48. PICKLED AND WET-BLUE LEATHER

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I. SUMMARY

This profile envisages the establishment of a plant for the production of Pickled and Wet-Blue leather with a capacity of 114,988 pieces per annum.

The present demand for the proposed product is estimated at about 115,000 pieces per annum. The demand is expected to reach at 154,000 by the year 2010.

The plant will create employment opportunities for 57 persons.

The total investment requirement is estimated at Birr 8.3 million, out of which Birr 5.6 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 26.7 and a net present value (NPV) of Birr 10.1 million, discounted at 8.5 %.

II. PRODUCT AND APPLICATION

In the process of tanning, technically the process of converting the protein in hides and skins which is subject to decay into a stable non putrefiable material, pickled and wet-blue leather are the first phase. Pickled leather is hides and skins that is made ready to allow tanning agents to penetrate by undergoing chemical treatments first by alkaline chemicals and then by acids and common salts, while wet blue leather is hides and skin treated with chrome tannage.

Pickled leather is used as raw material for wet-blue leather production which inturn is used as a raw material for crust leather production.

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 pickled and wet blue level. Upto 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. Presents 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 (tonnes)	Value '000 (Birr)
1992/93	2927	8870	5574	134515
1993/94	3871	10849	7807	203610
1994/95	10008	12884	8387	483549
1995/96	4347	16308	7546	309701
1996/97	5192	11112	8638	482253
1997/98	5551	17913	7892	347699
1998/99	4566	13031	8824	243052
1999/00	6483	10845	8604	286489
2000/01	9245	29028	12409	634852
2001/02	4569	10489	10334	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 increase to an average of 9,612 tonnes between the years 1997/98-2001/02. The growth rate between the two periods was about 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 places 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 loosing a considerable amount of the raw material which is exported illegally or not collected and utilized at all. This is, particularly true for the southern, 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 pickled and wet blue 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.

According to the three year plan of the region, the livestock population in the region is 253,702 cattle, 102,289 sheep and 240,848 goats. Taking the average off-take rate of 80%, 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 skin……30,687
- Goat skin…….84,296

Since the total hides and skins produced 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 processed upto pickled and wet blue leather is estimated as follows:-

- Hides……..17,252
- Sheeps skins……...26,084
- Goat skin…….71,652

2. Projected Demand

As indicated earlier, there is a very wide market for semi-processed hide and skins. The limiting factor, thus, would be the amount of raw material 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, contraband/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 PICKLED AND WET BLUE 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	148524	161799
2012	25489	144400	169889
2013	26763	151621	178384
2014	28102	159202	187304
2015	29500	167162	196668

3. Pricing and Distribution

Considering the past 2-3 years average prices for pickled and wet-blue leather, the following prices are adopted for sales projections.

- Pickled & wet-blue hide = Birr 52/piece
- Pickled & wet-blue sheep skin = Birr 45 / piece
- Pickled & wet-blue goat skin = Birr 36 / piece

The pickled and wet blue hides 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 crust leather level.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on the market study, the main factor in the determination of plant capacity is the amount of raw hides and skins to be collected in the region. So by considering the minimum economies of scale and the availability of raw hides and skin in the region, the envisaged plant will have a capacity of processing 600 tonnes of raw hides and skins (Hides - 17,252, sheep skins - 26,084 and goat skin - 71,652). The plant is expected to produce 40% pickled leather and 60% wet blue leather.

2. Production Programme

Considering skill development, market penetration and difficulty of collecting raw hides and skins the plant will start its operation at 70% of its full capacity in the first year, with a 15% buildup reaching full capacity in the third year and thenafter. The plant will operate 300 days a year under three shift system of 8 hours each day.

IV. MATERIALS AND INPUTS

A. RAW MATERIALS

The main raw materials required in the production of pickled and wet blue leather are raw hides and skins and chemicals like chrome salt, common salt, calcium hydroxide, sodium sulfide, ammonium sulfate, sulfuric acid, sodium carbonate, enzymatic bate, calcium format. Most of the chemicals are imported while the hides and skins, common salt, calcium hydroxide, sodium carbonate and sulfuric acid are locally available. Table 4.1 indicates the annual raw materials requirement at full operation capacity of the plant and the cost estimates.

