**PROFILE ON THE PRODUCTION OF MARGARINE**

Table of Contents

[I. SUMMARY 1](#_Toc369170606)

[II. PRODUCT DESCRIPTION AND APPLICATION 3](#_Toc369170607)

[III. MARKET STUDY AND PLANT CAPACITY 3](#_Toc369170608)

[IV. MATERIAL AND INPUTS 6](#_Toc369170609)

[V. TECHNOLOGY AND ENGINEERING 7](#_Toc369170610)

[VI. HUMAN RESOURCE AND TRAINING REQUIREMENT 13](#_Toc369170611)

[VII. FINANCIAL ANALYSIS 14](#_Toc369170612)

[FINANCIAL ANALYSES SUPPORTING TABLES 19](#_Toc369170614)

# SUMMARY

This profile envisages the establishment of a plant for the production of margarine with a capacity of 25,000 kg per annum. Margarine is widely used as a table spread in bakeries, pastries and as an ingredient in various food preparations, shortenings, basic input in baked products like bread, biscuit and the like.

The country`s requirement of margarine is met through import.The present (2012) demand for margarine is estimated at 670 tons. The demand for the products is projected to reach 898 tones and 1,092 tones by the year 2018 and year 2022, respectively.

The principal raw materials required are partially hydrogenated cotton seed oil, animal fats and skimmed milk which are available locally.

The total investment cost of the project including working capital is estimated at Birr 6.74 million. From the total investment cost the highest share (Birr 5.68 million or 84.23%) is accounted by fixed investment cost followed by pre operation cost (Birr 655.20 thousand or 9.71%) and initial working capital (Birr 408.56 thousand or 6.06%). From the total investment cost Birr 1.70 million or 25.29% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 21.14% and a net present value (NPV) of Birr 3.57 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 agro processing sub sector and forward linkage with the food processing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

# II. PRODUCT DESCRIPTION AND APPLICATION

Margarine is butter - like product obtained by mixing animal and vegetable fats with or without milk. Margarine was originally marketed as an imitation butter. However, it now has a recognized identity to its own. The proportion of the fat blend and other ingredients varies with the type of margarine and with the country of manufacture.

The product is widely used as a table spread in bakeries, pastries and as an ingredient in various food preparations, shortenings, basic input in baked products like bread, biscuit and the like.

Margarine is a resource based product that will substitute import.

# III. MARKET STUDY AND PLANT CAPACITY

1. **MARKET STUDY**

Due to absence of plants in the country that manufacture margarine the entire requirement is met through import and the yearly import is shown in Table 3.1.

**Table 3.1**

**IMPORT OF MARGARINE (TONS)**

|  |  |
| --- | --- |
| **Year** | **Import** |
| 2001 | 77 |
| 2002 | 59 |
| 2003 | 104 |
| 2004 | 70 |
| 2005 | 99 |
| 2006 | 423 |
| 2007 | 171 |
| 2008 | 379 |
| 2009 | 776 |
| 2010 | 339 |
| 2011 | 896 |

**Source:** *-Ethiopian Revenue and**Customs Authority.*

Although import of margarine has shown fluctuation over the years considered, a general increasing trend is observed. This can be clearly seen when the data set is analyzed in to three years interval. The yearly average imported quantity which was about 90 tons during the period 2001--2003 has increased to annual average of about 198 tons during the period 2004--2006, which is more than double of the previous three years average. Similarly the yearly average quantity imported during the period 2007 –2009 has increased to 442 tons. During the recent two years i.e. 2009--2011 the yearly average has reached to a level of 618 tones. Generally, import of the product has been growing by more than 25% annually during the past ten years, which increased from 77 tons in the year 2001 to 896 by the year 2011.

In order to determine the current effective demand, the recent three years average has been used since imports fluctuated over the period of study. Accordingly, the present effective demand is estimated at 670 tons.

**2. Demand Projection**

The demand for margarine will grow as a result of urban population growth, rise in income and change in the eating habit of the population. By considering the growth rate of import over the past years, urban population growth of about 4% , and increasing income and anticipating change in eating habit, a 5% annual average growth is adopted to forecast the demand (see Table 3.2).

