**PROFILE ON THE PRODUCTION OF JAM AND MARMALADE**

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# I. SUMMARY

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

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

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

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

The project is financially viable with an internal rate of return (IRR) of 19.35% and a net present value (NPV) of Birr 6.80 million, discounted at 10%.

The project can create employment for 25 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with the horticulture farming sub sector and sugar producers and also generates income for the Government in terms of tax revenue and payroll tax.

# II. PRODUCT DESCRIPTION AND APPLICATION

Jam is a product made by boiling fruit and sugar to a thick consistency without preserving the shape of the fruit while marmalade is a soft clear translucent jelly holding a suspension pieces or slices of fruit and fruit rind. Jam and marmalade are bread dressings served alone or together with margarine or fresh butter. The major consumers are pastries, households, hotels, schools and military camps. Jam and marmalade is a resource based product that can substitute import.

# III. MARKET STUDY AND PLANT CAPACITY

**A. MARKET STUDY**

**1. Past Supply and Present Demand**

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

**Table 3.1**

**PRODUCTION OF JAM AND MARMALADE (TONS)**

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

\*Not reported

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

Various Issues

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

**Table 3.2**

**IMPORT OF JAM & MARMALADE (TONS)**

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

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

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

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

**2. Demand Projection**

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

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

**Table 3.3**

**PROJECTED DEMAND FOR JAM & MARMALADE (TONS)**

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

**3. Pricing and Distribution**

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

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

**B. PLANT CAPACITY AND PRODUCTION PROGRAM**

**1. Plant Capacity**

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

**2. Production Program**

Assuming that the plant will require enough time during the initial period of operation for market penetration and technical skill development, it will start operation at 80% of its installed capacity which will grow to 90% in the second year. Full capacity production will be attained in third year and onwards. Details of annual production program are shown in Table 3.3.

**Table 3.3**

**ANNUAL PRODUCTION PROGRAM**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Unit of Measure** | **Production Year** | | |
| **1st** | **2nd** | **3rd & Onwards** |
| 1 | Jam and marmalade | ton | 240 | 270 | 300 |
| 2 | Capacity utilization rate | % | 80 | 90 | 100 |

# IV. MATERIALS AND INPUTS

**A. RAW MATERIALS**

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

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

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

## Guideline Recipe to get 68% Brix at Finished Product

Fruits - 11 kg at 10% TSS

Sugar - 9 kg

Citric acid - 55 g

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

**Table 4.1**

**ANNUAL RAW MATERIALS REQUIREMENT AT FULL CAPACITY AND COST**

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

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

**Table 4.2**

**ANNUAL AUXILIARY MATERIALS REQUIREMENT AT FULL CAPACITY AND COST**

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

# B. UTILITIES

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

**Table 4.3**

**ANNUAL AND UTILITIES REQUIREMENT AND COST**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Unit of Measure** | **Required Qty** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** | | |
| **F.C.** | **L.C.** | **Total** |
| 1 | Electric power | kWh | 34,800 | 0.58 |  | 20.18 | 20.18 |
| 2 | Water | m3 | 24,000 | 10.00 |  | 240.00 | 240.00 |
| 3 | Furnace oil | lt | 60,000 | 14.67 |  | 880.20 | 880.20 |
| **Total** | | | | |  | **1,140.38** | **1,140.38** |

# V. TECHNOLOGY AND ENGINEERING

**A. TECHNOLOGY**

**1. Production Process**

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

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

**2. Environmental Impact**

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

### B. ENGINEERING

**1. Machinery and Equipment**

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

**Table 5.1**

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

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

### 2. Land, Buildings and Civil Works

The total area of land required for the plant is 750 m2, out of which 450 m2 is built-up area. Hygiene requirements should be integrated in the construction of buildings. Total construction cost estimate at a rate of Birr 4,500 per m2 is Birr 2.025 million.

