



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)

RESTRICTED

08178

DP/ID/SER.A/144  
16 March 1978  
English

ASSISTANCE TO THE NATIONAL AGENCY  
FOR EXPORT DEVELOPMENT (NAFED), MINISTRY OF TRADE,  
IN THE FIELD OF EXPORT PRODUCT ADAPTATION\*

IS/INS/74/030/

INDONESIA

Technical report: Assistance to the tanning industry .

Prepared for the Government of Indonesia by the  
United Nations Industrial Development Organization,  
executing agency for the United Nations Development Programme

Based on the work of Fakhry Z. Samaan, production engineer  
for tanning industries

United Nations Industrial Development Organization  
Vienna

---

\*This report has been reproduced without formal editing.

id. 78-1446

The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Mention of firm names and commercial products does not imply the endorsement of the United Nations Industrial Development Organization (UNIDO).

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
PART ONE	
SUMMARY.....	1
INTRODUCTION.....	1
1. Background.....	1
2. Objectives.....	2
3. Official arrangement.....	3
4. Methodology and work programme.....	5
I. HIDES AND SKINS AVAILABILITY.....	8
1. Indonesian breeds.....	8
2. Methods of cattle raising.....	9
3. Livestock population.....	11
4. Livestock development policies.....	19
5. Ranching projects in Indonesia.....	22
6. Slaughter houses and flaying.....	26
7. Hides and skins preservation.....	30
II. TANNERIES AND LEATHER TANNING INDUSTRY.....	34
1. Kind of tanneries.....	34
2. Number of tanneries.....	36
3. Technology and leather quality.....	38
4. The quantity of leather produced.....	42
5. Marketing.....	44
6. Leather goods and leather footwear.....	51
7. Reptile skins.....	53
8. Obstacles facing tanning industry.....	53
9. Specific description for some selected tanneries.....	57
a. Governmental tannery.....	58
b. Exporting tannery.....	63
c. Domestic tannery.....	67
d. Home industry tannery.....	71
III. LEATHER RESEARCH INSTITUTE.....	73
IV. FORESTRY, ACACIA AND MANGROVE.....	85
RECOMMENDATIONS.....	90

<u>Chapter</u>	<u>Page</u>
<u>Annexes</u>	
I. Livestock population in Indonesia, 1967-1976.....	104
II. Number of animals slaughtend inside the slaughter houses.....	105
III. Production of vaccines.....	106
IV. Number of animals treated by vaccines.....	107
V. Total consumption of meat, eggs and milk.....	108
VI. Unarable land and its possible utilization for ranches in Indonesia.....	109
VII. Distribution of livestock in Indonesia.....	110
VIII. Quantities and value of exported live animals.....	111
IX. Quantities of imported meat, eggs and milk.....	112
X. Quantity and value of animal by-products.....	113
XI. List of Indonesian tanneries.....	114
XII. Labour cost comparison in industry in selected Asian countries.....	116
XIII. Technical literature.....	117
XIV. Requirements of the testing and experimentation section.....	120
XV. Leather Development Inter - Dept. Team.....	121
XVI. Lectures and discussions.....	122
XVII. List of tanneries visited.....	123
XVIII. List of persons contacted.....	125

PART TWO

SUMMARY.....	133
INTRODUCTION.....	133
OBJECTIVES.....	133
GENERAL REMARKS.....	134

TANNERIES VISITED

<u>Name of tannery</u>	<u>Location</u>	
1. Makmur Santosa	Jakarta	135
2. Kian Hien	Jakarta	146
3. Pan Vici and Sons	Jakarta	151
4. Tjakung Leather	Jakarta	154

<u>Name of tannery</u>	<u>Location</u>	<u>Page</u>
5. Ngian Ngian	Jakarta	160
6. Suka Jujur	Jakarta	167
7. H. Ramli	Jakarta	171
8. Firma Natraco	Jakarta	176
<u>CENTRAL JAVA</u>		
9. Budi Makmur	Jogyakarta	181
10. Bengawan Solo	S o l o	186
11. Amor Abadi	Semarang	190
12. Condro Purnomo Cipto	Semarang	192
13. General	Magelang	198
14. Mertoyudan	Magelang	206
15. Dharma Kusuma	Semarang	217
<u>WEST JAVA</u>		
16. Cicadas	Bandung	223
17. Universal	Bandung	227
18. Univli	Bandung	228
19. Leather Corporation	Garut	232
<u>EAST JAVA</u>		
20. HAKA I	Surabaya	234
21. HAKA II	Surabaya	235
22. Wonocolo	Surabaya	244
23. Rachbini	Surabaya	252
24. Wonosari	Surabaya	254
25. Pagina Cita A	Surabaya	265
26. Pagina Cita B	Surabaya	265
27. Kasin	Malang	269
28. Wangsa Brata	Surabaya	273
29. Sumber Setia	Probolingo	275
<u>OUTSIDE JAVA</u>		
<u>NORTH SUMATRA</u>		
30. Leng Tat	Medan	278
31. Sungai Agul	Medan	286
32. Adika Sari	Medan	288
33. Sinar Baru	Medan	289

## PART ONE

### SUMMARY

This report sets out the work programme completed during the UNIDO Advisers assignment in Indonesia and covers the original 6 months assignment and the just completed 4 months follow-up mission.

This Tanning Industries Export Product Adaptation project covered plant visits and specific advice to 32 tanneries plus a visit to several home industry tanneries (in Garut).

Each tannery visited was assisted in the solution of its own particular problems (See separate reports in part II) but flowing out of these plant visits the experts finding and conclusions have resulted in 45 recommendations which if adopted will upgrade the Indonesian tanning industry to International levels in terms of technology, product quality and price competitions.

### INTRODUCTION

#### 1. BACKGROUND

As leather tanning industry is a highly labour intensive one, thereby capable to absorb under-employed human resources. Most developing countries and especially those which have a large local supply of hides and skins are anxious to develop this processing industry.

The benefits of such developments are not however confined to employment alone but transcend other areas of the industrial development process

especially in terms of the transfer of technology, acquisition of know how and their beneficial effects upon the balance of payments.

In the initial stages the benefits manifest themselves in foreign exchange saving through import substitution and later, once the industry is upgraded sufficiently it becomes a foreign exchange earner through the export of its products.

The Government of Indonesia shares this desire to upgrade its leather industry and to assist manufacturers with export potential to adopt products and to improve production processes to meet world market competition.

In compliance with one of the Indonesia Governments stated policy aims, namely the development of non traditional exports, NAFED: The National Agency for Export Development requested UNIDO assistance in the field of product Adaptation for Export in the Tanning Industry.

## 2. OBJECTIVES

1. Participate in in-plant visits to various enterprises providing direct on-the-spot consulting services.
2. Identify and recommend the necessary adaptation of products as well as improvements of the production process for the individual plants.



3. Assist NAFED in identifying the external and internal factors influencing the performance of the industrial sector concerned and take part in discussions on the subject.
4. Train Indonesian counterparts in the above mentioned duties.

3. OFFICIAL ARRANGEMENTS

The adviser arrived in Jakarta on 9 February 1977 and called at the U.N.D.P. Office; a briefing meeting was arranged with:

Mr. Richard Brown	Assistant Resident Representative
Mr. Koo de Vries	Programme Officer

Mr. Brown kindly introduced me to the National Agency for Export Development (NAFED).

Several meetings were held with NAFED officials followed by meetings with 3 senior officials working in the field of leather.

The officials the adviser met with were:

A. from NAFED

Mr. M. Asjik Ali  
Director of Industrial Product Centre

Mr. C. Siahaan

Chief of Miscellaneous Industry Division

Mr. T.M. Yusuf

Chief of Sub-Division of Marketing Development,  
Miscellaneous Division

Mr. U. Sjamsudin

Chief of Sub-Division of Production Development,  
Miscellaneous Industry

B. from the leather field

Mr. Pietoyo Sukarbowo (Yogyakarta)

Director of the Leather Research Institute  
and Academy of Leather Technology

Mr. Ishak Noor (Jakarta)

Director firma MATRACO  
National Tannery in charge of marketing  
section A.K.I. (Assosiasi Perkulitan Indonesia)

Mr. Sjarifudin Siregar (Jakarta)

Secretary General of the Indonesian Leather  
Association, President Director of P.T. Cakung  
Leather Factory

4. METHODOLOGY AND WORK PROGRAMME

The following activities have been already fulfilled:

1. Studied all available reports on NAFED's activities as well as the activities of the leather Industry in Indonesia specially those related to leather goods and leather marketing.
2. Visited all official governmental organizations listed in the work programme as follows:
  - a. Department of Trade (Export Department)
  - b. Department of Industry (Light Industry Department)
  - c. Department of Agriculture (Livestock Department - Animal Health Department...etc)
  - d. Department of Finance (Import-Export taxes Department)
  - e. Department of Communication (Sea transport Department)
  - f. Indonesia Shipping Association (INSA) - Jakarta Llyod.
  - g. BIPIK (Project for Development of Small Scale Industry)
  - h. Department of Forestry

During these visits, the general problems of leather Industry were discussed with each department in their field of specialization.

These discussions were helpful to give a complete and clear picture of leather problems in Indonesia.

Meeting was held with the Inter-Department-Team with a long discussion on Leather Industry and Leather Problems in Indonesia.

During this meetings a very brief summary about my findings and recommendations was reported verbally.

3. The adviser participated in the round-table discussion on industrializing and modernizing traditional technology in the leather industry section which has been organized by the United Nations Industrial Development Organization (UNIDO) and Co-sponsored by the National Agency for Export Development in the frame work of the promotional project for development of export-oriented industries in Selected South East Asian Countries.

This round-table was held in Jakarta from 5th to 8th April 1977 in the premises of the NAFED.

4. Plant visit to 32 tanneries (plus several Home Industry Tanneries) all over Indonesia - in East, Central and West Java also outside Java in North Sumatera and Bali.

The Leather Research Institute had proposed those tanneries and were approved by NAFED officials to be representatives for tanneries working for exportation also for local demands.

In each of those tanneries, technical surveys had been made, with separate report for each tannery, including new formulation for new production as required by the tannery, also improving the current process for production.

Three Copies of each of those 33 reports were delivered to NAFED:

- ONE copy for NAFED
- ONE copy for the tannery under investigation
- ONE copy for the Leather Research Institute.

Before leaving Jakarta the adviser made sure that copies for tanneries and Leather Research Institute were delivered to each of them. The whole collection of these technical reports with the specific help to the visited industrial tanneries were included in Volume II of the final report of the adviser.

It should be noted that during the work, the adviser has been accompanied by three counterparts:

- ONE from NAFED
- TWO from the Leather Research Institute.

## CHAPTER I

### HIDES AND SKINS AVAILABILITY IN INDONESIA

#### 1. Indonesian breeds

##### 1.1. CATTLE BREEDS

In Indonesia there exists three kinds of cattle:

1. Bali Cattle (Known as *Bos Sondaicus*).
2. Madura Cattle.
3. Ongole Cattle (Known as *Bos Indicus*).

There are also other local kinds which are insignificant in number namely Aceh cattle - Java cattle.

The Bali cattle is purely indigenous breed while the Ongole type is exotic breed imported from India.

From the Ongole breed, there is the Sumba Ongole present in Sumba island, and the Java Ongole present in Java.

The Ongole cross cattle known locally as P.O cattle, has resulted from the cross breeding between Ongole and local cattle.

The Madura cattle - mainly found in Madura Island has been descended from *Bos sondaicus* and *Bos indicus*.

The Dairy cattle farming in Indonesia is concentrated mostly in west, central and East Java. They consist predominantly of the Friesian Holstein breed and its descendants.

1.2. SHEEP AND GOAT BREEDS

In Indonesia the most well known sheep and goat breeds are the native goats, Etawah goat, Etawah crossbred goat, fattailed sheep and Garut sheep.

1.3. BUFFALO

The Swamp Buffalo, found mainly in Java, Kalimantan, Sumatera are the only buffalo breed present in Indonesia. They are used for plough draggers on rise fields where it is impossible to use cattle due to the soil texture.

It is estimated that 58 percent of the total number of cattle and buffalo is used for agricultural cultivation, out of which 35 percent consists of young stock below the working age. Generally speaking, over half of the cattle population in Java is found in East Java where as nearly half of the water buffaloes are found in West Java.

Approximately half of the goat population is present in the East part of Java, while in the same time half of the sheep population can be found in west Java.

2. Methodes of cattle raising

Livestock in Indonesia are in most cases kept under traditional system by small farmers where very unsophisticated techniques are still widely

used.

Cattle are mainly kept as beasts of burden and slaughtered when their main function as animal traction in agricultural cultivation already expires.

Usually small farmers (approximately 12 million families) each owning 3-5 heads, or in some other cases they may own up to 15 head.

Since cattle raising is a part time activity of the farmer, these cattles are often supervised by the children of the family were they are feeded in the fields and grazing near roads and rivers.

A system of share-cropping of cattle is also commonly found were the owner of several cattles will arrange for them to be mentained by some one else with the payment either in kind (one calf at the end of every 2 year) or in the form of cash (averages from Rp. 1,000 to Rp.1,500 per month).

Another traditional system (mainly used for beef production) occurs in some places especially in Central Java. In this system, the cattle (mainly the Ongole breed) are used as a manure suppliers and for slaughter when their age is suitable.

These cattles are kept mostly inside the farmer's house, not used as animal traction in agricultural cultivation, being feeded with agricultural by-products and house hold residues.

The manure produced by those cattle is collected and used in field cultivation giving food to plants.

After a certain time when these cattles become fatter enough, they are sold as fattened beef cattle.



This system is locally known as "Spai Kereman" or traditional cattle fattening system.

A third traditional system used mainly for buffalo breeding is known as "Kalang system" especially adopted in south Kalimantan.

During the rainy season (usually from November until April) the Barito river is flooded with a result of covering a large area (about 500.000 ha) with a height of 1.5 to 2 metres.

As a result of this flood there exist a good kind of grass which proved to be suitable for animal feed.

Hence the farmers release their buffaloes into those swamps to get use from these nutritious watergrown vegetables, sleeping afterwards in the open air.

This system adopted by local farmers proved to be a profitable one of low cost beef production.

More modern methods for increasing the livestock population using ranching system is recently applied as will be mentioned later.

### 3. Livestock population

The livestock population figures of Indonesia as shown in Annex 1 indicates the following facts:

- a. The livestock for cattle and horse is decreasing.
- b. The livestock for pigs, goat and buffalo is increasing.
- c. The livestock for sheep is nearly kept constant since 1967 until present.

On the other side, by comparing the ratio of livestock population per 1000 person in Indonesia, it can be seen that the growth of livestock number in recent decades reflects a downsloping tendency as indicated by the following table:

Table 1

Ratio of Livestock population per 1000 persons

Species	Animal average		
	1925-1940	1951-1960	1961-1972
1. Cattle	71	58	60
2. Buffalo	50	32	27
3. Horse	10	7	7
4. Goat	59	66	56
5. Sheep	26	29	29
6. Pig	18	17	27
A.U./a	132	-	78

Source: Direktorat General of animal Husbandry - Jakarta.

From the above table it is clear that the animal unit has decreased from 132 per 1000 person in the period 1925-1940 to 78 in the period 1961-1972.

### 3.2. Animal slaughtered

The number of animals slaughtered officially in the governmental slaughter houses (1064 slaughter houses) is indicated in Annex II. The figures indicates an increasing tendency, yet the supply of hides and skins compared with the present level of real absorption capacity of the tanning industry indicates their is a real shortages of supply since 1973 until present time.

This will be discussed in details in chapter II.

### 3.3. Animal Health

One of the most obstaculs in the livestock production is the animal disease which still needs serious attention especially for the infection diseases.

The geographic nature of Indonesia - as consisting of groups of islands-this nature provides a limiting factor in disease control activity. But this nature is also favourable in case of outbreak since it will act as a natural boundaries preventing the disease from further spreading all over the country.

From the following table it can be seen the death rate of livestock which is still high, inspite of the efforts done, causing considerable economic losses:

**Table 2**  
**Livestock dath rate**

Species	Rate of dath	
	1967	1975
1. Cattle	2.14	1.22
2. Buffalo	5.31	2.21
3. Goat	4.68	1.97
4. Sheep	3.19	
5. Pig	17.02	10.29
6. Horse	3.95	2.23

Source: Central Bureau of Statistics - Jakarta.

**N.B.**

The figures shown in the table above was reported in 1967 livestock survey and the 1975 sample survey.

**3.3.1. Kind of animal diseases**

The most frequent types of animal diseases present in Indonesia are:

- Foot and Mouth disease (A.E)
- Antkrax
- Ticks (Skin disease)
- Seabies (Skin disease)
- Cascado (Blood disease)
- Septichaemia - opizootica (S.E) .....etc.

3.3.2. Animal disease Control

Generally speaking the medical treatment for cattles and Buffalos takes more careful attention than in the case of sheep and goat. One of the most important reasons for this fact is the high prices of cows and buffalos compared with that of sheep and goats.

In most provinces (Except in Bali) the medical treatment is not free of charge. Prepayment for medical treatment is requested, except in case of outbreak where the medical treatment is completely free of charge.

The government has already started a programme for mass vaccinations especially against Anthrax and S.E.

Among other activities already implemented are the strengthening of the production of vaccines (see Annex III and IV), the establishment of diagnostic laboratories, training courses for specialists to keep them up to date on most recent developments.

Two Disease Investigation centres have been established one at Bali which covers Bali, East and West Nusa Tenggara provinces, and the other one at Ujung Pandang to cover Irian Jaya, Maluku and Sulawesi provinces.

It is planned that another Disease Investigation centre should be established in Sumatera to cover the provinces around.

According to the intensive programme held by the government no more cases of foot and Mouth Disease have been reported in Bali for the last 3 years.

Also no more cases of Surra (Blood disease) has been discovered in Central Java.

(In 1960 there was an outbreak for this disease). The hope now is that sheep and goat should have the same medical attention as already given to cows and buffalos since they consists an important section in the livestock population.

3.4. Livestock products: (Meat - Egg - Milk)

The following table shows the production of livestock products in Indonesia.

Table 3

The production of Meat - Egg - Milk (in thousand tons)

Commodity	1973	1974	1975	1976	% increasing rate 1975-1976	average % increase 1973-1976
1. Meat	407,6	405,7	455,0	448,7	+ 3,15	+ 3,30
2. Egg	75,4	95,4	101,3	112,5	+11,05	+14,55
3. Milk	51,6	56,9	59,5	62,2	+ 4,54	+ 6,46

Source: Department of Agriculture  
Directorat General of Animal Housbandry  
Jakarta 1977.

N.B.

- a. The figures for 1976 is an estimated figures.
- b. The quantities of meat represent the products from: Cow-Buffalo-Goat-Sheep-Pig-Horse-Chicken.

Table 4 shows the consumption of these products per head of population:

Table 4

The consumption of Meat, Milk, Egg per head of population

Commodity	1973	1974	1975	1976	% increase rate 1975-1976	% average increase 1973-1976
Total population.	124,601	127,586	150,596	153,650	2,34	2,36
Consumption per head						
Meat	3,28	3,20	3,34	3,37	0,90	0,94
Egg	0,44	0,56	0,58	0,64	10,34	13,73
Milk	1,77	2,02	2,06	2,92	41,75	19,28

Source: Department of Agriculture  
Directorate General of Animal Hunsbandry -  
Jakarta 1977.

N.B.

- a. The figures in 1976 is estimated figures.
- b. The number of population in 1000 head.
- c. The consumption per head is in Kg in the whole year.
- d. See Annex V

The gap between the consumption of meat and the population can be seen from the following table:

Table 5

Quantities of Meat produced and estimated demand  
(in thousand tons)

Commodity	1978	1985	1988	1995	1998	2003
1. Demand	575,7	674,6	797,1	757,8	1100,4	1280,6
2. Production	513,7	581,5	680,5	796,2	931,6	1089,8
GAP	-62,0	-93,1	-116,6	-141,6	-168,8	-190,8

Source: Department of Agriculture  
Directorate General of Animal Husbandry Jakarta 1977.

From the above table it is quite clear that with the rapid increase in human population the demand of live-stock products is far exceeding the capacity of production.



4. LIVESTOCK DEVELOPMENT POLICIES

The objectives of livestock development in Indonesia is as follows:\*

- a. Self-sufficiency in animal protein foodstuffs.
- b. Increase of farmer's income.
- c. Absorption of man power (Job opportunities).
- d. Expansion of foreign exchange earning through livestock subsector.
- e. Improvement of public nutrition.

To achieve those objectives, the Directorate General of Animal Husbandry has laid down 5 fundamental policies:

- a. Expansion of livestock role in rural development.
- b. Application of the "Five efforts Principle in livestock development through:
  - Improvement of breeding stock
  - Improvement of livestock feeding
  - Disease control
  - Extension
  - Improvement of livestock products marketing.
- c. Stimulation of group activities towards cooperative establishment.
- d. Maximum utilization of resources: land, livestock, funds, man, power, institution, education, research and development, communication and transport facilities.

---

\*. Country paper Indonesia - Livestock production and marketing.

f. Improvement of marketing systems.

These 5 fundamental policies are reflected further in the 3 main programmes in the Five year Development Programme of Animal Husbandry (Department of Agriculture) i.c.:

- a. Programme on improvement of meat production and marketing.
- b. Programme on improvement of milk production and marketing.
- c. Programme on improvement of egg production and marketing.

The Programme already implemented by the Government up to the current third year of Pelita II (1976) in development of livestock, especially bovine animals (Cattle, dairy cattle, buffalo) are:

A. In small holder sector:

- 1. Extension as a preparatory activity prior to the actual implementation of the livestock Development Principles through key farmer training, field extension, specialist extension
- 2. Production upgrading through introduction and dissemination of high quality breeding stock, artificial insemination using liquid or frozen semen for dairy and beefcattle,

upgrading of grass production and quality.

3. Disease eradication and prevention, for example mass vaccination against A.E, H.S. Anthrax ....etc.
4. Establishment of milk marketing and livestock market facilities.
5. Mass guidance of backyard cattle farming through the slaughter Animal Development scheme (PUTP). In this system, the necessary finance for capital investment and technoeconomic information flow to the farm aiming for a successful production of slaughter animals (fattening) by small holders with special credit facilities from the government.

B. In commercial farming sector

1. Extension activities through ranch manager training, field workers and dairy training.
2. Assistance to private enterprises through investment programmes in livestock farming by means of creating relevant regulations for this purpose and making available credit facilities for private sector either from local Banks, domestic or foreign investments.

## 5. RANCHING PROJECTS IN INDONESIA

The land in Java are fully condensed and utilized and no more space are available for ranching.

Outside Java, about 9 million haetares can be used for ranching out of them about 500.000 haetares are already used for beef cattle ranches.

These ranches are mainly located in Aceh, North Sumatra, East Nusa Tenggara, South Kalimantan and South Sulawesi. The unarable land available for ranching can be seen from Annex VI.

In 1972 an estimated study showed that these areas outside Java are able to feed 3 times the cattle population they have now.

Ranching is still considered new to Indonesia, although some ranches started since 1960, but most of the already operating ranches now are less than 10 years old.

The Indonesian Government was the first to start some feasibility studies in order to have ranching on big scale projects.

At present, the private sector is also participating in Ranching projects, but not to the required extent. Until date, no accurate data are available about the exact number of ranches already operating in the country.

They are estimated to be about 50 Ranches varying in size (from several hundreds to thousands hectares) also varying in the number and kind of animals present (mostly Bali Cattle, Ongoles and their crosses, also Buffalos).

Bearing in mind that ranching is the only way to increase livestock population, the government is assisting ranches by all means.

Giving land, training necessary personnel to work and manage the ranch, also supply of grass seeds and breeding stock all are supported by the government. Artificial Breeding with frozen semen supplied by the Government is applied now in some ranches and the inseminator is an official field officer from the livestock service which has been trained specifically for this job.

Some private ranches have to Import what they need especially from Grass seeds and breeding stock since their big demands cannot be supplied locally by the government.

The Government has already under operation a big ranching corporation called: "P.T. Bina Mulya Ternak"

This Corporation is located in three place under three names:

1. "Maiwa Ranch" in South Sulawesi.
2. "Siwa Ranch" on the east coast of Sout Sulawesi.
3. "Kabarun Ranch" in east Sumba.

The total land for all the corporation amounts to 37,000 hectares of poor to fairly good land with an effective area of 26,000 hectares.

The project started running cattle since mid 1974, now the project is running approximately 6,500 head which is supposed to be 7,000 head at the end of 1977.

At full development, the Corporation will run 15,000 animal unit.

Each year it should supply the industry with about 3,750 surplus animals consisting mainly of young females for transmigration schemes, also breeding bulls for transigrations and village bulls.

It is expected that the project will progress as follows :

Year	: 1977	1978	1979	1980	1981	1982
Total animal	: 7,000	9,500	11,000	13,500	15,800	17,000

### CONCLUSION

1. In spite of all the efforts done to increase the livestock population, still the problem exist. Since ranching is very important in increasing the livestock, the private sector still needs the help of the government in ranching projects throw better financing facilities.
2. The redistribution of cattles from high concentrated provinces to other regions were their is shortages, and the land is technically very suitable for cattle raising see Annex VII.
3. A commercial study is required to decide which is much more benefit for the country :  
To export living animals or.  
To use them ( with their by products ) locally.

The following Annexs might help in this study:

Annex VIII Shows the quantity and value of exported living animals.

Annex IX Shows the quantities of meat, eggs, milk imported.

Annex X Shows the quantity and value of locally by product taken from one cattle slaughtered locally.

## 6. SLAUGHTER HOUSES AND FLAYING

1. The total number of slaughter houses in Indonesia is 1064 slaughter house(723 governmental + 341 private) all of them are under Government control. Most of the slaughter houses present are semi machinezed with a capacity varying from 10 cattles per day up to 60 cattle per day.

In Surabaya - East Java the only modern slaughter house exist under the name: "Abattoir Surya -Jaya". This slaughter house is most up to date one fully automatic with a capacity of 500 cattle/day (on 3 chifts) from this modern slaughter house, the frozen meat is already exported to Hongkong inspite of the fact that the slaughter house had started working since 4 months only.

Also the most benefit is done from all of the animal by products.

It is the policy of the Government to have more modern slaughter houses in the near future instead of the already existing ones.

2. Flaying

The hides and skins of animals are highly preshable products. It is noticed that the flaying operations is badly done in most slaughterhouses except in the modern one in Surabaya causing considerable damagedges to the hide and skin.

The hides and skins and concequently the finished



leather are reduced in value due to the carelessness in the flaying operations.

This defect was always a matter of complain from all the tanners. Due to bad flaying, knife-cuts are present on the flesh side of the hide which is very difficult to remove during the tanning operations and appears clearly in the finished product reducing its price value.

The proper flaying therefore makes considerable difference in utilization of leather and consequently to the value of the leather obtained from hides and skins..

The flaying in Indonesia is done by traditional way especially that the flayers themselves are not officially working in the slaughterhouses but with the butchers.

3. Factors influencing the flaying of hides and skins

1. Absence of modern flaying tools and equipments in all slaughterhouses except that in Surabaya.
2. Flaying is done in order to get the maximum benefit of meat inrespective of damage caused to the hide and skin.
3. Lack of good supervisor over the flayers mainly employed by the butchers.
4. General carelessness by the flayers themselves because of lack of knowledge about the value of the hide and skin.

