**PROFILE ON THE PRODUCTION OF**

**AGRICULTURAL IMPLEMENTS –HAND,**

**ANIMAL AND TRACTOR DRAWN**

Table of Contents

[I. SUMMARY 2](#_Toc369143614)

[II. PRODUCT DESCRIPTION AND APPLICATION 3](#_Toc369143615)

[III. MARKET STUDY AND MANUFACTURING CAPACITY 3](#_Toc369143616)

[IV. RAW MATERIALS AND INPUTS 7](#_Toc369143618)

[V. TECHNOLOGY AND ENGINEEING 8](#_Toc369143619)

[VI. HUMAN RESOURCE AND TRAINING REQUIREMENT 13](#_Toc369143620)

[VII. FINANCIAL ANALYSIS 14](#_Toc369143621)

[FINANCIAL ANALYSES SUPPORTING TABLES 20](#_Toc369143623)

# I. SUMMARY

This profile envisages the establishment of a plant for the production of 200,000 units of farm implements per annum (150,000 hand implants and 50,000 animal and tractor drawn implements). Agricultural implements are used for agriculture work to improve the efficiency and reduce the labour.

The demand for agricultural implements is met through import and domestic production. The present (2012) demand for hand implements and for animal and tractor drawn implements is estimated at 1,509 tons and 9,661 pieces, respectively. The demand for animal and tractor drawn implements is projected to reach 2,117 tons and 13,550 pieces by the year 2017 and 2,969 tons and 19,005 by the year 2022, respectively.

The principal raw materials required are steel and plates rivet which have to be imported.

The total investment cost of the project including working capital is estimated at Birr **38.22 million.** From the total investment cost the highest share (Birr 18.22 million or 47.68%) is accounted by initial working capital followed by fixed investment cost (Birr 16.77 million or 43.88%) and pre operation cost (Birr 3.22 million or 8.45%). From the total investment cost Birr 11.55 million or 30.21% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 21.40% and a net present value (NPV) of Birr 24.17 million discounted at 10%.

The project can create employment for 26 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 packaging and chemical manufacturing subsectors and forward linkage with the agricultural sector and also generates income for the Government in terms of tax revenue and payroll tax.

# II. PRODUCT DESCRIPTION AND APPLICATION

Agricultural implements are used for agriculture work to improve the efficiency and reduce the labour. A large variety of agricultural hand, animal and tractor drown are used. Among others the category of agricultural implements includes: Spade ,Shovel, Fork, Mattock, Pick, Hose, Rake, Axe and Bill hook on the hand implements side while Plough, Disc harrow, Cultivator, Weedier, Harvester, and Thrasher on the animal and tractor drawn side.

# III. MARKET STUDY AND MANUFACTURING CAPACITY

**A. MARKET STUDY**

**1. Past Supply and Present Demand**

For the purpose of this profile the following implements are selected;

|  |  |
| --- | --- |
|   **Hand implements** |   **Animal and tractor drawn** |
|   Spade |   Plough |
|   Shovel |   Disc harrow |
|   Fork |   Cultivator |
|   Mattock |   Weeder |
|   Pick |   Harvester |
|   Hose |   Thrasher |
|   Rake |  |
|   Axe |  |
|   Bill hook |  |

Some of the hand and animal and tractor drawn agricultural implements are manufactured by few of the existing metal industries locally. However, there is no available that that indicates the level of local production. Moreover, since the bulk of the products supply comes through import the demand for the product is estimated based on the trend in import. Accordingly, import of hand and animal and tractor drawn agricultural implements during the period 2002 – 2011 are shown in Table 3.1.

**Table 3.1**

**IMPORT OF HAND AND ANIMAL AND TRACTOR DRAWN AGRICULTURAL IMPLEMENTS**

|  |  |  |
| --- | --- | --- |
| **Year** | **Hand implements (tons)** | **Animal and tractor  drawn implements  (pcs)** |
| 2002 | 558 | 2,681 |
| 2003 | 984 | 3,459 |
| 2004 | 1,766 | 5,807 |
| 2005 | 1,919 | 3,803 |
| 2006 | 1,313 | 3,365 |
| 2007 | 1,816 | 3,290 |
| 2008 | 936 | 20,647 |
| 2009 | 1,867 | 3,392 |
| 2010 | 1,231 | 4,765 |
| 2011 | 1,695 | 16,212 |