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

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

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

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

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

Regarding land allocation of industrial zones if the land requirement of the project is below 5000 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 Completion  Period** | **Down  Payment** |
| Above 75% | 5 Years | 30 Years | 10% |
| From 50 - 75% | 5 Years | 28 Years | 10% |
| From 25 - 49% | 4 Years | 25 Years | 10% |

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

Accordingly, the total land lease cost at a rate of Birr 266 per m2 is estimated at Birr 199,500 of which 10% or Birr 19,950 will be paid in advance. The remaining Birr 179,550 will be paid in equal installments with in 28 years i.e. Birr 6,413 annually.

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

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

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

# VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

**A. HUMAN RESOURCE REQUIREMENT**

The total human resource required for the plant is 25 persons. The human resource requirement and estimated annual labor costs including fringe benefits are given in Table 6.1.

**Table 6.1**

**HUMAN RESOURCE REQUIREMENT AND LABOR COST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Job Title** | **Required No. of Persons** | **Salary, Birr** | |
| **Monthly** | **Annual** |
| 1 | Plant manager | 1 | 4,500 | 54,000 |
| 2 | Secretary | 1 | 800 | 9,600 |
| 3 | Personnel | 1 | 800 | 9,600 |
| 4 | Accountant | 1 | 850 | 10,200 |
| 6 | Salesman | 1 | 800 | 9,600 |
| 7 | Store keeper | 1 | 800 | 9,600 |
| 8 | Cashier | 1 | 800 | 9,600 |
| 10 | Production supervisor/chemist | 1 | 2,500 | 30,000 |
| 11 | Mechanic | 1 | 800 | 9,600 |
| 12 | Electrician | 1 | 800 | 9,600 |
| 13 | Operator | 5 | 2,750 | 33,000 |
| 14 | Production worker | 6 | 2,700 | 32,400 |
| 15 | Driver | 1 | 750 | 9,000 |
| 16 | Guard | 3 | 1,200 | 14,400 |
| **Sub - total** | | **25** | **20,850** | **250,200** |
| **Employees benefit, 20% of basic salary** | | | **4,170** | **50,040** |
| **Total** | | | **25,020** | **300,240** |

**B. TRAINING REQUIREMENT**

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

# VII. FINANCIAL ANALYSIS

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

Construction period 1 year

Source of finance 30 % equity

70 % loan

Tax holidays 3 years

Bank interest 10%

Discount cash flow 10%

Accounts receivable 30 days

Raw material local 30 days

Raw material imported 120 days

Work in progress 1 day

Finished products 30 days

Cash in hand 5 days

Accounts payable 30 days

Repair and maintenance 5% of machinery cost

**A. TOTAL INITIAL INVESTMENT COST**

The total investment cost of the project including working capital is estimated at Birr 15.02 million (see Table 7.1). From the total investment cost the highest share (Birr 11.26 million or 74.95%) is accounted by fixed investment cost followed by initial working capital (Birr 2.08 million or 13.86%) and pre operation cost (Birr 1.68 million or 11.19%). From the total investment cost, Birr 6.37 million or 42.41% is required in foreign currency.

**Table 7.1**

**INITIAL INVESTMENT COST (‘000 Birr)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr.No | **Cost Items** | **Local  Cost** | **Foreign  Cost** | **Total  Cost** | **%  Share** |
| **1** | **Fixed investment** |  |  |  |  |
| 1.1 | Land Lease | 19.95 |  | 19.95 | 0.13 |
| 1.2 | Building and civil work | 2,025.00 |  | 2,025.00 | 13.48 |
| 1.3 | Machinery and equipment | 1,592.70 | **6,370.80** | 7,963.50 | 53.02 |
| 1.4 | Vehicles | 900.00 |  | 900.00 | 5.99 |
| 1.5 | Office furniture and equipment | 350.00 |  | 350.00 | 2.33 |
|  | **Sub total** | **4,887.65** | **6,370.80** | **11,258.45** | **74.95** |
| **2** | **Pre operating cost \*** |  |  |  |  |
| 2.1 | Pre operating cost | 698.18 |  | 698.18 | 5.26 |
| 2.2 | Interest during construction | 982.68 |  | 982.68 | 6.54 |
|  | **Sub total** | **1,680.86** |  | **1,680.86** | **11.19** |
| **3** | **Working capital \*\*** | **2,081.64** |  | **2,081.64** | **13.86** |
|  | **Grand Total** | **8,650.15** | **6,370.80** | **15,020.95** | **100** |

\* N.B Pre operating cost include project implementation cost such as installation, startup, commissioning, project engineering, project management etc and capitalized interest during construction.

