3,264.62	3,267.47	3,267.47	3,267.47	3,267.47	3,267.47	3,267.47
Cash-in-hand	24.71	29.34	30.88	30.88	31.36	31.36	31.36	31.36	31.36	31.36
CURRENT ASSETS	**9,019.87**	**10,703.29**	**11,264.42**	**11,264.42**	**11,267.75**	**11,267.75**	**11,267.75**	**11,267.75**	**11,267.75**	**11,267.75**
Accounts payable	123.24	146.35	154.05	154.05	154.05	154.05	154.05	154.05	154.05	154.05
CURRENT LIABILITIES	**123.24**	**146.35**	**154.05**	**154.05**	**154.05**	**154.05**	**154.05**	**154.05**	**154.05**	**154.05**
TOTAL WORKING CAPITAL	**8,896.63**	**10,556.94**	**11,110.38**	**11,110.38**	**11,113.70**	**11,113.70**	**11,113.70**	**11,113.70**	**11,113.70**	**11,113.70**

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	25,501	30,282	31,876	31,876	31,876	31,876	31,876	31,876	31,876	31,876
Utilities	3,661	4,347	4,576	4,576	4,576	4,576	4,576	4,576	4,576	4,576
Maintenance and repair	979	1,163	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
Labour direct	500	593	625	625	625	625	625	625	625	625
Labour overheads	100	119	125	125	125	125	125	125	125	125
Administration Costs	200	238	250	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	34.20	34.20	34.20	34.20	34.20	34.20
Cost of marketing and distribution	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	**31,440**	**37,242**	**39,175**	**39,175**	**39,210**	**39,210**	**39,210**	**39,210**	**39,210**	**39,210**
Depreciation	9,497	9,497	9,497	9,497	9,497	585	585	585	585	585
Cost of Finance	0	5,198	4,549	3,899	3,249	2,599	1,949	1,300	650	0
Total Production Cost	**40,937**	**51,937**	**53,221**	**52,571**	**51,956**	**42,394**	**41,744**	**41,094**	**40,444**	**39,795**

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	44,442	52,775	55,553	55,553	55,553	55,553	55,553	55,553	55,553	55,553
Less variable costs	30,940	36,742	38,675	38,675	38,675	38,675	38,675	38,675	38,675	38,675
VARIABLE MARGIN	**13,502**	**16,033**	**16,878**	**16,878**	**16,878**	**16,878**	**16,878**	**16,878**	**16,878**	**16,878**
in % of sales revenue	30.38	30.38	30.38	30.38	30.38	30.38	30.38	30.38	30.38	30.38
Less fixed costs	9,997	9,997	9,997	9,997	10,031	1,119	1,119	1,119	1,119	1,119
OPERATIONAL MARGIN	**3,505**	**6,036**	**6,881**	**6,881**	**6,847**	**15,758**	**15,758**	**15,758**	**15,758**	**15,758**
in % of sales revenue	7.89	11.44	12.39	12.39	12.32	28.37	28.37	28.37	28.37	28.37
Financial costs		5,198	4,549	3,899	3,249	2,599	1,949	1,300	650	0
GROSS PROFIT	**3,505**	**838**	**2,332**	**2,982**	**3,597**	**13,159**	**13,809**	**14,459**	**15,109**	**15,758**
in % of sales revenue	7.89	1.59	4.20	5.37	6.48	23.69	24.86	26.03	27.20	28.37
Income (corporate) tax	0	0	0	0	0	3,948	4,143	4,338	4,533	4,728
NET PROFIT	**3,505**	**838**	**2,332**	**2,982**	**3,597**	**9,211**	**9,666**	**10,121**	**10,576**	**11,031**
in % of sales revenue	7.89	1.59	4.20	5.37	6.48	16.58	17.40	18.22	19.04	19.86

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	**58,616**	**58,188**	**52,798**	**55,561**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**24,046**
Inflow funds	58,616	13,746	23	8	0	0	0	0	0	0	0	0
Inflow operation	0	44,442	52,775	55,553	55,553	55,553	55,553	55,553	55,553	55,553	55,553	0
Other income	0	0	0	0	0	0	0	0	0	0	0	24,046
TOTAL CASH OUTFLOW	**58,616**	**45,186**	**50,622**	**50,783**	**49,572**	**48,960**	**52,255**	**51,800**	**51,345**	**50,890**	**43,937**	**0**
Increase in fixed assets	58,616	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	9,020	1,683	561	0	3	0	0	0	0	0	0
Operating costs	0	30,940	36,742	38,675	38,675	38,710	38,710	38,710	38,710	38,710	38,710	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	0	0	3,948	4,143	4,338	4,533	4,728	0
Financial costs	0	4,726	5,198	4,549	3,899	3,249	2,599	1,949	1,300	650	0	0
Loan repayment	0	0	6,498	6,498	6,498	6,498	6,498	6,498	6,498	6,498	0	0
SURPLUS (DEFICIT)	**0**	**13,002**	**2,177**	**4,777**	**5,981**	**6,593**	**3,298**	**3,753**	**4,208**	**4,663**	**11,616**	**24,046**
CUMULATIVE CASH BALANCE	**0**	**13,002**	**15,178**	**19,956**	**25,936**	**32,529**	**35,828**	**39,581**	**43,789**	**48,452**	**60,068**	**84,114**

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**	**44,442**	**52,775**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**55,553**	**24,046**
Inflow operation	0	44,442	52,775	55,553	55,553	55,553	55,553	55,553	55,553	55,553	55,553	0
Other income	0	0	0	0	0	0	0	0	0	0	0	24,046
TOTAL CASH OUTFLOW	**67,512**	**33,101**	**37,795**	**39,175**	**39,179**	**39,210**	**43,157**	**43,352**	**43,547**	**43,742**	**43,937**	**0**
Increase in fixed assets	58,616	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	8,897	1,660	553	0	3	0	0	0	0	0	0	0
Operating costs	0	30,940	36,742	38,675	38,675	38,710	38,710	38,710	38,710	38,710	38,710	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	0	0	3,948	4,143	4,338	4,533	4,728	0
NET CASH FLOW	**-67,512**	**11,341**	**14,980**	**16,378**	**16,374**	**16,343**	**12,396**	**12,201**	**12,006**	**11,811**	**11,616**	**24,046**
CUMULATIVE NET CASH FLOW	**-67,512**	**-56,171**	**-41,191**	**-24,814**	**-8,439**	**7,904**	**20,300**	**32,500**	**44,506**	**56,317**	**67,933**	**91,979**
Net present value	-67,512	10,310	12,380	12,305	11,184	10,148	6,997	6,261	5,601	5,009	4,478	9,271
Cumulative net present value	-67,512	-57,202	-44,822	-32,517	-21,333	-11,185	-4,188	2,072	7,673	12,682	17,161	26,431

NET PRESENT VALUE	26,431
INTERNAL RATE OF RETURN	17.54%
NORMAL PAYBACK	6 years