**PROFILE ON THE PRODUCTION OF TOMATO SAUCE AND KETCHUP**

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# I. SUMMARY

This profile envisages the establishment of a plant for the production of tomato sauce and ketchup with a capacity of 300 tons per annum. Tomato ketchup is mainly used as an appetizer during consumption of other food staffs whereas tomato sauce is used for food coloring, seasoning, soup preparation.

The country`s requirement of tomato sauce and ketchup is met through local production and import.The present (2012) demand for tomato sauce and ketchup is estimated at 8,799 tons. The local and export demand for the products is projected to reach 12,481 tones and 15,757 tones by the year 2018 and year 2022, respectively.

The principal raw materials required are fresh wholesome tomato fruit, salt, sugar, vinegar, spices which are locally available.

The total investment cost of the project including working capital is estimated at Birr 24.514 million. From the total investment cost the highest share (Birr 16.80 million or 68.53%) is accounted by fixed investment cost followed by initial working capital (Birr 5.19 million or 21.18%) and pre operation cost (Birr 2.52 million or 10.29%). From the total investment cost Birr 9.89 million or 40.34% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 18.25% and a net present value (NPV) of Birr 10.24 million, discounted at 10%.

The project can create employment for 34 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 and salt, sugar, vinegar produces and forward linkage with food processing sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

# II. PRODUCT DESCRIPTION AND APPLICATION

Tomato sauce and ketchup are flavored products processed from sorted, washed and fresh wholesome tomatoes and hot fruits. Tomatoes are one of the most widely grown vegetable crops which are used in processing of different food products. Tomatoes are valuable sources of vitamins and minerals. Studies have shown that people who consume large amount of tomato products may be at or lower risk of especially cancer of prostate gland, lung and stomach. Thus, tomato sauce and ketchup are produced from fresh and wholesome tomatoes of intensive red color by washing, crushing into pulp, concentrating and seasoning with different ingredients and bottling or canning.

Tomato ketchup is mainly used as an appetizer during consumption of other food staffs whereas tomato sauce is used for food coloring, seasoning, soup preparation and also for reducing the amount of ground hot pepper in “*Wot*” (traditional hot sauce) without affecting the attractive red color of same. Tomato sauce and ketchup are consumed mainly by households, restaurants, hotels and by public institutions like hospitals, training centers, boarding schools, orphanages, etc.

# III. MARKET STUDY AND PLANT CAPACITY

**A. MARKET STUDY**

**1. Past supply and present Demand**

Tomatoes are one of the most widely grown and commercially important vegetable crops and are valuable sources of food minerals and vitamins, particularly vitamins A and C. Processed and canned tomato sauces and ketchups are consumed by urban households, restaurants, hotels, hospitals and the like. The demand for tomato sauce and ketchup in Ethiopia is met both by domestic production and through import (see table 3.1 & 3.2).

**Table 3.1**

**DOMESTIC PRODUCTION OF TOMATO SAUCE AND KETCHUP**

|  |  |
| --- | --- |
| **Year** | **Production** |
| 2000/01 | 1,730 |
| 2001/02 |  555 |
| 2002/03 | 2,116 |
| 2003/04 | 1,846 |
| 2004/05 | 1,846 |
| 2005/06 | 1,790 |
| 2006/07 | 1,837 |
| 2007/08 | 2,343 |
| 2008/09 | 2,923 |
| 2009/10 | 4,292 |

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

 *Various Issues.*

As can be from Table 3.1, production of tomato sauce and ketch up which was 1,730 tons at the beginning of the period (2001/02) has grown to 4,292 tons at the end of the period (2009/10). A closer observation at the data set reveals that production of tomato ketchup and sauce over the study period has shown varying patterns that is, fluctuation (2000/01-2003/02), almost constant (2003/04- 2006/07) and then moderate rise (2007/08-2009/10). So, it was found more appropriate to take the average growth of the recent phase (33%) and apply it on the 2009/10 production in estimating the level of production in 2012. Accordingly, domestic production of tomato ketchup and sauce for 2012 is estimated at 7,591 tons.

Import of tomato sauce & ketchup covering the period 2001--2011 is shown in Table 3.2.