\*\* The total working capital required at full capacity operation is Birr 2.63 million. However, only the initial working capital of Birr 2.08 million during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).

##### B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 12.38 million (see Table 7.2). The cost of raw material account for 59.59% of the production cost. The other major components of the production cost are depreciation, financial cost and utility, which account for 16.38%, 7.64% and 9.21% respectively. The remaining 7.13% is the share of labor, repair and maintenance, labor overhead and administration cost. For detail production cost see Appendix 7.A.2.

**Table 7.2**

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

|  |  |  |
| --- | --- | --- |
| **Items** | **Cost** | **%** |
| Raw Material and Inputs | 7,378.80 | 59.59 |
| Utilities | 1,140.38 | 9.21 |
| Maintenance and repair | 238.91 | 1.93 |
| Labour direct | 250.20 | 2.02 |
| Labour overheads | 50.04 | 0.40 |
| Administration Costs | 100.00 | 0.81 |
| Land lease cost | - | - |
| Cost of marketing and distribution | 250.00 | 2.02 |
| **Total Operating Costs** | **9,408.33** | **75.98** |
| Depreciation | 2,028.34 | 16.38 |
| Cost of Finance | 945.83 | 7.64 |
| **Total Production Cost** | **12,382.49** | **100** |

### C. FINANCIAL EVALUATION

**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 667 thousand to Birr 2.56 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 19.58 million. For profit and loss statement and cash flow projection see Appendix 7.A.3 and 7.A.4, respectively.

**2. Ratios**

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

**3. Break-even Analysis**

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point for capacity utilization and sales value estimated by using income statement projection are computed as followed.

Break -Even Sales Value = Fixed Cost + Financial Cost = Birr 5,544,000

Variable Margin ratio (%)

Break -Even Capacity utilization = Break- even Sales Value X 100 = 56.37%

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 19.35% indicating the viability of the project.

**6. Net Present Value**

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle, a project is accepted if the NPV is non-negative. Accordingly, the net present value of the project at 10% discount rate is found to be Birr 6.80 million which is acceptable. For detail discounted cash flow see Appendix 7.A.5.

**D. ECONOMIC AND SOCIAL BENEFITS**

The project can create employment for 25 persons. The project will generate Birr 5.71 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create backward linkage with the horticulture farming sub sector and sugar producers and also generates income for the Government in terms of payroll tax.