**Table 3.2**

**PROJECTED DEMAND FOR MARGARINE (TONS)**

|  |  |
| --- | --- |
| **Year** | **Forecasted**  **Demand** |
| 2013 | 704 |
| 2014 | 739 |
| 2015 | 776 |
| 2016 | 815 |
| 2017 | 856 |
| 2018 | 898 |
| 2019 | 943 |
| 2020 | 990 |
| 2021 | 1,040 |
| 2022 | 1,092 |

Demand for margarine will increase from 704 tones in the year 2013 to 898 tones and 1,092 tones by the year 2018 and year 2022, respectively.

**3. Pricing and Distribution**

The current average retail price of margarine is Birr 200 per kg. Accordingly, allowing 25% margin for intermediaries a factory gate price of Birr 160 per kg is adopted for the envisaged plant.

The product will find its market outlet through the food stores and groceries throughout the county.

**B. PLANT CAPACITY AND PRODUCTION PROGRAM**

**1. Plant Capacity**

Based on the projected demand for margarine and considering the economic scale of production the capacity of the envisaged plant is proposed to be 25,000 kgs of margarine per annum. This capacity is proposed on the basis of one shift of 8 hours per day and 300 working days per annum. The capacity, upon requirement, can be increased by increasing the number of shifts per day.

**2. Production Program**

It is assumed that the envisaged project, at the initial stage of the production period may require some time to capture a significant market share. Therefore, the envisaged plant has to start production at 80% of its installed capacity which will grow to 90% in the second year. Full capacity production shall be attained in the third year and onwards. Details of annual production capacity 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 | Margarine from animal fat | kg | 20,000 | 22,500 | 25,000 |
| 2 | Capacity utilization rate | % | 80 | 90 | 100 |

# IV. MATERIAL AND INPUTS

**A. RAW MATERIALS**

The major raw materials required for production of margarine can broadly be classified into three groups: fat, blend, aqueous phase and additives.

In this study, partially hydrogenated cotton seed oil and animal fats are major constituents of the fat blend. Animal fat which is a by - product of cattle meet processing plant is the other constituent the blend. Ripened or skimmed milk, salt, water and brine constitute of the aqueous phase are also among the required raw materials. Cotton seed oil can be found from the currently operating oil plants. Skimmed milk can be obtained from milk processing plants. Thus, all these raw materials are locally available.

Lecithin, antioxidant, flavoring agents, fat-soluble dye, vitamins and aroma ingredients are classified under the group of additives. Additives will be imported.

The annual requirement for raw materials and the estimated costs at full capacity operation of the envisaged plant are shown in Table 4.1.

**Table 4.1**

**ANNUAL RAW MATERIALS REQUIREMENT AND ESTIMATED COSTS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Unit of Measure** | **Required Qty** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** | | |
| **F.C.** | **L.C.** | **Total** |
| 1 | Hydrogenated oil and fat | kg | 22,500 | 43.75 |  | 984.37 | 984.37 |
| 2 | Skimmed milk | kg | 4,250 | 12.00 |  | 51.00 | 51.00 |
| 3 | Salt | kg | 625 | 2.50 |  | 1.56 | 1.56 |
| 4 | Additives | kg | 1,125 | 42.00 | 37.80 | 9.45 | 47.25 |
| **Total** | | | | | **37.80** | **1,046.38** | **1,084.18** |

The only auxiliary material required is packing material that is food grade aluminum foil. The total annual cost of packing material at full capacity operation of the plant at lump sum is estimated at Birr 315,000, out of which Birr 252,000 will be required in foreign currency.

1. **UTILITIES**

The power and utilities required for the envisaged project include electric power, water and furnace oil. The annual power and utilities requirement at full capacity production of the plant and the estimated costs are indicated in Table 4.2.

**Table 4.2**

**ANNUAL POWER AND UTILITIES REQUIREMENT AND ESTIMATED COSTS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Unit of Measure** | **Annual**  **Req.** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** | | |
| **F.C.** | **L.C.** | **Total** |
| 1 | Electric power | kWh | 30,000 | 0.5778 |  | 17.33 | 17.33 |
| 2 | Water | m3 | 2,500 | 10.00 |  | 25.00 | 25.00 |
| 3 | Furnace oil | lt | 3,520 | 14.84 |  | 52.23 | 52.23 |
| **Total** | | | | |  | **94.56** | **94.56** |

# V. TECHNOLOGY AND ENGINEERING

**A. TECHNOLOGY**

**1. Process Description**

The process of margarine production involves melting of raw oils and fats in the melting tanks, blending it with salt, water, lactic substances, vitamins, coloring agents, aroma and other ingredients in mixing tanks, emulsifying in the emulsifying tank, sterilizing in continuous sterilizing equipment, rapid cooling in continuous cooling and kneading machine, ageing the intermediate product for a while, forming into the prescribed shape and finally packing and dispatching.