5. The flaying is done by unexperienced flayers mainly employed by the butchers.
6. The flayers are paid by piece or by contract. They try to handle as large a number of animals within a short possible time inspite of the quality of the hide obtained.  
It is estimated that over 40-50% of the hides are damaged due to improper flaying.

Generally speaking the flaying insome slaughter houses in Java are not very bad, but still the hides obtained are bearing cuts due to improper flaying. Hides from BALI and TIMOR Island are full of damages caused mainly by flaying to the extent that nearly all the sole leather produced from TIMOR hides are sold as third or fourth grade.

Recently, sepecial training courses are held in the leather research institute in order to upgrade the skillness of the supervisors over the flayers. These type of courses should be intensified and increased to be minimum three times a year instead of only one course all over the year as it is now. By paying much more attention to people angaged in flaying, high quality hides can be obtained.

#### 4. Recommendations

1. The flayers should have a governmental licence. Before getting such licenee every flayer should be asked to under go tests for efficiency in flaying.

2. The training course given by the leather research institute should be enlarged to have as much as possible all the personal working in the slaughterhouses with direct relation to the flaying process.
3. The number of courses given by the leather research institute should be increased to be minimum 3 times per year.  
By increasing the number of courses, bigger number of supervisors will be trained in the less possible time.
4. The knives used in flaying should be supplied by the slaughterhouse and not by the butchers. These knives should be very sharp and round shaped.
5. The wages of the flayers should be fixed by their efficiency in the flaying and not only by piece-wage system.
6. In big slaughterhouses, standard flaying knives and mechanical flaying machines driven by compressed air should be introduced.  
The flaying operation already done in the modern slaughterhouse in Surabaya should be the example to be applied in all the slaughterhouses all over Indonesia.

## 7. HIDES AND SKINS PRESERVATION

The hides and skins in Indonesia are generally preserved by either one of the following methods:

### 1. Wet - Salting

Almost 90% of the skins are preserved by this method together with the hides that goes directly from the slaughterhouse to the tannery.

Coarse grained slat of low quality is usually used, and in some places (villages) the salt is used more than one time which is practically not correct, since it contains bacteria which will cause bacterial damage to the hide or skin.

Usually the wet salted skins are sold by length (size) and not by weight, so the preserver usually apply less salt than practically required.

The amount of salt used should be about 25-30% of the raw hide or skin weight.

### 2. Drying

This is the most common method used for preservation especially for hides in Indonesia.

It is also applied for skins but on a very small percentage.

The cattle-or buffalo-hide are washed first, then the remaining flesh is removed by hand scraping.

In most cases-especially inside Java-the hide is

dipped in low concentration arsenic solution after which the hides are stretched on wooden or bamboo frames by means of strings and left from 2-3 days to dry in the sun.

In most of the places visited, the frames were arranged vertically which gives better ventilation and quicker drying.

In islands outside Java-e.g. Timor and Flores- the hides are not stretched on wooden frames, but they are dried by simply spreading them on the ground sometimes on bed of twigs or stomes.

This kind of drying is known as ground drying.

The hides dried by this method are very bad in quality since they became crumpled and do not possess the flatter shape which is usually obtained by the normal frame drying.

The hides from this kind are usually used for the production of low quality sole leather.

#### CONCLUSION

The hides and skins preserved inside Java are in most cases in good condition.

On the contrary, those from outside Java are very badly preserved causing damages to the hides and skins, lowering their value and consequently causing a big loss to the economy of Indonesia.

GENERAL RECOMMENDATIONS TO BE APPLIED IN THE  
PRESERVATION OF HIDES AND SKINS.

A. In wet - salting process

1. The amount of salt used for drying should not be less than 25-30% of the raw hide weight.
2. The used salt should not be reused once more under any condition.
3. Fine salt should be avoided since it causes patchy, wet cakes to the preserved hide or skin.
4. All parts of the hides should be well salted since any part which is left unsalted will be attacked by bacteria.
5. The piled hides must not exceed 5-8 feet high otherwise internal heat of the whole stock will take place causing damages to the preserved hides.

B. In Drying process

1. Ground drying applied outside Java should be stopped completely since it produces very low quality raw hide.  
This process should be transferred to the normal frame drying process.
2. The hides should be loosely strained out on the frames since, after drying, the hide shrinks and tightens up on the frame, and

if it is put in too tightly, over straining or stretching may cause weakness and thinness.

3. The hides or skins should be dried in an open sided covered shed, to keep off the direct heat of the sun and allow good ventilation.

4. Dried hides are very hard and must not be bent or creased unduly, as this will cause them to crack.

If they are to be folded, this should be done whilst they are slightly damp and still flexible enough.

5. The hides must be kept dry during storage to prevent putrefaction.

## CHAPTER II

### TANNERIES AND LEATHER TANNING INDUSTRY

#### 1. Kind of tanneries

Tanneries in Indonesia can be classified into 3 categories:

##### a. Exporting Tanneries:

This group of tanneries consists of about 14 big to moderate tanneries with up to date machines in most cases.

It is not a must that an exporting tannery should be very big or with modern machines, but there is small tanneries with old equipments and still exporting pickled or wet blue skins.

Most of the tanneries falling under this group are characterised by good quality production. Few of them are producing finished leather for exportation, the majority is producing pickled and wet blue skins and hides of good quality.

The exportation of crust leather has already succeeded especially in tanneries possessing the vacuum drying system, those having the normal air drying system are also producing crust leather with less quality, but still acceptable. These group of tanneries use hides and skins of cow, sheep and goat in their production.



b. Domestic tanneries

Those group of tanneries consists of average to small size tanneries producing almost all kinds of finished leather for domestic use (leather for shoes, hand bags, handicraft art .....etc).

Some of these tanneries have new machines, but most of them are working with very old equipments with an average age of 25 years old.

The number of tanneries under this group varries from 42 to 49 tanneries (This will be discused later).

In most of there tanneries the internal arrangement of the machines together with drums are in a very bad manner.

The flow of production are not in one line, but crossing in the production flow always exists causing delay in time and also affect the quality of the final product.

The main reason for this is that most of those tanneries has started production on a small scale, then enlargment started slowly, almost with shortage in capital, so the addition of new machines or drums was done without any scintific studies in advance.

Those group of tanneries use hides and skins of cows, buffalos, goats in their production.

c. Cottage or Home Industry.

This group of very primitive work shops or home industry producing leather, are scattered in several places such as Garut, Masin, Magetan.... etc.

The number of these work shops are not yet exactly known, but a study done in 1975 estimated them to be about 256 unit producing very low quality upper, sole and lining leather.

The methods used in producing leather are very primitive, no machines present, even no normal drums which is usually used in tanning industry and consequently no chemical control in the tanning process. The number of raw hides used in such a primitive work shope varies from 2 hides per day to maximum 4 hides per day.

The number-and age-of the workers are very small. Most of these so called tanneries lies inside the house of the owner and most of the workers are the members of the family.

Those group of home industry tanneries use hide, and skins of cow, buffalo, sheep and goat-in their production.

2. Number of tanneries

2.1. As mentioned earlier, the number of tanneries

reported at 1975 is as follows: (source: Ministry of Light Industry).

Factory for export:	14 tannery
Factory for domestic:	42 tannery
Cottage industry:	256 unit
Total:	<u>312</u>

2.2. In some cases the difference between a normal-small size-tannery and cottage industry unit is very small. The Central Bureau of Statistic gave the Number of tanneries (above 20 workers) to be 63 tannery (Annex XI). Those tanneries includes both exporting and domestic ones as follows:

a. West Java	23 tannery
b. Central Java	18 tannery
c. East Java	20 tannery
d. Out side Java	2 tannery
Total	<u>63 tannery</u>

N.B.

This figures do not contain the number of home industry units.

It is very difficult to give an exact figure for those home tanneries. But still the figure 63 given above seems to be not accurate since it does not contain all tanneries out side Java which is for sure more than 2 as mentioned above.

2.3. It is recommended that an official mission from:

1. The Ministry of Industry
2. The Leather Research Institute
3. The Leather Association
4. The Central Bureau of statistic

This mission should carry a complete servay all over Indonesia to give as accurate as possible the total number of tanneries present and their production capacity. It is also advisable to have exact figures about the number of cottage industry.

Such a survay will help to a big extent in further programming for Leather Industry in Indonesia.

### 3. Technology and leather quality

3.1. The tanning technology used in the tanneries differes from one tannery to another as well as from one category to the other influencing the final produced leather.

In most of the exporting tannerics the well known chemical control tests used in leather tanning, are used and applied. Measuring of pH, degree Be', neutralization test, boiling test.....etc all these principles of leather tanning is used and applied with greet success.

Consequently the leather produced from these tanneries are of good quality and well accepted overseas.

Most of the exported leather are in the form of pickked-wet blue crust leather from cow hides, sheep and goat skins.

Also some tanneries are exporting suede upper leather - Nappa.....etc. Very few tanneries are exporting finished leather of good quality, since the finishing operations needs very carefull and special technology which exist in only few tanneries. Due to the lack of the modern machines used in finishing opperations such as Vaeum drying machine, Automatic spraying maehine.....etc. the exportation of finished leather is not as much as supposed to be in a country with very good raw material with beautiful natural grain (Java Box).

But as mentioned above their are some few tanneries which are exporting finished leather of good quality e.g.:

P.T. Budi Makmur (Yogyakarta).

3.2. The leather produced for local market are mostly from domestic tanneries. The exporting tanneries are also good supplieres for the local market demands.

The tanning technology and chemical control tests are applied in proper way in some of

the domestic tanneries, while in other tanneries these chemical tests are not well applied.

The quality of leather produced thus differs from one tannery to the other. Generally speaking, the quality of the leather used for local market varies from good to fairly bad quality according to the tannery producing it.

Some tanneries are producing very good quality leather for local market such as:

Makmur Santosa & Sons (Jakarta)

Pan Vici & Sons (Jakarta)

Enivli (Bandung - West Java)

Kasin (Malang - East Java)

Wangsa - Brata (Surabaya - East Java)....etc.

- 3.3. The leather produced from the primitive work shops or home industry cottages are very bad in quality. Because of lack of chemical control, lack of technology, the so called leather produced - either upper or sole leather-are of a very low quality.

In producing upper leather for example, the quantities of chrome powder and fat-liquoring agents are much less than usually used in leather tanning.

Finishing of this kind of leather is done with very primitive way, affecting to a great

extent the finished product.

The shoes - for example - done from such leather are very low in quality and its life time is very short.

- 3.4. The sole leather produced all over Indonesia are very soft and not in the same standard of the upper leather or any other kind of finished leather.

Except the sole leather produced from KASIN tannery - Malang East Java - all the sole leather produced from tanneries can not be considered as of normal standard.

The sole leather produced from KASIN tannery can be considered as the best all over Indonesia, and can be easily compared with the European and International standards.

In some tanneries the sole leather produced seems to be in good, normal appearance and touch, but this is because the tannery do not use any kind of fat liquoring agents after tanning, this is technically wrong. The main reason for this soft sole leather produced by almost all tanneries is that the leather is not correctly tanned with vegetable tanning materials and consequently the degree of tanning is very low.

This bad production cannot be controlled by the government since until date, Indonesia

do not possess its own Chemical and Physical specifications concerning tanned leather. Once these specifications are implemented, then such kind of bad production sole leather will be gradually changed to the normal standard type which can be easily produced by the tanneries.

4. The quantity of leather produced

4.1. In 1975 an estimate study about the leather produced in Indonesia based on collectable data gave the following:

Table 6

	Unit	Capacity			Production value in thousand Rp	Labour
		Cow	Buffalo	goat and sheep		
Factory export	14	500	-	3.500.000	5.500	1.250
Factory Domestic	42	2800	600	200.000	7.500	3.850
Cottage industry	256	400	400	400.000	900	1.500
Total:	312	3700	1.000	4.100.000	13.700	6.400

Source: Ministry of Light Industry.



4.2. It is very difficult to calculate correctly the quantity of total production of leather in Indonesia for the following factors:

a. The number of cattles, buffalos, sheeps, goats slaughtered outside the slaughterhouses - especially in villages outside Java - these figures are very difficult to be known. It is true that it can be only estimated as: 25-30% for cows, 10% for Buffalo, 500% for sheep and goat.

b. About 80% of the total Buffalo raw hides and unknown quantities of cow raw hides are transferred to "food" to be eaten under the name "KRUPUK".

After the hides - either cattle or buffalo - arrives in the tannery, the owner may resell these hides again to be transferred to "Krupuk" instead of tanning them. It was impossible to have any data about the approximate quantities of raw hides which is not used in tanning industry.

c. The third factor is that until data the export of raw hides and skins are not prohibited from outside Java, the hides and skins - from inside Java - might find their way to be exported from outside Java. The quantities of the exported raw hides and skins can not be accurately known.

4.3. After several discussions with tanners, the director of the Leather Research Institute, and the Leather Association representatives the following estimated figures for total production quantities seems to be acceptable.

4.3.1. From cattle and buffalo hides

25-30 million square feet of upper leather.  
2-2.5 thousand tons of sole leather.

4.3.2. From goat and sheep skins

4.5 - 5 million pieces of sheep and goat skins.

About 85% of the production of sheep and goat is exported as pickled and wet blue skins. As mentioned before these figures are only estimated ones.

5. Marketing

Starting January 1974 it was prohibited by the government to export Raw Hides from Java (Decree of The Minister of Trade No. 47/Kp/III/73) Before that, the available raw hides for domestic leather industry was as follows:  
20% Cows, 60% Buffalos , 10% Sheeps , 15% goats from the total amounts available from the slaughter houses at that time, the rest was for exportation

mainly in the raw state.

By prohibiting the export of raw hides, the tendency to process these hides and skins into leather was very much supported which can be seen from the following table.

Table 7

**Export of Pickled and Wet blue  
and Finished leather  
(value in US\$)**

Goods	1971	1972	1973	1974	1975	1976
Raw Hides (Pickled, wet blue)	5,225,400	8,189,100	10,752,200	7,443,900	8,521,301	15,831,308
Raw Reptil Hides	390,800	760,900	1,102,400	755,800	585,962	735,436
finished Leather	101,600	700,200	1,059,500	1,312,400	451,286	1,987,964
Total	5,717,800	9,650,200	12,914,100	9,311,100	9,558,549	18,554,708

Source: Ministry of light industry

Bank of Indonesia gave the following data for the total export value for Pickled, Wet blue and finished leather (together with leather goods and leather products).

<u>Year</u>	<u>Total value in US\$</u>
1975	10,279,000
1976	20,775,000

Both sources are nearly identical.

From the above mentioned figures it is quite clear that the tendency for exportation of processed hides and skins i.e. leather - is becoming more and more higher.

5.2. The exported leather goods is also going higher which can be seen from the following table:

Table 8

The value in US\$ of Exported Leather Goods and Leather foot wear

	1971	1972	1973	1974	1975	1976
Leather goods	8,800	45,400	5,100	6,300	10,841	26,065
Leather foot wear	52,900	361,100	1,404,100	782,700	183,770	29,346
Total:	61,700	407,500	1,409,200	789,000	194,611	55,411

Source: Ministry of light industry

5.3. In spite of the fact that the labour cost in Indonesia are still one of lowest in the World (Annex XII), yet the leather produced is still high in price for both local and export market. Due to the high prices of finished leather especially if compared with that produced in some near countries such as Taiwan and S. Korea .....etc, some of the shoe factories started to import finished leather. Bata shoe factory imported finished leather from Taiwan. The price of this leather after arriving Bata shoe factory in Jakarta - is cheaper by 18% than the same leather produced locally. The following table shows the value of Imported leather and leather goods.

Table 9

The total value of Imported leather and leather goods in US\$

Goods	1975	1976
Finished leather	60.769	68.701
Leather goods	794.059	878.493
Leather footwear	490.639	1.871.886
Total:	1.345.467	2.819.080

Source: Ministry of light industry.

The tendency to import finished leather and leather goods is increasing due to the high prices of finished leather produced locally:

The main reasons for these high prices is as follows:

- 5.3.1. The very high price of raw hides especially of cattle hides. In spite of the fact that all hides used are locally available, yet the price is considered high if compared with similar places such as Australia and New Zealand.

The price of the raw hide consists 60% of the final price of the finished leather, so when the starting raw hide price is already high, consequently the finished leather will also be high in price.

- 5.3.2. The raw hides and skins available in the market are not enough for the tanneries to work with full capacity. All the tanneries all over Indonesia are working with capacities varying from 30-60% some of them has to stop the production completely So the average working capacity of the tanneries is 50%. The main reason for this drop of production is the scarcity of hides and skins with suitable price.

When a tannery is working with 50% capacity, the overheads will be big over the limited amount of production causing an increase in the final prices of the finished leather.

5.3.3. The high custom duties over the imported chemicals especially those used in finishing processes. The custom duties over Binders for example (which is used in finishing operations) is 60%, while for normal tanning agents is from 30-40%.

This high custom duties causes an increase in the final cost price.

The main reason of the low prices of finished leather in places like China, Republic of Korea - in spite of their high labour cost compared to that in Indonesia - is that they do not pay TAXES on the imported raw hides and skins and chemicals which are used for Exportation.

Using only a letter of Guaranty from the bank to the customs and proving later that these hides and skins with the chemicals have been reexported again, they receive these letter of Guaranty once more.

So practically they do not pay any custom duties and consequently their finished leather is cheap.

Bearing in mind the added value for the finished leather for the sake of the economy of the country, the exportation of finished leather - better finished goods - will be much more profitable than having high custom duties and increasing the prices for local and exported leather.

5.3.4. The 5% Export taxes on the exported pickled and wet blue hides and skins in one of factories which keeps the prices overseas in a high level.

It is advisable to encourage the tanneries to step forward their production from pickled to the wet blue state, and from wet blue to crust and finally to the finished state with its high added value to the economy of the country.

In a memo sent by the adviser to the Ministry of finance through NAFED - the adviser explained what are the main differences between pickled and wet blue leather and briefly the different steps which are done in the tanning operation. In this memo the adviser proposed the following export taxes system to be applied. The main object of this system is not only to encourage export, but also to develop the export of crust and finished leather.

The recommended short term policy for export taxes is as follows:

For Pickled state, the Export taxes should be 5%.

For Wet-blue state, the Export taxes should be 2.5%

For Crust state, the Export taxes should be zero%.

For Finished state, the Export taxes should be in the form of Export Rebate by 10%.



After 5 years period, these percentages can be changed according to result obtained.

In similar cases, e.g. Brazil, the exportation of raw hides and finished leather through government incentives has developed in 8 years time:

<u>1968 Export:</u>	60% raw hides
	20% wet blue
	20% crust and finished leather
<u>1976 Export:</u>	100% Crust and finished leather.

## 6. Leather goods and Leather footwear

6.1. It is estimated that 80% of the finished leather is used for shoe industry. The consumption of leather shoes in Indonesia is still very low, it amounts to 0.07 pairs per person per year. (In Europe it is 2.pairs/person/year) The consumption of footwear - including plastic shoes - amounts to 0.4 - 0.5 pair/person/year. The total amount of production of footwear is estimated to be 65-70 million pairs annually.

There are three main producers of footwear in Indonesia P.T. Bata, Famous Ltd, and P.T. Hana shoe Co. Ltd.

The biggest producers is Bata shoe factory, the production will amount to 7 million pair in 1977.

Famous Ltd produces about 2.4 million pair per year. P.T. Hana shoe Co. will expand the annual production to be 2.4 million pairs by the end of 1977.

Some of the shoe industry units are modern, but the greater part (about 85%) is still simple and semi-mechanized and they are spread out in the cities and regions. Like the tanning industry, 80% of the shoe industry units are found in the island of Java with the most concentration in Bandung.

6.2. The leather goods mainly bags - absorb 15% of the local tanned leather, while the handicraft art products absorb the 5% rest. The leather goods industry is still in early stages of development and is facing strong competition from the developing countries suppliers in developed country market. Production of leather goods is carried out in small scale enterprises (home industry).

Their production include travel goods, travel bags different styles of ladies handbags, purses, wallets belts .....etc.

Finished leather - mainly vegetable tanned leather- used in leather goods are produced locally by domestic tanneries, buckles and Zippers are imported.

Table (8) shows the value in US\$ of Exported Leather goods and Leather foot wear.

7. Reptile skins

The amounts of Reptile skins are estimated to be as follows:

Lizard	480,000 pieces
Snake	450,000 meters
Crocodile	12,000 pieces
Frog	300,000 pieces.

About 95% of these quantities are exported. The total value of Reptile skins exported is indicated in the following table:

Table 10

The total value in US\$ of Exported Reptile skins

Reptile skin	1971	1972	1973	1974	1975	1976
1. Snake	45,845	53,753	28,015	64,495	81,239	70,733
2. Crocodile	266,814	577,447	894,708	574,541	328,592	468,600
3. Lizard	72,110	123,885	161,744	102,909	77,739	66,974

Source : Central Bureau of Statistics Jakarta.

8. Obstacles facing tanning Industry in Indonesia

The main obstacles facing the tanning industry can be summarized as follows:

8.1. Lack of raw hides

According to the survey done by the adviser through visits to several tanneries, it is estimated that the total quantities of raw hides necessary for the tanneries to work with full capacity is 2.4 million pieces of cattle and Buffalo hides. The director of the Leather Research Institute and the Leather Association has agreed on this estimation. The number of cattles slaughtered inside the slaughter houses was officially recorded to be 784,000 pieces in 1976.

By adding 196,000 pieces which represent 25% for slaughtering outside the slaughter houses, then the total amount of cattle hides available is:

$$784,000 + 196,000 = 980,000 \text{ pieces}$$

From buffalo, the figures recorded from the slaughter houses is 195,700 pieces in 1976.

By adding 19,570 pieces as 10% for slaughter outside the slaughter houses, then the total number is:

$$195,700 + 19,570 = 215,270 \text{ pieces}$$

Total hides (cattle and buffalo):

$$980,000 + 215,270 = 1,195,270 \text{ approximately} \\ 1.2 \text{ Million.}$$

which is equal to 50% of that required to work with full capacity. It has to be noticed that the hides of buffalo has been calculated to be all tanned which is not true, since a very big amount (about 80%) is transferred to food-stuff under the name "Krupuk". This simply means that the hides available are even less than required to work with 50% capacity.

Concerning sheep and goat skins, the quantities available is quite enough, but the quality of the skin is sometimes not so good.

#### 8.2. Shortage of Capital

Most of the tanneries has no enough capital to work with. This is reflected mostly in the very small stock present in the stores of the tanneries, some times this stock is enough for only 10 working days.

One of the main reasons for the lack of capital is that the tanneries receives their money back from the local market after delivering the goods by minimum 4-6 months, a factor which tightens to a big extent the liquied capital of the tannery

#### 8.3. Lack of modern machines

The machines present in 75% of the tanneries especially those working for domestic market - are very old machines with an average age of 25 year old.

The high custom duties on imported machines which is 30% is a factor that lower the tendency of the tanneries to renew their old equipments.

8.4. Lack of Technology

All the technical staff in the tanneries - except very few-has gained their experience only by practice without any scientific bases. The trend is now high to make most benefit from technicians already graduated in the Leather Research Institute in Jogjakarta, this trend gives a big responsibility to the Institute as the only source for good scientific technologist.

Some of the owners of the tanneries have already sent their sons or relatives to be graduated in Leather Institutes abroad. ( Federal Republic of Germany and United Kingdom).

8.5. Lack of know-how

Big number of the tanneries are away from modern technical know-how. These tanneries are nearly isolated from outside connections and consequently far from the recent developments in leather tanning.

8.6. Lack of management

In some tanneries the management is not well carried out. This is reflected in several problems concerning the quality, quantity and marketing-

and most important for further future developments.

8.7. Polution and waste problems

Some tanneries-especially those located inside the cities start suffering from polution and waste sewage problems. The Leather Research Institute has to start several studies concerning the solution of these problems which has already resulted in stopping some tanneries from production.

The above mentioned obstaeles are the major ones which hamper the improvement of the leather industry in Indonesia.

But still there exists other problems which affects to a big extent the leather industry. These problems with their propossed solutions are mentioned briefly in the Recommendations in this report.

9. Spaeific description for some selected tanneries

The following are examples of some reportes done on tanneries visited and adviced by the adviser. The full reports of these tanneries are found in volum II of the final Report:

The tanneries mentioned below as examples represents:

- a. One Governmental tannery
- b. One Exporting tannery
- c. Cne Domestic tannery
- d. Home Industry tannery.

A. REPORT VISIT TO P.P.K. MERTOYUDAN M G L  
MAGELANG (CENTRAL JAVA)

- Discussion with : 1. Mr. A. BOESRI PRAPTOMOELJONO  
General Director
2. Mr. ARDEM MADJO  
Technical Manager
3. Mr. RIFAN HADI  
Technical Manager

Findings

1. The Tannery is owned and directed by the government of central Java.
2. Number of Drums present : 9 drums
3. Number of workers : 75 worker
4. Working capacity : 35-40.000 ft<sup>2</sup> shoe uppers and 10 tons of sole leather.
5. Maximum capacity : 50.000 ft<sup>2</sup> shoe upper leather and 12 tons of sole leather.
6. The market demands is the reason for the lower productivity since the production is done according to the local demands.
7. The production of the tannery:
  - a. Full grain, corrected grain upper leather (pigment finish)
  - b. Sole vegetable tanned leather, insole splitsBoth products are locally used.



Technical Research

1. The soaking process is not done properly, since the pit used for soaking, is not large enough and the percentage between the hide and water in the soaking process which is usually 400% water this percentage is not working, causing insufficient soaking operation which is the principle to have good quality leather.
2. The revolution of the liming drum is very high, since the R.P.M. of liming drum should not be more than 2-4 rounds per minute. This high revolution in the liming drum is one of the causes of loose grain which is quite clear in the finished product.
3. The low speed of the retanning and fatliquoring drum causes also bad fat liquoring operation.
4. The splitting machine is not working properly and needs a lot of mentenance.  
Also the Samming machine is very old and completly out of order and it causes a lot of harm to the leather and should be stopped completely.
5. The drying operation of the corrected grain leather is not done properly, since the leather is leaft to dry in the direct sun over inclined tables causing reduction in size without any need and this should be changed.  
The drying of full grain leather is well done and no need for further change.

6. The staking machine is very old and it needs some mechanical arrangements in order not to cause any harm to the finished leather.
7. The running formul for the production of full and corrected grain is using several chemicals without any need and this causes weast of maney.  
Also the p.H. of the pickling operation is very low and it should be raised to be between 3-3.5.
8. The sole leather produced is not bad according to the local market but still far away-as all the sole leather produced in Indonesian still far away from the International standard.
9. The corrected grain leather produced is not bad but the full grain leather has a very loose grain i.e. no tight grain, also bad fulness and softness.

#### Technical Advice

1. The number of hides should be reduced in every pit in the soaking operation to be only 30-35 hides in one pit soaking for 24 hours.  
Or in case of the necessaty to put 70 hides in the pit for soaking, then next day these hides should be resoaked again in a drum for 1-2 hours but the revolution of the drum should not exceed 2-4 R.P.M.
2. The R.P.M. of the deliming and Bating, Pickling, and tanning drum should be arranged to be from 6-8 r.p.m. Also that of retaning and fatliquoring should be changed to be 10-14 R.P.M.