**Table 3.2**

**IMPORT OF TOMATO SAUCE & KETCHUP (TONS)**

|  |  |
| --- | --- |
| **Year** | **Import** |
| 2001 | 57 |
| 2002 | 235 |
| 2003 | 521 |
| 2004 | 478 |
| 2005 | 841 |
| 2006 | 248 |
| 2007 | 377 |
| 2008 | 44 |
| 2009 | 784 |
| 2010 | 1,365 |
| 2011 | 1,476 |

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

As could be seen from Table 3.2, import of tomato sauce and ketchup which was 57 tons at the beginning of the period (2001) has grown to 1,476 tons by the end of the period (2011). A closer examination of the data set reveals that import of tomato ketch up and sauce has been fluctuating for most of the time. In the year 2001 the annual level of import was about 57 tons, it reached 521 tons by 2003 then declined to 248 tons in 2006 and this increased to 1,476 tons by the year 2011. During the recent three years i.e. 2009-2011 the annual average import has reached to a level of about 1,208 tons. This average of the recent three years import, that is 1,208 tons, has been taken as estimate of year 2012 import.

Therefore, summing the domestic production and import levels, the current effective demand for tomato ketchup and sauce is estimated at 8,799 tons.

**2. Projected Demand**

Demand for processed and canned tomato sauce and ketchup is mainly influenced by urbanization, income and change in the consumption habit of the population. As income rises and urbanization progresses, a shift towards relatively expensive but conveniently packed foods is inevitable. Urban population in Ethiopia is growing by about 4% while GDP in the last few years has been growing by more the 7%. In addition, average growth rate of import in the last three years has been 41%. Considering these facts that demand for tomato souses and Ketchups can be expected to grow more rapidly. However, for the sake of conservatism, it is forecasted to grow by 6% per annum. Domestic production is expected to remain at 2012 estimated level i.e., 7,591 tons. The resulting total projected demand, production by existing domestic firms and the residual is shown in Table 3.3.

**Table 3.3**

**PROJECTED DEMAND FOR TOMATO KETCHUP & SAUCE (TONS)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Projected** **Demand** | **Existing** **production** | **Gap****(Unsatisfied** **Demand)** |
| 2013 | 9,327 | 7,591 | 1,736 |
| 2014 | 9,886 | 7,591 | 2,295 |
| 2015 | 10,479 | 7,591 | 2,888 |
| 2016 | 11,108 | 7,591 | 3,517 |
| 2017 | 11,775 | 7,591 | 4,184 |
| 2018 | 12,481 | 7,591 | 4,890 |
| 2019 | 13,230 | 7,591 | 5,639 |
| 2020 | 14,024 | 7,591 | 6,433 |
| 2021 | 14,865 | 7,591 | 7,274 |
| 2022 | 15,757 | 7,591 | 8,166 |

**3. Pricing and Distribution**

Retail price of locally produced tomato sauce is Birr 50 per 850 grams in retail shops. This gives a retail price of Birr 58.82 per kg or Birr 58,820 per tone. Allowing 25% margin for distributors, a factory gate price of Birr 47,056 per tone is proposed as a factory gate price.

Experienced wholesalers in food staffs can be appointed to distribute the product. The end users of the product i.e. households and hospitality industries such as hotels and the like can obtain it at different general retail merchandised shops and super markets.

## **B. PLANT CAPACITY AND PRODUCTION PROGRAM**

**1. Plant Capacity**

Based on the market study and assuming the lowest share of the unsatisfied demand projection, the envisaged plant will have a capacity of producing 600 tons of tomato ketchup and sauce per annum, out of which 150 tons will be tomato ketchup and 450 tons tomato sauce. A capacity of 2 tones per day is considered on the basis of single shift of 8 hours per day and 300 working days per annum. This capacity, upon requirement, can be increased by increasing the number of shifts per day.

**2. Production Program**

At the initial stage of production, the plant may require some years to penetrate into the market. Therefore, in the first and second year of production, the capacity utilization rate will be 75% and 85%, respectively. From the third year onwards, 100% capacity production shall be attained. Details of the 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 | Tomato sauce | ton | 337.5 | 382.5 | 450 |
| 2 | Tomato ketchup | ton | 113 | 128 | 150 |
| 3 | Total product | ton | 450 | 510 | 600 |
| 4 | Capacity utilization rate | % | 75 | 85 | 100 |

# IV. MATERIALS AND INPUTS

**A. RAW MATERIALS**

The basic raw material required for the envisaged project is fresh wholesome tomato fruit of intense red color. Salt, sugar, vinegar, spices are also required for production of tomato sauce and ketchup.