**2. Environmental Impact**

The envisaged plant does not have any adverse impact on the environment. Thus the project is environment friendly.

**B. ENGINEERING**

**1. Machinery and Equipment**

The major plant machinery and equipment required for the project comprise tanks for melting, mixing, emulsifying and kneading of the ingredients; continuous sterilizing and cooling equipment; forming and packing machine and boiler for process steam generation. The total cost of machinery and equipment is estimated at Birr 2,131,979 of which Birr 1,705,583 will be required in foreign currency. List of the required plant machinery and equipment and their total estimated cost is shown in Table 5.1.

**Table 5.1**

**LIST OF MACHINERY AND EQUIPMENT AND ESTIMATED COST**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr.  No.** | **Description** | **Unit of Measure** | **Req.  Qty** | **Cost, ('000 Birr)** | | |
| **F.C.** | **L.C.** | **Total** |
| 1 | Melting tanks | set | 2 | 324.06 | 81.02 | 405.08 |
| 2 | Mixing tank | set | 1 | 153.50 | 38.38 | 191.88 |
| 3 | Emulsifying tank | set | 1 | 204.67 | 51.17 | 255.84 |
| 4 | Continuous sterilization equipment | set | 1 | 255.84 | 63.96 | 319.80 |
| 5 | Continuous cooling and mixing | set | 1 | 238.78 | 59.70 | 298.48 |
| 6 | Forming and packing machine | set | 1 | 255.84 | 63.96 | 319.80 |
| 7 | Boiler | set | 1 | 221.73 | 55.43 | 277.16 |
| 8 | Other auxiliary equipment | set | 1 | 51.17 | 12.79 | 63.96 |
| **Total** | | | | **1,705.58** | **426.396** | **2,131.98** |

**2. Land, Buildings and Civil Works**

The total area of land required for the envisaged project is 900 m2 out of which 350 m2 will be a built - up area. The cost of buildings and civil works at a unit construction rate of Birr 4,500/ m2 is estimated at Birr 1.575 million.

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

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

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

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

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

Regarding land allocation of industrial zones if the land requirement of the project is below 5000 m2 the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City’s Investment Authority. However, if the land request is above 5,000 m2 the request is evaluated by the City’s Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

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

The new regulation classified the city into three zones. The first Zone is Central Market District Zone, which is classified in five levels and the floor land lease price ranges from Birr 1,686 to Birr 894 per m2. The rate for Central Market District Zone will be applicable in most areas of the city that are considered to be main business areas that entertain high level of business activities.

The second zone, Transitional Zone, will also have five levels and the floor land lease price ranges from Birr 1,035 to Birr 555 per m2 .This zone includes places that are surrounding the city and are occupied by mainly residential units and industries.

The last and the third zone, Expansion Zone, is classified into four levels and covers areas that are considered to be in the outskirts of the city, where the city is expected to expand in the future. The floor land lease price in the Expansion Zone ranges from Birr 355 to Birr 191 per m2 (see Table 5.2).

**Table 5.2**

**NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA**

| **Zone** | **Level** | **Floor price/m2** |
| --- | --- | --- |
| 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 m2 which is equivalent to the average floor price of plots located in expansion zone is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The 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 m2 is estimated at Birr 239,400 of which 10% or Birr 23,940 will be paid in advance. The remaining Birr 239,400 will be paid in equal installments with in 28 years i.e. Birr 7,695 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

1. **HUMAN RESOURCE REQUIREMENT**

The total human resourcerequirement of the envisaged project is 27 persons. The human resourcerequirement along with the estimated annual labor cost, including fringe benefits, is given in Table 6.1.