***Source****: Ethiopian Revenues & Customs Authority*

Scrutiny of Table 3.1 reveals that imports of hand implements during the period under consideration (2002-2011) ranged from 558 tons (2002) to 1,919 tons (2005) with a mean import of 1,409 tons. Similarly, during the same period, import of animal and tractor drawn implements ranges from 2,681 pieces in 2012 to 20,647 pieces in 2008 averaging at 6,742 pieces. However, a general increase in the import of the products can be observed. For example the average import during the initial five years (2002-2006) was 1,308 tons for hand implements and 3,823 pieces for animal and tractor drawn implements. However during the recent five years (2007-2011) the average import has increased to 1,509 tons for hand implements and 9,661 pieces for animal and tractor drawn implements.

Accordingly, considering the trend in import of the products the recent five years (2007-2011) average import i.e., 1,509 tons for hand implements and 9,661 pieces for animal and tractor drawn implements is considered to approximate current (2012) demand for the products.

**2. Demand Projection**

The demand for hand and animal and tractor drawn agricultural implements depands on the performance of the agriculture sector. According to the GTP, during the period 2010/11 – 2014/15 the agriculture sector of the country (at a base case scenario) is expected to grow at an average annual growth rate of 8.6%.

However, in order to be conservative a growth rate of 7% which is slightly lower than the anticipated growth rate of the agriculture sector during the GTP period is used to project the demand for the products.

Accordingly, using the estimated present demand as a base and applying a growth rate of 7% the projected demand for hand and animal and tractor drawn agricultural implements is shown in Table 3.2.

**Table 3.2**

**PROJECTED DEMAND FOR HAND AND ANIMAL AND TRACTOR DRAWN AGRICULTURAL IMPLEMENTS**

| **Year** | **Hand implements (tons)** | **Animal and tractor  drawn implants  (pcs)** |
| --- | --- | --- |
| 2013 | 1,615 | 10,338 |
| 2014 | 1,728 | 11,061 |
| 2015 | 1,849 | 11,835 |
| 2016 | 1,978 | 12,664 |
| 2017 | 2,117 | 13,550 |
| 2018 | 2,265 | 14,499 |
| 2019 | 2,423 | 15,514 |
| 2020 | 2,593 | 16,600 |
| 2021 | 2,775 | 17,762 |
| 2022 | 2,969 | 19,005 |
| 2023 | 3,177 | 20,336 |
| 2024 | 3,399 | 21,759 |
| 2025 | 3,637 | 23,282 |

**3. Pricing and distribution**

The price of the envisaged products widely reneges on type, capacity and origin. Hence for the purpose of financial analyses an average factory gate price of Birr 175 per pieces for hand implements and Birr 1,000 pieces for animal and tractor drawn implements are considered.

The plant can sell its product either directly to government agencies or NGOs involved in development of the agriculture sector or through agents that distribute similar products throughout the country.

**B. PLANT CAPACITY AND PRODUCTION PROGRAMME**

1. **Plant capacity**

The capacity of the proposed plant is in the range of 200,000 units of farm implements (150,000 hand implants and 50,000 animal and tractor drawn implements. Being a multi purposed light engineering workshop, the plant is flexible to switch from one type of product to the other depending on the market. The capacity is estimated on the basis of single shift operation and 300 annual working days. Assuming that about a month will be needed for annual over-haul, net annual working days of 300 appear realistic.

**2. Production programme**

Full capacity production will be attained in the third year of operation with 85% and 90 % capacity utilization attained during the first and second year of operation. Being an engineering industry, it will take relatively long time to reach full capacity production, and hence full capacity utilization will be attained in the third year of production.

# IV. RAW MATERIALS AND INPUTS

**A. MATERIALS**

The main raw materials required are angle iron, steel tubes, MSS, and springs. Some products like sickles also require wooden handles. Annual cost of these materials at full production capacity of the plant is estimated at Birr 1.0 million. Table 4.1 below shows the details of major raw materials and related costs.

