

**205. PROFILE ON PRODUCTION OF
APICULTURE EQUIPMENT**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of apiculture equipment with a capacity of 2,000 units per annum.

The present demand for the proposed product is estimated at 42,420 units per annum. The demand is expected to reach at 76,396 units by the year 2022.

The plant will create employment opportunities for 26 persons.

The total investment requirement is estimated at Birr 3.83 million, out of which Birr 1 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 18% and a net present value (NPV) of Birr 1.33 million discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Apiculture equipment is equipment used for production of honey, especially in a modern way. Modern bee keeping equipment comprises of beehives, Bee smoker, Queen Extractor, Wax press Honey extractor and protective clothing, etc. In this profile the set of apiculture equipment (i.e. Bee smoker, Queen Extractor, Wax press, Honey extractor and protective clothing) are considered.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The Southern Nations Nationalities and Peoples Region (SNNPR) is one of the most known potential areas for apiculture in the country. The region's forest resource and other vegetation covers, such as cropping and grazing land, are a source of diversified honey flora that supply nectar and pollen to bee colonies. According to the resource assessment report, the region has a total of 1,114,303 hives, of which 1,060,512 are traditional, 50,980 are modern and 2,811 are intermediate. The total annual honey yield from these hives is 9,384 tons of which about 72% is obtained from traditional hives.

Available information reveals that the average annual output of honey from traditional, intermediate and modern hives is about 5 kg, 15 kg and 25 kg, respectively. The output of honey from modern hives is thus five fold of that from traditional hives. Apparently, this marked difference in output and the strenuous effort on the part of the government to improve rural livelihood is likely to induce farmers to quickly shift from traditional beehives to modern and improved ones. However, in determining the present demand for apiculture equipment, the existing traditional beehives are conservatively assumed to be replaced with modern ones in the coming 25 years. That is, on the average, about 42,420 modern beehives or 4% of the existing traditional beehives need to be disseminated annually. The present effective demand for apiculture equipment is thus estimated at 42,420 pcs per annum.

2. Demand Projection

The method used to determine the present effective demand is used for projecting the demand for apiculture equipment. The projected demand for the product is shown in Table 3.1.

Table 3.1**PROJECTED DEMAND FOR APICULTURE EQUIPMENT (PCS)**

Year	Projected Demand
2007	42420
2008	44117
2009	45882
2010	47717
2011	49626
2012	51611
2013	53675
2014	55822
2015	58055
2016	60377
2017	62792
2018	65304
2019	67916
2020	70633
2021	73458
2022	76396

3. Pricing and Distribution

The recommended factory get price is Birr 1,500 per piece. The product can get its market outlet through the existing agricultural inputs and equipment distributing enterprises throughout the region. Close collaboration with the Region's Bureau of Agriculture is imperative to promote the product.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME**1. Plant Capacity**

Based on the market study and the economic scale of production, the annual production capacity of the envisaged plant for apiculture equipment production is 3,000 sets, based on 300 working days and a single shift of 8 hours per day. Increasing the number of working hours per day can increase this capacity.

2. Production Programme

Table 3.2 shows the production programme of the envisaged project. At the initial stage of the production period, the plant requires some years to penetrate into the market. Therefore, in the first and second year of production, the capacity utilization rate will be 70% and 85%, respectively. In third year and thereafter, full capacity production shall be attained.

IV. RAW MATERIALS AND INPUTS**A. RAW MATERIALS**

The total annual cost of raw materials is estimated at Birr 3,314,250. Table 4.1 indicates the annual requirement of raw materials for the proposed project.

Table 4.1
RAW MATERIALS REQUIREMENT AND COST
(AT FULL CAPACITY)

Sr. No.	Raw Material	Unit of Measure	Qty.	Cost ('000 Birr)
1.	Perforated SS plate 1000 x 2000 x 20mm	Pcs	2000	800
2.	SS sheet 1000 x 2000 x 1mm	pcs	3500	950
3.	SS rods ϕ 6 mm	Kg	500	850
4.	Food grade ball bearing	Pcs	4000	80
5	Carbon steel pipe ϕ 38.1 mm	Pcs	2000	80
6	Carbon steel sheet metal 1000 x 2000 x 1mm	Pcs	2000	200
7	Carbon steel Plate 1000 x 2000 x 15 mm	Pcs	80	40
8	RHS 25 x 25 x 2.5 mm	Pcs	2700	108
9	RHS 20 x 20 x 2 mm	Pcs	1350	47.25
9	Assorted SS bolt and nut	Kg	300	6
10	Plastic hose ϕ 38.1 mm	Mt.	6000	30
11	Synthetic leather coated	Sq. mt	300	21
12	Angle iron 30 x 30 x 2mm	Pcs	1000	90
13	Carbon steel rods ϕ 8 mm	Kg	600	12
Total				3,314.25

B. UTILITIES

Electricity and water are the principal utilities of the project. The annual utilities requirement and cost are indicated in Table 4.2.