**Table 6.1**

**HUMAN RESOURCE REQUIREMENT AND LABOUR LABOR COST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.  No.** | **Job Title** | **Required No. of Persons** | **Salary, Birr** | |
| **Monthly** | **Annual** |
| 1 | General manager | 1 | 5,000 | 60,000 |
| 2 | Sales officer | 1 | 900 | 10,800 |
| 3 | Accountant | 1 | 900 | 10,800 |
| 4 | Cashier | 1 | 900 | 10,800 |
| 5 | Purchaser | 1 | 800 | 9,600 |
| 6 | Personnel | 1 | 800 | 9,600 |
| 7 | Store keeper | 1 | 900 | 10,800 |
| 8 | Production head | 1 | 3,500 | 42,000 |
| 9 | Mechanic | 1 | 1,000 | 12,000 |
| 10 | Electrician | 1 | 1,000 | 12,000 |
| 11 | Quality controller (chemist) | 1 | 1,500 | 18,000 |
| 12 | Driver | 1 | 800 | 9,600 |
| 13 | Operator | 4 | 2,400 | 28,800 |
| 14 | Laborer | 6 | 2,400 | 28,800 |
| 15 | Guard | 3 | 1,200 | 14,400 |
| **Sub- total** | | **25** | **24,000** | **288,000** |
| **Fringe benefits (20% Basic salary)** | | | **4,800** | **57,600** |
| **Total** | |  | **28,800** | **345,600** |

**B. TRAINING REQUIREMENT**

Four operators should be given a two weeks on – the – job training by the advanced technician of the machinery supplier during plant erection and commissioning. The total training cost is estimated at Birr 150,000.

# VII. FINANCIAL ANALYSIS

The financial analysis of the margarine 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 6.74 million (See Table 7.1). From the total investment cost the highest share (Birr 5.68 million or 84.23%) is accounted by fixed investment cost followed by pre operation cost (Birr 655.20 thousand or 9.71%) and initial working capital (Birr 408.56 thousand or 6.06%). From the total investment cost Birr 1.70 million or 25.29% 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 | 23.94 |  | 23.94 | 0.35 |
| 1.2 | Building and civil work | 1,575.00 |  | 1,575.00 | 23.35 |
| 1.3 | Machinery and equipment | 426.40 | 1,705.58 | 2,131.98 | 31.61 |
| 1.4 | Vehicles | 1,500.00 |  | 1,500.00 | 22.24 |
| 1.5 | Office furniture and equipment | 450.00 |  | 450.00 | 6.67 |
|  | **Sub total** | **3,975.34** | **1,705.58** | **5,680.92** | **84.23** |
| **2** | **Pre operating cost \*** |  |  |  |  |
| 2.1 | Pre operating cost | 213.96 |  | 213.96 | 3.17 |
| 2.2 | Interest during construction | 441.24 |  | 441.24 | 6.54 |
|  | **Sub total** | **655.20** |  | **655.20** | **9.71** |
| **3** | **Working capital \*\*** | **408.56** |  | **408.56** | **6.06** |
|  | **Grand Total** | **5,039.10** | **1,705.58** | **6,744.68** | **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 552.46 thousand. However, only the initial working capital of Birr 408.56 thousand during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).*

##### B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 3.50 million (see Table 7.2). The cost of raw material account for 40.00% of the production cost. The other major components of the production cost are depreciation, financial cost and labor, which account for 25.08%, 12.14% and 8.23% respectively. The remaining 14.55% is the share of utility, repair and maintenance, labor overhead and administration cost. For detail production cost see Appendix 7.A.2.

**Table 7.2**

**ANNUAL PRODUCTION COST AT FULL CAPACITY (year three)**

|  |  |  |
| --- | --- | --- |
| **Items** | **Cost** | **%** |
| Raw Material and Inputs | 1,399.18 | 40.00 |
| Utilities | 94.57 | 2.70 |
| Maintenance and repair | 106.60 | 3.05 |
| Labour direct | 288.00 | 8.23 |
| Labour overheads | 57.60 | 1.65 |
| Administration Costs | 100.00 | 2.86 |
| Land lease cost | - | - |
| Cost of marketing and destribution | 150.00 | 4.29 |
| **Total Operating Costs** | **2,195.95** | **62.78** |
| Depreciation | 877.19 | 25.08 |
| Cost of Finance | 424.69 | 12.14 |
| **Total Production Cost** | **3,497.83** | **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 ranges from Birr 394 thousand to Birr 1.18 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 9.48 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 1,680,000

Variable Margin ratio (%)

Break- Even Capacity utilization = Break even Sales Value X 100 = 52.57 %

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 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 21.14% 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 3.57 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 2.70 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 food processing sub sector and also generates income for the Government in terms of payroll tax.