Addis Ababa City Administration, being an urban center and capital city of the country, does not have adequate land for cultivation of tomatoes. However, the annual requirement for fresh tomato by the envisaged plant shall be satisfied by the local growers in the surrounding areas which stretch up to Debre Zeit, Modjo, Koka, Meki, Zeway and other localities.

Since the quality of tomato sauce and ketchup produced is determined largely by the quality of the tomato fruit used, great importance is attached to the procurement and reception of quality fresh tomato fruits as a raw material.

Besides the principal raw material, other preservative materials and additives are required in order to impart good taste and preserve the product during the accepted shelf life. Such materials include salt, sugar, vinegar, spices, onion, garlic, paprika and other ingredients. Annual raw materials requirement of the plant at full capacity operation and the estimated costs are shown in Table 4.1.

|  |
| --- |
| **Table 4.1** |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  **Sr . No.** | **Description** | **Unit of Measure** | **Required Qty** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** |
| **F.C.** | **L.C.** | **Total** |
| 1 | Fresh tomato fruit | ton | 2,500.00 | 6,000.00 |  | 15,000.00 | 15,000.00 |
| 2 | Salt | kg | 12.20 |  2.50 |  | 0.03 | 0.03 |
| 3 | Sugar | kg | 37.83 | 14.00 |  | 5.29 | 5.29 |
| 4 | Vinegar | kg | 15.50 | 30.00 |  | 0.46 | 0.46 |
| 5 | Spices | kg | 4.37 | 250.00 |  | 1.09 | 1.09 |
| 6 | Others | kg | 3.52 | 220.00 |  | 7.74 | 7.74 |
| **Total** |  | **15,014.63** | **15,014.63** |

The major auxiliary materials required for the plant are glass bottles, cans and carton boxes. The glass bottles and all other auxiliary materials can be procured locally, except laminated cans which have to be imported. Annual requirement for the auxiliary materials at full capacity production of the plant and the estimated costs are given in Table 4.2.

|  |
| --- |
| **Table 4.2** |

**ANNUAL AUXILIARY MATERIALS REQUIREMENT AND ESTIMATED COST**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Unit of Measure** | **Required Qty** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** |
| **F. C.** | **L.C.** | **Total** |
| 1 | Glass bottles | pc | 375,000 | 2.00 |  | 750.00 | 750.00 |
| 2 | Laminated cans | pc | 1,125,000 | 2.75 | 2475.00 | 618.75 | 3,093.75 |
| 3 | Cartons | pc | 62,696 | 2.40 |  | 150.47 | 150.47 |
| **Total** | **2,475.00** | **1,519.22** | **3,994.22** |

**B. UTILITIES**

The utilities required for the plant comprise electric power, water and fuel oil for boiler. The total annual requirement for utilities at 100% capacity utilization rate and the estimated costs are given in Table 4.3.

|  |
| --- |
| **Table 4.3** |

**ANNUAL UTILITIES REQUIREMENT AND ESTIMATED COST**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr.No.** | **Description** | **Unit of Measure** | **Annual Requirement** | **Unit Price, Birr/Unit** | **Cost, ('000 Birr)** |
| **F.C.** | **L.C.** | **Total** |
| 1 | Electric power | kWh | 17,152 |  0.5778 |  |  9.91 |  9.91 |
| 2 | Water | m3 | 5,100 | 5.00 |  | 25.50 | 25.50 |
| 3 | Furnace oil | lt | 40,000 | 14.84 |  | 593.60 | 593.60 |
| **Total** |  | **629.01** | **629.01** |

# V. TECHNOLOGY AND ENGINEERING

## **A. TECHNOLOGY**

**1. Production Process**

The major operations involved in the production of tomato sauce and ketchup include washing, crushing, concentrating, homogenizing, flavoring, bottling and/or canning, packing and dispatching. Each operation is discussed briefly as follows.