**Appendix 7.A**

# FINANCIAL ANALYSES SUPPORTING TABLES

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.1** | | | | | | | | | | |
| **NET WORKING CAPITAL ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Items** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Total inventory | 1,475.76 | 1,660.23 | 1,844.70 | 1,844.70 | 1,844.70 | 1,844.70 | 1,844.70 | 1,844.70 | 1,844.70 | 1,844.70 |
| Accounts receivable | 631.39 | 707.71 | 784.03 | 784.03 | 784.56 | 784.56 | 784.56 | 784.56 | 784.56 | 784.56 |
| Cash-in-hand | 7.10 | 7.99 | 8.88 | 8.88 | 8.97 | 8.97 | 8.97 | 8.97 | 8.97 | 8.97 |
| **CURRENT ASSETS** | **2,114.25** | **2,375.93** | **2,637.60** | **2,637.60** | **2,638.23** | **2,638.23** | **2,638.23** | **2,638.23** | **2,638.23** | **2,638.23** |
| Accounts payable | 32.61 | 36.68 | 40.76 | 40.76 | 40.76 | 40.76 | 40.76 | 40.76 | 40.76 | 40.76 |
| **CURRENT LIABILITIES** | **32.61** | **36.68** | **40.76** | **40.76** | **40.76** | **40.76** | **40.76** | **40.76** | **40.76** | **40.76** |
| **TOTAL WORKING CAPITAL** | **2,081.64** | **2,339.24** | **2,596.85** | **2,596.85** | **2,597.47** | **2,597.47** | **2,597.47** | **2,597.47** | **2,597.47** | **2,597.47** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.2** | | | | | | | | | | |
| **PRODUCTION COST ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Raw Material and Inputs | 5,903 | 6,641 | 7,379 | 7,379 | 7,379 | 7,379 | 7,379 | 7,379 | 7,379 | 7,379 |
| Utilities | 912 | 1,026 | 1,140 | 1,140 | 1,140 | 1,140 | 1,140 | 1,140 | 1,140 | 1,140 |
| Maintenance and repair | 191 | 215 | 239 | 239 | 239 | 239 | 239 | 239 | 239 | 239 |
| Labour direct | 200 | 225 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Labour overheads | 40 | 45 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Administration Costs | 80 | 90 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Land lease cost | 0 | 0 | 0 | 0 | 6.41 | 6.41 | 6.41 | 6.41 | 6.41 | 6.41 |
| Cost of marketing  and distribution | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| **Total Operating Costs** | **7,577** | **8,492** | **9,408** | **9,408** | **9,415** | **9,415** | **9,415** | **9,415** | **9,415** | **9,415** |
| Depreciation | 2,028 | 2,028 | 2,028 | 2,028 | 2,028 | 116 | 116 | 116 | 116 | 116 |
| Cost of Finance | 0 | 1,081 | 946 | 811 | 676 | 540 | 405 | 270 | 135 | 0 |
| **Total Production Cost** | **9,605** | **11,602** | **12,382** | **12,247** | **12,119** | **10,071** | **9,936** | **9,801** | **9,666** | **9,531** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.3** | | | | | | | | | | |
| **INCOME STATEMENT ( in 000 Birr)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** |
| Sales revenue | 10,560 | 11,880 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 |
| Less variable costs | 7,327 | 8,242 | 9,158 | 9,158 | 9,158 | 9,158 | 9,158 | 9,158 | 9,158 | 9,158 |
| **VARIABLE MARGIN** | **3,233** | **3,638** | **4,042** | **4,042** | **4,042** | **4,042** | **4,042** | **4,042** | **4,042** | **4,042** |
| in % of sales revenue | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 | 30.62 |
| Less fixed costs | 2,278 | 2,278 | 2,278 | 2,278 | 2,285 | 372 | 372 | 372 | 372 | 372 |
| **OPERATIONAL MARGIN** | **955** | **1,359** | **1,763** | **1,763** | **1,757** | **3,669** | **3,669** | **3,669** | **3,669** | **3,669** |
| in % of sales revenue | 9.04 | 11.44 | 13.36 | 13.36 | 13.31 | 27.80 | 27.80 | 27.80 | 27.80 | 27.80 |
| Financial costs |  | 1,081 | 946 | 811 | 676 | 540 | 405 | 270 | 135 | 0 |
| **GROSS PROFIT** | **955** | **278** | **818** | **953** | **1,081** | **3,129** | **3,264** | **3,399** | **3,534** | **3,669** |
| in % of sales revenue | 9.04 | 2.34 | 6.19 | 7.22 | 8.19 | 23.70 | 24.73 | 25.75 | 26.77 | 27.80 |
| Income (corporate) tax | 0 | 0 | 0 | 286 | 324 | 939 | 979 | 1,020 | 1,060 | 1,101 |
