# 71. PROFILE ON PLASTIC SHOES

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## I. SUMMARY

This profile envisages the establishment of a plant for the production of one million pairs of plastic shoes per annum.

The present demand for the proposed product is estimated to be 7.8 million pairs per annum and it is projected to reach at13.09 million pairs by the year 2015.

The plant will create employment opportunities for 32 persons.

The total investment requirement is estimated at Birr 11.27 million, out of which Birr 9.5 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 22 % and a net present value ( NPV) of Birr 7.42 million, discounted at 10.5%

## II. PRODUCT DESCRIPTION AND APPLICATION

Plastic shoe is a foot wear usually manufactured from either polyethae or polyurethane. They are classified as heavy and light shoes. The former include walking, sport and weather shoes or as sometimes known as Wellington shoes. The latter include plastic slippers and sandals. Plastic shoes are manufactured by injection moulding. Standard sizes are from 22 upto 38 for children and ladies and 39 upto 44 for men.

# III. MARKET STUDY AND PLANT CAPACITY

## A. MARKET STUDY

### 1. Past Supply And Present Demand

Plastic shoes are mainly demanded by lower income urban population and rural population. Local production of plastic shoes has shown a considerable growth in the past. Table 3.1 depicts annual local production of plastic shoes.

**Table 3.1**

**LOCAL PRODUCTION OF PLASTIC SHOES**

| Year | Local Production |
|---|---|
| 1988 | 604348 |
| 1989 | 1870279 |
| 1990 | 4421649 |
| 1991 | 5576111 |
| 1992 | 3242974 |
| 1993 | 4817033 |
| 1994 | 5430159 |
| 1995 | 5989671 |

***Source- CSA***

As shown in Table 3.1 above, local production of plastic shoes has shown an enormous growth increasing form 604,348 pairs in the year 1988 to 5,989,671 pairs in 1995 registering an annual average growth rate of 40 % during the period under consideration. The rapid growth of production can be explained by the low base and fast expansion in demand.

The current effective demand for the product has been estimated on the basis of average production during the period under review and the growth rate registered. Accordingly, the current ( 1997) effective demand for plastic shoes is estimated at 7,828,295 pairs.

## 2. Projected Demand

The demand for plastic shoes is projected using the rural population growth rate, which is the major end-user of the product. Accordingly, the projected demand taking the estimated present demand as a base and applying a 2.9% growth rate is given in Table 3.2

**Table 3.2**

**PROJECTED DEMAND FOR PLASTIC SHOES**

| Year | Projected Demand |
|---|---|
| 1998 | 8,055,316 |
| 1999 | 8,288,920 |
| 2000 | 8,529,298 |
| 2001 | 8,776,648 |
| 2002 | 9,031,171 |
| 2003 | 9,293,075 |
| 2004 | 9,562,574 |
| 2005 | 9,839,889 |
| 2006 | 10,125,245 |
| 2007 | 10,418,877 |
| 2008 | 10,721,025 |
| 2009 | 11,031,935 |
| 2010 | 11,351,861 |
| 2011 | 11,681,065 |
| 2012 | 12,019,816 |
| 2013 | 12,368,390 |
| 2014 | 12,727,074 |
| 2015 | 13,096,159 |

### 3. Pricing and Distribution

The selling price of plastic shoes at present ranges between Birr 12 to 20 per pair. Therefore, assuming margins for wholesalers and retailers a factory-gate price of Birr 8 per pair is proposed for the envisaged plant.

Agents can also be used to distribute the product to relatively far places where there is some amount of demand.

## B. PLANT CAPACITY AND PRODUCTION PROGRAMME

### 1. Plant Capacity

In this study, a plant with annual capacity of 1,000,000 pairs is envisaged. The plant will operate 8 hours a day, single shift, and 300 days a year. Sundays and national holidays amount to 65 days. If maintenance and repair works are to be conducted, it will be made during holidays.

### 2. Production Programme

The plant will start operation at 85% of its rated capacity in the first year. It will then build up its production capacity to 95% and 100% in the second and third year, respectively.

As the plant is new having new machinery, production build-up is made to start at reduced capacity and gradually rise to full capacity. The low production level at the initial stage is proposed to develop substantial market outlets for the product. Machinery operators will also get enough time to develop the required skills and experience.

## IV. MATERIALS AND INPUTS

### A. RAW AND AUXILARY MATERIALS

The annual requirement for raw and auxiliary materials and their costs are indicated in Table 4.1. Accordingly, the basic raw materials are polyvinyl chloride (PVC), colouring agents and belies which are going to be imported.

