

**118. PROFILE ON BAMBOO FURNITURE  
MANUFACTURING**

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## **I. SUMMARY**

This profile envisages the establishment of a plant for the production of bamboo furniture with a capacity of 3,800 sets per annum.

The present demand for the proposed product is estimated at 20,937 sets per annum. The demand is expected to reach at 54,259 seats by the year 2020.

The plant will create employment opportunities for 15 persons.

The total investment requirement is estimated at about Birr 1.13 million, out of which Birr 80,760 is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 12% and a net present value (NPV) of Birr 71,200 discounted at 8.5%.

## **II. PRODUCT DESCRIPTION AND APPLICATION**

Bamboo furniture is a furniture made from bamboo. At present, there are few artisans engaged in bamboo articles production. This includes tables & chairs various house hold items. Bamboo furniture could be used in individual homes, hotels and recreational areas.

## **III. MARKET STUDY AND PLANT CAPACITY**

### **A. MARKET STUDY**

#### **1. Past Supply And Present Demand**

Furniture are movable articles commonly made from wood, metal, stone and plastics. Wooden furniture being the most preferable, now-a-days since wood based furniture is becoming expensive, bamboo furniture are emerging as the best substitute for wooden furniture.

According to the 1999/2000 Household Income, Consumption and Expenditure Survey conducted by the CSA, 0.44% of households income or Birr 27.5 is allocated to furniture and fixture. On the other hand, the country level expenditure on wooden ware was 0.04% or Birr 2.66.

For estimating the present demand for the product the following assumptions are used;

- The main users of the product are the urban population
- Of the total urban house holds only 15% will utilize bamboo furniture

Accordingly, total expenditure for furniture fixture by the target group (Birr 27.5 per house hold) is, therefore, estimated at Birr 34,894,750. Assuming an average price of Birr 2,500 for bamboo sofa set, the estimated demand for bamboo furniture is shown in Table 3.1.

**Table 3.1**

**ESTIMATED PRESENT DEMAND FOR BAMBOO FURNITURE**

	<sup>1</sup> Urban Population size	<sup>2</sup> Target populations (1x 15%)	<sup>3</sup> Expenditure in furniture fixtures ( 2 x 27.5)	<sup>4</sup> demand for bamboo furniture ( 3 / 2500
SNNPRS	1,338,000	200,700	5,519,250	2,208
County Level	12,689,000	1,903,350	52,342,125	20,937

## 2. Projected Demand

The demand for bamboo furniture is even though is directly related with new housing units, the replacement of existing furniture with bamboo furniture will also be major market segment. Generally, household spending on furniture and fixture increases with the per capita growth rate. Thus, it is appropriate to forecast the demand for bamboo furniture and texture along with GDP growth rate. The 2000-2004 average

real GDP growth rate achieved was 7.6 %. Applying this annual growth rate, the demand for bamboo furniture is presented in Table 3.1.

**Table 3.2**  
**PROJECTED DEMAND FOR BAMBOO FURNITURE**

<b>Year</b>	<b>Projected Demand</b>
2008	22,528
2009	24,240
2010	26,082
2011	28,065
2012	30,198
2013	32,493
2014	34,962
2015	37,619
2016	40,478
2017	43,555
2018	46,865
2019	50,426
2020	54,259

### **3. Pricing and Distribution**

After considering the current retail price of various types of furniture, a factory-gate price of Birr 125 per set is recommended for the envisaged plant. The product can be distributed through establishment of own outlets at selected urban centers.

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

The envisaged plant, at the initial stage, can be made to produce tables and chairs. At later stages, the plant can diversify its production to baskets, and bamboo -based doors and windows. Based on the market study , the plant is designed to produce 3,800 sets of bamboo furniture's (3,800 tables and 15,200 chairs) operating 300 days

per year and 8 hours a day in a single shift. Sundays and National holidays are taken into consideration in setting the number of working days.

## 2. Production Programme

The plant will start production at 75% of its rated capacity. Then, it will build up production to 85% and 100% in the successive years. The gradual capacity build-up is suggested to develop substantial market outlets for the product and enable the operators to get adequate time to develop the required skills and experience.

## IV. MATERIALS AND INPUTS

### A. RAW AND AUXILIARY MATERIALS

The major raw material is bamboo. Other materials include varnish and black oil. The total annual expenditure for raw material and auxiliary materials required by the plant is estimated at Birr 210,500. Details are shown in Table 4.1.

**Table 4.1**

### **RAW AND AUXILIARY MATERIALS REQUIREMENT AND COST**

<b>Sr. No.</b>	<b>Item</b>	<b>UOM</b>	<b>QTY REQ'RD</b>	<b>Cost '000 Birr</b>
1.	Raw bamboo	PCS	190,000	190
2.	Varnish & Black Oil	Gallons	90	13.5
3.	Others	-		6.500
	<b>Grand Total</b>			<b>210.00</b>

### B. UTILITIES

Utilities required by the envisaged plant consist of electricity and water. The annual cost of utilities is estimated at Birr 1,960.4. From this, electric consumption

(1500kWh) accounts for Birr 710.4 and water consumption (125m<sup>3</sup>) accounts for Birr 1,250.