**Table 4.1**

**RAW MATERIAL REQUIREMENTS AND COST**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr.** |  |  | **Cost (`000 Birr)** | | |
| **No.** | **Description** | **Qty.** | **LC** | **FC** | **TC** |
| 1 | Angle iron | 500 ton | 2,200 | 11,000 | 13,200 |
| 2 | Steel tube | 350 ton | 1,540 | 7,700 | 9,240 |
| 3 | Mild steel sheet | 750 ton | 3,750 | 18,750 | 22,500 |
| 4 | Bushes | 150 ton | 360 | 1,800 | 2,160 |
| 6 | Leaf spring and shackles | 200 ton | 1,200 | 6,000 | 7,200 |
| 7 | Mild steel bar | 100 ton | 580 | 2,900 | 3,480 |
| 8 | Wooden bars | 1,5000 m | 45 | 225 | 270 |
| 9 | Wooden slates | 8,000 m | 18 | 88 | 106 |
| 10 | Paint and varnish | 150 gal | 4,500 |  | 4,500 |
| 11 | Packing materials | 50 ton | 1,250 |  | 1,250 |
|  | **Grand Total** |  | **15,443** | **48,463** | **63,906** |

**B. UTILITIES**

Electricity and water are utilities required for the envisaged plant. The total annual expenditure on utilities will be Birr 447,130.The details are shown in table 4.2.

**Table 4.2**

**ANNUAL UTILITIES REQUIREMENTS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Description** | **Annual  consumption** | **Unit** | **Unit Cost**  **( Birr)** | **Total Cost**  **( `000 Birr )** |
| 1 | Electricity | 660,000 | kwh | 0.65 | 429 |
| 2 | Water | 1,813 | m³ | 10 | 18.13 |
| **Total Annual cost** | | | | | **447.13** |

# V. TECHNOLOGY AND ENGINEEING

1. **TECNOLOGY**

**1. Production process**

The plant is a multi- purposed mechanical workshop with conventional sheet metal (plate) working facilities. The production process for manufacturing of products under consideration involves cutting, punching, forging, forming/bending, grinding/sharpening, heat treatment and painting.

**2. Environmental Impact**

The production process basically involves cutting, punching, forging, forming/bending, grinding/sharpening, heat treatment and painting which does not have any negative impact on the environment.

1. **ENGINEERING**
2. **Machinery and Equipment**

Thetotal F.O.B cost of machineries, is estimated at Birr 10.5 million. Total landed cost is Birr 12.6 million. The foreign and local cost components are Birr 11,550,000 and Birr 1,050,000 respectively. The machinery and equipment required are presented in Table 5.1

**Table 5.1**

**MACHINERY AND EQUIPMENT REQUIREMENT AND COST**

| **Machinery and Equipment** | **Number**  **Required** |
| --- | --- |
| Power shear for 6mm steel plate  Eccentric press(125T)  Fuel –Fired furnace ( 60cm X 60 cm X 75 cm)  Friction screw press (160T)  Eccentric press (60 T)  Double –ended pedestal grinder(30 cm wheel)  Quenching Tank( 1 cubic meter)  Manual tube bending machine (for tube diameter of upto 4cm)  Tumbler  Black smith’s tool  Painting equipment  Wooden handle making equipment | **1**  **1**  **1**  **1**  **1**  **1**  **1**  **1**  **1**  **1 set**  **1**  **1**  **1** |

1. **Building and Civil work**

The total area required for plant site is estimated to be 800 m2; of this the built-up area of the factory will be 600 m2. Building cost is estimated to be Birr 5,000 per m2, and the total building cost will, then, be Birr 3 million.

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

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

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

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

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

Regarding land allocation of industrial zones if the land requirement of the project is below 5,000 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 212,800 of which 10% or Birr 21,280 will be paid in advance. The remaining Birr 191,520 will be paid in equal installments with in 28 years i.e. Birr 6,840 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 envisaged project's human resourcerequirement is 26 persons. The list of required manpower & annual labour cost including fringe benefits is shown in Table 6.1

**B. TRAINING REQUIREMENT**

As the type of technology is locally developed and technical personnel with the basic technical skill are readily available in the labour market. No training has been envisaged for this project.