**Table 4.1**

**RAW AND AUXILIARY MATERIALS REQUIREMENT AND COST**

| Sr. No | Description | Unit of Measure | Qty. | Cost ('000 Birr) |
|---|---|---|---|---|
| | | | | Total |
| 1 | PVC compound | Tonnes | 863 | 4250 |
| 2 | Colours and dyes | Tonnes | 15 | 268.75 |
| 3 | Buckles | Pcs | 250,000 | 62.5 |
| | **Total Cost** | | | **4,581.25** |

### B. UTILITIES

Utilities required by the plant consist of electricity, water and fuel oil. Electricity is required to run the production machinery and to provide lighting for the plant. Water is required for general purposes The annual requirement and costs of these utilities are shown in Table 4.2.

**Table 4.2**

**UTILITIES REQUIREMENT AND COST(AT FULL CAPACITY)**

| Sr. No. | Item | Annual Requirement | Cost ('000 Birr) |
|---|---|---|---|
| 1 | Electricity | 45,000 kWh | 21.285 |
| 2 | Water ($2m^3$/hr | 4,800 $m^3$ | 9.60 |
| | **Total** | | **31.085** |

## V. TECHNOLOGY AND ENGINEERING

## A. TECHNOLOGY

### 1. Production Process

The raw material is first plasticzed for four seconds at a temperature of 150- 170$^o$c. Then, it is injected to the rotary table injection-moulding machine and formed for about four seconds. Then, it is cooled for 3-4 seconds. Finally, indexing takes place for about 10 seconds. The trimming and inspection activities are performed before it is packed and is ready for delivery. The scrape is fed to the waste granulator and processed.

### 2. Source of Technology

The technology required for plastic shoes manufacturing plant can be obtained from the following supplier;

Maxant Industries Inc.
P. O. Box 454.
Ayer, Massachusetts 01432,
USA.

## B. ENGINEERING

### 1. Machinery and equipment

Machinery and equipment required by the plant are given in Table 5.1. The total cost of plant machinery and equipment is estimated at Birr 9.5 million, of which Birr 7.5 million is required in foreign currency.

**Table 5.1**

**MACHINERY AND EQUIPMENT REQUIRED BY PLASTIC SHOES MANUFACTING PLANT**

| Sr. No | Description | Qty. |
|---|---|---|
| 1 | Low pressure, rotary table injection molding machine | 8 sets |
| 2 | Molds and dies | 100 sets |
| 3 | Waste granulation | 2 Pcs |

### 2. Land, Building and Civil Works

The total land area of the plant including open space is 1,000 $m^2$. The built-up area required by the plant is estimated at 600 $m^2$, which costs Birr 840,000. This would include cost of land preparation and associated civil works. The total cost of land lease for a period of 70 years is estimated at Birr 175,000. Thus, the total investment cost for land, building ad civil works assuming that the total land lease cost will be paid in advance is estimated at 1,015,000.

### 3. Proposed Location

Based on availability of infrastructure and market outlet Asosa town is proposed to be the location of the envisaged plant.

# VI. MANPOWER AND TRAINING REQUIREMENTS

## A. MANPOWER REQUIREMENT

The manpower requirement of the plant will be 32 persons, out of which 18 will be engaged in production activities and the remaining 15 will be involved in administrative activities. Table 6.1 shows the details of manpower requirement of the plant and estimated annual labour cost including fringe benefits.

**Table 6.1.**

**ANNUAL MANPOWER REQUIREMENT AND ESTIMATED LABOUR COST**

| No. | Description | No of persons | Monthly Salary, Birr | Annual Salary Birr |
|---|---|---|---|---|
| 1 | Plant Manager | 1 | 1,800 | 21,600 |
| 2 | Secretary | 1 | 700 | 8,400 |
| 3 | Accountant | 1 | 700 | 8,400 |
| 4 | Personnel Officer | 1 | 600 | 7,200 |
| 5 | Salesperson | 1 | 600 | 7,200 |
| 6 | Cashier | 1 | 500 | 6,000 |
| 7 | Clerks | 2 | 500 | 6,000 |
| 8 | General Services | 5 | 800 | 9,600 |
| 9 | Production Supervisor | 1 | 900 | 10,800 |
| 10 | Chemist | 1 | 700 | 8,400 |
| 11 | Skilled Workers | 9 | 2,700 | 32,400 |
| 12 | Unskilled Workers | 8 | 1,280 | 15,360 |
| | **Sub-total** | **32** | **11,780** | **147,360** |
| 13 | Benefit (20% BS) | - | 2,356 | 36,840 |
| | **Total cost** | | **14,136** | **184,200** |

## B. TRAINING REQUIREMENT

On-site training by the machinery supplier is required for key production personnel during errection and commissioning. The cost of such training is estimated to be Birr 12,000.

