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SOME ECONOMIC ASPECTS CONCERNING
THE ESTABLISHMENT OF TANNERIES
IN DEVELOPING COUNTRIES ^{1/}

by

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SOME ECONOMIC ASPECTS OF UPPER LEATHER TANNERY DEVELOPMENT

CAPITAL REQUIREMENTS AND RELATED POLICIES

INTRODUCTION

Without doubt the geographical centres of the tanning industry are rapidly changing. As is to be expected the developing countries, who in the past were content to supply the developed nations with raw hides and skins, have now begun to realise that there should be a large potential economic advantage and that they are fully capable of processing these raw materials to some intermediate stage, or even to the finished goods state with the obvious increase in "added value".

In most cases these developments have been coupled with planned export programmes for the products so produced. This trend - establishing tanneries in developing countries - is to some extent fought by the existent tanners in the developed world, but even so the trend will continue and the rate of tannery development in developing countries will accelerate. This is true whether Governmental assistance is given or not. The major factor is the realization that the technologies involved are of a relatively low level and easily acquired. Today, in large areas of the world Governments are actively promoting (by penalty or subsidy) this development (India, Indonesia and South America being typical examples). It is unfortunate that they have little documented work to guide them in assessing the true economics of tanning. There may be an abundance of papers covering the theoretical concepts of tannery development, and an even greater availability of processing and machinery detail, but there is obviously a need for some economic/financial data which could give Governments a better understanding of the fundamentals.

In a short paper it is impossible to cover the whole field of tannery economics and it is felt best to present a typical case study in outline, covering an actual Upper Leather Tannery Project which could yield useful background data.

The actual outline details of the Case Study may be found in Annexes I to III and in the paper conclusions are drawn as to the Capital Requirements and other factors for a tannery to produce at various stages of production, viz :-

Wet Blue Leather
 Crust Leather
 Finished Leather

As in most developing countries the "Foreign Currency" element is most important it has therefore been isolated from both capital requirement and annual running costs so that a true appreciation of the actual potential benefits and requirements may be obtained.

Basic economic details such as % Interest, Amortization etc., which are common to all new developments are not dealt with in depth in this paper, as they do not differ from other industries.

No one would suggest that the "Case Study" used in Annexes I to III can suit all circumstances, it is however based on an actual project in a typical development situation and can be accepted as a basis on which to judge future proposed projects.

CHAPTER I

BASIC CONCEPTS ACCEPTED FOR THE CASE STUDY

It may be assumed that the ultimate objective of all developing countries is to convert all, or as much as possible, of their raw hides and skins to fully finished Leather articles - be they shoes or other leather goods. As an interim measure most countries accept that they will obtain a good foundation by developing the tanning sector first. Fabrication - although obviously more lucrative - is a later development, and is outside the scope of this paper.

If we assume that the ultimate major future aim is the production of a leather shoe we need to have the capability to produce :-

- A. Good grade Upper Leather
- B. Good grade Sole Leather

It should be noted that the example of Italy and Spain (the two countries which have had success in shoe exports) show that the 100% Leather shoe is perhaps the article which yields the best economic return in Export markets. However in this short paper we will only deal with the production of Upper Leather.

(N.B. It is understood that a separate paper will be presented by others dealing with a newly developed economic sole leather process (1))

The case study given here is for a unit to process 1,200 African Dried Hides per day, this could be referred to as a large unit and obtains all such economies of scale as are available. The Hide and Finished Leather prices used are those of December 1972, and it is perhaps worth noting that these prices are near the maximum they have ever reached. This is responsible for a twofold effect :-

- (1) The capital requirements for work in progress are high - nearly double that which would have been the case a year earlier.
- (2) Due to the high hide and leather prices it becomes more and more certain that leather and/or leather goods will be exported as the cost/value of these items is beyond the pocket of the majority of the indigenous population of the developing countries.

In this paper reference to "economic viability" is referring to classical "Private Enterprise" economic systems. Some of the viewpoints would be the same in a "State Controlled Economy" but the emphasis and deductions may differ. In the same context it is assumed that the tannery will be operating in an unprotected situation, and its sales price structure must therefore be capable of withstanding direct competition with other similar products on the international market.