3. The p.H. of the pickling operation must end between 3-3.5 max and not lower than that.
4. The samming machine should be stopped completely from work and until it is completely renewed, saw dust should be used as explained to the tannery. Also the splitting machine must be in a good condition since this will effect the final appearance of the leather (i.e. Unequal thickness).
5. The drying of the corrected grain leather should be done by nailing which will give an increase in area per side not less than  $1/4 \text{ ft}^2$ .  
It is true that the quality of the produced leather will be lowered, but this could be recovered easily by good staking and finishing.
6. The tannery is in true need to replace the following machines in the following order:
  - a. The Spliting Machine
  - b. The fleshing machine
  - c. The samming machine
  - d. The Shaving machine
  - e. The Staking machine

Also a new Hydrolic press with new fashioned plates-  
expecially for corrected grain leather - is required.  
With respect to the sole leather produced, the  
quality can be easily increased by increasing the  
concentration of the final tanning drum to be between  
 $8-10^{\circ} \text{ Be}$  instead of  $5-6^{\circ} \text{ Be}$  as it is now also the  
running time of the leather in this concentrated

solution should be between 8-12 day and not 4 days as now.

By this process good quality sole leather is produced with higher weight which means more selling price for every side as the sole leather is solled by weight. The above recommendations with 4 working formulas, has been given to the tannery.

B. REPORT VISIT TO P.T. PAN VICI AND SONS  
J A K A R T A

Discussion with:

1. Mr. L. DJABAR DJUNAIDI  
Owner
2. Mr. KANS DJUNAIDI  
Director.

Findings

1. Number of workers : 150 worker
2. Number of drums : 27 drums + 6 paddles
3. Working capacity : 2 tons of dried cattle hides/  
day equivalent to 10.000 ft<sup>3</sup>/  
day and 2.000 pieces of sheep  
and goat skins per day.
4. Maximum capacity : 4 tons dried cattle hides/  
day equivalent to 20.000 ft<sup>2</sup>/  
day and 6.000 pieces of sheep  
and goat skins per day.
5. The reason of the drop in the production:
  - a. The raw cattle hides is not enough to work  
with full capacity, also no enough goat and  
sheep skins.
  - b. The prices of the raw hides is not stable, now  
adays these prices is going up and expected  
to be higher again.

c. The production depend on the demands of the local and export market.

6. The production of the tannery is :

- a. Full grain upper leather
- b. Corrected grain upper leather  
both are pigment finish and for the domestic uses
- c. Army and police leather for shoes
- d. Embossed upper leather for domestic uses
- e. Furniture leather
- f. Crust leather
- g. Pickled sheep and goat skins
- h. Wet blue goat skins  
The last 3 products are for exportation
- i. Sole and split vegetable tanned leather.

Technical comments :

- 1. The production is very good either for domestic uses or for exportation and no any technical observation, can be said.
- 2. All the necessary technical tests such as the control of temperature, measuring the  $p^H$  and the degree Be' all these chemical tests are well done and controlled.
- 3. The tannery is well arranged, well equiped with machines except the drying vacuum dryer and the summing machines.
  - a. There are more than one vacuum dryer including also locally done, but all of them are not working properly, and the drying operation is

done very slowly and this causes for sure reduction in size of the produced leather.

The tannery has either to buy a new vacuum dryer, or to nail the leather first until 50% dryness then to continue drying on the vacuum dryer.

- b. The samming machine present is not working properly causing lot of trouble to the leather and the tannery has to trim a lot from every side of the leather before shaving, and this of course causes indirect lose of area of the leather produced.

It is true that the tannery has a future plane to build a new factory for leather fiber board so using these trims as a starting raw material, but until that factory is build it is a true lose from these trims caused by the unproper use of the samming machine.

A recommendation has been given to the tannery either to have a new samming machine or to use the saw dust as drying agent before shaving.

4. The sole leather produced is far away from the Standard Normal sole leather, the process of tanning is not bad but the finishing of the sole leather is very bad. (A formula has been given to the tannery for finishing sole leather)

5. The tannery is producing pickled and wet blue goat and sheep skins.

Advice has been given that the production of crust sheep and goat skin is much more better to the tannery especially that the measurments of the crust leather

is much more accurate on a measuring machine, and not a matter of estimation as it is measured now on a wooden frame.

Also by producing crust skins, the area of the skin will be increased much more than in the pickled or wet blue since drying by nailing will increase the area by not less than  $\frac{1}{4} - \frac{1}{2}$  ft<sup>2</sup> in every piece.

6. Generally speaking the tannery under investigation can be considered as one of the biggest and best tanneries all over Indonesia, also the production either for the local market or for exportation can be considered as one of the best quality leather. There is a very big chance for this tannery to advance more and more especially for exporting finished leather.



C. REPORT VISIT ON NV. PABRIK KULIT  
"KIAN HIN"  
J A K A R T A

Director : Lo Jen Kie

Findings :

1. Number of workers : 85 workers
2. Number of drums : 12 + 3 paddels
3. Maximum eapacity : 45 tons of cattle hides/month
4. Working capacity : 20 tons of cattle hides/month
5. Production :
  - a. finished upper leather, full and corrected grain, pigment and semi aniline and aniline finish.
  - b. embossed upper leather
  - c. sole and lining leather (vegetable tanned)
  - d. glove and suede leather from splits (chrome tanned)
6. All the production is sold and used for Domestic uses.
7. The tannery is not working with its maximum capacity for the following reasons:
  - a. Lack of capital
  - b. Market demands which is not stable
  - c. Fluctuation in the prices of raw hides so the tannery has in stock only for 3 weeks production (which is very low stock)

8. The stock for chemicals is only for 10 days and for finishing chemicals only for 3 weeks which is also very low stock .  
(usually the stock of hides and chemicals should be at least for 6 months).
9. The tannery buies the raw hides from central Java, Medan, North Sumatera, Pontianak but not from Jakarta.
10. The tannery is complaining from the scarcity and high prices of the raw hides, which is almost much higher than the world market.

#### Technical Research

1. The machines present in the tannery are very old, and not working efficiently and this effect the quality of the final production such as in corrected grain leather, buffing is very bad. This is quite clear in the finished leather were traces of bad buffing parts appears after the leather is completed.
2. The Hides deffects such as skin diseases and mechanical damages, etc appears also in the final corrected grain leather, this is also because of bad buffing operation.
3. The finished leather has a bad appearance, loose grain is well noticed either in full or corrected grain leather.  
The reason for this might be from the process of liming and a lot of experiments should be done in order to reach a good formula to avoid this loose grain.

Also the finishing system has to be completely changed especially impregnation.

4. The retanning of corrected and full grain is not good and this is quite clear especially in the poorer parts of the hide (bellies, flaks, shoulder section).
5. The fat liquoring process is not done in a good way and this is obvious on the flesh side after the fat liquoring process and it appears also as fat spews on the finished leather, this is also because of the use of low quality fat liquoring agents.
6. Some side of the corrected grain leather was very hard without any obvious reason.
7. The drying system is not good, the vacuum drier used is locally made very primitive and without any cover i.e. only a hot plat over which the leather is dried. Even the setting out on this hot plate is not done in a good way, and this appears in the final production as a defect in the leather.
8. The sole leather produced is very soft and empty i.e. no enough tanning inside. This will also cause very low Abrastion Resistance and will be completely destroyed after making shoes and use for maximum 3-4 months.
9. The technology in the tannery is not sufficient and the necessary test usually done in the tanning process such as measuring  $p^H$ , degree Be' and so on, all these tests is not carried out regularly which effects the

final production especially from the quality point of view.

Technical Recommendations

1. The necessary chemical test should be done i.e. ph. ph test after deliming, pH after bating, measuring of degree Be' before pickling (especially that the salt used before adding the acid is not pure and full of humidity) measuring pH after complete chrome tanning, pH after neutralization and after retanning. These test are very important and must be done.
2. The buffing operation must be well done using buffing paper of low number first then those of higher ones until the visible defects on the leather have been completely removed.
3. A recommendation should be important of using good quality fat liquoring agents especially in full and corrected grain leather.
4. The setting out operation must be well done, by both hands.

D. VISIT REPORT TO GARUT

In Garut about 60 km away from Bandung, a group of primitive work shops producing leather. (about 70 work shops).

The name of a tannery can not be applied, yet they are still producing leather.

No drums, no machines every thing is done with a very primitive way.

The number of workers is ranging from 2 till 10 workers in every shop.

The hides is soaked in a pit maximum 2 hides/day.

Spliting is done by hand, which is very slow, inaccurate, primitive process.

The motion of hides in an open drum is done by the legs of the worker either in deliming, bating, pickling or even in the chrome tanning process.

Concequently No Chemical Control with respect to measuring pH or degree Be' or any other kind of chemical tests used in the leather tanning process.

Even staking is done by hand on a wooden holder.

The resultant leather is hard, stiff, empty, dead feeling not regular in thickeness, but according to the possibilities present in these primitive work shops, the leather produced seems to be a miracle.

Visiting some of these work shops, which are typically idential, discussion was done in details in only two of them:

I. AJAT RAHYAT work shop (this is the name of the owner and of the work shop)

a. Number of workers : 10 worker

- b. Working capacity : 2 cattle hides/day
- c. Production : chrome upper and lining leather.
- d. Formula used : The formula is not bad except in :
  - 1. No any chemical control is done during the tanning process even for the temp. of water.
  - 2. The percentages of chrome and fat liquor used is very small and less than enough. (They use only 5% chrome powder and 2% fat liquor agents).
- e. The work shop is working like this since 30 years, and ALL the production, which is of very low quality, is sold and used for domestic uses.
- f. The work shop is suffering from the lack of capital and this applies to all of them.

II. YUSEF Work Shop

(The name of the owner and the work shop)

- a. Number of worker : 8 worker
- b. Working capacity : 2 cattle hides/day
- c. Production : chrome upper and lining leather.
- d. They all use the same formula also with out any type of chemical control.

### Chapter III

#### The Leather Research Institute

1. General View :

The Governmental Leather Research Institute in Jogjakarta is the only Research Institute dealing with Leather Industry in Indonesia. The future advance of leather industry in the country depends to a big extent on this Institute.

The students graduated from the Academy of Leather Technology has their practical training in the Institute. Those graduated student are the future technicians in an industry already suffering from the lack of technicians and new technology.

The Institute has a very good relation will all tanneries together with all the people working in the leather industry.

They hope that the institute should provide them with the necessary technical assistance they need. In fact, the Institute through its well technical management and staff has been helpful to a big extent for the leather industry acting as a trouble shooter.

In some cases the technical staff from the institute are requested to carry practical work in tanneries for short time, assisting in the improvement and upgrading of the leather produced. In home industry tanneries, the assistance of the Leather Research Institute is quite noticeable.

The sources of budgetary revenue of the Leather Research Institute are :

A). Governmental Budget

This is supplied by the Government and it consists of :

- 1 - Routine Budget                      2 - Development Budget

B). Non-Governmental or earned Budget

This is earned by the institute through technical assistance given to the industry, fees charged for certification of exported leather ..... etc.

The noticeable increase (about 100%) in the Governmental budget is quite clear from the following data :

	<u>1975/1976</u>	<u>1976/1977</u>
1. Routine	Rp. 68.640.500 (=69,58%)	Rp. 101.466.400 (=49.44%)
2. Develop.	Rp. 30.000.000 (=30.42%)	Rp. 103.759.000 (=50.56%)
	_____	_____
Total	Rp. 98.640.500 (100%)	Rp. 205.225.400 (100%)

The Non-Governmental or earned budget had been increased also by 250% during the same period which means that the leather industry sector is giving big assistance and appreciation to the institute activities.

With the increase of this activities, the leather industry sector will give more and more, finally for the benefit of the leather industry in all Indonesia.



2. The Leather Research Institute consists mainly of TWO Big Centers ( Units )

2.1 TANNING CENTER ( Unit I )

This unit can be considered as a small tannery with 2 soaking pits, one paddle, 3 liming drums, 2 chrome tanning drums, one dyeing and fat liquoring drum. The necessary machines used in the tanning process is also present such as Fleshing, Splitting, Sammying and Shaving machines. For finishing operations, the machines present are : TWO buffing machines, ONE bruching, Three glazing machines, ONE automatic spraying unit ONE Vacuum dryer, ONE ironing and ONE rolling machine. The number of workers working in this unit are 30 workers.

This unit is working for :

a. Training

The students from the Academy of Leather Technology carries practical training in this unit.

They are trained on the different stages in the tanning processes under the supervision of the technical staff from the institute. This practical training is well done.

b. External Services

Through this unit, some external services are done for the private tanneries. Starting from soaking until chrome tanning process, all are done in this unit.

The hides or skins with their chemicals belongs to the external tannery, the institute will supply equipments and workers and some times the method of tanning itself.

c. Production

In case that there is no external services done in this unit, the institute will carry its own production. The main production is Leather for textile industry, pickled, wet blue from sheep and goat skins.

The quantity of the production-compared to the possibilities of the institute-can be considered VERY SMALL and should be increased.

For the tanning Unit it is recommended :

1. The arrangement of the machines is not in the proper way. Those machines have to be arranged in order that the flow of production should be in one line and not crossed as it is now.
2. The paddle is out of order and has to be prepared and used in the production since liming in the paddle is highly recommended and preferred than drum liming.
3. The unhairing and fleshing knives has to be completely changed and renewed since they are out of order since a long time.
4. Some machines e.g. the shaving machine has to stopped for a long time without any work on it.

In such cases it is recommended that the machine should be kept in operation periodically in order that it is always ready for use.

5. The scudding machine is out of order and quick maintenance is needed to put it once more in operation.
6. By adding one or 2 more drums for chrome tanning the whole productivity of this unit could be increased.
7. The rounds per minute of the dying and fat liquoring drums has to be changed to be from 12 - 16 r.p.m.
8. The Vegetable tanning unit is not working properly. A complete use of this unit must be done. By adding 2 or more tanning drums, this unit can produce vegetable tanned leather easily at least for the requirements of the handicraft unit.  
The pit/drum system can be used very easily and properly in the production of sole leather. In future, this vegetable tanning unit can be used in advising the tanners how to improve their vegetable tanning process and to produce sole leather according to the international standards.
9. The technicians supervising this unit needs abroad training in order that they can produce and assist in producing leather according to recent developments in the tanning industry.

2.2 Shoe and handicraft Center ( Unit II )

The shoe manufactory section is producing shoes on small scale, mainly for external request.

One of the main objectives of this unit is to train personal working in shoe industry which is an important sector in the field of leather products.

The handicraft section is working nearly the same as the shoe manufacturer section, for external demands and training personal working for handicraft art. This section gives also new and recent designs for the market, assisting in increasing exports of leather goods.

The number of workers working in these 2 sections are 30 workers.

3. The organization of the Institute

The Leather Research Institute consists of 5 departments, each has 5 sections as follows :

3.1 Department of Research and Scientific Development  
Sections :

- 3.1.1 Process and Product Research
- 3.1.2 Testing and Standardization
- 3.1.3 Experimentation Laboratories
- 3.1.4 Data Compilation and Analises
- 3.1.5 Material Research.

3.2 Department of Technological Development Sections :

- 3.2.1 Process and Product Technology
- 3.2.2 Handicraft - Design and Production
- 3.2.3 Leather Technology
- 3.2.4 Synthetion and Plastic Technology
- 3.2.5 Industrial Leather and Plastics.

3.3 Department of Industrial Development and Economics Sections :

- 3.3.1 Statistics and Data Analyses
- 3.3.2 Affiliation ( Industrial )
- 3.3.3 Planning and Programming
- 3.3.4 Industrial Development & Market Research
- 3.3.5 Law and regulations.

3.4 Department of Scientific and Training Sections :

- 3.4.1 Library Scientific Documentation
- 3.4.2 Exhibition and Information
- 3.4.3 Training & Up grading
- 3.4.4 Publication
- 3.4.5 Extension Services

3.5 Department of General Administration Sections :

- 3.5.1 Finance
- 3.5.2 Personnel
- 3.5.3 Building and Groundside
- 3.5.4 Supply & Logistik
- 3.5.5 Power and Technical Maintenance.

4. Personnel

- 4.1 The Director of the institute is at the same time The Director of the Academy of Leather Technology located also in Jogyakarta. This is quite good since ONE Director can arrange and manage the training courses done by the students of the Academy in the Research Institute. Also the recent developments and researches in the tanning industry can be

transferred immediately to the Leather Academy.

4.2 The number of persons graduated from the Academy of Leather Technology until date are 282 persons. They occupied Jobs in governmental and private sector as follows :

a. number of persons working in the governmental sector	= 132
b. number of persons working in the private sector	= 113
c. number of persons working independently	= 37
	—
T o t a l	= 282

The future advance of leather industry depends on those technicians graduated from the Academy and trained in the Research Institute.

4.3 The number of staff working in the Leather Research Institute are 220 persons out of them are 111 persons (approximately 50%) have received high level of education.

The number of men working is 179 = 81,4 %

The number of women working is 41 = 18,6 %

— —  
T o t a l : 220 100 %

## 5. Library

The library consists one of the most important sections related to the research works done by the Institute. There is shortage of scientific and technical books and technical literature dealing with leather technology and leather

products industry. It has to be intensified by recent books on leather technology, shoe and handicraft magazines.

The Director of the Institute has already started contacts with some Leather magazines and Journals in an attempt to supply the library with the most recent developments in the Leather Industry.

Some books and magazines recommended for the library is mentioned in Annex XIII.

6. Testing and Experimental section :

The equipments present in the laboratories of the institute are directed towards chemical, physical and microbiological tests.

For chemical and microbiological tests, the equipments present are not enough for such an institute. It has to be increased in number and upgraded in quality in order to fulfil the tasks of the institute in creating and implementing the Indonesian Leather specifications.

The necessary equipments needed for this section is mentioned in Annex XIV.

It has to be noticed that :

- a. There is no Air-Conditioned room for physical testing. This room has to be present as a condition for perfect physical tests since these tests - according to international standards - has to be carried in certain temperature with certain humidity.

b. A Separate room for workers and for samples is also recommended.

7. Future tasks for the Leather Research

Institute :

7.1. The most important role for the Leather Research Institute in future is to establish special specifications for Leather in Indonesia, i.e. chemical and physical specifications. These specifications does not exist in Indonesia until date. The necessity of existance of such specifications is well known.

Through several meetings with Mr. Pietoyo, the Director of the Leather Research Institute the following 2 stage working plan was agreed :

A. Stage I or Short term plan :

This stage will consist of :

1. Collection of samples from different tanneries representing different varieties of leather produced in the whole country.
2. Chemical and physical analyses of these samples by the Institute according to the international standard methods of analyses.
3. Comparison of the actual figures obtained with the international standards.
4. Establishing the extent of discrepancy between the actual and the international standard.

The Institute has already started working in this stage, 12 samples from different tanneries had been already collected and analysed.



B. Stage II or Long term plan

This stage will consists of :

1. The production of leather in the pilot plant in the Institute in accordance with the international standard established.
2. The transfer of the tanning procedures from the Institute to the tanneries.
3. Giving assistance to the tanneries to enable them to produce leather according to the international standards.
4. After a trial period, the inforcement of this standard through Indonesia.

For simplisity the last iteam could be done first through provinces before applying to whole of Indonesia.

As agreed with Mr. Pietoyo, The Institute with the possibilities present can carry alone stage I but in stage II the assistance of UNIDO is required.

This assistance should be in the form of a UNIDO Leather Tanning Adviser (see Recommendations).

- 7.2. The Institute should make most benefit from the tanning unit already present, The quantity of work done in this unit at present is quite small if compared with the possibilities present.

With the internal arrangement of the machines, adding 2 or more tanning drums etc the tanning unit can produce quite a lot of either pickled, wet blue sheep or goat skins, or even finished upper leather.

The aim of transferring the tanning unit to a production one is not only for earning purposes, but also to be an example of well arranged and technically directed tannery. The transfer of this unit to be a productive one will not stop the role of the Institute as a Research one, but on the contrary will assist to a big extent in this direction.

The assistance given to the private sector will be much more supportable by this new tanning unit.

The Director of the Leather Research Institute has agreed on this idea.

The assistance of UNIDO Leather Tanning Adviser is also required. In my opinion that a Leather tanning adviser can give his assistance to the Institute for both the specifications and the production activities.

Chapter IV  
Forestry  
Acacia and Mangrove

1. General View

In Indonesia there exists 3 kinds of Acacia :

- a. *Acacia Decurrens* (green wattle )  
with an average tannin content 27 - 42 %
- b. *Acacia Mollissima* ( black wattle )  
with an average tannin content 35 % - 39 %
- c. *Acacia Leucophlea*  
with an average tannin content 15 %

In all acacia trees, the tannins and their associated non-tannins are concentrated mainly in the bark.

- 1.1 Mature black wattle bark (8 -10 years growth) contains an average 35% tannin. The tannin content of the bark varies within a single tree, being highest in the thick basal bark and gradually decreasing with increasing height. The bark of lowest tannin content is therefore to be found in the youngest portions of the trunk and branches. Tannin content usually increases with increasing age and thickness of the bark, but variation in soil conditions, rainfall and other environmental factors also exercise a marked influence.
- 1.2 The green wattle possesses bark equally rich in tannin as that of the black wattle, although the bark is rather thinner. The tannin is more highly coloured and when used in vegetable tanning it produces highly coloured leather.

The green wattle is easily grown, yields good straight poles and is much more resistant to cold and to the two major insect pests (bagworm and froghopper).

- 1.3 Black wattle bark extractives are readily soluble in hot water. In tanneries the bark is broken up and extracted by a hot counter-current leach. Alternatively, the bark is first cold-leached and finally hot-leached to remove all solubles. The hot and cold extractives have different tanning properties and used in the production of vegetable tanned leather.

2. Acacia

Previously, the total area cultivated by Acacia trees was estimated to be 47,000 - 50,000 hectares. Now a days only 1,000 - 2,000 ha are still remained.

The reason for this drop is that the cultivation of Acacia seems not to be profitable which is not true. The cultivation of Acacia is quite profitable especially when the correct methods of planting and thinning is applied. The Acacia extracts is used locally on a wide scale in tanneries producing sole leather. The demands of those tanneries for Vegetable Tanning Extracts is going higher and higher with the increased demands of Vegetable tanned leather ( for shoe industry, textile industry, handicrafts ..... ) The following table shows the quantities of imported vegetable extractes and their value in U S \$ .

Table 11  
The quantities of Imported Vegetable Tanning Materials  
and their value in U S \$

Period	Quantity (in Tons)	Value in U S \$
1970	128	26.769
1971	266	58.967
1972	118	30.881
1973	162	58.000
1974	213	60.000
1975	594	191.027
1976	708	252.471

Source : Central Bureau of Statistics - Jakarta.

The Acacia trees are now cultivated by farmers in East and Central Java but on a very small scale. The farmers has to sell those trees before its normal life time i.e they sell younger trees with an average age of 5 - 6 years.

Concequently those small age trees contains smaller tannin contents in their bark (average 12 % tannin content).

What ever the price of Acasia will be in the future, it will be still much more cheaper than the imported similar extracts.

The average price of Acacia is Rp 30/Kg and every 5 Kg of Acacia Bark yeilds 1 Kg of extract which means that the price of One Kg extract will be Rp 150, much cheaper than mimosa extract with an average price Rp 450/Kg.

3. Mangrove

The tannin present in mangrove barks of different kinds may vary from less than 10% to over 40 %. It is only when the tannin content is fairly high that exploitation for tan-bark or for extract is worth while. Bark for export should have not less than 30% tannin. For local extract manufacture barks with a lower tannin content may be profitable to work.

It is considered that mangrove constitute the world's greatest potential source or reserve of tanning material. Mangroves constitute in fact the only commercial tanning material of natural growth that seems inexhaustible.

The age of the bark or of the tree yielding is important, the tendency being the older the tree the richer the bark.

In Indonesia the mangrove trees exists in all Swampy coasts as in Kalimantan, east coast of Sumatra, Sulawesi and Ujung Pandang.

The estimated amounts of mangrove already present is about 250.000 - 300.000 hactares.

The mangrove are inexhaustible i.e the trees are rapidly grown up and self regenerating.

The mangrove trees, BAKAW, is already exported with their BARK to Taiwan and Japan.

4. Recommendations

- 4.1 Establishment of extracting factory for mangrove in Tarakan ( East Kalimantan ).
- 4.2 Reforestration of the barran hills with trees producing tannines instead of fire wood trees.

According to the Leather Research Institute, there exist in Indonesia about 45 kinds of trees containing tanning material varying from 10 up to 25 tannin content in their bark.

4.3 Rehabilitation and expansion of the existing Acacia areas. As *Acacia decurrens* is cultivated on the altitude of about 1000 meter above sea level it is advisable to plant another kind of Acacia that grow beneath 1000 meter namely *Acacia Pycnantha* which has a longer growth period and has more tannin content ( about 43 % ).

4.4 Selective cutting with new plantation in between so that the Acacia forest will not be barren and the trees can fulfil its hydrological function.

4.5 The prevention of Acacia stealing for firewood that occur in most of the Acacia forest. The storage of Acacia bark must be centralized in certain places to prevent stealing. The drying process should be taken into consideration to produce good quality.

The rehabilitation of Acacia (together with the other recommendations) is not only for domestic uses by tanneries producing sole leather but also for exportation purposes.

Among the Asian countries, Indonesia has the greatest possibilities to be the biggest producers of Acacia and Mangrove extracts.

---

RECOMMENDATIONS

I. HIDES AND SKINS

A. AVAILABILITY

A decrease in the total livestock population has produced a shortage of hides and skins. This shortage has resulted in increased underutilization of capacity by existing tanneries. To overcome this shortfall of raw material it is recommended that:

1. Ranching on the some 9 million hectares available outside Java should be encouraged to augment and, within sum 7 to 10 years, increase the supply of locally produced hides.

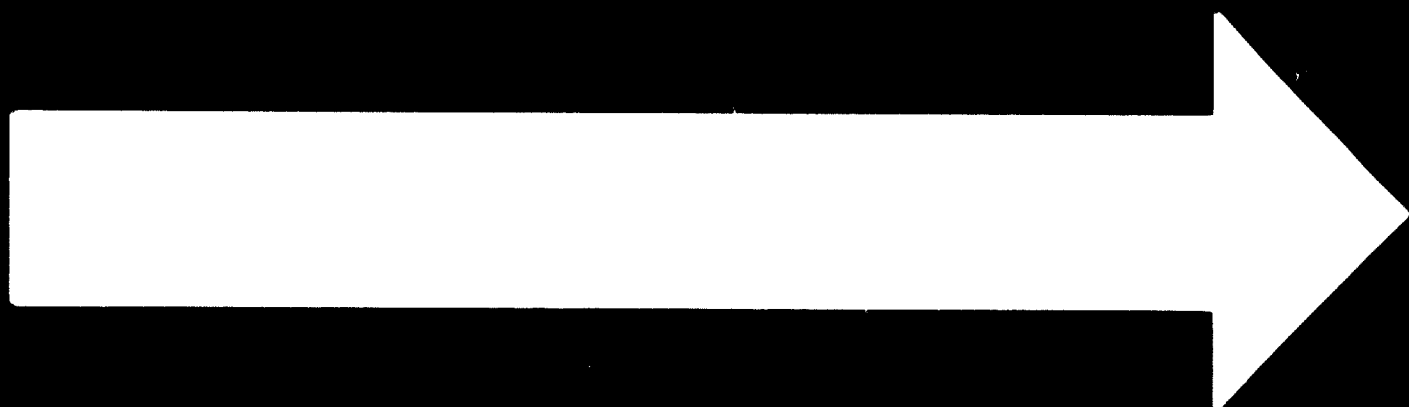
Ranching projects should be encouraged by the government through the provision of better financing and credit facilities. Bank credit of at least 15 years with a grace period of 7 years should be provided to give time for the ranchers to increase their livestock population.