**Appendix 7.A**

# FINANCIAL ANALYSES SUPPORTING TABLES

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.1** | | | | | | | | | | |
| **NET WORKING CAPITAL ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Items** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Total inventory | 279.84 | 314.82 | 349.80 | 349.80 | 349.80 | 349.80 | 349.80 | 349.80 | 349.80 | 349.80 |
| Accounts receivable | 148.90 | 165.95 | 183.00 | 183.00 | 183.64 | 183.64 | 183.64 | 183.64 | 183.64 | 183.64 |
| Cash-in-hand | 6.14 | 6.90 | 7.67 | 7.67 | 7.78 | 7.78 | 7.78 | 7.78 | 7.78 | 7.78 |
| **CURRENT ASSETS** | **434.87** | **487.66** | **540.46** | **540.46** | **541.21** | **541.21** | **541.21** | **541.21** | **541.21** | **541.21** |
| Accounts payable | 26.31 | 29.60 | 32.88 | 32.88 | 32.88 | 32.88 | 32.88 | 32.88 | 32.88 | 32.88 |
| **CURRENT LIABILITIES** | **26.31** | **29.60** | **32.88** | **32.88** | **32.88** | **32.88** | **32.88** | **32.88** | **32.88** | **32.88** |
| **TOTAL WORKING CAPITAL** | **408.56** | **458.07** | **507.58** | **507.58** | **508.33** | **508.33** | **508.33** | **508.33** | **508.33** | **508.33** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.2** | | | | | | | | | | |
| **PRODUCTION COST ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Raw Material and Inputs | 1,119 | 1,259 | 1,399 | 1,399 | 1,399 | 1,399 | 1,399 | 1,399 | 1,399 | 1,399 |
| Utilities | 76 | 85 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Maintenance and repair | 85 | 96 | 107 | 107 | 107 | 107 | 107 | 107 | 107 | 107 |
| Labour direct | 230 | 259 | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 |
| Labour overheads | 46 | 52 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 58 |
| Administration Costs | 80 | 90 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Land lease cost | 0 | 0 | 0 | 0 | 7.70 | 7.70 | 7.70 | 7.70 | 7.70 | 7.70 |
| Cost of marketing  and distribution | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| **Total Operating Costs** | **1,787** | **1,991** | **2,196** | **2,196** | **2,204** | **2,204** | **2,204** | **2,204** | **2,204** | **2,204** |
| Depreciation | 877 | 877 | 877 | 877 | 877 | 108 | 108 | 108 | 108 | 108 |
| Cost of Finance | 0 | 485 | 425 | 364 | 303 | 243 | 182 | 121 | 61 | 0 |
| **Total Production Cost** | **2,664** | **3,354** | **3,498** | **3,437** | **3,384** | **2,554** | **2,494** | **2,433** | **2,372** | **2,312** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.3** | | | | | | | | | | |
| **INCOME STATEMENT ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Sales revenue | 3,200 | 3,600 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| Less variable costs | 1,637 | 1,841 | 2,046 | 2,046 | 2,046 | 2,046 | 2,046 | 2,046 | 2,046 | 2,046 |
| **VARIABLE MARGIN** | **1,563** | **1,759** | **1,954** | **1,954** | **1,954** | **1,954** | **1,954** | **1,954** | **1,954** | **1,954** |
| in % of sales revenue | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 | 48.85 |
| Less fixed costs | 1,027 | 1,027 | 1,027 | 1,027 | 1,035 | 266 | 266 | 266 | 266 | 266 |
| **OPERATIONAL MARGIN** | **536** | **731** | **927** | **927** | **919** | **1,688** | **1,688** | **1,688** | **1,688** | **1,688** |
| in % of sales revenue | 16.75 | 20.32 | 23.17 | 23.17 | 22.98 | 42.21 | 42.21 | 42.21 | 42.21 | 42.21 |
| Financial costs |  | 485 | 425 | 364 | 303 | 243 | 182 | 121 | 61 | 0 |
| **GROSS PROFIT** | **536** | **246** | **502** | **563** | **616** | **1,446** | **1,506** | **1,567** | **1,628** | **1,688** |
| in % of sales revenue | 16.75 | 6.84 | 12.55 | 14.07 | 15.40 | 36.14 | 37.66 | 39.18 | 40.69 | 42.21 |