| **NET PROFIT** | **955** | **278** | **818** | **667** | **757** | **2,190** | **2,285** | **2,379** | **2,474** | **2,568** |
| in % of sales revenue | 9.04 | 2.34 | 6.19 | 5.05 | 5.73 | 16.59 | 17.31 | 18.03 | 18.74 | 19.46 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.4** | | | | | | | | | | | | |
| **CASH FLOW FOR FINANCIAL MANAGEMENT ( in 000 Birr)** | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** | **Scrap** |
| **TOTAL CASH INFLOW** | **11,957** | **13,657** | **11,884** | **13,204** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **4,815** |
| Inflow funds | 11,957 | 3,097 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inflow operation | 0 | 10,560 | 11,880 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,815 |
| **TOTAL CASH OUTFLOW** | **11,957** | **10,674** | **11,186** | **11,967** | **11,856** | **11,767** | **12,245** | **12,150** | **12,056** | **11,961** | **10,516** | **0** |
| Increase in fixed assets | 11,957 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in current assets | 0 | 2,114 | 262 | 262 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 7,327 | 8,242 | 9,158 | 9,158 | 9,165 | 9,165 | 9,165 | 9,165 | 9,165 | 9,165 | 0 |
| Marketing and  Distribution cost | 0 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 0 |
| Income tax | 0 | 0 | 0 | 0 | 286 | 324 | 939 | 979 | 1,020 | 1,060 | 1,101 | 0 |
| Financial costs | 0 | 983 | 1,081 | 946 | 811 | 676 | 540 | 405 | 270 | 135 | 0 | 0 |
| Loan repayment | 0 | 0 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 0 | 0 |
| **SURPLUS (DEFICIT)** | **0** | **2,983** | **698** | **1,237** | **1,344** | **1,433** | **955** | **1,050** | **1,144** | **1,239** | **2,684** | **4,815** |
| **CUMULATIVE CASH  BALANCE** | **0** | **2,983** | **3,681** | **4,918** | **6,262** | **7,696** | **8,651** | **9,700** | **10,844** | **12,083** | **14,767** | **19,583** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.5** | | | | | | | | | | | | |
| **DISCOUNTED CASH FLOW ( in 000 Birr)** | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Item** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** | **Year 10** | **Year 11** | **Scrap** |
| **TOTAL CASH INFLOW** | **0** | **10,560** | **11,880** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **13,200** | **4,815** |
| Inflow operation | 0 | 10,560 | 11,880 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 13,200 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,815 |
| **TOTAL CASH OUTFLOW** | **14,038** | **7,834** | **8,750** | **9,408** | **9,695** | **9,739** | **10,353** | **10,394** | **10,434** | **10,475** | **10,516** | **0** |
| Increase in fixed assets | 11,957 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in net working capital | 2,082 | 258 | 258 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 7,327 | 8,242 | 9,158 | 9,158 | 9,165 | 9,165 | 9,165 | 9,165 | 9,165 | 9,165 | 0 |
| Marketing and Distribution cost | 0 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 0 |
| Income (corporate) tax |  | 0 | 0 | 0 | 286 | 324 | 939 | 979 | 1,020 | 1,060 | 1,101 | 0 |
| **NET CASH FLOW** | **-14,038** | **2,726** | **3,130** | **3,792** | **3,505** | **3,461** | **2,847** | **2,806** | **2,766** | **2,725** | **2,684** | **4,815** |
| **CUMULATIVE NET CASH FLOW** | **-14,038** | **-11,313** | **-8,183** | **-4,391** | **-886** | **2,575** | **5,422** | **8,228** | **10,993** | **13,718** | **16,403** | **21,218** |
| Net present value | -14,038 | 2,478 | 2,587 | 2,849 | 2,394 | 2,149 | 1,607 | 1,440 | 1,290 | 1,156 | 1,035 | 1,856 |
| Cumulative net present value | -14,038 | -11,560 | -8,974 | -6,125 | -3,731 | -1,582 | 25 | 1,465 | 2,755 | 3,911 | 4,946 | 6,802 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| NET PRESENT VALUE | 6,802 |  |  |  |  |  |  |  |  |  |  |  |
| INTERNAL RATE OF RETURN | 19.35% |  |  |  |  |  |  |  |  |  |  |  |
| NORMAL PAYBACK | 6 years |  |  |  |  |  |  |  |  |  |  |  |