Within Java an increase in the existing livestock population can be increased through the redistribution of the herd from places of high density to low density areas through the provision of government incentives.

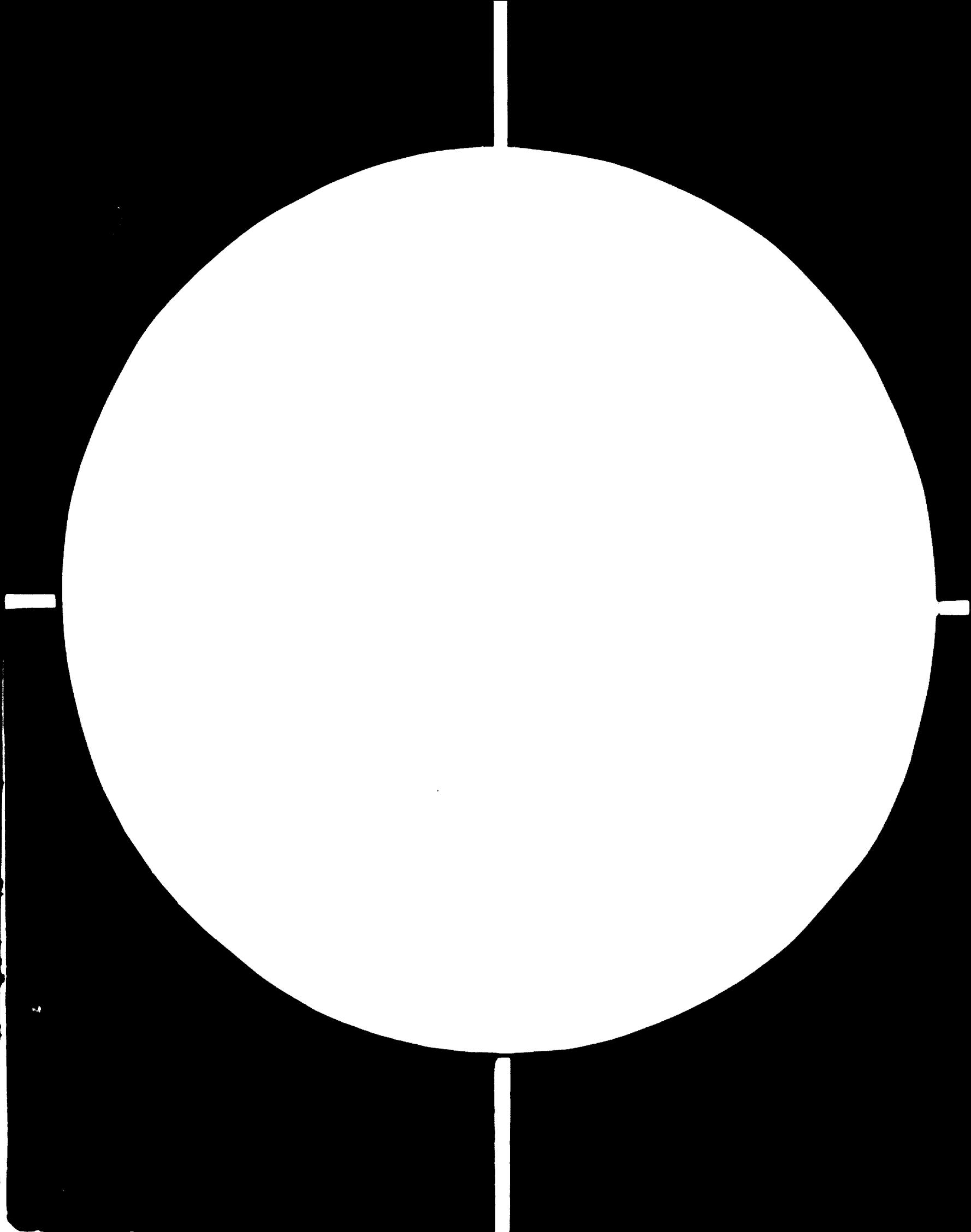
2. A proper proportion between the bull and cow populations should be established since the



**C-688**

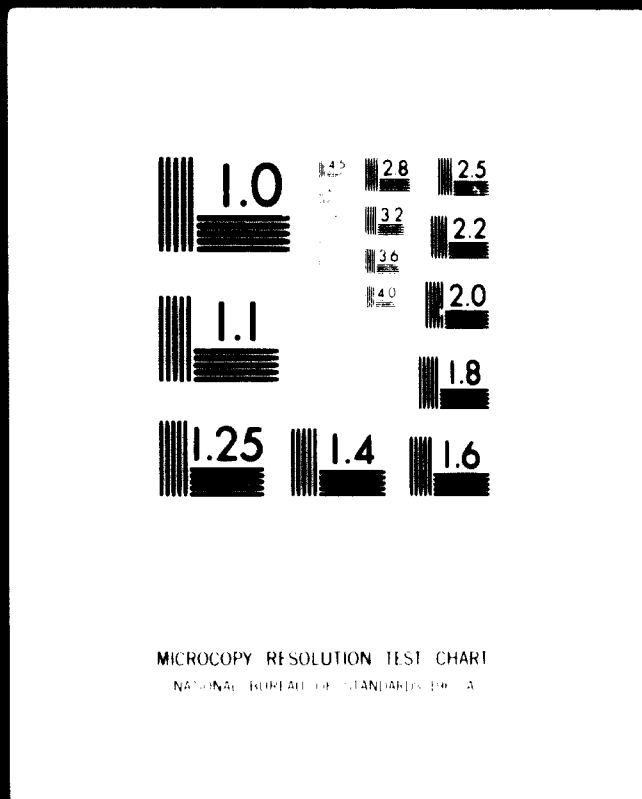


**78.11.22**



# 2 OF 4

# 08178



# 24x

# B

number of bulls exceeds that of cows.

3. The existing ban on the export of raw hides currently in force in Java be extended to cover the whole of Indonesia.
4. The importation of raw hides and skins should be encouraged by the government and the import duties on imported hides and skins should be reduced to a maximum of 5%. (insted of 30% as present)
5. Proper cool storage facilities in ports and harbours should be established to prevent imported hides and skins from spoiling through heat and humidity while awaiting customs clearance.
6. Full pest control and veterinary checks should be instituted at importation ports.
7. The export of live animals should be stopped to utilize the meat, hides and by products inside Indonesia.

B. QUALITY

A major problem in the quality of skins, arises from the lack of proper veteraning supervision and results in large quantities of skins bearing disease traces making them unacceptable for export:

1. Regular veterinary inspections/innoculations should be extended to goats and sheep (and not only for cattle) to improve the quality of their skins.
2. High quality animal feedstuff (Tapioca chips) currently exported to Europe should be utilized to improve the local herd for meat production, and the production of hides and skins. The latter tends to be given relatively low priority as a by-products by Government officials.
3. Proper training facilities should be provided through the Leather Research Institute, Yogyakarta, to upgrade the current weak flaying practices.  
Every official slaughterhouse must contain trained staff who not only attend such training courses but gain practical experience during this course.
4. Modern electric flaying equipment must replace sharp knives predominantly in use at present. UNIDO/FAO inputs may be considered for the implementation of these recommendation.
5. The slaughter of productive cows should be banned completely.

6. Chemical branding should replace the current practice of hot Iron branding which damages the quality of hides and skins.
7. The process of preserving hides as practiced in the inslands outside Java especially e.g. BALI - TIMOR - FLORES etc. is somewhat primitive and results in the production of preserved hides full of defects. These poor preservation techniques adversely effect the quality of hides and lower their grade considerably. To upgrade the preservation of these hides, UNIDO/FAO assistance may be required. Furthermore, the chemicals used in hide preservation should be made available free of import duty.

C. BY PRODUCT UTILIZATION

1. The creation of a Glue and Gelatine Industry based on the by-products of tanneries should be considered.  
UNIDO inputs can assist in the establishing of such an industry.
2. An indigneous raw material industry should be established such as Bating Agents (PANCREATIC BATES, which are made by using the digestive enzymes from the pancreatic glands from slaughter animals) and the production of lubricating oils from hooves and horners.

## II. THE LEATHER RESEARCH INSTITUTE

To enhance the effectiveness of The Leather Research Institute and to ensure its possessing the services necessary to meet the requirements of the tanning Industry in Indonesia, the following recommendations should be implemented.

### 1. Training

Institute staff must receive extensive training abroad in specialize leather centres and/or large chemical companies.

### 2. Equipment

A small fully equipped production unit should be created at the Institute to enable the Institute to establish and test specifications prior to the adaption of these standards in the tanneries on a large scale.

### 3. Library

A comprehensive library must be established to collect refrence material and keep abreast of current international developments in leather technology.

### 4. The linkage between the Institute and Industry should be extended by designing a comprehensive

programme of Industrial services, training, product and process development.

5. Standards

To ensure the acceptability of Indonesian leather and command competitive prices in export markets, specifications must comply with international standards.

The establishment of standards and specifications may require the assistance of a UNIDO expert (minimum one year).

His arrival at the Institute should however be made conditional upon prior implementation of the recommendation on training, equipment and the library.

6. Once a standard is established, a strict quality control system should be instituted covering all Indonesian tanneries.

The enforcement of standards and the quality control throughout Indonesia is necessary to upgrade the quality of Indonesian leather.

7. No definitive figure exists for the total number of tanneries in Indonesia. This is especially outside Java. Each government department has a different set of figure varying from 63 to over 500 tanneries (including home industries). A survey should be conducted with the help and participation of the Leather Research Institute and the Leather Association.



This survey would not only establish the number of existing tanneries, but should also give a comprehensive picture of the leather industry, its equipment, production capacity etc.

### III. LEATHER

#### 1. Upgrading

As each step in the tanning process from hide or skin to finished leather adds an increasing proportion or value added, the aim must be to upgrade Indonesian production so that in-time all hides and skins are processed to a finished state.

It is recommended therefore that a policy decision should be taken to progressively ban the export of pickled then wet blue over a period of maximum of 2 years for each step and to be replaced eventually by exportation of crust and finished leather only.

#### 2. Measurement

- a. The present measurement system have 3 different sizes of square feet (20 cm x 20 cm, 28 cm x 28 cm and 30.45 cm x 30.45 cm). This should be replaced by the uniform international square feet (30.45 cm x 30.45 cm) and used for the both local and export markets.

- b. Frame measurements which at best produces a rough estimate should be discontinued and replaced by the use of modern measuring machines.

Alternatively the export of pickled should be stopped and upgraded to crust which is much easier to measure accurately. Poor measurements result in a loss of least half square feet per skin in every tannery which exports pickled hides and skins.

- c. The Leather Research Institute should be instrumental in the introduction and acceptance of these international standards of measurements.

#### IV. CUSTOMS DUTIES

##### 1. Import Duties

- a. Import duties on chemicals and machinery should be reduced as current levels merely increases production costs in an already high cost tanning industry. High duties on new machinery prevents many tanneries from replacing their old and worn out equipment which is the major factor preventing the improvement and upgrading of Indonesian leather industry.

- b. Benefit should be drawn from recent developments in advanced countries where the leather industry will be redeployed especially in the case of not new but still very usable machines.

2. Export duties

The present classification for duties on leather to be exported, i.e. semi-processed and finished, does not take account of the different stages of semi-processed leather. Since leather can be exported as pickled, wet blue or crust (all semi-processed stages), the export duties must take account of this fact and reflect the different degree of processing and value added inherent in each stage.

3. Export Incentives

In order to encourage the upgrading of equipment and technology in the leather industry and at the same time obtain sustained growth in exports, the government should consider the introduction of incentives to exporters of finished leather. (See page 50 of the report).

By this incentives all those exporters of semi-processed leather (pickled, wet blue, crust) will spontaneously progress to the finished stage with its big added value to the country.

4. Duty Drawback

Any drawback system should be applied equally to finished leather and leather goods as well as to the semi-finished stages i.e. pickled, wet blue or crust leather.

By applying the drawback system the prices of the exported leather will be lowered to the extent that it is competitive with the neighbouring countries.

V. CONTRACTS

a. Indonesian leather is presently exported on an ad-hoc basis where the price obtained do not always reflect the prevailing international prices in spite of the presence of the "Check price" published by the Trade Department.

In most cases some abnormal conditions exist in the contracts for the sake of the buyer.

In the absence of international standards this is to be expected. Once standards have been adapted however, international fixed contracts should be applied.

- b. It is recommended that a copy of the recent contracts should be submitted for final approval through a governmental committee chaired by the Director of the Leather Research Institute and include members of the Trade and Industry Departments. The committee should discuss the conditions present in the contract, also the capability of the tannery to fulfil the conditions concerning the production capacity.

VI. FREIGHT RATES

Prevailing freight rates from Indonesia to Europe are uncompetitive when compared with rates from other countries. The leather industry should press for Government help to renegotiate freight rates with the shipping conference.

VII. BANK CREDIT

One persistent obstacle to the creation of a modern efficient tanning industry in Indonesia is the high cost of credit. Present rate of interest at 18% are prohibitively. Special investment rate of maximum 7% should be made available to enable the industry to modernise its equipment and there-by upgrade its products.

VIII. T A X E S

The current taxation system where a tanner has to pay four kinds of taxes to four different departments causes serious difficulties for the tanneries.

It is advisable that taxes should be streamlined so that one single annual payment at one location covers all kind of taxes due to the Government.

IX. JOINT VENTURES

The creation of joint ventures with foreign capital and equity participation should be accepted in principle by the Government and encouraged.

This would not only provide a new source of much needed capital but also modernise the industry by the introduction of up-to-date equipment as well as the transfer of technology in production and marketing know-how.

Joint Ventures should be arranged only between existing Indonesian tanneries and foreign companies. No new tanneries should be created at present as long as the present shortage of raw hides and skins prevails.

X. REAFFORERSTATION

The wholesale distruction of Aceasia trees in recent years has resulted in the need for the

import of increasing quantities of vegetable tanning material.

Reafforestation of Accasia trees should be started immediately with the establishment of two vegetable extracting plants:

One based on Accasia in East Java, the other for Mangrove in Kalimantan.

The establishment of 2 factories in these areas would obviate the need for importation of vegetable tannies from abroad.

**XI. LEATHER ASSOCIATION**

The Leather Association should be assisted to play a more major role in promoting technical and commercial progress in the tanning industry.

**XII. HOME INDUSTRY TANNERIES.**

In places such as Garut where some 70 very small (home industry) tanneries exist in a restricted area, amalgamation through the formation of an association should be encouraged.

The Association with the Government help (B.I.P.I.K.) should provide some essential equipments for Joint-use with the final aim of creating a modern production unit under one roof.

XIII. COMPARATIVE STUDY

To obtain an insight into the cost structure of the Indonesian tanning industry when compared with similar industries in the area e.g. China, Republic of Korea etc. a comparative study should be undertaken through UNIDO/ITC auspices.

Such a study would enable the Indonesian industry to identify the areas to be improved to become competitive in price and quality when compared with its most direct competition.

XIV. INTERNATIONAL FAIRS

Participation by the industry in International Fairs and Exhibition should be encouraged to widen contacts and act as a catalyst for a better appreciation of modern trends and developments by Indonesian tanners.

XV. MARKETING

1. To promote, stimulate and intensify market for Indonesian Leather abroad (export) it is recommended that a Marketing Board should be established which would coordinate the exporters.
2. To create a stable environment for growth for the leather industry the mechanism of acquiring and distribution of hides and skins and other raw materials (chemicals) should be done by the Leather Association and supervised by the Leather Development Board.



Annex I

**LIVESTOCK POPULATION IN INDONESIA  
1967 - 1976**

(000 Heads)

Livestock	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1. Cattle	7716	6575	6446	6013	6245	6260	6637	6380	6805	6900
2. Buffalo	2732	2993	2940	2885	2916	2825	2489	2433	2859	3044
3. Horse	632	613	653	663	665	696	645	600	556	517
4. Pig	2602	2727	2268	2844	3362	3300	2768	2906	3044	3192
5. Sheep	3704	3556	3531	3327	3146	2997	3547	3403	3632	3680
6. Goat	7093	7282	7543	6791	6943	6997	6793	6517	7915	8602

\* Tentative figures.

Source: Department of Agriculture

Directorat General of Animal Husbandry - Jakarta

Annex II

**Number of animals slaughtered  
inside the slaughter houses  
(in 1000 heads)**

Kind of Animal	1969	1970	1971	1972	1973	Average increase in first Development Plan %	1974	1975	1976	Average increase 3 years 2nd development plan %
1. Cattle	769,2	823,1	664,1	740,9	693,9	- 1,77	694,1	728,3	783,9	+ 6,29
2. Buffalo	182,4	192,5	175,2	133,1	188,7	+ 0,86	192,5	195,7	195,7	+ 0,33
3. Goat	470,9	703,4	489,4	575,3	530,6	+ 11,53	561,3	618,0	620,5	+ 5,25
4. Sheep	220,6	208,3	193,7	230,5	246,9	+ 3,38	255,7	272,0	269,4	+ 3,39
5. Pig	394,0	422,6	531,5	607,3	917,9	+ 21,19	689,1	748,8	775,1	+ 6,09
6. Horse	3,0	6,5	3,2	4,0	6,7	+ 39,60	7,5	7,6	7,8	+ 1,9E

Source : Department of Agriculture  
Directorat General of Animal Husbandry - Jakarta.

## Annex III

Production of Vaccines  
( in 1000 dosis )

Name of Vaccine	1973	1974	1975	1976	Increase % 1975 - 1976	Average % Increase 1973 - 1976
1. A.E.	265,3	66,4	138,0	200	+ 44,93	+ 25,93
2. S.E.	2,086,7	1,402,7	1,295,0	1,385	+ 6,95	- 11,17
3. Anthrax	502,0	439,5	495,0	500	+ 1,01	+ 0,40
4. Blackleg	44,6	53,5	54,0	-	-	+ 10,44
5. Brucella S - 19	0,5	1,0	1,2	25	+ 1,903,33	+ 701,11
6. Rabies	57,4	41,0	64,0	100	+ 56,25	+ 27,92
7. Antisera	7,9	8,6	9,2	-	-	+ 7,92
8. Diagnostika	223,5	262,0	266,2	-	-	+ 9,41

Source : Department of Agriculture  
Directorat General of Animal Husbandry - Jakarta.

## Annex IV

Number of Animals Treated by  
Vaccines  
( in head )

Name of Vaccine	1973	1974	1975	1976	% Increase 1975 - 1976	Average % Increase 1973 - 1976
1. N.D.	23.500.000	14.946.719	17.750.000	13.850.396	- 21,97	- 13,20
2. A.E.	255.000	26.066	1.690.241	733.849	- 56,58	+ 2079,93
3. S.E.	1.280.000	1.821.340	1.404.665	1.633.907	+ 16,32	+ 11,91
4. Anthrax	463.000	619.602	699.984	485.782	- 30,60	+ 5,40
5. Rabies	46.947	25.909	57.000	66.428	+ 16,54	+ 30,57

Source : Department of Agriculture

Directorat General of Animal Husbandry - Jakarta.

## Annex V

## Total consumption of Meat, Eggs, Milk

	1973	1974	1975	1976
<b>I. A - Meat</b>				
production X	407,63	405,70	435,000	448,70
Import	1,61	2,14	1,01	1,38
Total	409,24	407,84	436,01	450,08
<b>B - Egg X</b>				
Production	54,76	71,06	75,89	85,50
Import	0,09	0,11	0,07	0,13
Total	54,85	71,17	75,96	85,63
<b>C - Milk XX</b>				
Production X	51,6	56,9	59,5	62,2
Import	168,91	200,41	209,69	328,62
Total	220,51	257,31	269,19	390,82
<b>II. Population</b> (in 1000 head)	124,601	127,586	130,596	133,650
<b>III. Consumption/head</b>				
Meat	3,28	3,20	3,34	3,37
Egg	0,44	0,56	0,58	0,64
Milk	1,77	2,02	2,06	2,92

I. In 1000      II. Kg per year      X The production is suitable for use . XX Fresh Milk  
 Source : Department of Agriculture - Direktorat General of Animal Husbandry - Jakarta.

Annex VI

UNARABLE LAND AND ITS POSSIBLE UTILIZATION FOR  
RANCHES IN INDONESIA

Province	Unarable Land (000 ha)	Short-term establ't of Ranch (000 ha)	Long-term establ't of Ranch (000 ha)
Aceh	670	9,4	-
North Sumatra	275	16,0	450
R i a u	465	15,0	-
J a m b i	620	-	-
West Sumatra	225	-	240
South Sumatra (incl. Bengkulu)	930	6,0	650
Lampung	484	-	450
West Java	197	-	-
Central Java	60	-	-
East Java	96	-	-
B a l i	18	-	-
West Nusatenggara	137	-	-
East Nusatenggara	400	27,0	-
West Kalimantan	500	-	-
Central Kalimantan	250	-	-
South Kalimantan	450	17,6	250
East Kalimantan	300	-	163
North Sulawesi	520	-	150
Central Sulawesi	516	-	-
South Sulawesi	1200	84,0	-
South-east Sulawesi	142	-	-
Maluku	200	-	-
Irian Jaya	130	-	-
<b>T O T A L</b>	<b>8.985</b>	<b>175,0</b>	<b>2.355</b>

Source: Department of Agriculture  
Directorate General of Annual Husbandry - Jakarta

Annex VII

DISTRIBUTION OF LIVESTOCK IN INDONESIA

	Place	Number (in Head)	Place	Number (in Head)
1. Cattle	: Jember	: 136.000	: Wonosobo	: 21.000
	: Malang	: 144.000	: Kebumen	: 24.000
	: Sumenep	: 216.000	: Sukoharjo	: 22.000
	: Tuban	: 119.000	: Purbalinggo	: 10.000
	: Lumajang	: 101.000	: Pemalang	: 5.000
	: Blora	: 100.000	: Purworejo	: 8.000
	: Probolinggo	: 99.000	: Kudus	: 5.000
	: Situbondo	: 79.000	: Kulonprogo	: 25.000
	: Rembang	: 81.000	: Sleman	: 31.000
			: Bantul	: 31.000
2. Goat	: Semarang	: 81.000	: Pekalongan	: 27.000
	: Boyolali	: 112.000	: Sukoharjo	: 38.000
	: Wonogiri	: 226.000	: Jepara	: 33.000
	: Gunung Kidul	: 100.000	: Sleman	: 15.000
	: Kediri	: 100.000	: Bantul	: 28.000
	: Trenggalek	: 109.000	: Situbondo	: 15.000
	: Ponorogo	: 129.000	: Pasuruan	: 12.000
	: Pacitan	: 140.000	: Probolinggo	: 20.000
	3. Sheep	: Semarang	: 58.000	: Purwakarta
: Temanggung		: 104.000	: Bekasi	: 22.000
: Sleman		: 28.000	: Demak	: 5.000
: Tuban		: 41.000	: Pati	: 1.000
: Lamongan		: 39.000	: Kudus	: 2.000
: Bandung		: 190.000	: Blora	: 3.000
: Garut		: 133.000	: Pekalongan	: 13.000
: Majalengka		: 119.000	: Sukoharjo	: 9.000
: Sukabumi		: 188.000	: Wonogiri	: 11.000
			: Mojokerto	: 1.000
			: Pacitan	: 6.000
			: Tulungagung	: 2.000
		: Sidoarjo	: 8.000	

Source : PEPEHANI (Indonesian Cattle Breeder Association).

Annex VIII

**A - Quantities of Exported  
live animals  
( in head )**

Kind	1973	1974	1975	1976	Increase % 1975 - 1976	Average Increase % (1973-1976)
1. Cattle	51.109	45.020	31.886	24.544	- 23,02	-21,37
2. Buffalo	11.492	13.240	4.168	2.080	- 50,10	-34,47

**B - Value in U S \$ of  
Exported live animals  
( in 1000 U S \$ )**

Kind	1973	1974	1975	1976	Increase % 1975 - 1976	Average Increase % 1973 - 1976
1. Cattle	3.632,2	7.471,3	5.824,9	3.949,3	- 32,20	+ 17,08
2. Buffalo	813,6	1.658,3	712,9	279,1	- 60,85	+ 4,69
Total :	4.449,8	9.129,6	6.537,8	4.228,4	- 35,32	+ 13,82

Source : Department of Agriculture - Direktorat General of Animal Husbandry - Jakarta.



## Annex IX

Quantities of Imported Meat, Egg, Milk  
and The Value in US \$

	1973		1974		1975		1976		% Increase 1975 - 1976		Average Increase % 1973 - 1976	
	Ton	1000 US\$	Ton	1000 US\$	Ton	1000 US\$	Ton	1000 US\$	Volume	Price	Volume	Price
Meat	1.611,6	1.755,6	2.137,5	2.250,3	1.101,5	1.532,4	1.381,7	2.711,4	+ 36,73	+ 76,94	+ 5,55	+ 24,41
Milk	25.210,8	14.912,8	29.912,8	23.722,1	25.571,9	26.032,3	40.075,9	37.732,7	+ 56,72	+ 45,02	+ 20,29	+ 39,99
Butter	3.704,9	3.281,0	4.760,9	5.501,1	861,0	837,6	01,7	873,0	- 6,89	+ 4,25	+ 20,10	- 3,46
Cheese	729,1	427,4	525,5	459,9	367,9	293,5	299,9	275,2	- 18,48	- 6,24	- 25,16	- 11,61
Egg	87,2	53,7	109,8	46,2	73,0	73,4	129,6	142,1	+ 77,53	+ 93,60	+ 23,31	+ 46,17
Total	31.343,6	19.876,8	37.446,5	32.069,6	27.884,3	28.769,3	42.688,9	41.754,4	+ 53,09	45,14	15,67	32,06

Source : Department of Agriculture

Directorat General of Animal Husbandry - Jakarta.