(A case study of a tannery operating in a heavily tariff^e protected country yields little useful information as, however inefficiently it may be run, it can still show a profit in its accounts).

It has been accepted, in the case study, that machines will be operated two or three shifts per day to suit any technology adopted, and ensure maximum use of plant installed. Likewise building costs have allowed for essential requirements only, and have assumed single storey light constructions capable

(1) Atkinson & Scowcroft - Montecatini 5/73 via "LEATHER"
June 1973

of expansion, suitable for most developing countries (e.g. light steel frame - subject to local availability). No allowance has been made for overhead cranes or similar systems as these have two retrograde effects :-

- (1) Require buildings to be much sturdier - often twice as expensive
- (2) Lessen labour usage - when it must be accepted that the prime objectives in many developments is the employment of local personnel, and an important factor is Capital cost per person employed.

One would assume that fork lift trucks and pulling motors are all that is essential for economic operation.

We have already assumed that the products from our Case Study will end up on the world export market - which it must be noted is extremely competitive - for this reason the social and hygienic amenities allowed in the study are minimal, utilitarian - on the lines of a commercial project - not up to the standards of a Governmental prestige project.

Most authorities strongly hold the view that each project must be tailored to the situation, and deplore greatly the initiating of projects in developing countries which are based on copying the layout and structure of existing plants in developed countries.

In the Case Study it has been assumed that maximum use has been made of local manufacture. Drum bodies, tables, pallets etc. can be produced at very low cost in most developing countries. Sometimes it may be necessary to import one of each item as samples for local artisans to copy.

It may be questioned whether an "ideal Case Study project" can ever be developed. To this it may be replied that the figures quoted in Annexes I to III are based on actual experience in developing countries. However it must be noted that capital figures 100% up or down have been reported for smaller sized units.

An experienced entrepreneur who was prepared to use reconditioned machinery and have minimum reserve capacity could well reduce his requirements by over 50%.

Likewise a prestige project - with a surfeit of reserve capacity and ultra modern social amenities could well require an increase of 100% in capital requirement.

Although the "Case Study" refers to a typical developing country it is assumed that power is available. Also water (piped, well, river or lake) is essential, and obviously these two factors would have been evaluated prior to site selection.

Due to the fluctuations of Raw Hide and Skin prices over the period 1971 - 3, it is difficult to be over definite concerning the capital involvement in the Case Study. The 100% or more rise in Hide Prices obviously altered many factors. In August 1973 there have been signs of a fall in prices but for consistency the Case Study uses the data of December 1972.

In the calculations that follow it has been assumed that 100% production is exported. In actual fact one would only expect to export some 80%, as the lower grade material would be used on the domestic market.

CHAPTER II THE FOUNDING OF A TYPICAL LEATHER ESTABLISHED
IN THE UPPER MIDDLE TANNERY TO PRODUCE 1,200
AFRICAN HIDES PER DAY

The production of a tannery will be governed by marketing considerations as well as economics, therefore, some of the following will need to be elaborated and examined in each project being initiated.

A TOTAL CAPITAL REQUIREMENT

From Annexes I and II one may find the Total Capital requirements for the various stages of processing :-

TABLE I - TOTAL CAPITAL REQUIREMENT FOR TANNERY (in U.S.\$)

	To produce :-		
	Wet Blue	"Ready to Finish"	Finished Leather
Foreign Currency	765,692	1,624,103	2,321,598
Local Currency	1,234,308	1,875,897	2,178,402
Total Capital U.S.	\$2,000,000	\$ 3,500,000	\$ 4,500,000

One may compare the figures in Table I with ex factory selling prices (December 1972) (for complete run of production).

TABLE II - SALES - TOTAL CAPITAL INVESTED (in U.S.\$)

Product	Ex Factory Value of Sales	Capital Invested	<u>Sales</u> <u>Capital</u>
<u>Wet Blue</u>	@ 31.0 cents ft = 2,790,000	2,000,000	1.39
<u>Ready to Finish</u>	@ 41.0 cents ft = 3,690,000	3,500,000	1.05
<u>Finished</u>	@ 46.0 cents ft = 4,140,000	4,500,000	0.92

On these figures one may initially feel that Wet Blue offers a good return for the capital invested.