* **Washing**: The incoming fresh tomato is cleaned by washing in water. This task is accomplished using a special washing technique that enables the preservation of the fresh, natural qualities of ripe tomato.
* **Crushing**: Washed tomato is crushed into tomato pulp (Juice) which is then strained and filtered.
* **Concentration**: After crushing the filtered tomato pulp becomes preheated and concentrated to about one - third of its original volume by means of a continuous concentrator, for which a boiler plant is used. Since the concentration would be achieved in a very short time, a special technical know - how shall be employed. Instantaneous concentration is necessary since; otherwise, heating the tomato pulp would cause oxidation giving it a dark - reddish disagreeable color, which is different from the normal color of ripe natural tomato.
* **Homogenization**: Concentrated tomato pulp (juice) is homogenized.
* **Flavoring**: Salt, sugar, spices, vinegar & other ingredients are added in the seasoning room to give the tomato sauce & tomato ketchup the flavor associated with the products.
* **Bottling/canning**: The products are then filled into bottles and cans.
* **Packing and dispatching**: After bottling/canning, the products will be packed in carton box and dispatched.

There are various recipes employed for production of tomato ketchup and sauce. The recipe applied for tomato ketchup shows a considerable variation from the recipe used to produce tomato sauce. For production of tomato ketchup, spices are added to the vinegar and cooked at about 85oC, covered in a dried kettle for about 2-3 hours. Onion, garlic and paprika are then added directly to the ketchup.

**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 plant machinery and equipment required for the envisaged project include tomato charging machine, washing and sorting machine, continuous concentrator, filter, homogenizer, mixer, bottling machine and boiler. The total cost of machinery and equipment is estimated at Birr 12,362,546, of which Birr 9,890,037 will be required in foreign currency.

Details of the machinery and equipment and the estimated costs are indicated in Table 5.1.

**Table 5.1**

**LIST OF MACHINERY AND EQUIPMENT AND ESTIMATED COSTS**

| **Item No.** | **Description** | **Unit of Measure** | **Required Qty** | **Cost, ('000 Birr)** |
| --- | --- | --- | --- | --- |
| **F.C.** | **L.C.** | **Total** |
| 1 | Tomato charging machine | set | 1 |  494.50  |  123.63  |  618.13  |
| 2 | Tomato washing and sorting machine | set | 1 |  1,186.80  |  296.70  |  1,483.51  |
| 3 | Continuous concentrator | set | 1 |  1,087.90  |  271.98  |  1,359.88  |
| 4 | Filter | set | 1 |  593.40  |  148.35  |  741.75  |
| 5 | Homogenizer | set | 1 |  692.30  |  173.08  |  865.38  |
| 6 | Seasoning mixer | set | 1 |  692.30  |  173.08  |  865.38  |
| 7 | Bottling machine | set | 1 |  890.10  |  222.53  |  1,112.63  |
| 8 | Cooler | set | 1 |  890.10  |  222.53  |  1,112.63  |
| 9 | Labeler | set | 1 |  593.40  |  148.35  |  741.75  |
| 10 | Packing machine | set | 1 |  791.20  |  197.80  |  989.00  |
| 11 | Water treatment facility | set | 1 |  692.30  |  173.08  |  865.38  |
| 12 | Boiler | set | 1 |  791.20  |  197.80  |  989.00  |
| 13 | Other auxiliary equipment | set | 1 |  494.50  |  123.63  |  618.13  |
| **Total** | **9,890.03** | **2,472.50** | **12,362.54** |

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

The total area of land required for the project is 1,400 m2. The total built-up area is 700 m2. This includes production hall, finished products and raw materials stores, offices and social facilities. The total cost of buildings and civil work at a unit cost of Birr 4,500 per m2, is estimated at Birr 3.15 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 372,400 of which 10% or Birr 37,240 will be paid in advance. The remaining Birr 335,160 will be paid in equal installments with in 28 years i.e. Birr 11,970 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 project is 34 persons. The total human resource requirement along with annual estimated labor cost, including fringe benefits, is presented in Table 6.1.