Annex X

QUANTITY AND VALUE (IN RUPIAH)  
OF ANIMAL BY-PRODUCTS

NO.	ITEMS	AVERAGE WEIGHT (KG)	PRICE Rp./KG
1.	Cattle alive	336	-
2.	Hide	26,16	325
3.	Skin From Head	4,16	90
4.	Oxtongue	1,71	1.200
5.	Spleen	0,53	800
6.	Heart	1,12	700
7.	Intestine	4,75	400
8.	Stomach	7,08	450
9.	Oxtail	0,89	1.100
10.	Lung	1,67	500
11.	Liver	3,26	1.500
12.	Head	11,13	210
13.	Foot	6,66	90
14.	Litter	3,08	600

Source: P.T. ABATTOIR SURYA - JAYA  
SUHABAYA  
MAY 1977

Annex XI

LIST OF INDONESIAN BANNERIES

WEST JAVA

1. NATRACO
2. RAMLIE
3. SARMILI & SONS
4. PAN VISI & SONS
5. CAKUNG
6. SUKA JUJUR
7. VICTORY
8. MAKMUR SANTOSO
9. KIAN HIEN
10. SINAR BOGOR
11. KIAN KOK
12. NGIAN NGIAN
13. CICADAS
14. TIONG NAM
15. TZU CHIANG
16. UNIVERSAL
17. ENVILI
18. CICACAK
19. HO TJLANG
20. HAW YAN
21. KA HION
22. JAKARTA
23. APPOLO

CENTRAL JAVA

1. MERTOYUDAN PPKM
2. SINAR OBOR
3. KARYADI
4. SAMPURNA
5. GENERAL
6. BENGAWAN SOLO
7. SAPTO TUNGGAL
8. P.P.K.K.
9. JAYA MAKMUR
10. TEGAL BARU
11. CONDRU PURNOMO
12. DARMA KUSUMA
13. RATNA
14. BUDI MAKMUR
15. CIPTO BUDI
16. AMOR ABADI
17. UPI INDONESIA
18. SUMBER JAYA

EAST JAVA

1. WONOCOLO
2. RACHBINI
3. WONOSARI
4. PASURUHAN
5. AKHOR
6. MAGETAN
7. KOPERASI MOJOPURO
8. KASIN
9. WANGSA BRATA
10. SIDO JOYO
11. KEMASAN
12. CAIRO
13. HARDJOSUMARTO
14. SUMBER SETIA
15. RIAN TEK
16. NASIONAL
17. PAGINA CIPTS
18. ERLANGGA JAYA
19. AMICO
20. HADI

OUTSIDE JAVA

1. HAKAMA
2. KOMODO (TIMOR)

---

Source : Central Bureau of statistic - Jakarta.

Annex XII

Labor Cost Comparison in Industry  
of some selected Asian Countries,  
August 1977.

COUNTRY	LABOR COST INDEX
Indonesia	100
Thailand	115
Malaysia	230
Rep. of Korea	150- 250
Singapore	300- 400
Hongkong	400- 600

A rough average - Estimate.

TECHNICAL LITERATURE : Annex XIII

1. Trade Journals.

A. Predominantly practice oriented.

1. Leder und Häutemarkt ( with appendix : Tanning  
Science and technology ).

Special trade journal for the leather Industry,  
the hide and leather mechanics :

Published by : Umschau - Verlag  
D - 6 Frankfurt am Main  
Stuttgarter Str 18 - 24

( Appears Weekly ).

2. Ravue Technique des Industries du cuir.

Published by : 54 Rue Rene - Boulanger  
Paris ( X<sup>e</sup> ), France.

( Appears monthly ).

3. Leather.

Published by : Benn Brothers Ltd, Bourvorio  
House 154 Fleet Street  
London E.C.4./U.K.

( Appears monthly ).

4. The leather Manufacturer.

Published by : Shoes Trade Publishing Co  
Boston, Mass 02111/U.S.A.

( Appears monthly ).

B. Predominantly Science oriented :

1. Das Leder.

Trade paper for the chemistry and technology of  
leather manufacture. Bulletin of the German  
Tanning Chemist Federation ( VGCT ).

Published by : Eduard Roether Verlag  
D - 61 Darmstadt  
Berliner Allee 56.

( Appears monthly ).

2. Journal of the Society of leather Trades Chemist.

Published by : Society of leather Trade Chemist  
52 Crouch Hall Lane  
Redbourn, Herts U.K.

( Appears monthly ).

3. The Journal of the American leather chemists Association.

Published by : Easton Printing Company  
Printers Easton, PA/U.S.A.

II. Technical literature ( Books ).

1. Gerborcicemie and Gerbercitechologie

Author : Dr. Philhabil. Fritz Stather

4 edition 1967/Publisher : Akademie Verlag  
D - 1 Berlin.

2. Modern Practice In leather Manufacture.

Author : Jon Arthur Wilson Sc.D

1. Edition 1941/Publishers : Reinhold Publishing  
Corporation.  
330 West Forty-Second Str  
New York/U.S.A.

3. The Chemistry and Technology of leather.

Author : Fred O'Flaherty, William T. Roddy, Robert M.  
Lollar.

Volume 1 : Preparation of Tannage 1. edition 1956

Volume 2 : Types of Tannage 1. edition 1958

Volume 3 : Process Control of  
leather quality 1. edition 1961

Volume 4. : Evaluation of leather 1. edition 1965

**Publishers** : Reinhold Publishing Corporation  
330 West Forty - Second Street  
New York/U.S.A.

4. A Survey of Modern Vegetable Tannage.

**Published by** : The Tanning Extract Producers  
Federation  
58 Bleicherweg - 8027 Zurich  
Switzerland.

5. Leather Technician's Handbook

**Author** : J.H. Sharphouse B.Sc.  
**Published by** : Leather Producers' Association  
9, Thomas Street  
LONDON SE1.

---



REQUIREMENTS OF THE TESTING AND EXPERIMENTATION CENTRE  
=====

**A - New equipments for leather physical testing**

1. Tensile Strength Tester in large scale  
( up to 250 or 500 kg ).
2. Abrasion Strength Tester using small sample  
( as the abrasion strength tester for rubber ).
3. Zwick Tester machines
4. Electric Finished Rubfastness Tester.

**B - Equipments for testing footwear**

1. Sole Adhesion Tester
2. Dow Corning Shoe Tester (Shoe Flexing Machine)
3. Thread Stitch ability Testing Device

**C - Equipments for Experimentation**

1. Hydraulic press laboratory with compressor
2. Splitting Machine for finished leather
3. Universal Ball Mill.

**D - Equipments of Chemical Laboratory**

1. Nitrogen Analyzer ( for testing leather )
  2. Unitized Extraction Assembly
  3. Shaker
  4. Magnetic Stirrer.
-

Annex XV

**LEATHER DEVELOPMENT INTER - DEPT - TEAM**

=====

- Chairman I : Mr. Pietojo Sukarbowo  
Director of Leather Research Institute  
and Academy of Leather Technology.
- Chairman II : Mr. Arifin Mursalin  
( Dir. General of Light Industry ).
- Secretary : Mr. Suripto
- Members : - Mr. M. Asjik Ali  
Director of Industrial Products  
Centre - NAFED.
- Mr. Dachlan  
Director General of Animal &  
Husbandry - Dept. Agriculture.
- Mr. Gatot Sudomo  
Senior Official of Bureau of  
Research & Development of Dir.  
General of Light Industry.
- Mr. Rustandi  
Research Department of Institute  
of Agriculture Bogor
- Mr. Donni Djatmika  
Dir. General of Foreign Trade  
Department of Trade.

Annex XVI

Lectures and Discussions

1. Discussion with the staff of the Leather Research Institute on 5 July 1977 - evening - on :  
" The role of the Institute in leather industry "  
Number of participants 22
2. Discussion with the staff of the Leather Research Institute on 6 July 1977 - evening - on :  
" The relation between the Institute, the Academy of leather technology and the industry, what can each one give each one "  
Number of participants 20
3. Lecture in the Academy of Leather Technology on 7 July 1977 - morning - on :  
" The principles of modern Vegetable tannag "  
Number of participants 60
4. Lecture in the Leather Research Institute on 7 July 1977 - evening - on :  
" Polyurethan finish or Patent leather, theory and Practic "  
Number of participants 25
5. Discussion with the Leather Development Inter - Dept - Team (annex 15) on 12 July 1977 on :  
" Leather Industry and Leather Problems in Indonesia "
6. Discussion about the recommendations of the adviser in a meeting containing both members of the Leather Development Inter-Dept-Team and the Indonesian Leather Association on 9 January 1978
7. Lecture on : "Problems of marketing of leather in Indonesia" on 11 January 1978 - Number of participants 59.
8. Discussion in the seminar held during the second Indonesian Leather week on 9 - 12 January 1978.

Annex XVII

LIST OF TANNERIES VISITED

<u>NO</u>	<u>NAME OF TANNERY</u>	<u>LOCATION</u>
1.	Makmur Santosa	Jakarta
2.	Kian Hien	Jakarta
3.	Pan Vici & Sons	Jakarta
4.	Tjakung Leather	Jakarta
5.	Ngian Ngian	Jakarta
6.	Suka Jujur	Jakarta
7.	H. Ramli	Jakarta
8.	Firma Natraco	Jakarta
<u>CENTRAL JAVA</u>		
9.	Budi Makmur	Jogyakarta
10.	Bengawan Solo	S o l o
11.	Amor Abadi	Semarang
12.	Condro Purnomo Cipto	Semarang
13.	General	Magelung
14.	Mertoyudan	Magelang
15.	Dharma Kusuma	Semarang
<u>WEST JAVA</u>		
16.	Cicadas	Bandung
17.	Universal	Bandung
18.	Univli	Bandung
19.	Leather Coperation	Garut
<u>EAST JAVA</u>		
20.	HAKA I	Surabaya
21.	HAKA II	Surabaya
22.	Wonocolo	Surabaya
23.	Rachbini	Surabaya
24.	Wonosari	Surabaya
25.	Pagina Cita A	Surabaya
26.	Pagina Cita B	Surabaya
27.	Kasin	Malang

<u>NO</u>	<u>NAME OF TANNERY</u>	<u>LOCATION</u>
28.	Wangsa Brata	Surabaya
29.	Sumber Setia	Probolinggo
<u>OUTSIDE JAVA</u>		
<u>NORTH SUMATRA</u>		
30.	Long Tat	Medan
31.	Sungai Agul	Medan
32.	Adika Sari	Medan
33.	Sinar Baru	Medan

Annex XVIII

LIST OF PERSONS CONTACTED

1. UNDP / UNIDO

- Mr. H. RANA  
UNDP - Resident Representative.
- Mr. Richard M. Brown  
UNDP - Assistance Resident Representative.
- Mr. A. Sousou  
UNDP - Assistance Resident Representative.
- Mr. F.M. Iqbal  
UNIDO - Senior Industrial Development  
Field Adviser.
- Mr. Koo de Vries  
UNIDO Programme Officer
- Mr. R.S. Sharma  
UNIDO - Senior Industrial Policy Adviser.
- Mr. Hirata Shin Ichiro  
UNIDO - Project Manager, Export promotion.
- Mr. George Dzięcielewski  
UNIDO - Adviser
- Mr. Orvis J. Fairbanks  
UNIDO - Adviser

2. ITC - UNCTAD / GATT

- Mr. Tharmaratnam  
Project Manager
- Mr. Howard L. Borret  
Market Development Adviser
- Mr. Stanko Tezak  
Export marketing adviser.
- Mr. Michel Demidoff  
Export marketing adviser.

- Mr. Heinrich Von Massow  
Export marketing adviser.
- Mr. Adolf de Coene  
Timber marketing adviser.
- Mr. T.W. Robinson O.B.E.  
Senior Market development adviser.
- Mr. Szoboles Pickolti  
Market development adviser.
- Mr. Andrew Mc Cullough  
Market development adviser.

3. Technical Aid Program of the Federal Republic of Germany  
German Advisory Team.

- Mr. J. Walter
- Mr. Thomas Pauli Haffke

4. N.A.F.E.D.

- Mr. Sockirman  
Chairman of NAFED
- Mr. Asjik Ali  
Director of Industrial Products Center.
- Mr. Rudy Lengkong  
Secretary General
- Mr. C. Siahaan  
Chief of Miscellaneous Industry Division.
- Mr. Abdullah Hassan  
Chief of General Affairs Division
- Mr. T.M. Jusuf  
Chief of Sub Division of marketing development  
miscellaneous division - Permanent Counterpart.

- Mr. Usep Sjamsudin  
Chief of Sub Division of Production  
development - Counterpart.

5. Ministry of Industry

- Mr. Arifin Moersalin  
Director of Leather Industry  
Director General of Light Industry.
- Mr. Soendoro Tjokrokoesoemo  
Assistant Director of Light Industry.
- Mr. S. Sjarief  
Department of Light Industry
- Mr. Suropto  
Department of Light Industry
- Mr. Pratisto Martodilogo  
Department of Light Industry.

6. Ministry of Trade

- Mr. Muchtar  
Directorate for Export
- Mr. Asjari Darus  
Head of Department of Trade - North Sumatra  
Medan.
- Mr. R.K. Tandjung  
Branch Manager - Medan
- Mr. R.O. Siahaan - Medan
- Mr. Gustamin Siregar - Medan
- Mr. Kushadi Kusdinar  
Head of Department of Trade of East Java  
Surabaya.



- Mr. R.M.S. Koesoemopranoto - Surabaya
- Mr. Soewetere  
Head of Department of Trade - Denpasar-Bali
- Mr. R. Ismoe Suwanto  
Head of Department of Trade of Central Java  
Semarang.
- Mr. Zul Zaini  
Head of Department of Trade - West Java  
Bandung.
- Mr. E.B. Tinendeng  
Head of Department of Trade - Solo

7. Ministry of Agriculture

- Drh A. Dahlan  
Director of Livestock Production.
- Drh Koesmono  
Assistant Director of Livestock Production
- Mr. Mohammad Anwar Abidin  
Livestock Production Department.
- Mr. Paring Asmara  
Director of Animal Health
- Drh Soegondo  
Shief of Animal Husbandry - BALI
- Mr. Harimurti Martoyo  
University of Agriculture - BOGOR
- Mr. Jan Nari  
Manager of Animal Disease Research Institute  
BOGOR.

- Mr. R. Soetegjo  
Assistant manager of Animal Disease Research  
Institute Bogor.

8. Leather Research Institute

- Mr. Pieloyo Soekarbowo  
Director of Leather Research Institute and  
The Academy of Leather Technology.
- Mrs. Soemarmi Soedarjo
- Mr. Soedarjo
- Mr. Brotomulyono - Permanent Counterpart
- Mr. Zainuri - Permanent Counterpart.

9. Sea Communication

- Mr. Haryono Nimpuno  
Director General of Sea Communication
- Mr. L. Lapta Adji  
Director of Sea Transport
- Capt. D.J. Parera  
Fleet Commercial Director  
P.T. Djakarta Lloyd
- Mr. R. Makmun  
Line Manager Europe Service  
P.T Djakarta Lloyd.

10. Ministry of Finance

- Mr. Achmad Din  
Secretary of Direktorat General of Taxation.
- Mr. Marzuki Usman  
Chief of Devision of Export Taxes.

11. Slaughter Houses

- A. Surya Slaughter House - East Jakarta
  - Drh. Jafizhan Daoed  
Chief of Sub-Division of Jakarta Timur.
- B. Medan Slaughter House
  - Drh. Tadjul Arifin Lubis  
Division of Cattle and Slaughter Houses - MEDAN.
- C. P.T. Abattoir Surya Jaya  
( Modern Slaughter House ) - Surabaya.
  - a. Mr. M. Ng. Soedarto  
Director
  - b. Mr. R. Soeparmo  
Vice Director ( Veterinary Surgeon )
  - c. Mr. Louis Skenaji  
Consultant.

12. Forestry Department

- Mr. Soe Djarwo  
Director General of Forestry.
- Mr. Sumarso No  
Assistant Director General

13. Hide Collectores

- a. P.T. Tjipta Niaga - Medan
- b. P.T. Suud Said - Bali
- Mr. H. Abubakar Aldjufri  
Chief of Indonesian Cattle Breeder Association  
( PEPEHANI )

14. Shoe Factories

A. BATA Shoe Factory

- Mr. Asad Fawzy  
Marketing Manager
- Mr. Gerard J.M. Wilmas  
General Production Manager
- Mr. H.S. Muliando  
Manager Development Officer

B. WIMO Shoe Factory

- Mrs. Wiwih Reksomo  
Managing Director

C. P.T. Kurnis Shoe Factory

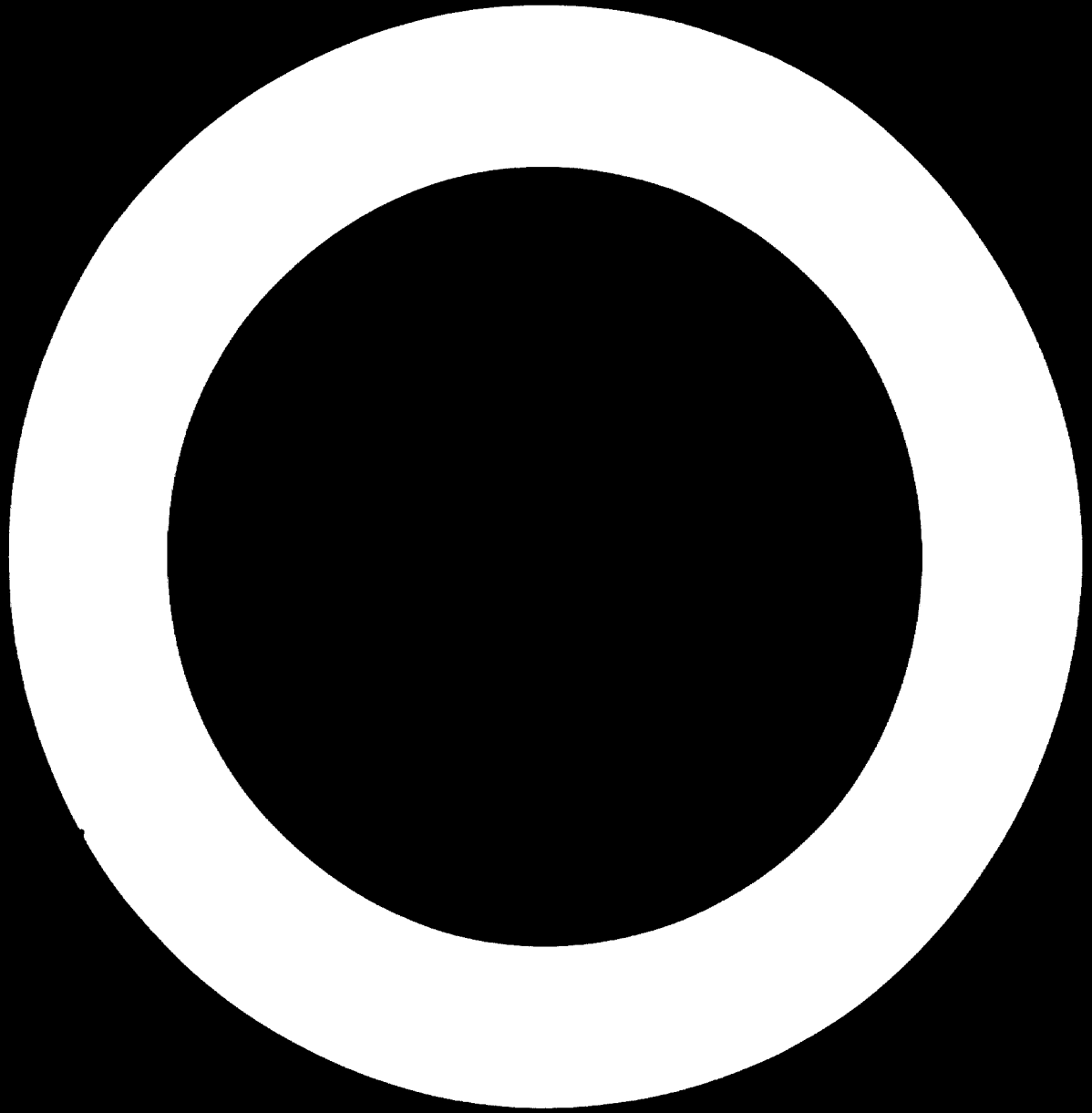
- Mr. Ramli Rachman  
Owner and Director.

D. Solo Shoe Factory

- Mr. Sodikone Songkapamilih  
Owner and Director.

15. Tanneries

The names of the owners, directors, technicians of all the tanneries visited (as mentioned in Annex XVII are mentioned in details in part II of this report.



PART TWO

SUMMARY

This report represents part two of the Final Report. It includes technical reports with specific help to visited industrial tanneries.

The Adviser visited 32 tanneries as well as two selected primitive workshops out of 70 typically identical ( GARUT ) Each of these tanneries have been advised on the spot and also given a special report on their specific technical problems. The whole collection of these technical reports represent part two.

INTRODUCTION.

The Indonesian Government is practically anxious to encourage the leather Industry since it represents quite an important section within the light industries.

The Government wants also to assist manufacturers with export potential to adopt leather products and to improve leather production processes to meet world market competition.

As a result of this decision, the National Agency For Export Development ( NAFED ) requested UNIDO assistance through the provision of an Export Product Adaptation Adviser/Production Engineer for Tanning Industries for a period of six months followed by a return mission for another three months.

The specific tasks involve the adaptation of existing production methods to export requirements.

OBJECTIVES.

1. Participate in in-plant visits to various enterprises providing direct on-the-spot consulting services.
2. Identify and recommend the necessary adaptation of products as well as improvements of the production process for the individual plants.

3. Assist NAFED in identifying the external and internal factors influencing the performance of the industrial sector concerned and take part in discussions on the subject.
4. Train Indonesian counterparts in the above mentioned duties.

General Remarks :

1. The reports have been classified by provinces and irrespec-  
tively of timing of visits.
2. Each single report has its own number of pages present in  
the middle of the page while the sequence of pages for the  
whole report exists on the upper right part of each page.

REPORT VISIT TO

MAKMUR SANTOSA & CO. JAKARTA

14 and 25/3/1977

---

The discussion were held with :

1. Mr. HASAN KARTARAHARDJA  
Owner and Director
2. Mr. SURYADJ KARTARAHARDJA  
Product Manager

Findings :

1. Number of workers : 130 worker
2. Number of drums : 10 drums and 6 paddels
3. Working capacity : 25 tons of cattle hides / month
4. Maximum capacity : 40 tons of cattle hides / month
5. The reasons for this drop of production is :
  - a. The production depends on the market demands
  - b. Lack of capital
  - c. The cattle raw hides is not enough
  - d. The quick variation in the prices of raw hides. (The prices of raw hides since 4 months was 850 Rp. for 1 kg now it is 1000 Rp. for 1 Kg and expected to be 1100 Rp. for 1 Kg in the near future).
6. Stock in the stores of the tannery
  - a. Dried hides enough for 1.5 working months
  - b. Chemicals 4 months
7. The tannery works with the following raw cattle hides :
  - 40% green hides
  - 10% salted hides
  - 50% dried hides
8. Production :

The tannery produces the following :

  - a. Shoe upper's for ladies full grain pigment finish and semi aniline finish - also poly urethane finishes.
  - b. Shoe upper's for men full grain pigment finish.
  - c. Softy smooth semi aniline finish and softy printed semi-aniline finish.
  - d. Printed and smooth corrected grain leather for shoe upper's and bags.
  - e. Sole leather from rejected hides and insole splites vegetable tanned.



The production of shoe upper's either full grain or corrected grain or softy is of a good quality inspite of the problems of the machines and handling (as will be mentioned latter) which lower the grade of the produced leather.

The production of patent leather i.e. polyurethane finish is not good and far away from the normal standard.

The sole leather produced is very soft and empty because of the lacke of enough tanning material inside.

The insole splits is good inspite of the patches present on its surface due to the carless handling and sorting during tanning.

All the production is for domestic uses.

The necessary chemical testes i.e. measure of pH and control of temperature and degree Be is well done and well controlled.

Technical Rearch :

1. The machines present in the tannery is very old and must be completely renewed since most of these machine causes harm to the leather during the production operation, for example the samming machine (after chome tanning) is very bad and causes a lot of trouble to the finished leather and the tannery is forced to trim a lot from every piece of leather to overcome these faults. These trims from every pice can be calculated to be a lot of square feets and consequently represent a lose of money without any technical reason.
2. The handling of the leather inside the tannery and from one department to another is very bad and causing lot of trouble to the finishing department , and finally appears in the finished leather causing lower grad in the final selection inspite of the high quality produced leather.
3. The selection of hides after splitting (concerning the direction of hides to be chrome tanned or vegetable tanned), also the selection after shaving (in order to be directed as full grain or corrected grain), these 2 se - lections; is done in a bad way causing an indirect loss to the tannery i.e. some of the hides which has a very bad surface is directed towardcs chrome tanning insted of vegetable tanning, also pelts which is not suitable for full grain is finished as such, so forcing the tannery to sell them in a lower grade.

4. The drying system is very slow, the 2 vacuum drying machines present is not working properly and one of them should be stopped completely since it is waste of electricity and steam, the leather after drying on this vacuum dryer is nearly without any change.
5. Generally speaking the tannery needs a total internal arrangement since machines is far away from any good arrangement and as said before this effects the final leather produced causing lowering in the grade.

Technical Advices :

1. To overcome the defects of the samming machine, saw dust should be used for partial drying before shaving, and the samming machine should be stopped completely. The way of using saw dust in drying has been explained with detail to the tannery.
2. Great care should be paid to the selection of the pelts before tanning (after splitting). Also the selection after shaving to be directed either for full or corrected grain finish should be also well controlled and this needs very careful attention from the technical director of the tannery.
3. The handling of the pelt should be well done and attention should be paid for this matter by well observation and training the workers to the proper way especially for horsing up the pelts after chrome tanning and also after retanning and fatliquoring.
4. The drying system should be changed and the tannery will try on a small scale to nail first on a wooden frame for 50% dryness before vacuum drying. If this will not work properly, than drying by toggling must be done also before vacuum drying.
5. As mentioned before the production is nice except for patent leather and sole leather.

Following is the necessary formulas for the production of soft patent leather (buffed) and new process for vegetable tanning using pretanning agents.

Also some formulas as requested by the tannery.

I. Soft Baygen Patent Leather (Buffed)

A/Retanning and Fat liquoring

Material : chrome tanned sides, percentages on shaved weight shaving substances 1.2. - 1.4. m.m.

Wash : 250% water 50° C  
0.5% baymol A ( 1 : 5)  
run for 10 min. - drain float

Retanning : 150% water 60°  
5% Baychrome A  
2% Tanigan PAK  
1.5% Sodium formate  
added together undissolved  
run for 75 min.  
pH of the liquor 4.0. - 4.3.  
rinse at 60° C  
drain for 10 min.

Fat liquor : 150% water 60° C  
4% coripol B Z N  
4% coripol D X F  
To be diluted 1 : 4 - run for 30 min.  
add + 5% tanigan OS undissolved  
run for 30 min  
pH liquor 4.2. - 4.5.  
rinse at 25° C for 5 min

Horse up over night, set out slightly, vacuum drying for 2 - 4 min. at 75° C hang up to complete drying, condition stake, vacuum drying for 1 - 2 min. at 75° C. hang up to complete drying, condition stake, vacuum drying for 1 - 2 min. at 75°.

B. Finishing with polyurethane finish (Baygen).

Material : sides retanned and fatliquored as above buff with 320 buffing paper.

Impregnation: 100 - 150 parts eukanol driver PI  
550 - 650 parts water  
250 - 300 parts Eukanol Binder IM  
one pad coat (lamb skin pad)  
horse up overnight, plate at 60° C /200Kg/cm<sup>2</sup> rebuff with fine grade paper 400 cr 500 and remove dust.

Base coat : 100 - 150 parts pigment colour  
400 - 600 parts water  
150 - 200 parts Baygen Botton A  
2 pad coats, plate, 1 pad coat, spray coat plate at 60° C and 200 Kg/cm<sup>2</sup>.