**Table 6.1**

**MANPOWER REQUIREMENT & ANNUAL LABOUR COST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Description** | **Req. No.** | **Salary, Birr** | |
| **No.** |  |  | **Monthly** | **Annual** |
| 1 | General manager | 1 | 8,000 | 96,000 |
| 2 | Production head | 1 | 6,000 | 72,000 |
| 3 | Welders | 3 | 6,000 | 72,000 |
| 4 | Fitters | 3 | 6,000 | 72,000 |
| 5 | Helpers | 5 | 5,000 | 60,000 |
| 6 | Machinists | 4 | 10,000 | 120,000 |
| 7 | Secretary | 1 | 2,000 | 24,000 |
| 8 | Store-keeper | 1 | 2,500 | 30,000 |
| 9 | Cashier | 1 | 1,750 | 21,000 |
| 10 | Clerk | 1 | 1,200 | 14,400 |
| 11 | General services (inc. Guards) | 5 | 5,000 | 60,000 |
|  | **Sub-total** | **26** |  | **641,400** |
|  | Employees Benefit (25% of basic salary) |  |  | 128,280 |
|  | **Total** |  |  | **769,680** |

# VII. FINANCIAL ANALYSIS

The financial analysis of the agricultural implements –hand, animal and tractor drawn 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 38.22 million (See Table 7.1). From the total investment cost the highest share (Birr 18.22 million or 47.68%) is accounted by initial working capital followed by fixed investment cost (Birr 16.77 million or 43.88%) and pre operation cost (Birr 3.22 million or 8.45%). From the total investment cost Birr 11.55 million or 30.21% 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 | 21.28 |  | 21.28 | 0.06 |
| 1.2 | Building and civil work | 3,000.00 |  | 3,000.00 | 7.85 |
| 1.3 | Machinery and equipment | 1,050.00 | 11,550.00 | 12,600.00 | 32.96 |
| 1.4 | Vehicles | 900.00 |  | 900.00 | 2.35 |
| 1.5 | Office furniture and equipment | 250.00 |  | 250.00 | 0.65 |
|  | **Sub total** | **5,221.28** | **11,550.00** | **16,771.28** | **43.88** |
| **2** | **Pre operating cost \*** |  |  |  |  |
| 2.1 | Pre operating cost | 728.00 |  | 728.00 | 1.90 |
| 2.2 | Interest during construction | 2,500.58 |  | 2,500.58 | 6.54 |
|  | **Sub total** | **3,228.58** |  | **3,228.58** | **8.45** |
| **3** | **Working capital \*\*** | **18,223.30** |  | **18,223.30** | **47.68** |
|  | **Grand Total** | **26,673.16** | **11,550.00** | **38,223.16** | **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 21.43 million. However, only the initial working capital of Birr 18.22 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 71.64 million (see Table 7.2). The cost of raw material account for 89.20% of the production cost. The other major components of the production cost are depreciation, financial cost and direct labour which account for 4.17%, 3.36% and 0.89% respectively. The remaining 2.38% is the share of utility, repair and maintenance, labour overhead, cost of marketing and distribution 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**  **( 000 Birr)** | **%** |
| Raw Material and Inputs | 63,906.00 | 89.20 |
| Utilities | 447.00 | 0.62 |
| Maintenance and repair | 378.00 | 0.53 |
| Labour direct | 641.00 | 0.89 |
| Labour overheads | 128.00 | 0.18 |
| Administration Costs | 250.00 | 0.35 |
| Land lease cost | - | - |
| Cost of marketing and distribution | 500.00 | 0.70 |
| **Total Operating Costs** | **66,250.00** | **92.47** |
| Depreciation | 2,990.60 | 4.17 |
| Cost of Finance | 2,406.81 | 3.36 |
| **Total Production Cost** | **71,647.41** | **100** |

**C. FINANCIAL EVALUATION**

**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 5.43 million to Birr 6.89 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 66.25 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 25,348,405

Variable Margin ratio (%)

Break Even Capacity utilization = Break even Sales Value X 100 = 33%

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 5 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 21.40% 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 principal 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 24.17 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 26 persons. The project will generate Birr 13.74 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 packaging and chemical manufacturing subsectors and forward linkage with the agricultural sector generate other income for the government.