**Table 6.1**

**HUMAN RESOURCE REQUIREMENT AND LABOR COST**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item 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 | 1 |  800 |  9,600 |
| 6 | Cashier | 1 | 1,000 | 12,000 |
| 7 | Salesman /Purchaser | 2 | 1,800 | 43,200 |
| 8 | Store keeper | 1 |  900 | 10,800 |
| 9 | Production and technical manager | 1 | 3,800 | 45,600 |
| 10 | Production supervisor | 1 | 1,800 | 21,600 |
| 11 |  Quality controller/chemist | 2 | 3,600 | 86,400 |
| 12 | Mechanic | 1 | 1,000 | 12,000 |
| 13 | Electrician | 1 | 1,000 | 12,000 |
| 14 |  Operator | 3 | 1,800 | 64,800 |
| 15 | Production worker | 12 | 5,400 | 777,600 |
| 16 | Driver | 1 |  800 |  9,600 |
| 17 | Guard | 3 | 1,350 |  48,600 |
| **Sub - total** | **34** |  **35,450** |  **1,278,600** |
| **Employees benefit, 20% of basic salary** | **7,090** | **255,720** |
| **Total** |  | **42,540** |  **1,534,320** |

## **B. TRAINING REQUIREMENT**

One production supervisor and 3 operators should be given a one month on- the-job training in Merti Processing Plant before start up of operation. The total training cost is estimated at Birr 150,000.

# VII. FINANCIAL ANALYSIS

The financial analysis of the tomato sauce and ketchup 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

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 24.514 million (see Table 7.1). From the total investment cost the highest share (Birr 16.80 million or 68.53%) is accounted by fixed investment cost followed by initial working capital (Birr 5.19 million or 21.18%) and pre operation cost (Birr 2.52 million or 10.29%). From the total investment cost Birr 9.89 million or 40.34% 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 | 37.24 |   | 37.24 | 0.15 |
| 1.2 | Building and civil work | 3,150.00 |   | 3,150.00 | 12.85 |
| 1.3 | Machinery and equipment | 2,472.51 | 9,890.03 | 12,362.54 | 50.43 |
| 1.4 | Vehicles | 900.00 |   | 900.00 | 3.67 |
| 1.5 | Office furniture and equipment | 350.00 |   | 350.00 | 1.43 |
|  | **Sub total** | **6,909.75** | **9,890.03** | **16,799.78** | **68.53** |
| **2** | **Pre operating cost \*** |  |  |  |   |
| 2.1 | Pre operating cost | 918.13 |   | 918.13 | 3.75 |
| 2.2 | Interest during construction  | 1,603.75 |   | 1,603.75 | 6.54 |
|  | **Sub total** | **2,521.88** |  | **2,521.88** | **10.29** |
| **3** | **Working capital \*\*** | **5,192.76** |  | **5,192.76** | **21.18** |
|  | **Grand Total** | **14,624.38** | **9,890.03** | **24,514.41** | **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 6.55 million. However, only the initial working capital of Birr 5.19 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 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 26.83 million (see Table 7.2). The cost of raw material account for 70.85% of the production cost. The other major components of the production cost are depreciation, financial cost and labour, which account for 11.17%, 5.75% and 4.77%, respectively. The remaining 7.46% 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****(in 000 Birr)** | **%** |
| Raw Material and Inputs |  19,008.85  | 70.85 |
| Utilities  |  629.01  | 2.34 |
| Maintenance and repair |  618.13  | 2.30 |
| Labour direct |  1,278.60  | 4.77 |
| Labour overheads |  255.72  | 0.95 |
| Administration Costs |  150.00  | 0.56 |
| Land lease cost |  -  | - |
| Cost of marketing and distribution |  350.00  | 1.30 |
| **Total Operating Costs** |  **22,290.31**  | **83.08** |
| Depreciation |  2,997.13  | 11.17 |
| Cost of Finance |  1,543.61  | 5.75 |
| **Total Production Cost** |  **26,831.05**  | **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 1.136 million to Birr 4.04 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 31.60 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 11,858,280

 Variable Margin ratio (%)

