

## **46. CRUST LEATHER**

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## **I. SUMMARY**

This profile envisages the establishment of a plant for the production of Crust Leather with a capacity of 114,988 pieces of hides and skins per annum.

The present demand for the proposed product is estimated at 114,988 pieces per annum. The demand is expected to reach at 154,095 pieces by the year 2010.

The plant will create employment opportunities for 68 persons.

The total investment requirement is estimated at Birr 4.28 million, out of which Birr 8.85 thousand is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 16% and a net present value (NPV) of Birr 2.37 million, discounted at 8.5 %.

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

Crust leather is higher added value skin and hides already tanned ready for the finishing stage. The semi-tanned wet-blue leather undergo final tanning to produce crust leather. The distinct feature of this product from the wet-blue leather is that it has a visible physical properties such as size, thickness, fullness, looseness of grain and grain damages. It is rather a product of better tensile and tear strength chrome and fat content, etc than wet-blue leather. It is used by the leather finishing industries.

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

### **A. MARKET STUDY**

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

This project envisages to process raw hides and skins upto crust leather. Processing of leather upto crust level will be made by receiving raw material in the form of pickled and wet-blue leather from a project to be established in the region. Till recent times, hides and skins in Ethiopia is the second largest export commodity. The major export items are pickled, wet-blue, crust and some finished hides and skins. Table 3.1. contains data on the development of the production and export of hides and skins.

**Table 3.1**  
**INDUSTRIALLY PROCESSED DOMESTIC PRODUCTION AND EXPORT**  
**OF HIDES AND SKINS**

Year	Domestic Production		Export of Hides & Skins	
	Hides ('000sq.ft.)	Skins ('000 Pcs)	Quantity (tonne)	Value '000 Birr
1992/93	2927	8870	5574	134515
1993/94	3871	10849	7807	203610
1994/95	10008	12884	8387	373549
1995/96	4347	16308	7546	309701
1996/97	5192	11112	8638	372253
1997/98	5551	17913	7892	347699
1998/99	4566	13031	8824	243052
1999/00	6483	10845	8624	286489
2000/01	9245	29028	8604	633752
2001/02	4569	10489	12409	674426

**Source:** - *For Domestic production, statistical Abstract of CSA.*  
- *For Export, Annual Report of National Bank of Ethiopia.*

Table 3.1 reveals that there is a general increase in the processing of hides and skins by local tanneries although there is some fluctuation from year to year. When the data set is analyzed by grouping into two periods that is between 1992/93-1996/97 and between 1997/98-2001/02 the following facts are observed.

- Domestic production/processing of hides and skins crust and wet-blue hides, which was about 5.3 million sq.ft. on the average between 1992/93-1996/97 has increased to an average of about 6.1 million sq.ft. Between the two periods, there is an increase of about 15.5% on the average.
- Average domestic production/processing of skins between the above two cited periods have increased by about 35%. The average production which was 12 million Pcs of skins between 1992/93-1999 has reached to a level of about 16.3 million Pcs.
- The export volume of semi-processed hides and skins have shown a significant change during the past 10 years. During the period 1992/93-1996/97, the annual average volume of export was about 7,590 tonnes. This level has increased to an average of 9,612 tonnes between the years 1997/98-2001/02. The growth rate between the two periods was almost 27%.

- Export earning from hides and skins between the two periods have shown a significant increase. During the period 1992/93-1996/97, the annual average earning was about Birr 278.7 million. This has increased to a level of Birr 397.1 million during the period 1997/98-2001/02. In terms of value, the increase is by about 42% during the two periods.

Although the processing of raw hides and skins as well as export volume has increased in the past due to the banning of exporting raw hides and skins a substantial quantity of raw hides and skins are not collected mainly for the following reasons.

- Private collectors are only operating in place where easy collection is possible and areas where collection is more difficult are neglected.
- Large quantities of hides and skins are lost on account of smuggling.

The tanneries in Ethiopia are mainly located in Addis Ababa and its surroundings and few in the Northern part of the country. As a result, the country is losing a considerable amount of the raw material which is exported illegally or not collected and utilized at all. This is, particularly, true for the south, eastern and western part of Ethiopia. In view of the existing wide export market opportunity and availability in the supply of raw material in the BGRS, it is necessary to support the establishment of a small scale tannery. At country level, the export potential, as depicted in Table 3.1, is more than 10 thousand tonnes of hides and skins.