Table 4.1
ANNUAL REQUIREMENT OF RAW MATERIALS AND COST

Sr. No.	Description	Qty	Cost ('000 Birr)		
			FC	LC	TC
1.	Raw hides and skin	600 tonnes	-	1021.2	1021.2
2.	Chrome salt 26% CR_2O_3	28 tonnes	147.8	-	147.8
3.	Common salt	40 tonnes	-	60	60
4.	Calcium hydroxide power	27 tonnes	-	24.84	24.84
5.	Sodium sulfide, 60%	27 tonnes	44.55	-	44.55
6.	Ammonium sulfate	10 tonnes	8.73	-	8.73
7.	Sulfuric acid	8 tonnes	-	36.8	36.8
8.	Sodium carbonate	4 tonnes	-	4.8	4.8
9.	Enzymatic bate	4 tonnes	80.6	-	80.6
10.	Calcium format	3.3 tonnes	14.8	-	19.8
	Grand Total		**301.48**	**1147.64**	**1449.12**

As shown in Table 4.1, the annual cost of raw materials is estimated to be Birr 1,449,120.

B. UTILITIES

Water, fuel and electricity are the utilities required for the production of pickled and wet-blue leather 17,000m^3 of water, 5000 lt of fuel and 80,000 kWh of electricity is required for the envisaged plant when it operates at full capacity. The total cost of utilities is estimated to be Birr 86,920.

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The process for producing pickled leather involves the following procedures

a) Soaking

It is aimed at restoring hides and skins to the state they had immediately after flaying from the animals. Flayed hides and skins are in most cases cured to prevent putrefaction before reaching the tanneries.

b) Trimming

Is carried out to remove those parts of raw hides which would be of no use as leather and which could cause difficulties in latter operations.

c) Fleshing

Is performed to break up the fibres of the hide substance and to remove flesh tissues. Wet -salted stock of good condition may not need the fleshing after soaking, but all stock should be fleshed after liming.

d) Liming /unhearing

Is required to open up the hide structure and to dissolve the hair roots, leaving a clean grain side free from hair.

e) Deliming / bathing

Pickling removes the lime and certain hide constituents and degradation products that are detrimental to a satisfactory result in the subsequent processes by soaking in a weak solution of acid.

The production of wet blue leather envolves the following additional processes in the pickled leather production.

f) Chrome tanning

The skins & hides are immersed in a basic chromium sulfate solution with in a large revolving drum that tumbles the skins and hides.

g) Sammying (wringing)

In this process, the moisture content of semi finished leather is reduced. Although the usual practice is to use a sammying machine (which squeezes the wet leather as it passes between the two rollers of the machine for this operation), a manufacturer may decide to do it by hanging the leather on poles or simply by letting them lie in piles.

h) Sorting

After sammying the leathers are sorted and graded according to grain quality.

In leather manufacturing, substantial effluent is generated which, if not fully treated, can cause air and water pollution.

2. Source of Technology

The following company can be contacted to get the machinery and equipment for processing raw hides and skins to pickled and wet blue leather.

Hohen forst Machinery Co.
300 forest AV Amsterdam
New York 12101, USA
Tel: 1-518-842-0011
Fax: 1-518-842-4871
E-mail: HOHEN MACH@aol.com.

B. ENGINEERING

Machinery and equipment required for the envisaged project are shown in Table 5.1. The total cost of machinery and equipment including, spare parts is estimated to be Birr 5.6 million, out of which Birr 4.5 million is required in foreign currency.