Lacquer coat : 70 parts Baygen lack K

65 parts Baygen Hardener S

(Ethyl acetate can be used up to 50% from the quantity of Baygen thinner O, the brilliancy will increase, but air bubbles might appear).

Airless spraying machine is recommended to be used in spraying on the flat lying leather.

Drying at elevated temp. of 40 - 50° C, leave over night in dust free and well ventilated room.

The above formulation is used for any desired colour except of white and black, which needs special other formulations.

Finishing of chrome splits for shoe - uppers.

Base coat I :

150 parts Eukanol Black D  
100 parts Eukanol filler F  
40 parts Eukanol past G  
50 parts Eukanol past FO  
210 parts water  
150 parts Eukanol Binder IM  
300 parts Eukanol Resin FD

one pad coat - rebuff with 400 buffing paper then 2 pad coat, then 2 smooth plating 100<sup>0</sup> C /350 for 5 seconds, then Base coat II

Base coat II

150 parts Eukanol Black D  
70 parts Eukanol past FA  
330 parts Water  
150 parts Eukanol Binder IM  
300 parts Eukanol Resin FD

one pad coat, 2 spray coats,

Intermidate laquer :

400 parts water  
500 parts Isoderm LA 81  
100 parts Butyl acetate

one spray coat - plate or Emboss at 90<sup>0</sup>/350/5 Sec

Top coat should be done by either (a) or (b) formulation

(a) Top coat : 600 parts Isoderm LA 81  
300 parts Water  
100 parts Butyl acetate

2 spray coats.

(b) Top coat : 500 parts Isoderm LO 401  
500 parts Butyl acetate

2 spray coats.

Full grain upper leather :

Beamhouse work - chrome tannage :

Material : Salted cattle hides - percentages on salted weight.

Soaking : dirt soak, leave one hour then run 3 times at  
( drum 2-4.r.p.m) one hour intervals for 15 min each Total durata-  
tion time of dirt soak is 4 hours.  
Then Main Soak in frech bath with 0.2 % Cismo-  
llan BH ( or Mollescal C )  
run for 15 min, then subsequently run 10 min  
every 4 hours.  
Total duration of main soak 20 hours

Liming : 200 % water  
in drum or  
paddle 1 % Sodium sulphide 60/62 %  
6 % slaked lime  
run 30 min. leave 2 hours.  
+ 1.5% Sodium sulphide  
run 15 - 30 min  
leave 30 min  
run 15 - 30 min  
If possible run 2 - 4 times for 10 min each during night  
total liming period approx 20 hrs. rinse at 25°C for  
20 min flesh, split to 3.2 - 3.5 m m percentages on  
split weight.

Deliming and Bating :  
300 % water at 35°C  
run for 10 min drain float  
100 % water at 35°C  
1.7 % Ammonium sulphate  
run for 20 min pH = 8.6  
cross section with phenol phethalein : colourless  
0.6 % Oropon OR  
run for 30 min pH 8.8.  
drain floate  
wash with 200 % water for 10 min.

Pickling and Tanning :

(drum 12 - 14 r.p.m)

- 40 % water
- 5 % common salt
- 1 % Calcium formate
- run for 10 min
- Be' about 7
- +1.2% sulphuric acid 66<sup>Q</sup> Be'
- ( diluted 1 : 10 )
- run for 2 hours - pH 3.6
- cross section with bromocresol green gives light green.
- + 10% chromosal B
- run for 30 min
- + 1.5% Soda ash
- ( dissolved 1 : 10 )
- To be added slowly over 60 min continue running for further 6 hours.
- leave overnight, run next morning for 6 hours - pH 3.7

horse up, Sam , Shave, weigh.

Retanning and fat liquoring :

- Wash 200 % water 50<sup>0</sup>C
- run for 10 min
- drain float
- New bath 100 % water at 50<sup>0</sup>C
- 1 % Cutisan TMK -E
- (1;4 ) run for 10 min
- 3 % Tanigan OS
- 1 % Tanigan PC
- 1 % Retingan R7
- 3 % Mimosa extract
- run for 60 min.
- pH 4
- drain float.
- 200 % water 60<sup>0</sup>C run for 10 min drain float

100 % water at 60°C

1 % Dyestuff ( dissolved hot )

run for 20 min

+4.5 % Coripol B Z N

3.5 % Coripol D X

0.5 % raw fish oil

The oil is dissolved 1 : 4 ( in hot water )

run for 40 min

pH 4.2

+0.3 % formic acid 85%

( 1 : 10 )

run for 10 min

pH 3.6

rinse at 20°C - horse up- set out, Vacuum dry for 2 - 3 min at 80°C hang up to complete drying.

Formula for Vegetable Tanning :

A) Pit Pretannage followed by drum tanning :

The deliming process is done by any way untill complete deliming i.e the cut section is colourless to phenolphathaline.

Pretannage :

The rinse liquor from the tanning drum is used as pretannage solution in the pit

The liquor to goods ration is 3 ; 1

Acidify with formic acid to 3.2 pH

This requires about 1.25% on limed pelt weight The delimed pelt is left in the pretanning pit for 48 hours. Pile one day before druming.

Drum tannage :

All the percentages are calculated on limed pelt weight.

Transfer goods to drum.

Add 15 % Spraydried Mimosa powder

15 % water drum for 1 hour

Add 15 % spraydried Mimosa powder

drum 5 hours.

Add 10 % Spraydried mimosa powder drum untill fully penetrated.



Usual drumming time 36 hours.

This depends on local conditions.

The drum should run at 4 r.p.m.

Add :           50% water  
                  1% Formic acid  
                  drum 20 min.

Remove goods and pile 1 - 2 days.

Finish as described in the following Formula .

Transfer the rinse liquor from the drum for the pretanning pits.

B) By using syntans as pretanning agents :

Reliming       :   in pits for 2 - 3 days

Deliming       :   150% water  
                  1.5% Ammonium sulphate  
                  1.5% Sodium Bisulphate  
                  run for 4 hours.  
                  1/3 pink with ph.ph

wash well for one hour

drum            150% water  
                  2-3% Pretanning agent ( calculated on pelt weight )  
                  dissolved in 4 times water, to be added in 2-3 por-  
                  tions at half hour intervals.  
                  Run for 1 - 2 hours untill the liquor is completely  
                  exhausted.

Transfer to the concentrated drum contain tanning solution of 4 - 5° Be' consisting of either mimosa alone or mimosa and Quebracho extract. After 2 - 3 days the concentration of the tanning solution should be increased to 8 - 10° Be' run for futher 6 - 8 days untill complete ta-  
nning ( The running time can be reduced according to the final hardness re-  
quired i.e the more running time the more hard and firm leather is produced )  
Age for 24 hours.

Fixation and fat liquoring and Bleaching

The percentages on the samed weight.

                  50 % water  
                  0.5 -1% magnesium sulphate  
                  1% glucose  
                  3 - 4 % mimosa powder  
                  1.5 -2 % Basyntan F.C.B.I3 ( B.A.S.F )

All these products to be added after dissolved in water run for 45 minutes.

Add 0.5 - 1 % Asulgan K (B.A.S.F.)  
( diluted 1 : 2 )

run for 30 min

Add 1 % Lipoderm liquor i  
diluted 1 : 2

run for 10 - 20 min

Pile overnight, set out, oil off, dry slowly, moisten and roll.

N.B. :

a. The Pretanning agents used could be one of the following agents :

Tanigan CH ( Bayer )

Basyntan P ( B.A.S.F.)

Tanichor HN special ( Hockest )

b. Equivalent to Basyntan F.C.B.I3 ( B.A.S.F) is Tanigan BL ( Bayer )

In case of absence of Pretanning Syntans, the pretanning can be done as follows :

After partial deliming and washing, the pelt is transfered to a used mangrove solution, run for 2 - 3 hours then for 24 hours in a new solution of 5 % mangrove ( or more better Valonsia powder ) then continue as before in the concentrated tanning solution.

REPORT VISIT ON NV. FABRIK KULIT

" KIAN HIN "

J A K A R T A

11 - 12 - 23 March 1977.

Director : Lo Jen Kie

Findings :

1. Number of workers : 85 worker
2. Number of drums : 12 + 3 paddels
3. Maximum capacity : 45 tons of cattle hides / month
4. Working capacity : 20 tons of cattle hides / month
5. Production :
  - a. finished upper leather, full and corrected grain, pigment and semi aniline and aniline finish.
  - b. embossed upper leather
  - c. sole and lining leather ( vegetable tanned )
  - d. glove and suede leather from splits ( chrome tanned )
6. All the production is sailed and used for Domestic uses.
7. The tannery is not working with its maximum capacity for the following reasons:
  - a. Lack of capital
  - b. Market demands which is not stable
  - c. Fluctuation in the prices of raw hides so the tannery has in stock only for 3 weeks production ( which is very low stock )
8. The stock for chemicals is only for 10 days and for finishing chemicals only for 3 weeks which is also very low stock ).  
( usually the stock of hides and chemicals should be at least for 6 months).
9. The tannery buies the raw Hides from central Java, Medan, North Sumatera, Pontianak but not from Jakarta.
10. The tannery is complaining from the high prices of the raw hides, which is almost much higher than the world market.

Technical Research :

1. The machines present in the tannery are very old, and not working efficiently and this effect the quality of the final production such as in corrected grain leather, buffing is very bad.

This is quite clear in the finished leather were traces of bad buffing parts appears after the leather is completed.

2. The Hides defects such as skin diseases and mechanical damages, etc appears also in the final corrected grain leather, this is also because of no good buffing operation.

3. The finished leather has a bad appearance, loose grain is well noticed either in full or corrected grain leather.

The reason for this might be from process of liming and a lot of experiments should be done in order to reach a good formula to avoid this loose grain.

Also the finishing system has to be completely changed especially impregnation.

4. The retanning of corrected and full grain is not good and this is quite clear especially in the poorer parts of the hide ( bellies, flaks, shoulder section.

5. The fat liquoring process is not done in a good way and this is obvious on the flesh side after the fat liquoring process and it appeared also as fat spews on the finished leather, this is also because of the use of low quality fat liquoring agents.

6. Some side of the corrected grain leather was very hard without any obvious reason.

7. The drying system is not good, the vacum drier used is locally made very primitive and without any cover i.e. only a hot plat over which the leather is dried.

Even the setting out, this hot plate is not done in a good way, and this appears in the final production as a defect in the leather.

8. The sole leather produced is very soft and empty i.e. no enough tannin inside. This will also cause very low abrasion Resistance and will be completely destroyed after making shoes and use for maximum 3 - 4 months.

9. The technology in the tannery is not sufficient and the nessecary test usually done in the tanning process such as measuring pH, degree Be' and so on, all these tests is not carried out regularly which effects the final production especially from the quality point of view.

Technical Recommendations :

1. The necessary chemical test should be done i.e. ph.ph test after deliming, pH after bating, measuring of degree Be' before pickling, ( especially that the salt used before adding the acid is not pure and full of humidity) measuring pH after complete chrome tanning, pH after neutralization and after retanning.  
These test are very important and must be done.
2. The buffing operation must be well done using buffing paper of low number first then those of higher ones until be sure that all the visible defects on the leather have been completely removed.
3. A recommendation should be important of using good quality fat liquoring agents especially in full and corrected grain leather.
4. The setting out operation must be well done, by both hands ( as illustrated in the figure ).

Technical Advice :

1. Retanning for leather suitable for buffing :

Material :

Chrome tanned cattle hides, percentages based on showed wight :

- Washing : 250 % water 40°C ( closed drum )  
10 min drain the float
- Retannage : 100% water 50° C  
4 % Chromosal B ( or chromitan B )  
1 % Calcium formate  
1 % Sodium bicarbonate  
60 min  
pH of float 4.2 - 4.5
- add : 2 % tannigan OS  
2 - 4 % Mimosa extract powder add together undissolved  
run for 45 min.  
pH pf float 4.0 - 4.5  
drain the float
- Washing : 250 % water 50° C ( closed drum )  
run for 10 min drain the float.

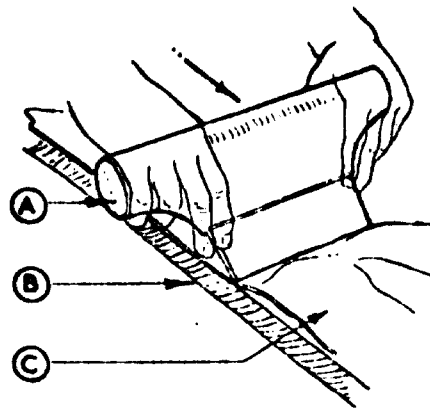


Fig. Hand striking out

- A Hand slicker having steel, plastic brass or glass blade
- B Slate or glass table
- C Leather being truck out

Fat liquoring : 100 % water  
4 - 5 % Lipoderm liq II  
1 - 2 % raw fish oil  
emulsified together at 70<sup>0</sup>C  
run for 30 - 45 min until complete exhaustion of the fat liquor.

Rinse : Cold water  
soaks up overnight, continue as usual.

2. Impregnation for corrected grade paper :

Only One of the following methods to be used

- A) 100 - 150 parts Eukanol Drive PI  
550 - 650 parts Water  
250 - 300 parts Eukanol Binder JM mix all together

After first buffing by 280 paper, one pad coat of the above Solution ( lambskin pad ) lay in pile overnight plate or vacuum dry ( 1 min ), afterwards buff with 500 paper, remove dust finish normally.

- B) 250 parts corial Binder SR  
680 parts water  
70 parts Amollan PR  
mix all together, proceed as the last process.

REPORT VISIT TO  
PT. PAN VICI AND SONS  
J A K A R T A  
29 - 30 / 3 / 1974 -  
27 / 4 / 1974.

Discussion with :

1. Mr. L. DJABAR DJUNAIDI  
owner
2. Mr. KANS DJUNAIDI  
Director.

Findings :

1. Number of workers : 150 worker
2. Number of drums : 27 drums + 6 paddles
3. Workcapacity : 2 tons of dried cattle hides / day  
equivalent to 10.000 ft<sup>2</sup> / day and  
2.000 pieces of sheep and goat skins per day.
4. Maximum capacity : 4 tons dried cattle hides / day equivalent to  
20.000 ft<sup>2</sup> / day and  
6.000 pieces of sheep and goat skins per day.
5. The reason of the drop in the production :
  - a. The raw cattle hides is not enough to work with full capacity, also not enough goat and sheep skins.
  - b. The prices of the raw hides is not stable, nowadays these prices are going up and expected to be higher again.
  - c. The production depends on the demands of the local market.
6. Discussion came to the following conclusions :
  - a. There must be a big governmental project to increase the livestock population for both cattle hides and sheep and goat skins.
  - b. The exportation of skins outside Java must also be banned.
  - c. The exportation of living animals must also be stopped, to make use of the hides and exportation should be only for the meat.
7. The flaying of the animals is not done in a good way either in the governmental slaughter houses or the private ones.  
Only few slaughter houses in Mid and East Java since they were trained by the previous importers of cattle hides, only in those slaughter houses the flaying is done in good way.



8. The production of the tannery is :
- a. full grain upper leather
  - b. Corrected grain upper leather  
both are pigment finish and for the domestic uses
  - c. Army and police leather for shoes.
  - d. Embossed upper leather for domestic uses
  - e. Furniture leather
  - f. Crust leather
  - g. Pickled sheep and goat skins
  - h. Wet blue goat skins  
The last 3 products are for exportation
  - i. Sole and split vegetable tanned leather.

Technical comments :

1. The production is very good either for domestic uses or for exportation and no any technical observation, can be said.
2. All the necessary technical tests such as the control of temperature, measuring the pH and the degree Be' all these chemical tests are well done and controled.
3. The tannery is well arranged, well equiped with machines except the drying Vacum dryer and the samming machine.
- A. Their are more than one vacum dryer including also localy done, but all of them are not working properly, and the drying operation is done very slowly and this causes for sure reduction in size of the produeed leather. The tannery has either to buy a new vacum dryer, or to nail the leather first untill 50% dryness then to continue drying on the vacum dryer.
- B. The samming machine present is not working properly causing lot of trouble to the leather and the tannery has to trim a lot from every side of the leather before shaving, and this of course causes indirect lose of area of the leather produced.  
It is true that the tannery has a future plane to build a new factory for leather fiber board so using these trims as a starting raw matofial, but untill that factory is build it is a true lose from these trims caused by the unproper use of the samming machine.  
A recommendation has been given to the tannery either to have a new samming machine or to use the saw dust as drying agent before shaving.

4. The sole leather produced is far away from the Standard Normal sole leather, the process of tanning is not bad but the finishing of the sole leather is very bad.

The following formula can be recommended to improve the tanned sole leather :

After the leather has been already tanned - Age for 24 - 48 hours : same  
The following percentages on the same weight :

50% Water

0.5 - 1 % Magnesium sulphate

1 % Glucose

3 - 4 % Mimosa powder

1.5 - 2 % Basyntan F.C.S.13 ( B.A.S.F. )

All these products to be added after dissolved in water.

run for 45 minutes - add

0.5 - 1 % Asulgan K (B.A.S.F.) diluted 1 : 2

run for 30 minutes

Add 1 % Lipoderm liquor '

( diluted 1 : 2 )

run for 10 - 20 minutes

Pile overnight, set out, oil off, dry slowly, moisten and roll.

The above formula will improve the quality of the sole leather produced to a big extent especially that the tannery is not using any fatliquoring agents in finishing the sole leather, which is not correct completely.

5. The tannery is producing pickled and wet blue goat and sheep skins.

Advice has been given that the production of crust sheep and goat skin is much more better to the tannery especially that the measurements of the crust leather is much more accurate on a measuring machine, and not a matter of estimation as it is measured now on a wooden frame.

Also by producing crust skins, the area of the skin will be increased much more than in the pickled or wet blue since drying by nailing will increase the area by not less than  $\frac{1}{4}$  -  $\frac{1}{2}$  ft<sup>2</sup> in every piece.

6. Generally speaking the tannery under investigation can be considered as one of the biggest and best tanneries all over Indonesia, also the production either for the local market or for exportation can be considered as one of the best quality leather.

There is a very big chance for this tannery to advance more and more especially for exporting finished leather.

REPORT VISIT TO  
PT. TJOKING LEATHER FACTORY  
31 - 5 - 1977

Discussion : 1. Mr. SJARIFUDIN SIREGAR  
President Director  
2. Mr. BUDIMAN INDRADJAYA  
Director  
3. Mr. K.MORI  
General Manager

Findings :

1. Number of drums : 7 drums
2. Number of pits : 4 pits
3. Number of workers: 20 worker
4. Maximum capacity : 3.500 pieces of sheep and goat skins per day
5. Working capacity : 2.000 pieces of sheep and goat skins per day

The reason for the drop of the production :

- a. The high prices of the raw skins
- b. The quality of raw skins is not always suitable for work in the tannery since the tannery is working only for exportation
- c. The market demands
- d. Lack of capital

6. Production :

The tannery is producing pickled and wet blue sheep and goat skins for exportation.

The tannery is exporting mainly to Japan and Europe.

Technical Research and Recommendations :

1. The tannery is producing only pickled and wet blue skins according to the possibilities present, but extension can be easily done since there is quite enough space to enlarge the tannery by having more drums either to increase the production or to produce crust skins.

2. The quality of the skins produced is good and well accepted overseas. After the liming operation the skins has some wrinkles over the surface but this does not effect the final quality.

The reason for this is from soaking and liming and several trials has to done in order to get rid from this wrinkles. Thoes several trials has already been explained to the tannery after discussing the current process in the tannery.

And according to the request of the tannery, the following formulas is given :

1. Formula for Crust shoe upper leather ( imitation kid) from sheep skins
2. Formula for Crust goat upper leather for shoes (suitable for glaze finish )
3. Formula for Crust goat upper leather for shoes ( suitable for plated finish)
4. Formula for sheep liming leather.

The tannery will start making trials according to these formulas in order to export crust leather.

CRUST SHOE UPPER LEATHER ( imitation kid )  
Sheep Skins

Material : Chrome tanned sheepskins

Percentages on shaved weight :

Without washing and rinsing

Retannage :       70% water at 25°C  
                  0.3 -0.5 sulphuric acid 66°Be'  
                                  (dilute 1:10)

run for 10 min

+ 0.5 %   Baymol A (dilute 1:5 at 50°C)  
                  run for 5 min

+ 4%       Blancorol 28 undissolved  
                  run for 30 min

pH of float 2.2 - 2.4

Washing : 200 % water 40°C  
3 % Tanigan PC undissolved  
run for 15 min  
1 % Sodium bicarbonate ( dissolved 1 : 20 )  
run for 30 min  
pH of float 4.6 - 4.8

Rinsing : Water at 30°C

Dyeing : 50 % water 30°C  
1 % Ammonia tech  
(diluted 1 : 2 )  
run for 5 min  
+ 2/3 Dyestuff ( undissolved )  
run approx 30 min until desired degree of penetration  
is reached.  
+ 200% water at 70°C  
run for 10 min  
formic acid 85%  
50% on the weight of dyestuff used (diluted 1 : 10 )  
run for 30 min  
+ 1% Levagen LF ( diluted 1 : 5 at 50°C)  
run for 10 min  
+ 1/3 of the dyestuff ( dissolved hot)  
run 20 min

Fat liquoring :

1% Coripol DXF  
1 % Coripol B2N  
0.3% Coripol ICA  
10% Water at 70°C for emulsifying run for 20 min  
2-4 % Tanigan AN undissolved run for 20 min  
+ formic acid 85%  
50% on weight of dyestuff used  
run for 30 min

Rinsing : water 25°C  
horse up overnight set out dry condition, stake, toggle  
(nail).

Crust Goat Upper Lather for shoes ( suitable for glaze finish)

Material : wet blue goat skins  
shave to 1 - 1.1 mm  
Percentages on shaved weight  
wash or rinse at 30°C

Retannage : 100 % water at 30°C  
0.1 % formic acid 85%  
run for 5 min  
+ 3 % relugan GT 50  
run for 40 min  
+ 1 % Sodium Formate  
1 % Sodium bicarbonate  
run for 40 min  
pH 5  
wash or rinse at 40°C

Dyeing and fat liquoring :

100 % water at 40°C  
6 % Basytan N  
run for 60 min  
+ 2-3 % Dyestuff  
run for 20 min  
+ 4 % Lipoderm Liquor SA  
3 % Lipoderm Liquor 1  
1 % Lipoderm oil SK  
run for 40 min  
+ 2.5% Formic acid 85%  
2 x 10 min + 20 min  
pH 3.5

Pile - set out - dry - Moisten - Stake - Toggle ( nail )

Crust Goat upper leather for shoes ( suitable for plate finish ).

Material : Chrome tanned goat skins as done in the tannery ;  
Shave to 1 mm  
Percentages on shaved weight  
wash or rinse at 30°C

Retannage : 50 % water at 40°C  
4 % Basynten CD  
run for 40 min  
+ 1 % Neutrigan  
run for 30 min  
pH 4.5 - 5  
wash or rinse at 40°C

Dyeing and fat liquoring :

150 % water at 50°C  
2 % Tamol NNCL  
run for 10 min  
+ 1-1.5% Dyestuff  
run for 20 min  
+ 3 % Lipoderm liquor SA  
1 % Lipoderm liquor I  
0.5% Lipoderm liquor oil SK  
run for 40 min  
+ 0.5% formic acid 85%  
run for 20 min  
pH 3.6  
wash or rinse at 25°C

Pile - Set out - dry - Moisten - stake - Toggle ( nail )

Sheep liming leather :

Material : Chrome tanned shaved sheep skins  
percentage on shaved weight  
without washing and rinsing

Neutralization and retannage :

100 - 150% water 30°C  
2 - 5 % Tanigan OS ( undissolved )  
1 - 3 % Mimosa ( undissolved )  
1 % Sodium Bicarbonate  
run for 45 min  
pH of liquor approx 4.5  
Rinse at 50°C

Dyeing and fat liquoring :

200 % water at 50°C

0-3 % dyestuff

run 0 - 15 min

+ 1.5 % Cutizen TMK

0.5 % Baykanol Liquor T

0.5 % Sperm oil unsulphonated

10 % water of 60°C for emulsifying

run for 30 min

acidify as may be required

Rinse : With cold water

hose over night, sam, set out, hang for drying.

saw dust - staks - toggle end finish.



REPORT VISIT TO  
" NGLIAN NGLIAN TANNERY "  
JAKARTA  
2/6/1977

---

Discussion with :

1. Mr. : Liauw Yoeng Fo,  
Director.
2. Mr. : Jasin Widjaja,  
Technical Manager.

Finding :

1. Number of drums : 11 drums.
2. Number of Pits : 12 pits.
3. Number of workers : 70 workers.
4. Working Capacity : 130,000 ft<sup>2</sup> of upper leather.
5. Maximum Capacity : 200,000 ft<sup>2</sup> of upper leather.
6. The reason for the drop of production :
  - a. Lack of capital.
  - b. The tannery is selling the production on a long term credit having the money back after 4 - 8 month which effects the working capital.
7. The tannery has in stock :
  - a. Stock for hides enough for 2 months.
  - b. Stock for chemicals enough for 4 months.
8. The tannery is using either the Bali hides or the second and third grade Java hides.
9. Production :

The Tannery is producing the following :

  - a. Full grain upper leather.
  - b. Corrected grain upper leather.
  - c. Embossed upper leather.

All the production is for the local market.

Technical Research and Recommendation :

1. The corrected grain leather produced is not well retanned i.e. the retanning formula used is not good.  
This appears quite good in the poorer parts of the leather ( bellies and flanks ).  
Also as a result of bad retanning the leather posses loose grain which is quite clear in the finished leather.
2. Pilling the chrome tanned leather immediately after the tanning operation is not well done.  
Marks appears on the leather due to incorrect pilling. These marks are not easily removed from the surface of the leather especially when produding full grain.  
The process of good pilling has already been explained to the tannery.
3. Hand scudding should be done over a wooden beam with a blunt, curved knife which squicezes and pushes the grain, removing loose protein, hair roots, gland tissue ..etc,. The process already done in the tannery must be completely changed and done as described above.
4. The buffing operation is not well done causing irregular patches on the finished leather.
5. The plating operation on the hydrolic press is also not well done. The result of this bad operation is well seen in the finished leather. Recommendation has been given to the tannery to overcome this deffect.
6. Advice has been given to the tannery to start exporting crust leather since the trials already done on such production is promising.  
According to the request of the tannery the following Formulas are given :
  - I. Two formulas for retanning of corrected grain upper leather.
  - II. Two formulas for Impregnation.
  - LII. Formula for sucde leather.

I. Formulas for retanning of corrected grain upper leather.

Formula A.

Material : Chrome tanned cattle hides.  
Percentages based on shaved weight.

Washing : 250 % Water 40°C ( closed drum )  
Run for 10 min.  
Drain the float.

Retannage : 100 % Water 50°C.  
4 % Chromosal B.  
1 % Calcium formate.  
1 % Sodium Bicarbonate.  
Run for 60 min.  
pH of float 4.2 - 4.5  
+ 2 % Tanigan OS.  
4 % Mimosa extract powder.  
Add together undissolved.  
Run for 45 min.  
pH float 4 - 4.5  
Drain float.