The tannery to be established in BGRS is going to process upto crust leather level has a very wide market. Thus, for plant capacity determination the main factor to be considered is the amount of raw hides and skins to be collected in the region and the capacity of the project which processes upto pickled and wet-blue leather.

According to the three year plan of the region, the livestock population is 253,702 cattle, 102,289 sheep and 240,848 goats. Taking the average off-take rate of 8%, 30% and 35% for cattle, sheep and goat, respectively, the raw hides and skins in the region would be as follows:

- Hides.....20,296
- Sheep skins.....30,687
- Goat skins.....84,296

Since the total produced hides and skins in the region is not expected to be collected, about 85% is assumed to be supplied to the market and processed upto pickled and wet-blue leather. Thus, the present amount of hides and skins to be upto pickled and wet-blue leather is estimated as follows:-

- Hides.....17,252
- Skins.....26,084
- Goat skins.....71,652

## 2. Projected Demand

As indicated earlier, there is a very wide market for semi-processed hides and skins. The limiting factor thus would be the amount of pickled and wet-blue leather to be supplied. On the other hand, it is believed that the collection system of hides and skins will be improved as a result of the development of infrastructure in remote areas. Moreover, contra band/illegal trade will be minimized due to the various measures which are being implemented by the government. Considering these positive trends, an annual average growth rate of 5% is applied for the future taking the present demand/supply as a base. The demand projection based on the supply of the raw material is given in Table 3.2.

**Table 3.2**  
**PROJECTED DEMAND FOR CRUST LEATHER FOR A PROJECT TO BE**  
**ESTABLISHED IN BGRS (IN PIECES)**

Year	Hides	Sheep and Goat Skin	Total
2004	17252	97736	114988
2005	18115	102623	120738
2006	19020	107754	126774
2007	19971	113142	133113
2008	20970	118798	139768
2009	22018	124739	146757
2010	23119	130976	154095
2011	24275	137524	161799
2012	25489	144400	169889
2013	26763	151621	178384
2014	28102	159202	187304
2015	29500	167162	196668

## 3. Pricing and Distribution

Price of crust leather fluctuates from year to year in the market. Considering the past 2-3 years average prices for crust leather, the following prices are adopted for sales projections.

- Crust hide = Birr 90 per piece
- Crust sheep skin = Birr 75 per piece
- Crust goat skin = Birr 65 per piece

The crust hides and skins can be directly exported without intermediaries. But in order to add value and to gain other benefits from the product, it is recommended to supply to a factory to be established at BGRS that process upto finished leather.

## B. PLANT CAPACITY AND PRODUCTION PROGRAMME

### 1. Plant Capacity

The market study reveals that there will not be any problem in marketing the crust leather. The factors that limit the capacity of the plant are availability of raw material, minimum economies of scale and availability of capital. Based on the above factors, the envisaged plant will have a capacity of processing 17,252 hides, 26,084 sheep skins and 71,652 goat skins from pickled and wet-blue stage to crust leather stage.

### 2. Production Programme

The plant will start its operation at 70% of its full capacity in the first year with a 10% build-up of capacity reaching full capacity in the fourth year and thereafter, considering skill development & market penetration problems. The plant will operate 300 day per year working under three shift system of 8 hours each.

## IV. MATERIALS AND INPUTS

### A. RAW MATERIALS

The main raw materials for production of crust leather from wet-blue leather stage are wet-blue leather, oils, synthetic tannins, vegetable tannins, aniline dyes, sodium bicarbonate, sodium acetate and formic acid. The consumption rate & their cost are shown in Table 4.1 below. The total cost of raw materials is estimated to be Birr 5,890,106, out of which Birr 1,239,750 is required in foreign currency.