Table 5.1
LIST OF MACHINERY AND EQUIPMENT

Sr. No.	Item	Qty.
1	Mixer	2
2	Drum	2
3	Fleshing machine	2
4	Wring / seting-out machine	1
5	Measuring heavy duty	1
6	Balance heavy duty	
7	Hot water generator	1
8	Scales, hand tools, transport wagons, pallets & work tables	1

2. Land, Building and Civil Works

The total land requirement is 5000 m^2. This will include raw stock store, chemical store, production area, grading / packing room, mechanical workshop, offices, space for effluent treatment and for future expansion. The space occupied by factory buildings is estimated to be 1000 m^2. The factory buildings are fairly simple construction but the concrete foundation in the production area should be designed with the disposal of the different effluents in mind. The total cost of building at a construction cost rate of Birr 900/m^2 is estimated at Birr 900,000. The land lease value at a rate of Birr 1.5 per m^2 for 70 years 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 1,425,000.

3. Proposed Location

The plant can be located in an area where there is raw material availability and center for market to produce the product at a reasonable and competitive price. The location should also consider the availability of utilities, specially water. So, the proposed location for the envisaged plant will be at Assosa zone considering its cattle, sheep and goat potential and availability of infrastructure.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

A total of 57 employees are required for the plant and the total labour cost including fringe benefits is estimated to be Birr 505,500. The manpower requirement for the envisaged plant and their salary requirement is shown Table 6.1.

Table 6.1
MANPOWER REQUIREMENT AND LABOUR COST

Sr. No.	Description	Req. No.	Monthly salary (Birr)	Annual salary (Birr)
1	Plant manager	1	2,000	24000
2	Executive secretary	1	750	9000
3	Chemist	3	1,200	43200
4	Production Supervisor	3	1,200	43200
5	Mechanic	3	600	21600
6	Electrician	3	600	21600
7	Skilled operators	12	600	86400
8	Unskilled laborers	15	300	54000
9	Store keeper	2	500	12000
10	Purchaser	1	900	10800
11	Accountant	1	900	10800
12	Cashier	1	500	6000
13	Sales man	1	900	10800
14	Personnel	1	900	10800
15	Time keeper	3	450	16200
16	Guard	4	300	14400
17	Drivers	2	400	9600
	Sub-total	**57**		**404400**
	Employees benefit (25% of sub total)			101100
	Grand total			**505500**

B. TRAINING REQUIREMENT

Production personnel, technical personnel and chemists need training on the production process, quality and maintenance of machinery and equipment for about two weeks by the expert of technology supplier. The cost of training is estimated to be Birr 30,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the Pickle and Wet Blue 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	5 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	30 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 about 8.3 million of which 55.2 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

Sr. No.	Cost Items	Total ('000 BIRR)
1	Land lease value	525
2.	Building and Civil Work	900
3.	Plant Machinery and Equipment	5,600
4.	Office Furniture and Equipment	10
5.	Vehicle	600
6.	Pre-production Expenditure*	474.3
7	Working Capital	174.4
	Total Investment cost	**8,283.7**
	Foreign share	**55.2%**

* *N.B Pre-production expenditure includes interest during construction (Birr 439.3 thousand), training (Birr 30 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 of the plant is estimated at Birr 3.3 million (see Table 7.2). The material and utility cost accounts for 46.2 per cent depreciation and financial costs take 35.4 per cent of the production cost.

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

Items	Cost	%
Raw Material and Inputs	1,449	43.6
Utilities	86.9	2.6
Maintenance and repair	76.4	2.3
Labour direct	404.4	12.2
Factory overheads	101.1	3.0
Administration Cost	30.0	0.9
Total Operating Costs	**2,147.9**	**64.7**
Depreciation	759.3	22.9
Cost of Finance	415.1	12.5
Total Production Cost	**3,322.3**	**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 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 operates at full capacity (year 3) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 47.8\ \%$$

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 26.7% and the net present value at 8.5% discount rate is Birr 10.05 million.

D. ECONOMIC BENEFITS

The project can create employment for 57 persons. In addition to supply of the domestic needs, the project will generate Birr 0.5 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 exchange earning effect to the country by on increasing the current export level.