## VII. FINANCIAL ANALYSIS

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

| | |
|---|---|
| Construction period | 2 years |
| Source of finance | 30 % equity |
| | 70 % loan |
| Tax holidays | 3 years |
| Bank interest | 10.5% |
| Discounted cash flow | 10.5% |
| Repair and maintenance | 5 % of the total plant and machinery |
| Accounts receivable | 30 days |
| Raw material (import) | 90 days |
| Work in progress | 1 days |
| Finished products | 30 days |
| Cash in hand | 5 days |
| Accounts payable | 30 days |

## A. TOTAL INITIAL INVESTMENT COST

The total initial investment cost of the project including working capital is estimated at Birr 11.27 million, of which about 70 % will be required in foreign currency.The major breakdown of the total initial investment cost is shown in Table 7.1

**Table 7.1**

**INITIAL INVESTMENT COST ('000 BIRR)**

| Sr. No. | Cost Items | Foreign Currency | Local Currency | Total |
|---|---|---|---|---|
| 1 | Land | - | 175 | 175 |
| 2 | Building and Civil Work | - | 840 | 840 |
| 3 | Plant Machinery and Equipment | 7500 | 2000 | 9500 |
| 4 | Office Furniture and Equipment | - | 50 | 50 |
| 5 | Vehicle | - | 250 | 250 |
| 6 | Pre-production Expenditure* | - | 1028.34 | 1028.34 |
| | **Total Investment cost** | **7500** | **3328.34** | **10828.34** |
| 7 | Working Capital | 400.44 | 47 | 447.44 |
| | **Grand Total** | **7900.44** | **3375.34** | **11275.78** |

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** Pre-production expenditure include interest during construction (Birr 810.34 thousand), training (Birr 12,000), and costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

## B. PRODUCTION COST

The annual production cost at full operation capacity of the plan is estimated at Birr 6.92 million (see Table 7.2). The material and utility cost accounts for 66.68% per cent while repair and maintenance take 3.9 per cent of the production cost.

**Table 7.2**

**ANNUAL PRODUCTION COST ('000 BIRR)**

| Sr. No. | Items | Year | | | |
|---|---|---|---|---|---|
| | | **3** | **4** | **7** | **10** |
| 1 | Raw Material and Inputs | 4,352.19 | 4,581.25 | 4,581.25 | 4,581.25 |
| 2 | Labour direct | 84 | 88.42 | 88.42 | 88.42 |
| 3 | Utilities | 29.53 | 31.09 | 31.09 | 31.09 |
| 4 | Maintenance and repair | 256.5 | 270 | 270 | 270 |
| 5 | Labour overheads | 35 | 36.84 | 36.84 | 36.84 |
| 6 | Administration cost | 56 | 58.94 | 58.94 | 58.94 |
| | **Total Operating Costs** | **4,816.22** | **5,070.54** | **5,073.54** | **5,076.54** |
| 7 | Depreciation | 1,066.50 | 1,066.50 | 1,024.50 | 1,024.50 |
| 8 | Cost of Finance | 840.57 | 779.96 | 557.2 | 466.84 |
| | **Total Production Cost** | **6,723.29** | **6,917.00** | **6,655.24** | **6,567.88** |

## C. FINANCIAL EVALUATION

### 1. Profitability

According to the projected income statement, the project will start generating profit in the first year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the lifetime of the project. The income statement and the other indicators of profitability show that the project is viable.

**2. Break-even Analysis**

The break-even point of the project is estimated by using income statement projection**.**

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 33\ \%$$

**3. Pay-Back Period**

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment and working capital will be fully recovered within 5 years.

**4. Internal Rate of Return and Net Present Value**

Based on the cash flow statement, the calculated IRR of the project is 22 % and the net present value at 10.5% discount rate is Birr 7.42 million.

**D. ECONOMIC BENEFITS**

The project can create employment for 32 persons. In addition to supply of the domestic needs, the project will generate Birr 19.7 million in terms of tax revenue. Moreover, the Regional Government can collect employment, income tax and sales tax revenue.