| Income (corporate) tax | 0 | 0 | 0 | 169 | 185 | 434 | 452 | 470 | 488 | 507 |
| **NET PROFIT** | **536** | **246** | **502** | **394** | **431** | **1,012** | **1,054** | **1,097** | **1,139** | **1,182** |
| in % of sales revenue | 16.75 | 6.84 | 12.55 | 9.85 | 10.78 | 25.30 | 26.36 | 27.42 | 28.48 | 29.55 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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** | **5,895** | **4,076** | **3,603** | **4,003** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **1,919** |
| Inflow funds | 5,895 | 876 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inflow operation | 0 | 3,200 | 3,600 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,919 |
| **TOTAL CASH OUTFLOW** | **5,895** | **2,663** | **3,136** | **3,280** | **3,336** | **3,299** | **3,487** | **3,444** | **3,402** | **3,359** | **2,710** | **0** |
| Increase in fixed assets | 5,895 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in current assets | 0 | 435 | 53 | 53 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 1,637 | 1,841 | 2,046 | 2,046 | 2,054 | 2,054 | 2,054 | 2,054 | 2,054 | 2,054 | 0 |
| Marketing and  Distribution cost | 0 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 0 |
| Income tax | 0 | 0 | 0 | 0 | 169 | 185 | 434 | 452 | 470 | 488 | 507 | 0 |
| Financial costs | 0 | 441 | 485 | 425 | 364 | 303 | 243 | 182 | 121 | 61 | 0 | 0 |
| Loan repayment | 0 | 0 | 607 | 607 | 607 | 607 | 607 | 607 | 607 | 607 | 0 | 0 |
| **SURPLUS (DEFICIT)** | **0** | **1,413** | **467** | **723** | **664** | **701** | **513** | **556** | **598** | **641** | **1,290** | **1,919** |
| **CUMULATIVE CASH  BALANCE** | **0** | **1,413** | **1,880** | **2,603** | **3,268** | **3,969** | **4,482** | **5,038** | **5,636** | **6,277** | **7,566** | **9,485** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.5** | | | | | | | | | | | | |
| **DISCOUNTED CASH FLOW ( in 000 Birr)** | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** | **Scrap** |
| **TOTAL CASH INFLOW** | **0** | **3,200** | **3,600** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **4,000** | **1,919** |
| Inflow operation | 0 | 3,200 | 3,600 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,919 |
| **TOTAL CASH OUTFLOW** | **6,303** | **1,836** | **2,041** | **2,196** | **2,366** | **2,388** | **2,637** | **2,656** | **2,674** | **2,692** | **2,710** | **0** |
| Increase in fixed assets | 5,895 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in net working capital | 409 | 50 | 50 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 1,637 | 1,841 | 2,046 | 2,046 | 2,054 | 2,054 | 2,054 | 2,054 | 2,054 | 2,054 | 0 |
| Marketing and Distribution cost | 0 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 0 |
| Income (corporate) tax |  | 0 | 0 | 0 | 169 | 185 | 434 | 452 | 470 | 488 | 507 | 0 |
| **NET CASH FLOW** | **-6,303** | **1,364** | **1,559** | **1,804** | **1,634** | **1,612** | **1,363** | **1,344** | **1,326** | **1,308** | **1,290** | **1,919** |
| **CUMULATIVE NET CASH FLOW** | **-6,303** | **-4,940** | **-3,381** | **-1,577** | **58** | **1,670** | **3,032** | **4,377** | **5,703** | **7,011** | **8,301** | **10,219** |
| Net present value | -6,303 | 1,240 | 1,289 | 1,355 | 1,116 | 1,001 | 769 | 690 | 619 | 555 | 497 | 740 |
| Cumulative net present value | -6,303 | -5,064 | -3,775 | -2,420 | -1,303 | -303 | 466 | 1,156 | 1,775 | 2,330 | 2,827 | 3,567 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| NET PRESENT VALUE | 3,567 |  |  |  |  |  |  |  |  |  |  |  |
| INTERNAL RATE OF RETURN | 21.14% |  |  |  |  |  |  |  |  |  |  |  |
| NORMAL PAYBACK | 6 years |  |  |  |  |  |  |  |  |  |  |  |