## **V. TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**

#### **1. Production Process**

The major operation involved in the production of bamboo furniture (tables & chairs) are raw bamboo cooking, slitting, forming (setting the framework) body preparation and finishing. Different designs can be incorporated into the product.

First raw bamboo is cooked and dried. Then, it is split and cut into required thickness and size by tools prepared for this purpose. The framework required for the specific product is, then, prepared. Bamboo splits are, then, interwoven according to the design and required strength. Varnishes can be applied on the product to produce fine and attractive finish.

#### **2. Source of Technology**

Machinery and equipment for the new envisaged plant can be acquired from local companies such as Hagbes Plc, Blue Nile Trading, etc.

### **B. ENGINEERING**

#### **1. Machinery and Equipment**

Machinery and equipment required by the plant are a range of wood working tools together with benches. Hand saws, knives, vises, hand drills, etc. are some of the usefull appliance required by the plant. The complete list of machinery & equipment together with the cost, which is required in local currency, is given in Table 5.1. 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 250,000.

**Table 5.1****LIST OF MACHINERY AND EQUIPMENT AND COST**

<b>Sr. No.</b>	<b>Item</b>	<b>Qty.</b>	<b>Cost '000 Birr</b>
1	Knives (pcs)	19 pcs	0.38
2	Hacksaw (with blades)	11 pcs	0.44
3	Drilling machine	3 sets	4.50
4	Grinding machine	6 sets	6.00
5	LPG torch (with gas cylinders)	7 sets	1.75
6	Vise (with benches	8 pcs	3.20
7	Files	as require	0.4
8	Wood lathe	1 pcs	45
9	Power saw	1 pcs	15
10	Other items	-	4
	<b>Grand Total</b>		<b>80.76</b>

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

The plant requires a total of 600m<sup>2</sup> area of land out of which 300 m<sup>2</sup> is built-up area which includes Processing area, raw material stock area, offices etc. Assuming construction rate of Birr 2500 per m<sup>2</sup>, the total cost of construction is estimated to be Birr 750,000. The total cost, for a period of 80 years with cost of Birr 1 per m<sup>2</sup>, is estimated at Birr 600. The total investment cost for land, building and civil works is estimated at Birr 750,600.

**3. Proposed Location**

According to the resource potential study of the region, several varieties of bamboo are identified in Woredas like Bitta , Yeki Bench ,E/aner ,and Azernet. Based on the availability of raw material infrastructure, utility and market out let Gunchere town of E/aner woreda is selected and recommended to be the location of the envisaged plant.

## VI. MANPOWER AND TRAINING REQUIREMENT

### A. MANPOWER REQUIREMENT

Manpower required by the plant is 15 persons. The detailed list of labour force along with annual labour cost is presented in Table 6.1.

### B. TRAINING REQUIREMENT

The operators are required to be trained in institution like Development Agency for Handcrafts and Small Industries (DAHSI) in Addis Ababa. Such a training is estimated to cost about Birr 6,000.

**Table 6.1**  
**MANPOWER REQUIREMENT AND LABOUR COST (BIRR)**

Sr. No.	Description	Qty.	Monthly Salary	Annual Expenditure
1	<b>A. Administration</b>			
1.1	Plant Manager Clerk	1	900	10800
1.2	General Services	1	250	3000
			200	2400
2	<b>B. Production</b>			
2.1	Operators	3	400	14400
2.2	Labourers	10	200	24000
	<b>Sub total</b>	<b>15</b>		<b>54,600</b>
3	Benefits (25% Bs)			13,500
	<b>Grand Total</b>			<b>68,100</b>

## VII. FINANCIAL ANALYSIS

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

Construction period	1 year
Source of finance	30 % equity 70 % loan
Tax holidays	3 years
Bank interest	8%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30 days
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 1.13 million. 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	48.0
2	Building and Civil Work	750.0
3	Plant Machinery and Equipment	80.8
4	Office Furniture and Equipment	75.0
5	Pre-production Expenditure*	138.0
6	Working Capital	39.5
	<b>Total Investment cost</b>	<b>1,131.3</b>

\* *N.B Pre-production expenditure includes interest during construction ( Birr 63.01 thousand ) training (Birr 6 thousand ) and Birr 69 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 410,830 (see Table 7.2). The material and utility cost accounts for 51.59 per cent, while repair and maintenance take 3.65 per cent of the production cost.

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

<b>Items</b>	<b>Cost</b>	<b>%</b>
Raw Material and Inputs	210.00	51.12
Utilities	1.96	0.48
Maintenance and repair	15	3.65
Labour direct	32.76	7.97
Factory overheads	10.92	2.66
Administration Costs	21.84	5.32
Total Operating Costs	292.48	71.19
Depreciation	68.08	16.57
Cost of Finance	50.27	12.24
<b>Total Production Cost</b>	<b>410.83</b>	<b>100</b>

**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.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 73 \%$$

## 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 7 years.

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

Based on the cash flow statement, the calculated IRR of the project is 12 % and the net present value at 8.5% discount rate is Birr 71,200.

## D. ECONOMIC BENEFITS

The project can create employment for 15 persons. In addition to supply of the domestic needs, the project will generate Birr 210,050 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.