However, if we refer to the added value only (i.e. deduct value of raw hide, 15.7 U.S. cents which could have been exported easily and obtained foreign currency) we find :-

TABLE III - ADDED VALUE - TOTAL CAPITAL INVESTED (in U.S. \$)

Product	Added Value	Capital Invested	<u>Added Value</u> Capital
<u>Wet Blue</u>	@ 12.30 cents ft = 1,107,000	2,000,000	0.55
<u>Ready to Finish</u>	@ 22.30 cents ft = 2,007,000	3,500,000	0.57
<u>Finished</u>	@ 27.30 cents ft = 2,457,000	4,500,000	0.55

On this basis the return for Wet Blue is not such an attractive proposition, and this is perhaps a more sensible way to assess the situation and shows the economy of "Ready to Finish".

In some circumstances one may be more interested in "Added Value" compared with the foreign currency element of the total investment.

This would give us :-

TABLE IV - ADDED VALUE to FOREIGN CURRENCY INVESTED (in U.S.\$)

Product	Added Value	Foreign Capital Invested	<u>Added Value</u> Foreign Currency Invested
<u>Wet Blue</u>	1,107,000	765,692	1.45
<u>Ready to Finish</u>	2,007,000	1,624,102	1.24
<u>Finished</u>	2,457,000	2,321,538	1.06

On these figures Wet Blue once more appears as a good economic

proposition but perhaps more these figures show the merit of "Ready to Finish" leather over Finished leather.

(The lower apparent uplift between sale prices of Finished over "Ready to Finish" is mostly accounted for by the peculiar situation we are in today with many countries subsidising Finished Leathers (to aid export) thus making Finished Leather from developing countries almost uneconomic to process without subsidy).

B ANNUAL FOREIGN CURRENCY REQUIREMENT

Another important aspect of tannery economics is the continuing Annual Foreign Currency requirement for the tannery operation. From Annex III we can obtain :-

TABLE V - ANNUAL FOREIGN CURRENCY REQUIREMENT AND EARNINGS
(in U.S. \$)

	<u>Wet Blue</u>	<u>"Ready to Finish"</u>	<u>Finished Leather</u>
Annual Foreign Currency reqd.	427,785	793,425	1,175,756
"Added Value" per sq.ft. U.S. cents	12.30	22.30	27.30
Annual "Added Value" 9 million ft.	1,107,000	2,007,000	2,457,000
<u>Net "Added Value" In Foreign Currency: U.S.\$</u>	679,215	1,213,575	1,281,244

As expected on these figures "Ready to Finish" and Finished Leather both show a greater "Added Value" in foreign currency than wet Blue (when processing the same number of hides).

"Ready to Finish" appears a better proposition - they return almost the same "Added Value", yet Total Capital Investment is U.S. \$ 1,000,000 less. When this is seen in context of the market situation where "Ready to Finish" sells much easier - in larger lots - than Finished, one has no hesitation today in recommending the production of "Ready to Finish" leathers rather than Finished Leathers.

C. CAPITAL/JOB OPPORTUNITIES

From Annexes I and II and the attached notes we may relate job opportunities with capital invested.

TABLE VI - RELATIONSHIP: CAPITAL/JOB OPPORTUNITIES

	Wet Blue	"Ready to Finish"	Finished Leather
Local Employees	71	225	313
Total Capital U.S. \$	2,000,000	3,500,000	4,500,000
Total U.S. \$ per job opening	28,169	15,556	14,377
CAPITAL:FOREIGN CRNCY U.S.\$	765,692	1,624,103	2,321,598
FOREIGN CRNCY U.S. \$ per job opening	10,784	7,218	7,417

On these figures one may state that Wet Blue is not an economic method of creating job opportunities. "Ready to Finish" and Finished do not differ greatly, but on Foreign Currency "Cost per Job Opportunity", "Ready to Finish" shows up best.