Break -Even Capacity utilization = Break -even Sales Value X 100 = 53.18 %

 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 18.25% 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 10.24 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 34 persons. The project will generate Birr 9.031 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 and salt mining sectors and forward linkage with 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 | 3,801.77 | 4,276.99 | 4,752.21 | 4,752.21 | 4,752.21 | 4,752.21 | 4,752.21 | 4,752.21 | 4,752.21 | 4,752.21 |
| Accounts receivable | 1,491.85 | 1,674.69 | 1,857.53 | 1,857.53 | 1,858.52 | 1,858.52 | 1,858.52 | 1,858.52 | 1,858.52 | 1,858.52 |
| Cash-in-hand | 25.58 | 28.78 | 31.98 | 31.98 | 32.14 | 32.14 | 32.14 | 32.14 | 32.14 | 32.14 |
| **CURRENT ASSETS** | **5,319.21** | **5,980.46** | **6,641.72** | **6,641.72** | **6,642.88** | **6,642.88** | **6,642.88** | **6,642.88** | **6,642.88** | **6,642.88** |
| Accounts payable | 126.45 | 142.25 | 158.06 | 158.06 | 158.06 | 158.06 | 158.06 | 158.06 | 158.06 | 158.06 |
| **CURRENT LIABILITIES** | **126.45** | **142.25** | **158.06** | **158.06** | **158.06** | **158.06** | **158.06** | **158.06** | **158.06** | **158.06** |
| **TOTAL WORKING CAPITAL**  | **5,192.76** | **5,838.21** | **6,483.66** | **6,483.66** | **6,484.82** | **6,484.82** | **6,484.82** | **6,484.82** | **6,484.82** | **6,484.82** |

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| **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 | 15,207 | 17,108 | 19,009 | 19,009 | 19,009 | 19,009 | 19,009 | 19,009 | 19,009 | 19,009 |
| Utilities  | 503 | 566 | 629 | 629 | 629 | 629 | 629 | 629 | 629 | 629 |
| Maintenance and repair | 495 | 556 | 618 | 618 | 618 | 618 | 618 | 618 | 618 | 618 |
| Labour direct | 1,023 | 1,151 | 1,279 | 1,279 | 1,279 | 1,279 | 1,279 | 1,279 | 1,279 | 1,279 |
| Labour overheads | 205 | 230 | 256 | 256 | 256 | 256 | 256 | 256 | 256 | 256 |
| Administration Costs | 120 | 135 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Land lease cost | 0 | 0 | 0 | 0 | 12 | 12 | 12 | 12 | 12 | 12 |
| Cost of marketing and distribution  | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| **Total Operating Costs** | **17,902** | **20,096** | **22,290** | **22,290** | **22,302** | **22,302** | **22,302** | **22,302** | **22,302** | **22,302** |
| Depreciation | 2,997 | 2,997 | 2,997 | 2,997 | 2,997 | 161 | 161 | 161 | 161 | 161 |
| Cost of Finance | 0 | 1,764 | 1,544 | 1,323 | 1,103 | 882 | 662 | 441 | 221 | 0 |
| **Total Production Cost** | **20,899** | **24,858** | **26,831** | **26,611** | **26,402** | **23,345** | **23,125** | **22,904** | **22,684** | **22,463** |

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| **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 | 22,587 | 25,410 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 |
| Less variable costs | 17,552 | 19,746 | 21,940 | 21,940 | 21,940 | 21,940 | 21,940 | 21,940 | 21,940 | 21,940 |
| **VARIABLE MARGIN** | **5,035** | **5,664** | **6,294** | **6,294** | **6,294** | **6,294** | **6,294** | **6,294** | **6,294** | **6,294** |
| in % of sales revenue | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 | 22.29 |
| Less fixed costs | 3,347 | 3,347 | 3,347 | 3,347 | 3,359 | 523 | 523 | 523 | 523 | 523 |
| **OPERATIONAL MARGIN** | **1,688** | **2,317** | **2,947** | **2,947** | **2,935** | **5,771** | **5,771** | **5,771** | **5,771** | **5,771** |
| in % of sales revenue | 7.47 | 9.12 | 10.44 | 10.44 | 10.39 | 20.44 | 20.44 | 20.44 | 20.44 | 20.44 |
| Financial costs |   | 1,764 | 1,544 | 1,323 | 1,103 | 882 | 662 | 441 | 221 | 0 |
| **GROSS PROFIT** | **1,688** | **552** | **1,403** | **1,623** | **1,832** | **4,889** | **5,109** | **5,330** | **5,550** | **5,771** |
| in % of sales revenue | 7.47 | 2.17 | 4.97 | 5.75 | 6.49 | 17.31 | 18.10 | 18.88 | 19.66 | 20.44 |
| Income (corporate) tax | 0 | 0 | 0 | 487 | 550 | 1,467 | 1,533 | 1,599 | 1,665 | 1,731 |
| **NET PROFIT** | **1,688** | **552** | **1,403** | **1,136** | **1,282** | **3,422** | **3,576** | **3,731** | **3,885** | **4,040** |
| in % of sales revenue | 7.47 | 2.17 | 4.97 | 4.03 | 4.54 | 12.12 | 12.67 | 13.21 | 13.76 | 14.31 |