**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 | 13,580.03 | 14,378.85 | 15,976.50 | 15,976.50 | 15,976.50 | 15,976.50 | 15,976.50 | 15,976.50 | 15,976.50 | 15,976.50 |
| Accounts receivable | 4,698.96 | 4,972.92 | 5,520.83 | 5,520.83 | 5,521.40 | 5,521.40 | 5,521.40 | 5,521.40 | 5,521.40 | 5,521.40 |
| Cash-in-hand | 16.49 | 17.46 | 19.40 | 19.40 | 19.50 | 19.50 | 19.50 | 19.50 | 19.50 | 19.50 |
| **CURRENT ASSETS** | **18,295.48** | **19,369.23** | **21,516.74** | **21,516.74** | **21,517.40** | **21,517.40** | **21,517.40** | **21,517.40** | **21,517.40** | **21,517.40** |
| Accounts payable | 72.18 | 76.43 | 84.92 | 84.92 | 84.92 | 84.92 | 84.92 | 84.92 | 84.92 | 84.92 |
| **CURRENT LIABILITIES** | **72.18** | **76.43** | **84.92** | **84.92** | **84.92** | **84.92** | **84.92** | **84.92** | **84.92** | **84.92** |
| **TOTAL WORKING CAPITAL** | **18,223.30** | **19,292.80** | **21,431.82** | **21,431.82** | **21,432.48** | **21,432.48** | **21,432.48** | **21,432.48** | **21,432.48** | **21,432.48** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | 54,320 | 57,515 | 63,906 | 63,906 | 63,906 | 63,906 | 63,906 | 63,906 | 63,906 | 63,906 |
| Utilities | 380 | 402 | 447 | 447 | 447 | 447 | 447 | 447 | 447 | 447 |
| Maintenance and repair | 321 | 340 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 |
| Labour direct | 545 | 577 | 641 | 641 | 641 | 641 | 641 | 641 | 641 | 641 |
| Labour overheads | 109 | 115 | 128 | 128 | 128 | 128 | 128 | 128 | 128 | 128 |
| Administration Costs | 213 | 225 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Land lease cost | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 7 | 7 | 7 |
| Cost of marketing  and distribution | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| **Total Operating Costs** | **56,388** | **59,675** | **66,250** | **66,250** | **66,257** | **66,257** | **66,257** | **66,257** | **66,257** | **66,257** |
| Depreciation | 2,991 | 2,991 | 2,991 | 2,991 | 2,991 | 145 | 145 | 145 | 145 | 145 |
| Cost of Finance | 0 | 2,751 | 2,407 | 2,063 | 1,719 | 1,375 | 1,031 | 688 | 344 | 0 |
| **Total Production Cost** | **59,378** | **65,416** | **71,647** | **71,304** | **70,967** | **67,777** | **67,433** | **67,089** | **66,746** | **66,402** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Appendix 7.A.3** | | | | | | | | | | |
| **NET 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 | 64,813 | 68,625 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 |
| Less variable costs | 55,888 | 59,175 | 65,750 | 65,750 | 65,750 | 65,750 | 65,750 | 65,750 | 65,750 | 65,750 |
| **VARIABLE MARGIN** | **8,926** | **9,450** | **10,500** | **10,500** | **10,500** | **10,500** | **10,500** | **10,500** | **10,500** | **10,500** |
| in % of sales revenue | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 | 13.77 |
| Less fixed costs | 3,491 | 3,491 | 3,491 | 3,491 | 3,497 | 652 | 652 | 652 | 652 | 652 |
| **OPERATIONAL MARGIN** | **5,435** | **5,959** | **7,009** | **7,009** | **7,003** | **9,848** | **9,848** | **9,848** | **9,848** | **9,848** |
| in % of sales revenue | 8.39 | 8.68 | 9.19 | 9.19 | 9.18 | 12.92 | 12.92 | 12.92 | 12.92 | 12.92 |
| Financial costs |  | 2,751 | 2,407 | 2,063 | 1,719 | 1,375 | 1,031 | 688 | 344 | 0 |
| **GROSS PROFIT** | **5,435** | **3,209** | **4,603** | **4,946** | **5,283** | **8,473** | **8,817** | **9,161** | **9,504** | **9,848** |
| in % of sales revenue | 8.39 | 4.68 | 6.04 | 6.49 | 6.93 | 11.11 | 11.56 | 12.01 | 12.46 | 12.92 |
| Income (corporate) tax | 0 | 0 | 0 | 0 | 0 | 2,542 | 2,645 | 2,748 | 2,851 | 2,954 |
| **NET PROFIT** | **5,435** | **3,209** | **4,603** | **4,946** | **5,283** | **5,931** | **6,172** | **6,412** | **6,653** | **6,894** |