**Table 4.1**  
**ANNUAL RAW MATERIALS REQUIREMENT AND COST**

Sr. No.	Type of Raw Material	Unit of Meas.	Qty.	Cost ('000 Birr)		
				FC	LC	TC
1	Wet-blue					
	- hides	Pcs	17252	-	897.104	897.104
	- sheep skin	Pcs	26084	-	1173.780	1173.780
	- goat skin	Pcs	71652	-	2579.472	2579.472
2	Oils		23	621		621
3	Synthetic tannins, powder		17	238		238
4	Vegetable tannins		13	130		130
5	Aniline dyes		3.5	210		210
6	Sodium bicarbonate		2.6	13		13.0
7	Sodium acetate		1.5	13.50		13.50
8	Formic acid		1.5	14.25		14.25
	<b>Grand Total</b>			<b>1239.75</b>	<b>4650.356</b>	<b>5890.106</b>

## **B. UTILITIES**

Water, fuel and electricity are the utilities required by the crust leather processing plant. The annual consumption rate for utilities is 15,000 m<sup>3</sup> of water, 220 m<sup>3</sup> of fuel oil and 130,000 kWh of electricity. The total cost of utilities is estimated to be Birr 751,620.

## **V. TECHNOLOGY AND ENGINEERING**

### **A. TECHNOLOGY**

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

The processes that follow from the wet-blue leather stage to produce crust blue leather are mentioned below.

##### **a) Trimming**

Rough edges of leather are trimmed to remove uneven, and ragged edges.

##### **b) Splitting**

Thick hides will be split by splitting machine. The top layer is called the grain part and the bottom layer, flesh part.

##### **c) Shaving**

Thickness of splits is adjusted in a machine fitted with shaving blades which reduce the substance of the leather according to the desired thickness.

##### **d) Retanning, fat liquoring and dyeing**

This is a combined process in which the semi-finished leathers will get a final tanning and some further treatment.

##### **e) Setting out**

As in sammying thin process involves the removal of moisture content. Creases are also removed at this stage.

##### **f) Drying**

The damp leather is dried. In hot weather natural drying is preferred.



### g) Conditioning

After drying, leather becomes stiff. For further operations, a certain degree of conditioning, i.e. moistening the leather to 28 to 30 per cent moisture content, is essential. Then, staking and sorting unit operations follow.

In the production of crust leather substantial effluent is generated. Full or partial treatment of effluent is essential to avert its adverse impact on environment.

### 2. Source of Technology

The following supplier can be contacted for machinery and equipment of processing wet-blue leather to crust leather.

Hohen forst Machinery Co.  
300 forest AV Amsterdam  
New York 12010, USA  
Tel: 1-518-842-0011  
Fax: 1-518-842-3771  
E-mail: HOHENMACH@aol.com.

## B. ENGINEERING

### 1. Machinery & Equipment

Machinery and equipment required for the envisaged project are depicted in Table 5.1 below. The total cost of machinery and equipment including appropriate spare parts is estimated to be Birr 8.85 million, out of which Birr 7.08 million is required in foreign currency. The plant needs three pick-up vehicles for transportation of finished product and for office work. The total cost of vehicles is estimated to be Birr 450,000.

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

<b>Sr. No.</b>	<b>List of Machinery</b>	<b>Qty</b>
1	Drum (retaning / dyeing)	2
2	Wringing machine	1
3	Setting out machine	1
4	Splitting machine	1
5	Shaving machine	1
6	Vacuum dryer, 2-plate	1
7	Drying machine, Tunnel drier	1
8	Measuring machine	1
9	Balance, heavy duty	1
10	Boiler	1
11	Scales, hand tools transport wagons, pallets, work tables & pipings	1

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

The plant requires a total of 5000 m<sup>2</sup> area of land, out of which 2000m<sup>2</sup> is built-up area which include raw stock store, chemical store, production area, grading / packing room, mechanical workshop, boiler room and offices. Assuming construction cost rate of Birr 900 per m<sup>2</sup>, the total cost of construction is estimated to be Birr 2,400,000. The land lease value by taking lease rate of Birr 1.5 per m<sup>2</sup> with 70 years of holding period is estimated to be Birr 525,000. The total cost of land, building and civil works assuming that the total land lease cost will be paid in advance is estimated to be Birr 2,925,000.

## **3. Proposed Location**

Availability of raw materials, labour force, utilities like electricity and water, infrastructure like road for ease of transportation of raw materials and processed materials are the major factors considered for the selection of location. So, Assosa zone is proposed to be the best location for the crust leather plant.