Washing : 250 % Water 50°C ( closed drum )  
Run for 10 min.  
Drain float.

Fat-liquoring : 4 % Coripol BZN.  
0.5 % Baykanol Liquor T.  
2 % Coripol DX.  
1 % Coripol ICA.  
All the above products with water  
of 70°C emulsified together.  
Run for 30 min.  
+ 0.3 % Formic acid 85 % ( diluted 1 : 10).  
Run for 10 min.  
pH of float 4 - 4.3  
Rinse leather cold, horse up over-  
night, sam, set out, dry.

N.B. :

The fat-liquoring process can be done as the current formula in the tannery.

Formula B.

Material :

Chrome tanned cattle hides.  
Percentages on shaved weight.

Washing :        300 %    Water at 30°C.  
                      0.3 %    Acetic acid 6°Be.  
    Run for 10 min.  
    Drain float.

Neutralization :

100 %    Water 30°C.  
      2 %    Tamol GA.  
      1 %    Sodium formate.  
    Run for 45 min.  
    pH 4.5  
    Wash or rinse at 30°C.

Retannage :

30 %    Water at 40°C  
      4 %    Mimosa extract powder.  
      3 %    Relugan A.  
      2 %    Basyntan C2.  
    All the above products added undissolved.  
      2 %    Lipoderm Liquor 1.  
      3 %    Lipoderm Liquor SA.  
      1 %    Lipoderm Liquor SO.  
10 %    Water at 70°C.  
    Run for 60 min.  
    pH 3.8

( The fatliquors should be emulsified in water before addition ).

Wash or rinse at 25°C.

## II. Formulas for Impregnation .

### Formula A .

100 - 150 parts Eukanol driver PI  
550 - 650 parts water.  
250 - 300 parts Eukanol Binder IM.

Mix all together.

After buffing the leather with 280 - 320 buffing paper one pad coat of the above solution ( lamb skin pad ) pile over night plate ( 1 min ), rebuff with 480 - 500 buffing paper, remove dust, finish as usual.

### Formula B.

250 parts Corial Binder SR.  
680 parts water.  
70 parts Amollan PR.  
Mix all together, use the same process as above.

## III. Formula for Suede leather . .

Material : Chrome tanned shaved leather.  
Percentages on shaved weight.

Retannages : Without washing and rinsing :  
60-100 % Water 60 - 70°C.  
6 - 8 % Chromosal B undissolved.  
1.5 - 2 % Sodium Bicarbonate undissolved.  
Run for 1.5 - 2 hours.  
Rinse at 35°C for 10 min.

Neutralization :  
200 % Water 35°C.  
1 % Calcium formate ( undissolved ).  
1 - 2 % Sodium Bicarbonate ( undissolved )  
1 - 1.5 hours.  
pH of float 5.5 - 6.



If necessary leave overnight.  
Run off float.  
Rinse at 55 - 60°C for 10 min.

Dyeing : 600 - 800 % Water 55 - 60°C.  
1 - 2 % Ammonia Tech.  
8 - 12 % Dyestuff.

Dissolved in hot water running time  
until penetration of dyestuff -  
approx. 90 min.

+ 8 - 12 % Formic acid 85 %.

Diluted with 10 parts water.

Run for 30 - 45 min.

Rinse at 50°C for 5 min.

Fat-liquoring :

( normal ). 1.5-2.5 % Cutisan TMK.

Addition 30 min before acidification.

After treatment : ( for writting and silky-shine effects ).

400 - 600 % Water at 50°C.

2 - 4 % Persiderm S1

1 - 1.5 % Persoftal WKF.

0.4 -0.8 % Glycerine.

Without rinsing, horse up leather  
overnight, dry, saw dust or condition,  
mill toggle, buff with 320 to 400 grade  
paper remove buffing dust, mill.-

-----o-----o-----

REPORT VISIT TO  
PT. SUKA JUJUR LEATHER FACTORY  
B O G O R ( 7-6-1977)

Discussion With : 1. Mr. LUKMAN SETIANA  
Director  
2 Mr. ARIFE DHARMABUDI  
Leather Technician

Findings :

1. Number of drums : 13 drum and one Paddle
2. Number of pits : 4 pits
3. Working capacity: 5.000 pieces of sheep and goat skins per day and  
200 pieces of cattle hides
4. Maximum capacity: 8.000 pieces of sheep and goat skins per day and  
300 pieces of cattle hides.

The tannery is working now with only 5.000 pieces of sheep and goat skins because of the high prices of raw cattle hides.

5. Production :

The tannery is producing pickled and wet blue skins and hides for exportation.

6. The tannery is exporting to :

Japan - U.S.A. - France - Germany - Holland - Australia.

Technical Research :

1. The tannery is completely new, working since 3 years only
2. The tannery is very well arranged and the flow of production is very well and in one line as supposed to be
3. All the chemical control tests are well done and controlled.
4. The production is very good and well accepted overseas
5. The tannery is considered as one of the biggest exporter all over Indonesia  
( over 3 million US dollar / Year)



6. The tannery has big possibilities for the future to produce crust leather  
- but the following machines will be needed :

- a. Splitting machine
- b. Buffing machine
- c. Staking machine
- d. Vacuum dryer

These machines are not needed in case of producing pickled or wet blue as the case now, but as said before these machines will be a must in case of producing crust leather which is much more profitable to the tannery. And according to the request of the tannery the following formulas are given to start experiments on producing crust leather :

- I Sheep nappa leather for clothing
- II Shoe Upper leather from goat skins
- III Goat lining leather

I. Sheep nappa leather for clothing, weakly pigmented :

Material : Pickled sheep skins  
Percentages on the pickled weight + 30%

Degreasing: 5 % Common salt  
2 % Sodium Acetate  
15% Kerosene  
2 % Lutensol ON 30  
run for 45 min  
+100% brime, 8°Be', 38°C  
run for 20 min

Drain float :

Wash with 100 % brime, 8°Be', 38°C for 10 min

Drain float flesh

Tannage : 200 % water at 30°C  
2 % Lipoderm Liquor 1  
8 % Basyntan D  
run for 3 hours  
pH 4.5  
+ 8 % Chromitan MS  
run for 4 hours - pH 3.8

Pile - Sam - Shave - Weigh - Wash or rinse at 40°C

Neutralization :

150 % water at 40°C  
2 % Neutrigan  
run for 60 min  
pH 5.5

Dyeing and fatliquoring :

200 % water at 50°C  
1 % Tamol NNOL  
run for 10 min  
0-4% Dyestuff  
run for 30 min  
+ 3 % Lipoderm Liquor SAF  
1.5% Lipoderm Liquor 1  
2 % Lipoderm A  
run for 30 min  
+ 0-3% formic acid 85%  
2X10 min  
+ 1 % Lipamin Liquor SO  
run for 20 min  
pH 3.8

Wash or rinse at 25°C - Horse up - Set out - Hang up to dry - moisten -  
Stake - Toggle (or nail).

II. Goat upper leather for shoes :

Material : Chrome tanned goat skins  
Percentages on shaved weight  
Shave to 1 mm  
Wash or rinse at 30°C

Retannage : 50 % water  
4 % Basyntan CD  
run for 40 min  
+1 % Neutrigan  
run for 30 min  
pH 4.5 - 5

wash or rinse at 40°C

Dyeing and fatliquoring : 150 % water at 50°C  
2 % Tamol NNOL  
run for 10 min  
0-2 % Dyestuff run for 20 min  
+ 3 % Lipoderm Liquor SA  
1 % Lipoderm Liquor 1  
0.5% Lipoderm Oil SK  
run for 40 min  
+0-5% Formic acid 85%  
run for 20 min  
pH 3.6

wash or rinse at 25°C

pile - set out - Dry - Moisten - Stake - Toggle (or nail ).

III. Goat liming leather :

Material : Chrome tanned goat skins

Percentages on shaved weight

Shave to 1 mm

wash or rinse at 40°C

Neutralization :

100 % water at 40°C

1 % Sodium bicarbonate

1 % Sodium formate

run for 60 min

wash or rinse at 40°C

Retannage : 100 % water at 40°C

10 % Basynton MK

run for 60 min

+ 4 % Lipoderm Liquor SAF

2 % Lipoderm Liquor 2

run for 60 min

+0.1% formic acid 85%

run for 10 min

wash or rinse at 25°C - Horse up - set out - Vacuum dry at 50 - 60°C - pile

moisten - stake - vacuum dry

REPORT VISIT TO  
C.V. RAMLIE  
JAKARTA  
8 / 6 / 1977

---

Discussion with : Mr. H. Ramlie Owner and Director.

Findings :

1. Number of drums : No drums present in the tannery.
2. Number of pits : 20 pits.
3. Number of workers : 15 workers.
4. Production : 500 pieces of pickled sheep and goat skins per month.

Technical Research and Recommendations :

1. The tannery is producing pickled sheep and goat skins for exportation.  
The whole process of production starting from soaking liming, deliming, bating and pickling all these processes are done in pits by hand or the legs of the workers.
2. There is no machines completely in the tannery.
3. In spite of lack of possibilities in the tannery, the production is not of a bad quality.
4. All the production of the tannery are exported to Japan and some European Countries.
5. The owner is willing to build a complete new tannery in another place.  
In the new tannery the necessary drums and machines will be present.
6. Technical advices has already been given to the owner concerning the new tannery and the necessary machines which should be present.

7. The tannery is producing also finished reptil skins and crocodile for export and home manufacture.

And according to the request of the owner the following 2 formulas has been given :

- I . White tannage for snake and lizard skins ( with natural grain pattern ).
- II. Retannage, dyeing and finishing of wild crocodile skins.

White Tannage for snake and lizard skins ( with natural grain pattern ).

Soak ( Vat or pit ) : 1500 % Water.  
0,3-0,5 % Mollescal C conc.  
Soak for 1 - 2 days, break if necessary, place in a fresh soaking bath ( as above ) for 1 - 2 days, break, weigh.

Liming : 600 % Water.  
Adjust to 2° Be with sodium sulphide, stir well and adjust to 2,2° Be by adding slaked lime.  
Liming time 7 - 9 hours.  
Wash for 30 min at 28° C.

Deliming in stationary

vessel : 500 % water at 28 - 30° C.  
1-3 % Decaltal N Powder  
Move for 30 - 40 min.

Batting : 500 % Water at 30° C.  
1-2 % Eukesol oil SR.  
1-1,5 % Oropon O  
Move for 1 hour, wash for 10 minutes.

Pickling

- : 500 % water at 25° C.  
40 % Sodium sulphate.  
Move for 10 minutes, add  
1-1,2 % Formic acid 85 %  
10 % Water  
Move for 2 hours, leave in  
the bath overnight.

Tannage

- : Tannage is started with Basyntan DLX  
or Basyntan DLE in liquor of :  
500 % Water at 0,5° Be.  
And concluded after 6 - 8 days  
at 3,5° Be.  
By adding Basyntan DLX or Basyntan DLE  
the concentration of the tan liquor is  
raised daily by 0,5 - 0,8° Be untill  
3,5° Be is attained. The leathers are  
left in the 3,5° Be tan liquor for  
another 1-3 days.  
After tannage, condition the leathers  
for 1-2 days.

Fatliquoring in  
stationary vessel

- : 500 % water at 35 - 40° C.  
2-4 % Lipoderm liquor 2.  
Treat for 1-2 hours, condition overnight,  
set out, dry, sawdust stake, nail dry.

Finishing

- : 100 parts luron Top  
3 parts Eukesol oil SR.  
50 parts egg albumen, 10 % solution.  
850 parts water.  
Pad, dry well, fix by top spraying  
with 10 % formaldehyde dry, glaze.

Retannage, dyeing and finishing of wild crocodile skins.

Material : Vegetable tanned crocodile skins ( with little fatliquor ).  
Buff reverse side, weigh percentage on dry weight of leather.

Wetting back : 1500 % water at 40° C.

1-3 % Mollescel AE conc.

2-5 % Sodium bisulphite.

Drum for 2 hour, then rinse for 10 minutes.

Bleaching : 800 % water at 40° C.

8 % Hydrosulphite conc ( B.A.S.F. ).

Drum for 30 minutes, add

0.8% Formic and 85 %

Until pH 4.0 is attained drain bath.

Retannage : 1000 % water at 30° C.

15 % Basytan CD undissolved drum for 2 hours, add

0.3 % Sodium bicarbonate to bring pH to

3.8 - 4 .

Horse up overnight Rinse for 10 minutes at 45° C.

Dyeing : 1000 % water at 45° C.

1-2 % Lipoderm liquor 1

Drum for 20 minutes, add

0.5-5% Dyestuff ( Luganil dye )

Drum for 20 minutes, add

0,5-3% Formic acid 85 %

Drum for 30 minutes untill pH is attained then give a short rinse, nail wet.

Glazed finish with improved gloss :

Spray two cross coats of : 150 parts luron Top.  
5 parts Eukesol oil SR.  
50 parts egg albumen 10 % Solution.  
50 parts gelatine, 1 % solution.  
800 parts water.  
Dry.

Fixation : 300 parts formaldehyde 40 %.  
50 parts acetic acid 6° Be  
650 parts water  
Spray one coat, dry, glaz.

Polished finish with silky gloss :

Spray two cross coats of : 300 parts luron lustre.  
500 parts Water.  
200 parts formaldehyde 30 %  
Dry, polish on plushweel.



REPORT VISIT TO  
FIRMA NATRACO NATIONAL TANNERY  
J A K A R T A

Discussion with : Mr. ISHAK NOOR  
Owner and director

Findings :

1. Number of drums : 3 drums
2. Number of pits : 12 pits
3. Number of workers : 20 worker
4. Maximum capacity : 20,000 pieces of pickled skins and  
10,000 pieces of finished skins per month
5. Working capacity : 3,000 pieces of finished skins per month  
only.

6. The reason for the drop of production is :

- a. Market demands
- b. No enough capital

7. Production :

The tannery is producing pickled and wet blue goat and sheep skins for exportation.

Also finished skins for local market.

At the time of the visit the tannery is producing only for the local market. The prices for exportation is not suitable, generally speaking the production of the tannery is good and well accepted by the market.

8. The tannery is in true need for the following :

- a. Two drums
- b. Horizontal table to be used in finishing process.
- c. Shaving machine
- d. Staking machine

According to the request of the tannery the following formulas are given :

- (1) Sheep nappa leather for clothing, semianiline finish
- (2) Sheep suede leather for clothing

1. Sheep nappa leather for clothing, semianiline finish :

Soaking, liming, deliming as done in the tannery.

Pickling : 30 % water at 25°C  
1.8 % picatal flakes  
0.2 % formic acid 85 %  
run for 10 min  
pH 3.7

Tannage : + 5 % chromitan NA  
2 % Lipoderm Liquor 1  
1 % Eusapon LPK  
run for 60 min  
+ 3 % Relugan GT 50  
run for 60 min  
+ 1 % implenal AP  
run for 3 hours

Wash : 150 % water at 30°C  
0.5 % Nutrigan  
run for 20 min  
pH 4.5  
horse up - Sam  
shave to - 0.5 - 0.6 mm  
wash or Rinse at 40°C

Retannage : 100 % water at 40°C  
4 % Bastamol CN  
2 % Basytan C2  
run for 60 min  
1 % sodium formate  
1 % Sodium bicarbonate  
run for 40 min  
pH 6  
wash or Rinse at 40°C

Dyeing and fat liquoring :

100 % water at 50°C  
2 % Tamol NNOL  
run for 10 min

- 2.5 % Dyestuff  
run for 20 min
- + 100 % water at 70°C  
run for 10 min
- + 4 % Lipoderm liquor SAF  
2 % Lipoderm liquor 1  
2 % Lipoderm A  
run for 40 min
- + 2.5 % formic Acid 85%  
2 x 10 min
- + 1 % Lipamin Liquor 50  
20 min  
pH 3.8

Wash or Rinse at 25°C - pile - set out - Dry - Moisten - Stake - Toggle

Finish :

Bottoming : 50 parts pigment colour  
850 parts water  
6 parts ammonia  
500 parts Lipton Binder WB  
100 parts Eukasolar dyes liquid  
( according to the required colour )  
one spray coat.

Pigment finish: 50 parts pigment colour (the same pigment colour used in  
bottoming )  
620 parts water  
150 parts Corial Binder OR  
100 parts Corial Binder OBN  
30 parts Lipton wax A  
50 parts Eukasolar Dyes liquid  
(according to the required colour)  
2 spray coats.

Top coat : 320 parts corial EM Base lustre S  
80 parts Corial EM Base Matt N  
280 parts water  
200 parts ethyl glycol  
120 parts formaldehyde 30%  
one spray coat, plat.

N.B. : The mixture of pigments colours, and the Eukasolar liquid colours depends upon the final required colour

II. Sheep suede leather for clothing :

Soaking, liming, deliming, as done in the tannery Pickling and Tanning as mentioned in formula number I.

Shave to 0.9 - 1.0 mm.

Wash or Rinse at 40°C

Retannage : 100 % water at 40°C  
6 % B<sub>2</sub>stemol CN  
run for 60 min  
+ 1 % Sodium formate  
1 % Sodium bicarbonate  
run for 60 min — pH 5.5 - 6  
wash or Rinse at 40°C

Fat liquoring : 100 % water at 60°C  
3 % Lipoderm liquor 2  
1.5 % Lipoderm liquor SAF  
1 % Lipoderm A  
run for 40 min  
+ 0.2 % formic acid 85%  
run for 10 min  
pH 4.8  
wash or Rinse at 25°C

Hang up to dry - Moisten - stake - Ruff - weigh

Wetting Back : 1.000 % water at 40°C  
1 % Ammonia  
run for 60 min

Dyeing : 800 % water at 60°C  
1 % Tamol NNOL  
run for 10 min

2- 2.5 % Dyestuff colours.  
run for 30 min  
+ 1 % Lipoderm liquor 2  
1 % Lipoderm A  
run for 20 min  
2 % formic acid 85%  
2 x 5 min + 10 min  
Drain float

Fixation : 500 % water at 50°C  
0.5 % Relugan B  
run for 20 min  
1 % Lipamin liquor 50  
run for 10 min  
pH 3.7

wash or Rinse at 25°C - Hang up to dry - Moisten - Stake - Mill - Toggle.

Visit report to  
P.T. BUDI MAKMUR  
YOGYAKARTA  
on 4 / 3 / 1977

---

Discussion with :

- A. Mr. R. Johannes Suratno - President Director  
B. Mr. Sutanto Handoko - Director

Findings :

1. Number of Workers : 200 worker
2. Working Capacity : 1.200 pieces / day of skins  
200 pieces / day of cattle hides
3. Max. Capacity : 6.000 pieces / day of skins  
500 pieces / day of cattle hides
4. With respect to the cattle hides, the market for the domestic uses is limited according to the high prices of leather produced.  
According to the present technology, they can not export finished leather from cattle hides and the tannery needs help in this field.
5. The tannery is producing sheep and goat skins (suede, garment, shoe upper, for exportation).
6. Also finished shoe upper leather from cattle hides for domestic uses.
7. The tannery is complaining from the low standard of the available raw skins, since there is no effort done for animal feedings, also medical treatment is very weak which effect the quality of the raw hides.
8. Production for exportation is of good quality and well accepted overseas, so technically speaking nothing has to be done concerning these production.
9. Discussions about marketing problems can be summerized as follows :
  - a. Indonesia must compete with its neighbourhoods and also with the European countries in Leather and Leather goods.
  - b. Study on the Labour costs, showed it is higher by 20% in Korea and Taiwan than in Indonesia.
  - c. In these two countries also all the raw hides and skins is imported from U.S.A. and Pakistan.  
Chemicals used are also imported, and inspite of all these factors, they are still competing most of the neighbourhood countries in lather and leather goods.

- d. The reason for their cheap prices overseas is that they do not pay TAXES on the imported raw hides and skins and chemicals which are used in exportation.
  - e. They use a letter of guaranty from the bank to the customs and when they prove that they export the leather goods the bank receives his letter again, the tanners has to pay nothing from their capital and consequently the prices of final product is cheap.
  - f. The taxes in Indonesia is from 30 - 40% for tanning chemicals and 60% on finishing chemicals.  
The chemicals used in the production of leather covers about 15% of the total price of the final product, so if this part will be of high cost the price of the final product will be high.
  - g. The taxes on imported machines is 30% and this does not encourage the importation of new machines.
10. Discussion was also held concerning livestock population, which is not enough for cattle hides, and idea came that a big governmental project has to be done not only for the increase of livestock population but also to improve the quality of raw hides and skins.

TECHNICAL RESEARCH :

1. As said before, the quality of the exported products garment, suede washable leather ..... etc from both sheeps and goat skins, is very nice and no need for any change, but only some improvement can be done on goats for shoe upper leather and this shall be done on another long visit to the tannery.
2. The shoe upper leather produced from cattle hides is not good since :
  - a. The leather produced has a hard and empty feeling
  - b. The grain break tends to be not good
  - c. The fat is not enough in the grain layer
  - d. No mellow feel present, which is required in leather to day.

The reason for all these problems lies in :

1. Neutralization.
2. Retanning
3. Dyeing
4. Fat-liquoring
5. Drying.

All of the above factors can be technically discussed as follows :

1. Neutralization and

2. Retanning

Under modern retanning systems, neutralization is combined with Retanning in one operation.

The use of calcium formate and syntans as buffering agents is recommended the final pH value of the float should be between 4.0. - 4.5.

On testing with bromocresol green the cut should react green to greenish blue.

Using sodium bicarbonate on its own, overneutralization is easily possible with the resultant risk of loose grain.

The use of chrome powder (chromosal or chromitan) is recommended in view of the mellow feel required for the leather of to day and in order to preserve the chrome character in the grain structure and gives better dyeing properties.

Using vacuum drying process the tannery under investigation tends to have a firmer feel.

The chrome materials can eliminate this to some extent but it is wrong to try to achieve the necessary softness slowly by stronger neutralization or using excessive quantities of fat liquor.

To ensure drying that is as iniforme as possible by the vacuum process used in the tannery and to achive a good mellow feeling a syntan or a resin tanning material must be used.

This is the only way in which the poorer parts of the hide (bellies, flanks, shoulder section) can be given roughly the thickness of the better structured parts also it gives the favourable influence on fell, good distribution of dyestuff and fat-liquor and satisfactory behavior during drying and finishing.

3. Dyeing

The use of products possesing good affinity is recommended in order to contract any spotting of the leather during drying.

4. Fat-liquoring :

In drying by vacuum drying system, the direction of water going out of the leather is towards the flesh side so the unfixed substances in the leather such as salts tans, dyes and fat-liquoring agents migrate.



The result is a reduction in the quantity of these substance in the grain layer particularly of fat-liquoring agents.

Only special types of Fat-liquoring agents is recommended on using vacuum drying system namely.

Lipoderm liquor II (B.A.S.F.)  
Sandolix WWL (Sandoz)  
Coripol DXL and ) (Stockhausen & Cie. Krefeld)  
Sultafon L A C )

#### 5. Drying

To over come the problems on using vacuum drying system and to gain max . area from the leather, experience has shown that the best way for drying should be first by togeling (or nailing) the leather after drying and fat-liquoring leave in shadow, to reach about 50% dry, after that normal drying on the vacuum for only 1.5 - 2 minutes.

Instead of togeling or nailing, hanging can be done after vacuum drying this gives a better feeling but reduction in size will appear.

More than one formula can be given to the tannery to produce shoe upper leather from cattle hides using vacuum drying system present in the tannery.

The following is ONE of them : (according to the possibilities present in the tannery under investigation).

Material : Chrome tanned cattle hides  
percentages based on shaved weight.

Washing : 250% water 40C° (Closed drum)  
run for 10 min.  
drain float

Retannage : 100% water 50% C°  
4% Chromosal B (or chromitan B)  
1% } Calcium formate  
1% } Sodium bicarbonate  
run for 60 min.  
pH float 4.0. - 4.5.  
add.  
4 - 5% Tanigan OS  
2 - 3% Mimosa extract powder  
add together undissolved  
run for 45 min.  
pH float 4.0. - 4.5.

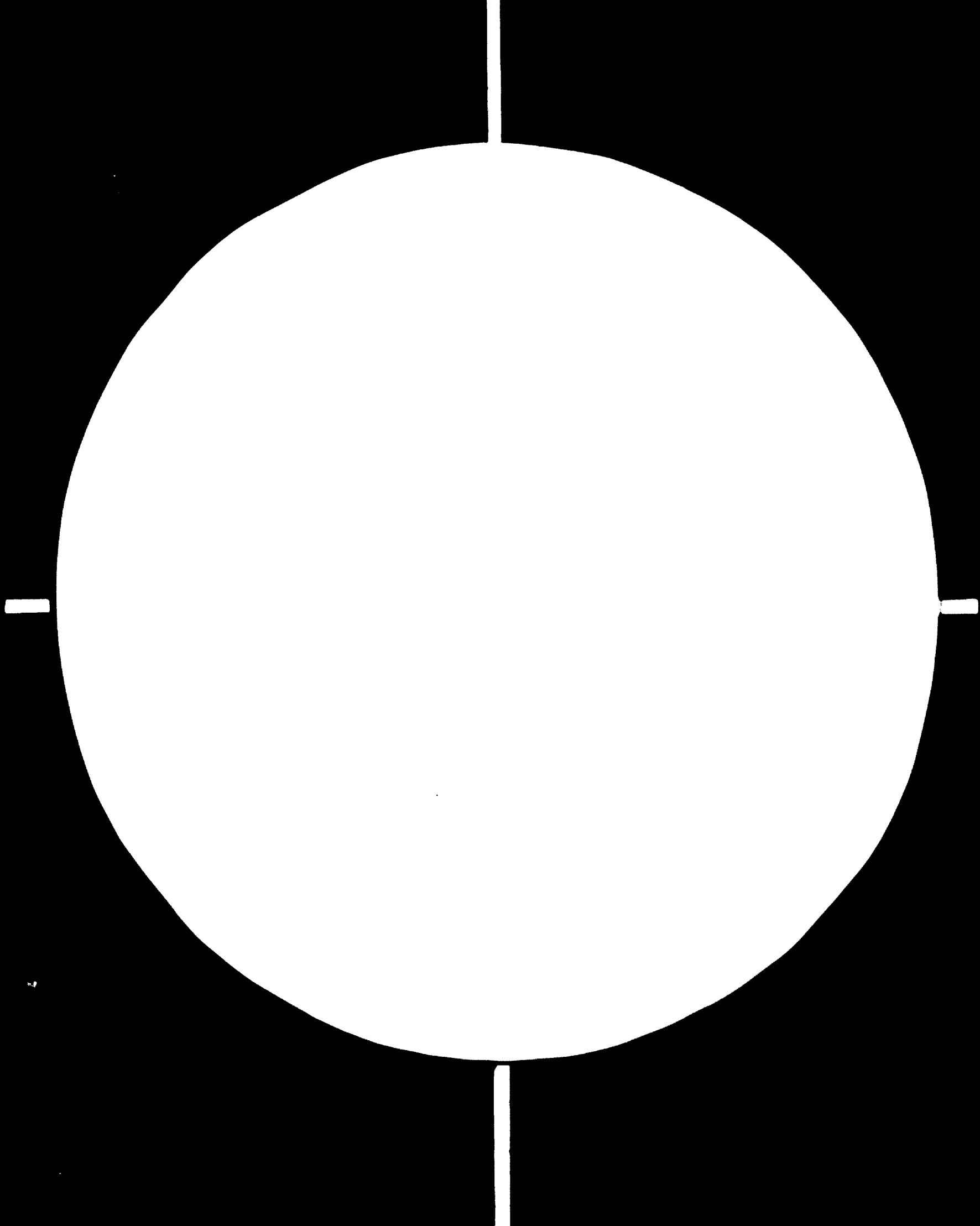
Dyeing : 100% water 60° C  
0.5 - 1% Acid or direct dyestuff  
(Dissolved 1 : 20 hot water  
run for 20 min.  
add.  
5% lipoderm Liq. II  
1% raw fish oil (unsulphonated)  
run for 40 min.  
pH of the float 4.2. - 4.4.  
add.  
0.5% Formic acid 85%  
(dissolved 1 : 10)  
run for 15 min.  
pH : 3.4.  
rinse at 20° C for 5 min.

horse up over night, set out (if possible)  
nail on a wooden fram and keep it in closed shadow place - without sun - for 50%  
drying , vacum dry for 1.5. - 2.5. min. only - continue finishing as usual.  
It should be also mentioned that this tannery is very well equiped and  
organized. It contains most up-to-date new machines and drums.  
Lot of possibilities can be done in the future for this tannery to produce  
all kinds of finished leather on European standard.