PROFITABILITY

All of the examples given in the Case Study (Annexes I, II and III) show good profits :-

TABLE VII - PROFITABILITY AT DIFFERING STAGES OF PROCESS
(9,000,000 sq. ft.) (in U.S. \$)

	<u>Wet Blue</u>	<u>"Ready to Finish"</u>	<u>Finished</u>
Ex factory sales	2,790,000	3,690,000	4,140,000
Less cost of production	2,373,185	3,020,205	3,567,756
PROFIT	416,815	669,795	572,244
% TOTAL CAPITAL	20.84%	19.14%	12.72%

Thus, for an actual tanner Wet Blue may show best returns but from a countries overall economic viewpoint "Ready to Finish" is far better. When one allows for the much higher "Added Value" in foreign currency (see Table II in B above), plus a good profit figure, there is no doubt that such a stage of processing yields maximum value under current conditions, for a given amount of raw material.

CONCLUSION

Under present conditions - with many nations subsidising the export of Finished leathers, it is not economic to enter the Finished Leather field unless one has Governmental aid.

Wet Blue - which is not really economic to produce - i.e. yields minimum "Added Value" per unit processed, gives big profit return to individual producers, as tanners in developed countries all demand it to allow them to retain and finish to their own requirements, but the producing country gets a poor return in Foreign Currency.

"Ready to Finish" which appears to give good return on capital, plus high "Added Value" in terms of foreign currency, seems the ideal object for future projects, especially as it allows the final finishing in country of importation to exact requirements.

The current situation whereby Wet Blue pays little or no duty, and Finished Leather pays a high duty accentuates the above position, and until the current tariff systems are altered trade in Finished Leathers will be difficult.

The relationship sales turnover to Total Capital given in these examples may appear low to tanners operating in developed countries, partly due to the fact that in most cases their plant and machinery stands them at much lower values.

Traditional established tanners in Europe expect turnover:capital to be at least 3:1. The figures quoted in the Case Study are however more in line with new developments (inflated machine prices) (more goods in pipeline, therefore higher "Work in Progress") in developing countries where ratios of 1:1 or 1:2 are more normal.

FIXED CAPITAL REQUIREMENTS FOR A FARMERY TO
PRODUCE 1,200 AFRICAN WIDERS PER DAY

(See notes on following pages)

(All expressed in U.S. \$)

	To Wet Blue		To Ready to Finish		To Finished State	
	Foreign Crncy	Local Crncy	Foreign Crncy	Local Crncy	Foreign Crncy	Local Crncy
Land		50,000		70,000		80,000
Buildings (a)	120,000	60,000	240,000	120,000	360,000	180,000
Machinery deliv	240,000	80,000	585,000	195,000	850,000	200,000
Spares	24,000	8,000	58,500	19,500	85,000	20,000
Installation of Machinery	32,000	32,000	78,000	78,000	105,000	105,000
Water/Effluent/Services (b)	100,000	100,000	150,000	150,000	170,000	170,000
Vehicles	14,000		27,000		27,000	
Laboratory	4,000	1,000	6,000	1,500	8,000	2,000
Maintenance Dept.	20,000		30,000		40,000	
Boiler etc.	20,000		100,000		144,000	
Contingencies At 10%	57,400	33,100	127,450	63,400	178,900	75,700
	631,400	364,100	1,401,950	697,400	1,967,900	832,700

TOTAL

FIXED CAPITAL U.S. \$ 995,500

U.S.\$ 2,099,350

U.S.\$ 2,800,600

ANNEX II

WORKING AND TOTAL CAPITAL REQUIRED FOR A TANNERY
TO PRODUCE 1,200 AFRICAN HIDES PER DAY

(See notes on following pages)