| in % of sales revenue | 8.39 | 4.68 | 6.04 | 6.49 | 6.93 | 7.78 | 8.09 | 8.41 | 8.73 | 9.04 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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** | **17,499** | **85,609** | **68,629** | **76,258** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **25,754** |
| Inflow funds | 17,499 | 20,796 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inflow operation | 0 | 64,813 | 68,625 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25,754 |
| **TOTAL CASH OUTFLOW** | **17,499** | **77,184** | **66,938** | **74,243** | **71,751** | **71,415** | **73,612** | **73,372** | **73,131** | **72,890** | **69,211** | **0** |
| Increase in fixed assets | 17,499 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in current assets | 0 | 18,295 | 1,074 | 2,148 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 55,888 | 59,175 | 65,750 | 65,750 | 65,757 | 65,757 | 65,757 | 65,757 | 65,757 | 65,757 | 0 |
| Marketing and  Distribution cost | 0 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 0 |
| Income tax | 0 | 0 | 0 | 0 | 0 | 0 | 2,542 | 2,645 | 2,748 | 2,851 | 2,954 | 0 |
| Financial costs | 0 | 2,501 | 2,751 | 2,407 | 2,063 | 1,719 | 1,375 | 1,031 | 688 | 344 | 0 | 0 |
| Loan repayment | 0 | 0 | 3,438 | 3,438 | 3,438 | 3,438 | 3,438 | 3,438 | 3,438 | 3,438 | 0 | 0 |
| **SURPLUS (DEFICIT)** | **0** | **8,426** | **1,692** | **2,016** | **4,499** | **4,835** | **2,638** | **2,878** | **3,119** | **3,360** | **7,039** | **25,754** |
| **CUMULATIVE CASH  BALANCE** | **0** | **8,426** | **10,117** | **12,133** | **16,632** | **21,467** | **24,104** | **26,983** | **30,102** | **33,462** | **40,500** | **66,255** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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** | **64,813** | **68,625** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **76,250** | **25,754** |
| Inflow operation | 0 | 64,813 | 68,625 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 76,250 | 0 |
| Other income | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25,754 |
| **TOTAL CASH OUTFLOW** | **35,723** | **57,457** | **61,814** | **66,250** | **66,251** | **66,257** | **68,799** | **68,902** | **69,005** | **69,108** | **69,211** | **0** |
| Increase in fixed assets | 17,499 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increase in net working capital | 18,223 | 1,070 | 2,139 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 55,888 | 59,175 | 65,750 | 65,750 | 65,757 | 65,757 | 65,757 | 65,757 | 65,757 | 65,757 | 0 |
| Marketing and Distribution cost | 0 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 0 |
| Income (corporate) tax |  | 0 | 0 | 0 | 0 | 0 | 2,542 | 2,645 | 2,748 | 2,851 | 2,954 | 0 |
| **NET CASH FLOW** | **-35,723** | **7,356** | **6,811** | **10,000** | **9,999** | **9,993** | **7,451** | **7,348** | **7,245** | **7,142** | **7,039** | **25,754** |
| **CUMULATIVE NET CASH FLOW** | **-35,723** | **-28,367** | **-21,556** | **-11,556** | **-1,556** | **8,437** | **15,888** | **23,236** | **30,481** | **37,623** | **44,662** | **70,416** |
| Net present value | -35,723 | 6,687 | 5,629 | 7,513 | 6,830 | 6,205 | 4,206 | 3,771 | 3,380 | 3,029 | 2,714 | 9,929 |
| Cumulative net present value | -35,723 | -29,035 | -23,406 | -15,893 | -9,064 | -2,859 | 1,347 | 5,118 | 8,498 | 11,527 | 14,241 | 24,170 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| NET PRESENT VALUE | 24,170 |  |  |  |  |  |  |  |  |  |  |  |
| INTERNAL RATE OF RETURN | 21.40% |  |  |  |  |  |  |  |  |  |  |  |
| NORMAL PAYBACK | 5 years |  |  |  |  |  |  |  |  |  |  |  |