# **VI. MANPOWER AND TRAINING REQUIREMENT**

## **A. MANPOWER REQUIREMENT**

The total cost of manpower is estimated to be Birr 587,250. A total of 68 employees are required to run the plant. The manpower requirement for the plant and their monthly salary is indicated in Table 6.1.

**Table 6.1**  
**MANPOWER REQUIREMENT AND ANNUAL LABOUR COST**

<b>Sr. No.</b>	<b>Description</b>	<b>Req. No.</b>	<b>Monthly Salary (Birr)</b>	<b>Annual Salary (Birr)</b>
1	Plant manager	1	2000	24,000
2	Production and tech. manager	1	1800	21,600
3	Finance and administrative manager	1	1500	18,000
4	Commercial manager	1	1500	18,000
5	Chemist	3	900	32,400
6	Executive secretary	1	700	8,400
7	Production supervisors	3	800	28,800
8	Mechanic	3	500	18,000
9	Ass. mechanic	3	400	14,400
10	Electrician	3	500	18,000
11	Ass. electrician	3	400	14,400
12	Skilled operators	15	500	90,000
13	Unskilled workers	10	300	36,000
14	Accountant	2	900	21,600
15	Purchaser	1	900	10,800
16	Sales man	1	900	10,800
17	Cashier	1	450	5,400
18	Personnel	1	1200	14,400
19	General service head	1	900	10,800
20	Store keeper	2	450	10,800
21	Guard	6	300	21,600
22	Driver	3	300	10,800
23	Time keeper	2	450	10,800
	<b>Sub-Total</b>	<b>68</b>		<b>469,800</b>
	Employees benefit (25% of sub total)			117,450
	<b>Grand total</b>			<b>587,250</b>

## **B. TRAINING REQUIREMENT**

Production personnels, technical personnels and chemists need training on production technology, quality of product, operation and maintenance of machinery and equipment for about one month by expert of the technology supplier and / or at Ethiopian Leather Technology Institute. The total cost of training is estimated to be Birr 50,000.

## **VII. FINANCIAL ANALYSIS**

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

Construction period	1 years
Source of finance	30 % equity 70 % loan
Tax holidays	6 years
Bank interest	7.5 %
Discounted cashflow	8.5 %
Repair and maintenance	3 % of the total plant and machinery
Accounts receivable	30 days
Raw material, local	2 days
Raw materials, import	90 days
Work in progress	5 days
Finished products	15 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 4.28 million, of which 7.2 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**

<b>Sr. No.</b>	<b>Cost Items</b>	<b>Total ('000 BIRR)</b>
1	Land lease value	525.0
2.	Building and Civil Work	2,400
3.	Plant Machinery and Equipment	8.85
4.	Office Furniture and Equipment	5
5.	Vehicle	450
6.	Pre-production Expenditure*	289.5
7	Working Capital	604.8
	<b>Total Investment cost</b>	<b>4,283.2</b>
	<b>Foreign share</b>	<b>7.2</b>

\* N.B Pre-production expenditure includes interest during construction (Birr234.5 thousand), training (Birr 50 thousand), and ( Birr 5 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 7.7million (see Table 7.2). The material and utility cost accounts for 86 per cent while repair and maintenance take 0.4 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	5,889.8	76.3
Utilities	751.6	9.7
Maintenance and repair	33.9	0.4
Labour direct	469.8	6.1
Factory overheads	117,500	1.5
Administration Cost	5.0	0.1
<b>Total Operating Costs</b>	<b>7,767</b>	<b>94.1</b>
Depreciation	248.6	3.2
Cost of Finance	205.8	2.7
<b>Total Production Cost</b>	<b>7,722</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 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 including cost of finance when it starts to operate at full capacity ( year 1) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 17\%$$

**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 6 years.

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

Based on the cash flow statement, the calculated IRR of the project is 16% and the net present value at 8.5% discount rate is Birr 2.37 million.

**D. ECONOMIC BENEFITS**

The project can create employment for 68 persons. In addition to supply of the domestic needs, the project will generate Birr 0.2 million per annum in terms of tax revenue when it starts to operate at full capacity. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such factory will have a foreign currency earning effect to the country by increasing the current export level.