	<u>To Wet Blue</u>		<u>"Ready to Finish"</u>		<u>Finished State</u>	
	<u>Foreign Crncy</u>	<u>Local Crncy</u>	<u>Foreign Crncy</u>	<u>Local Crncy</u>	<u>Foreign Crncy</u>	<u>Local Crncy</u>
A						
<u>WORKING CAPITAL</u>						
Hides (3 mths supply) (1)		421,200		421,200		421,200
Chemical Stks (3 mths)	55,186		96,311		155,489	
Work in Progs (2 mths) (3)	79,106	315,424	125,842	377,525	198,209	396,417
Other		132,584		379,772		528,085
WORKING CAPITAL	134,292	810,208	222,153	1,178,497	353,698	1,245,702
TOTAL WORKING CAPITAL	U.S.\$ 1,001,500		U.S.\$ 1,400,650		U.S.\$ 1,699,400	
B						
<u>TOTAL CAPITAL</u>						
<u>Fixed Capital from Annex I</u>	631,400	364,100	1,401,950	697,400	1,967,900	832,700
	U.S.\$ 995,500		U.S.\$ 2,099,350		U.S.\$ 2,800,600	
<u>TOTAL CAPITAL</u>						
Foreign Crncy	765,692		1,624,103		2,321,598	
Local Crncy		1,234,308		1,875,897		2,178,402
<u>TOTAL CAPITAL</u>	U.S.\$ 2,000,000		U.S.\$ 3,500,000		U.S.\$ 4,500,000	

ANNEX III

ANNUAL PRODUCTION COSTS

TO PROCESS 360,000 Hides per annum at 25 sq. ft. average =
9,000,000 sq. ft. per annum

(See notes on following pages)

(All expressed in U.S. \$)

	Wet Blue		"Ready to Finish"		Finished	
	Foreign Crncy	Local Crncy	Foreign Crncy	Local Crncy	Foreign Crncy	Local Crncy
Chemicals	220,745		385,245		621,956	
Depreciation (c)	31,600	10,400	73,500	24,300	104,800	27,200
Senior Staff (d)	31,440		55,680		84,000	
Other Staff (e)		61,200		193,680		270,000
Other Expenses (f)	44,000	44,000	104,000	104,000	140,000	140,000
Packing (g)		45,000		45,000		45,000
Interest on Total Capital (h)	100,000	100,000	175,000	175,000	225,000	225,000
	427,785	260,600	793,425	541,960	1,175,756	707,200
Raw Hide		1,684,800		1,684,800		1,684,800
U.S.\$	427,785	1,945,400	793,425	2,226,780	1,175,756	2,352,000
<u>Total Annual Production Costs</u>	U.S.\$ 2,373,185		U.S.\$ 3,020,205		U.S. \$ 3,567,756	

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(a) It is assumed that 9,000 sq. ft. of building would be needed for the "finished" project, the other stages of production being proportionately less. It is assumed that U.S. \$ 60 per sq. ft. will produce a reasonable building.

(b) Cost of supply of water and services and treatment of effluent vary greatly, according to location. Typical examples have been used.

(c) Depreciation has been allowed on Buildings - 4%
on Plant and Machinery - 10%
on Vehicles - 20%

(d) It is assumed that in the initial years of operation some expatriate assistance will be required.

(e) Assume Skilled labour paid circa U.S.\$ 4.8 p.day
Unskilled labour paid circa U.S.\$ 2.4 p.day

<u>Requirements</u>	<u>Wet Blue</u>	<u>Ready to Finish</u>	<u>Finished</u>
Skilled labour	14	44	62
Unskilled labour	57	181	251
	71	225	313

(f) Other expenses include local Land Taxes, Building and Site Maintenance, Heat, Power, Local Transport, Office expenses and Insurance etc. Have assumed a 50:50 Foreign:Local currency requirement.

(g) Allow U.S. \$ cents 0.5 per sq. ft.

(h) Allow 10% - As method of financing is unknown assume 50:50 Foreign:Local currency payments.

(i) 1,200 Hides (Selected Air Dried) to be processed daily = 360,000 p.a. @ 5.2 Kg average = 1,872,000 Kg @ U.S. cents 0.90 Kg (Dec.1972) = U.S. \$ 4.68 Hide = U.S. \$ 1,694,800 p.a. or U.S. cents 18.72 per sq.ft. raw material.

(j) The "Work in Progress" has been allocated vis a vis Foreign and Local currency requirements in roughly the proportions of annual production costs.



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