Table 4.2
UTILITIES REQUIREMENT AND COST

Sr. No.	Utility	Unit of Measure	Qty.	Cost ('000 BIRR)
1	Electricity	KWh	40,000	18.944
2	Water	M ³	600	6
	Total			24.944

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The manufacturing process of the above mentioned apiculture equipment mainly involves shearing, cutting, bending, grinding, drilling, welding, riveting and next assembling of the unit.

2. Source of Technology

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B. ENGINEERING

1. Machinery and Equipment

The list of machinery and equipment is indicated in Table 5.1. The total cost of machinery is estimated at Birr 1 million. The plant needs vehicles (one pick-up) for transportation of finished product and for office activities. The total cost of the vehicles is estimated at Birr 320,000.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT REQUIRED

Sr. No.	Raw Material	UOM	Qty.
1.	Shearing machine, max. 4mm thick.	Pcs	1
2.	Manual bending machine	Pcs	1
3.	Drilling machine	Pcs	2
4.	Bench grinder	Pcs	4
5.	Mechanic tool box	Set	2
6.	Welding transformer, ARC, & its accessories	Set	4
7.	Riveting machine	set	1
8.	Power hack saw		1
9.	Welding transformer, GAS, & its accessories		4
10.	Work bench with w/s vice		4
11.	Hand drilling machine		4
12.	Hand grinding machine		4

2. Land, Building and Civil Works

The plant requires a total of 1000m² area of land out of which 500 m² is built-up area, which includes manufacturing area, raw material stock area, offices etc. Assuming construction rate of Birr 1500 per m², the total cost of construction is estimated to be Birr 1.5 million. The total cost, for a period of 80 years with cost of Birr 1 per m², is estimated at Birr 1000. The total investment cost for land, building and civil works is estimated at Birr 1,501,000.

3. Proposed Location

Konta special woreda is found highly suitable for honey production. Therefore, the special woreda is selected as a potential location of the project .

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The manpower requirement of the envisaged project is 26 persons. The list of manpower is indicated in Table 6.1. The total annual labour cost including fringe benefits is estimated at Birr 148,500.

B. TRAINING REQUIREMENT

Currently, government, private and other institutions are training several students on woodworks. Since experienced operators and fitters can be recruited from the market training arrangement is not required for the envisaged project.

Table 6.1
MANPOWER REQUIREMENT AND LABOUR COST

Sr. No.	Description	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr)
1.	General Manager	1	2,000	24,000
2.	Secretary/cashier	1	700	8,400
3.	Production & technical Head	1	1,200	14,400
4.	Operators	4	2,400	28,800
5.	Fitters	4	1,600	19,200
6.	Welders	8	4800	57,600
7.	Laborers	5	1,500	18,000
8	Guard	2	500	6,000
9	Driver	1	550	6,600
	Sub-Total	26	15,250	183,000
	Benefits (25% BS)		3812.5	45750
	Grand Total		19,063	228,750

VII. FINANCIAL ANALYSIS

The financial analysis of the apiculture equipment 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	8%
Discount cash flow	8.5%
Accounts receivable	30 days

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Raw material local	30days
Raw material, import	90days
Work in progress	5 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 3.83 million, of which 16 per cent 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

Sr. No.	Cost Items	Total Cost ('000 Birr)
1	Land lease value	80
2	Building and Civil Work	1,500.00
3	Plant Machinery and Equipment	1,000.00
4	Office Furniture and Equipment	75
5	Vehicle	200
6	Pre-production Expenditure*	363.08
7	Working Capital	616.98
	Total Investment cost	3,835.1
	Foreign Share	16

* *N.B Pre-production expenditure includes interest during construction (Birr 213.08 thousand) and Birr 150 thousand 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 is estimated at Birr 4.08 million (see Table 7.2). The material and utility cost accounts for 81.75 per cent, while repair and maintenance take 1.84 per cent of the production cost.

Table 7.2
ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	3,314.25	81.14
Utilities	24.94	0.61
Maintenance and repair	75	1.84
Labour direct	109.8	2.69
Factory overheads	36.6	0.90
Administration Costs	73.2	1.79
Total Operating Costs	3,633.79	88.96
Depreciation	252.5	6.18
Cost of Finance	198.32	4.86
Total Production Cost	4,084.61	100

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 life-time 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 including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 29\%$$

3. Pay Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 4 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 18 % and the net present value at 8.5% discount rate is Birr 1.33 million.

D. ECONOMIC BENEFITS

The project can create employment for 26 persons. In addition to supply of the domestic needs, the project will generate Birr 1.21 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.