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| **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** | **17,718** | **29,510** | **25,426** | **28,250** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **10,016** |
| Inflow funds | 17,718 | 6,923 | 16 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inflow operation | 0 | 22,587 | 25,410 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,016 |
| **TOTAL CASH OUTFLOW** | **17,718** | **24,825** | **24,727** | **26,700** | **26,306** | **26,161** | **26,856** | **26,702** | **26,547** | **26,393** | **24,033** | **0** |
| Increase in fixed assets | 17,718 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in current assets | 0 | 5,319 | 661 | 661 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 17,552 | 19,746 | 21,940 | 21,940 | 21,952 | 21,952 | 21,952 | 21,952 | 21,952 | 21,952 | 0 |
| Marketing and Distribution cost | 0 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 0 |
| Income tax | 0 | 0 | 0 | 0 | 487 | 550 | 1,467 | 1,533 | 1,599 | 1,665 | 1,731 | 0 |
| Financial costs | 0 | 1,604 | 1,764 | 1,544 | 1,323 | 1,103 | 882 | 662 | 441 | 221 | 0 | 0 |
| Loan repayment | 0 | 0 | 2,205 | 2,205 | 2,205 | 2,205 | 2,205 | 2,205 | 2,205 | 2,205 | 0 | 0 |
| **SURPLUS (DEFICIT)** | **0** | **4,685** | **699** | **1,549** | **1,928** | **2,073** | **1,378** | **1,532** | **1,687** | **1,841** | **4,201** | **10,016** |
| **CUMULATIVE CASH BALANCE** | **0** | **4,685** | **5,384** | **6,933** | **8,862** | **10,935** | **12,313** | **13,845** | **15,532** | **17,373** | **21,573** | **31,589** |

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| **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** | **22,587** | **25,410** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **28,234** | **10,016** |
| Inflow operation | 0 | 22,587 | 25,410 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 28,234 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,016 |
| **TOTAL CASH OUTFLOW** | **22,911** | **18,548** | **20,742** | **22,290** | **22,779** | **22,852** | **23,769** | **23,835** | **23,901** | **23,967** | **24,033** | **0** |
| Increase in fixed assets | 17,718 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in net working capital | 5,193 | 645 | 645 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 17,552 | 19,746 | 21,940 | 21,940 | 21,952 | 21,952 | 21,952 | 21,952 | 21,952 | 21,952 | 0 |
| Marketing and Distribution cost | 0 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 0 |
| Income (corporate) tax |   | 0 | 0 | 0 | 487 | 550 | 1,467 | 1,533 | 1,599 | 1,665 | 1,731 | 0 |
| **NET CASH FLOW** | **-22,911** | **4,039** | **4,668** | **5,944** | **5,455** | **5,382** | **4,465** | **4,399** | **4,333** | **4,267** | **4,201** | **10,016** |
| **CUMULATIVE NET CASH FLOW** | **-22,911** | **-18,871** | **-14,203** | **-8,259** | **-2,804** | **2,578** | **7,043** | **11,442** | **15,775** | **20,042** | **24,242** | **34,258** |
| Net present value | -22,911 | 3,672 | 3,858 | 4,466 | 3,726 | 3,342 | 2,520 | 2,257 | 2,021 | 1,809 | 1,619 | 3,862 |
| Cumulative net present value | -22,911 | -19,239 | -15,380 | -10,915 | -7,189 | -3,847 | -1,326 | 931 | 2,952 | 4,762 | 6,381 | 10,243 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| NET PRESENT VALUE | 10,243 |  |  |  |  |  |  |  |  |  |  |  |
| INTERNAL RATE OF RETURN | 18.25% |  |  |  |  |  |  |  |  |  |  |  |
| NORMAL PAYBACK |  6 years |  |  |  |  |  |  |  |  |  |  |  |