**C-688**

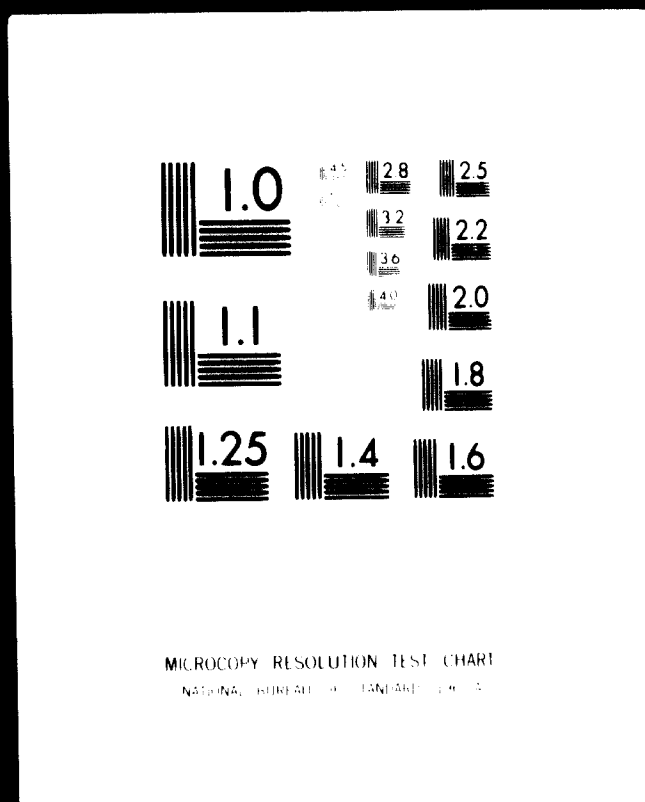


**78.11.22**



3 OF 4

08178



24x  
B

MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

VISIT REPORT TO C.V. BENGAWAN SOLO  
ON 3th MARCH, 1977

The owner and the director : Mr. Mulyo Budiono

FINDING :

1. No. of workers : 48 worker ( 38 men + 10 women )
2. No. of drums : 14
3. Working hours : 7 hours with one hour rest.
4. Working Capacity : 2.500 pieces of Pickled and Wet Blue cattle hides  
12.000 pieces sheep skins
5. Max. Capacity : 5.000 pieces of cattle hides  
60.000 pieces of sheep & goat skins  
All the production now is exported in the form of Pickled and Wet Blue.
6. The reason of the drop of production is the contract between the owner and the broker which fixes the production of the tannery at that stage, and if the tannery produces more and sells it to any else, the broker will take 3% from the sale price.  
The tannery can work easily with full capacity especially with cattle hides, but it needs 2 shifts to work with full capacity from sheep and goat skins.
7. No problems concerning buying chemicals or hides and skins which are in stock only for 15 days ( due to the lack of capital ).
8. Most of the chemicals used is from Kempen Company in West Germany ( As mentioned in the contract between the tannery and the broker ).
9. No capital available for buying new machines, especially the present splitting and fleshing machines which are very old ( working since 1950 ) and it should be renewed or changed especially that the maintenance seems to be bad.
10. The process of calculating the sale price is not based on any scientific base. According to the owner's calculation, he makes only 3 % profit on exporting Pickled and Wet Blue, and this is a very low profit which disappears due to the complete inaccuracy in the final measurements of the skins. This type of measurements is based only on estimation and the percentage of error is very high to the benefit of the buyers.
11. The true profit of the tannery comes from the by products.

TECHNICAL RESEARCH.

1. The production of Pickled and Wet Blue is nice and no technical observation on it except the process of soaking and liming takes a very long time and it can be shortened easily.
2. The Process of measuring the exported product either Pickled and Wet Blue is a matter of estimation and it is absolutely wrong especially since the hides and skins are not stretched before measuring, so the skin ( or hide ) is not giving its actual size but a smaller one.  
The process of measuring must be changed either by having a special measuring machine or selling the final product by weight, and not in square feet, or finally producing crust leather which is easily measured accurately on normal measuring machine.
3. The tannery should produce crust leather for the following reasons :
  - a. The profit is much higher.
  - b. The overseas market for crust is very well known especially in Italy and Spain and there is no need for a broker in between.
  - c. Measuring can be done easily and accurately on a standard measuring machine without any difficulty.
  - d. No need for adding or buying any new drums or machine except measuring machine which is a must in all cases.
  - e. The Wet Blue stage done already in the tannery is good and no change should be envisaged, so for AS producing crust leather is concerned only ONE process is added namely ; Retanning and fat-liquoring only ( dyeing also can be added if required by the buyer ).
4. In producing sole leather the time factor is not considered at all ( total time about 2.5 - 3 month ) and this should be changed.
5. Concerning sole leather, the final product is not good since :
  - a. Very soft sole leather is produced.
  - b. Very light in weight i.e. not enough tanning material inside the leather and this causes a loss to the tannery since by having heavy leather, more money is gained on the same piece of leather.
  - c. No setting out by hand and this affects the surface of the sole leather, ( bad looking ).

6. Leather produced for handicraft purposes is good and there is no need for any change in the system.

TECHNICAL ADVICE

A. Sole Leather :

Deliming after washing is a must to remove as much<sup>~</sup> possible of Mechanically held line.

Using the current process in the tannery, the change should only be done by increasing the time and the concentration of the tanning drum as follows: After the leather is removed from the pits, a drum liquor with 8 - 12° Be solution. The Tanning solution should consist of :

70 % Minosa  
30 % Quebrache

Continuous drumming of 8 - 10 days. After complet tanning, the leather should be pilled for 24 - 48 hours.

The PH of the final liquor should be 3.9 - 4.5

The concentration of the concentrated tanning solution should not be reduced under any conditions below 8° Be.

By this process the weight of the final product will increase but even this takes a very long time.

B. Producing Crust Leather from cattle hides.

1. Normal way done now in the tannery until complete chrome tanning, shaving until the required thickness.

Retanning and Fat-liquoring :

Percentage on the shave weight ; wash with running water for 20 minutes.

<u>Raw Bath</u>	150 % water	60 - 65° c
	3 - 4 % Tanigan OS	
	2 - 3 % Tanigan 3 LN	
	0.4 % Sod Bicarbonata	
	4 % Lipoderm Liq II	
	1 % Tamol GA.	

All together, running for 60 minutes add :



0.5 % Lipamin Liqi 0

run for another 30 minutes.

( In case of absence of Lipamin Liqi 0, increase the Lipoderm Liq II to 5% and the total running time should be 90 minutes ).

Pile the leather, leave for 48 hours.

Stretch the leather on a wooden fram ( such as in handicraft leather ), leave until complete dry. Max. 48 hours, remove the leather ffrom the frams stack well.

C. Producing Crust Leather from sheep and Goat skins.

There is a lot of recipies which can be give but it depends on the perpose the leather will be used after i.e. clothing Nappa, Sucde, Garment, glove leather.

During a second visit held to the same tannery. This point will be discused and formulas will be given according to the requirement of the tannery.-

REPORT VISIT TO PT. AMOR ABADI

S E M A R A N G

12 - 4 - 1977.

Discussion was held with : Dr. EDDY WIDJAYA

Managing Director.

Findings :

1. Number of drums : 13 drum - 9 only is working and 4 drums is kept as reservatory.
  2. Number of workers : 30 worker ( + 10 worker temporary )
  3. Working Capacity : About 20.000 ft<sup>2</sup> of upper leather and about 25.000 pieces of goat skin / month.
  4. Maximum capacity : 30.000 ft<sup>2</sup> of upper leather and 75.000 pieces of goat skins / month.
  5. The reason for the drop in the production is :
    - a. Market demands
    - b. The payment for the products selled in the local market is done after a long time from 4 - 6 months, causing shortage in the capitals of the tannery.
  6. The tannery is producing :
    - a. Pickled goat skines for exportation.
    - b. Finished upper full grain leather for shoes
    - c. Up holstery leather
    - d. Nappa garment leather from cattle hides
    - e. Suede leather for shoes and furniture
    - f. Corrected grain for shoe upper's
    - g. Crust leather for exportation.
- All the production is for domestic uses except the pickled goat skines and the crust leather, which is for exportation.
7. The production is very nice and no any technical comments.
  8. The tannery is very well arranged and contralled / and the techniques applied are most up to date.

Also the machines present are very good and the tannery is renewing the old machines.

9. The tannery have been built according to the Domestic Investment law P.M.O.N. giving the following facilities ;
  - a. The imported machines are free from import taxes
  - b. 50 % Taxes Reduction on the imported chemicals
  - c. Three years Taxes holiday
10. The tannery can be considered as one of the best tanneries all over Indonesia and the prospect for the future is very nice in this tannery.

REPORT VISIT TO  
PT. CONDRU PURNOMO CIPTO  
SEMARANG ( CENTRAL JAVA )  
12 - 4 - 1977

Discussion with :

1. Mr. HENDRO SURYO  
owner and Director
2. Mr. A. EKANTO  
Technical manager

Findings :

1. No of drums : 5 drums
2. No of workers : 70 worker
3. Maximum capacity : 3000 pieces of sheep and or goats / month.  
working capacity : 1000 pieces of sheep and or goats / month.
4. The reason for this drop in production :
  - a. The prices of the raw hides is higher than the selling price and the tannery is loosing at the time being.
  - b. The quantity of raw skin is not enough
  - c. Lack of capital
5. The production :
  - a. Pickled, wet blue sheep and goat skin
  - b. Some times pickled and wet blue from cattle hides.
  - c. The tannery is starting the production of crust on goat skin to be used as shoe upper - but this production is in experimental stage.  
The production is of a good quality and is saled to a broker ( exported).
6. The stock of the tannery is :  
3 months for skines  
and 3 months for chemicals
7. The production of tannery is saled to a broker.  
The tannery guarantee the broker the sale and the quality of the hides / skines manufactured for a period of minium 5 years.
8. The prices is not stable and is fixed nearly every one weak.  
The contract between the tannery and the broker states that in case that the prices offered by the broker is not workable, the tannery has the right to stop the production, or in case that the prices of the broker are lower than those from others, the tannery has the right to sell to others, throw the

the broker or directly, however with payment of 3 %, commission on basis F.O.B. Indonesia ports to the broker.

Payment of this commission applies to a period of minimum 5 years as well.

This commission should not be paid on hides or skins that the tannery sells for the local market (i.e not for export)

9. The tannery has the right to import new machine, free from taxes, but their is no enough money to import such important machines.
10. The goverment is requested to help such exporters who has started recently their production.

( This tannery has been build in the year 1973 and the production started at April 1975 ).

With the aid of the goverment such tanneries should :

- a. Import their necessary machine to produce crust or even finished leather.
- b. To work free by and not under such condition putten by a broker, and the tannery has no choice, since their is a need of money.

Technical Research :

1. The production is good and well accepted overseas
2. The tannery wants to start trials on crust goat skins and crust cattle hides.
3. The necessary drums and machines required for the production of crust goat skins is present in the tannery and no need for buying or adding anything else.
4. For producing crust cattle hides the tannery needs the following machines :
  - a. Splitting machines and / or
  - b. Shaving machine
  - c. Staking machine
  - d. Measuring machine and as request by the tannery, the following 2 formulas have been given to the owner :
    1. For the production of ( dyed ) crust goat skins for shoe upper.
    2. For crust cattle hides

Goat upper leather for shoes :

Soaking, liming, fleshing, scudding( as done and the tannery )

Dalimingand bating :

200 % water at 35<sup>0</sup>C  
2.5 % decalcal N powder  
0.5 % Sod bisulphite  
run for 30<sup>0</sup>  
+ 2 % oropon OR  
run 2 - 3 hours

p.H 8.2

Wash or Rinse at 25<sup>0</sup>C

Pickle : 50 % water at 20<sup>0</sup>C  
7 % common salt

run for 10 min.

0.4% Sulphuric acid ( diluted 1 : 10 )

0.4% Formic acid 85% ( diluted 1 : 10 )

run for 60<sup>0</sup>

p.H 3.7

+ 2 % chromitan B ( or chromosal B )

run for 2 hours

Drain float

Tarriage : 40 % water at 30<sup>0</sup>C

5 % chromitan MS

run for 20 min

2 % Implenal AP

run for 5 hours

p.H 3.6.

Pile, Sam, Shame weight

wash or Rinse at 30<sup>0</sup>C

Retannage : 50 % water at 40<sup>0</sup>C

4 % Basyntan CD

run for 40 min

+ 1 % Neutrigan

run for 30 min

p.H 4.5 - 5

wash or Rinse at 40<sup>0</sup>C

Dyeing and fat liquoring :

150 % Water at 50<sup>0</sup>C

2 % Tamol NNOL

run of 10 min

+ 1-1.5 % Dyestuff

run for 20<sup>0</sup>

+ 3 % Lipoderm liquor SA

- 1 % Lipoderm liquor I  
0.5 % Lipoderm oil SK  
run for 40 min  
+0.5 % formic acid 85 %  
run for 20 min  
p.H 3.6

Wash or rinse at 20<sup>0</sup>C, pile, set out, dry, Moistem Stake, Nail or Toggle.  
N.B : if required with dyeing, no need for addition of the dye and the formic acid.

Side leather, crust, white color; from cattle hides

Raw material : wet Salted cattle hides.

Soaking : 4 hours to remove the dirt, water at 20<sup>0</sup>C  
fresh bath with 200 - 500 g cismollan BH ( or Mollescal C )  
per cu.m water.  
Total soak time 24 hours.  
Percentage based on salted weight.

Liming ( drum ) : 250 % water, temp about 25 - 30<sup>0</sup>C.  
1.5 % Sodium sulphide conc 60/62%  
2-3 % Hydrated lime.  
move for 30 min, stop for 2 hours.  
add :  
1.5 % Sod. Sulphide conc 60 / 62 %  
move for 15 min, then briefly every hour.  
Total liming time 16 - 24 hours.  
Rinse for 15 - 20 min, with water at 25<sup>0</sup>C flesh  
split to 3 - 3.5 m.m.  
Scud if necessary, weigh: percentages based on pelt weight.

Rinse : for 10 - 15 min temp. between 25 - 35<sup>0</sup>C

Deliming and bating ( drum ) :  
300 % water 35<sup>0</sup>C  
0.5 - 0.8 % Sodium bisulphite powder.  
0.8 - 1 % Ammonium sulphate

0.1 - 0.2 % formic acid 85 % ( diluted with 10 parts water,  
addition in several portions )

run for 20 min

0.5 - 1 % of a bating agent

( oropon OR )

add products undissolved run for 25 - 40 min.

final p.H 8 - 8.5

cut edge, tested with phenol phthalein Inner zone

about  $\frac{1}{3}$  pink

Pickle :  
(drum 12-16 r.p.m)

50 % water 20<sup>0</sup>C

5 % Common salt

1 % Calcium formate

run for 5 min

at least 5<sup>0</sup>Be'

add :

+ 1.2 - 1.4 % sulphuric acid 66<sup>0</sup>Be'

10 % water

run for 1 - 2 hours if necessary overnight in  
the pickle liquor, move 10 min next morning.

p.H of float 3.4 - 3.6

cut edge reacts yellow to yellowish green to  
bromocresol green.

Tannage in the pickle liquor :

add in the same bath

10 % Chromosal B ( or chromitan B )

Undissolved, run for 30 min

Basification

+ 1.2% soda ash

0.5 % sodium sulphite

10 % water

add together slowly in 1 hour

run for further 6 hours.

final p.H of float 3.6 - 3.8

Hoese up leather, sam, shave, thickness as required  
weigh.

Wash or Rinse at 30<sup>0</sup>C.



Neutralization : 100 % water 40<sup>0</sup>C  
1.5 % Sodium formate  
2 % Tamol NNOL  
add all together, undissolved, run for 40 min  
p.H. 4.6

Wash or Rinse at 40<sup>0</sup>C.

Retannage : 100 % water 40<sup>0</sup>C  
5 % Basyntan D L E  
run for 60 min  
p.H. 4.2

Wash or Rinse at 60<sup>0</sup>C.

Fatliquoring : 100 % water 60<sup>0</sup>C  
3.5 % Lipoderm liquor SAF + 2% Lipoderm liquor SA  
2 % Lipoderm liquor A  
The fat liquor should be dissolved ( emmuleified )  
in 1:3 hot water of 80<sup>0</sup>C.  
+ 0.5 - 1 % Lipton white cB  
2 % Lipamin liquor SO  
run for 20 - 30 min  
+ 2 % Basyntan DLE  
run for 30 min  
+ 0.2 % formic acid 85 % ( diluted 1 : 10 at 30<sup>0</sup>C )  
run for 10 min.  
p.H. 3.5

Wash or Rinse at 20<sup>0</sup>C. Hores up, set out, dry by Hanging ( or nailing )  
moisten, stake,

REPORT VISIT TO

CV. GENERAL - MAGELANG - 12 - 4/1977.

Owner and Director : Mr. J.Y. LIONG.

Due to his absence the Discussion was held with Mrs Liong ( assistant director).

Findings :

1. Number of drums : 4 drums
2. Number of workers: 30 worker
3. Working capacity : 8 tons of cattle raw hides / month ( about 40,000 ft<sup>2</sup>)
4. Maximum capacity : 16 tons of cattle raw hides / month
5. The reason of the lower productivity of tannery is :
  - a. Lack of Capital
  - b. Marketing demande, also for local market the payment is after 4 - 6 months causing blocking of liquid capital.
  - c. The unstability of prices of raw hides.
6. The production of the tannery :
  - a. Full grain upper leather pigment finish
  - b. Corrected grain upper leather pigment finishBoth product are for local use

Technical Problems :

1. The final product posses a very loose grain, which is quite clear over several parts of the whole leather.
2. The leather is empty, very bad retanning.
3. The buffing operation is very bad, and this results in unequal absorbtion of the finishing chemicals causing different Shades in the same piece of leather.
4. The machines present are very old and most of them are working unproperly.
5. The production is done in 2 separt tannerie far away from each other.  
From soaking untill Retanning and fat liquoring and drying in one tannery and the rest of the finishing in another place.
6. Generally speaking the internal arrangement of the drums and machines and concequantly the movements of the leather from soaking untill finishing is not done properly, and this could not be changed under the present suitation.

The only thing that could be done is changing the working formula in an attempt to up grade the quality of the finished product.

Due to the absence of the owner who is responsible for the technical part, No technical points was discussed. A second meeting will be held after the arrival of the owner from abroad.

Meeting with the owner of CV.General was held on 25 / 4 / 1977.

The following Recommendations has been given to him after discussing the running formula.

1. No need for dry drumming after soaking in the pit since excessive drumming may make the resultant leather too soft<sup>and</sup> loose, particularly in the thin parts of the skin or damage the grain.

It is quite enough to drum with water for one hour only.

Also it has been recommended to change the soaking water after 24 hours with new water.

2. The reliming time is very long - Reliming is done in the tannery for 2 nights.

This time has to be shorten to be one night only or even to stop reliming completely if the leather after liming is plumped enough.

In my opinion that the dry drumming, and long reliming time is the main reason for loose grain appearing in the final finished leather.

As requested by the tannery, the following formulas has been given :

I. Beam house work and chrome tanning :

for Side leather, corrected grain and full grain.

Raw material : wet salted cattle hides

Soak : 4 hours to remove the dirt; water 25°C, then fresh bath with 200 - 500 gm molleal C or Cismollan 9H per cubic meter of water used.

Total soaking time 24 hours only.

Liming : (drum ) : 250 % water

1.5% Sodium sulphide conc 60/62 %

2-3% Hydrated lime

Move for 30 min, stop for 2 hours.

+ 1.5 % Sodium sulphide conc 60/62 %

Move for 15 min, then briefly every hour.

Total liming time 24 hours. Rinse for 15 - 20

min with water, flesh, split to 3.0- 3.5 m.m

Scudd if necessary, weigh.

Percentages based on pelt weight.

Rinse : for 10 - 15 min

Deliming and Bate

( Drum )

: 300 % water 35°C

0.5 - 0.8 % Sodium bisulphite powder

0.8 - 1 % Ammonium sulphate

0.1 - 0.2 % Formic acid 85% ( dilute with 10 parts  
water, addition in several portions )  
run for 20 min.

add : 0.5 % Dropon DR

Add products undissolved 25 - 40 min final pH

8.0 - 8.5

Cut edge tested with phenol, phthalwin Inner Zone  
about  $\frac{1}{3}$  pink.

Pickle

( drum 12 - 16 r.p.m)

: 50 % water

5 % Common salt

1 % Calcium formate

run for 10 min at least 5°C

+ 1.2 - 1.4 % sulphuric acid 66°C

10 % water

run for 1 - 2 hours

leave overnight in the pickle liquor, move

10 min, next morning pH of float 3.4 - 3.6

cut edge reacts yellow to yellowish green to  
bromocresol green.

Tannage in the pickle liquor :

add : 10 % Chromosal B undissolved

or ( chromitan B undissolved ) run for 30 Min.

Sanification

: add to the same bath

1.2 % Soda ash

0.5 % Sodium sulphite

10 % water

Added all slowly in 1 hour run for further 6 hours

final pH of float 3.6 - 3.8

Hoese up leather, sam. shave, weigh

As mentioned before the previous process can be used for full or corrected  
grain upper leather.

Deliming and Bate

( Drum )

: 300 % water 35°C  
0.5 - 0.8 % Sodium bisulphite powder  
0.8 - 1 % Ammonium sulphate  
0.1 - 0.2 % Formic acid 85% ( dilute with 10 parts  
water, addition in several portions)  
run for 20 min.

add : 0.5 % Dropon DR

Add products undissolved 25 - 40 min final pH

8.0 - 8.5

Cut edge tested with phenol, phethalein Inner Zone  
about  $\frac{1}{2}$  pink.

Pickle

( drum 12 - 16 r.p.m)

: 50 % water  
5 % Common salt  
1 % Calcium formate  
run for 10 min at least 5<sup>0</sup>Be'  
† 1.2 - 1.4 % sulphuric acid 66<sup>0</sup>Be'  
10 % water

run for 1 - 2 hours

leave overnight in the pickle liquor, move

• 10 min, next morning pH of float 3.4 - 3.6  
cut edge reacts yellow to yellowish green to  
bromocresol green.

Tannage in the pickle liquor :

add : 10 % Chromosal B' undissolved  
or ( chromitan B undissolved)run for 30 Min.

Basification

: add to the same bath  
1.2 % Soda ash  
0.5 % Sodium sulphite  
10 % water  
Added all slowly in 1 hour run for further 6 hours  
final pH of float 3.6 - 3.8  
Horse up leather, sam. shave, weigh

As mentioned before the previous process can be used for full or corrected  
grain upper leather.

II. Retannage for full grain leather :

Material : Chrome tanned cattle hides percentages based on shaved weight.

Washing : 250% water 50°C ( closed drum )  
run for 10 min, drain the float.

Retanning : 100 % water 50°C  
5 % Chromosal B ( or chromiten B )  
run for 15 min.  
+ 2 % Tanigen BAK  
run for 60 min.  
+ 1 % Coripol BZN ( emulsified 1 : 5 )  
run for 10 min  
+ 2 % Tanigen OS  
2 % Retingan R7  
run for 45 min  
pH float 4.3 - 4.6 drain float

Washing : 250 % water 60°C ( closed drum )  
run for 10 min, drain the float

Dyeing : 100 % water 60°C  
1 % Dyestuff  
1 : 20 dissolved hot  
run for 20 - 30 min

Fat - liquoring :

4 - 5 % lipoderm liquor II  
1 % Unsulphomated fish oil-run for 30 min  
+ 0.2 % formic acid 85 % ( diluted 1 : 10 )  
run for 10 min.  
+ 1 % Tanigen OS  
run for 10 min. pH of the liquor approx 4.5  
drain the float  
Rinse for 10 min. Horse up over night.  
Suspension dry with seaming and setting out

III. Retanning for corrected grain, suitable for buffing :

Material : Chrome tanned cattle hides  
percentages based on shaved weight.

Wash : 300 % water 30°C  
0.3 % acetic acid 6°Be'  
run for 10 min drain float.

Neutralization : 100 % water 30°C  
2 % Tamol GA  
1 % Sodium formate  
run for 45 min  
pH 4.5

Wash or Rinse at 30° C

Retannage : 30 % water 40°C  
and 4 % mimosa extract powder  
fat liquoring 3 % Relugan A  
2 % Basyntan C2  
2 % Lipoderm liquor I  
3 % Lipoderm liquor SA  
1 % Lipamin liquor SO  
10 % water at 70°C - run for 60 min  
pH 3.8  
wash or Rinse at 25°C

Horse up - set out, dry by hanging ( or nailing ) moisten, Stake,  
redry again, Buff.

Before finishing corrected grain leather, Impregnation should be done  
according to one of the following formulas :

IV. Formulas for Impregnation :

A. Impregnation : 250 parts corial Binder SR  
680 parts water  
70 parts Amollan PR

mix all together, one bed coat after buffing by 280  
paper. lay in pile overnight, plate, 1min after words  
Rebuff again with 480 - 500 buffing paper, remove dust.



8. Impregnation : 150 parts eukanol driver PI  
150 parts water  
300 parts Eukanol Binder IM  
( mix all together )

After first buffing by 280 paper, one pad coat of the above solution,  
lay in pile overnight, plate for 1 min afterwards rebuff with 500 buffing  
paper remove dust and finish normally.

REPORT VISIT TO  
P.P.K. MERTOYUDAN M G L  
MAGELANG ( Central Java )  
13 - 4 - 1977

Discussion with : 1. Mr. A. BOESRI PRAPTOMOELJONO  
General Director.  
2. Mr. AROEM MADJO  
Technical Manager  
3. Mr. RIFAN HADI  
Technical Manager

Findings :

1. The Tannery is owned and directed by the government of central Java.
2. Number of Drums present : 9 drums
3. Number of workers : 75 worker
4. Working capacity : 35 - 40.000 ft<sup>2</sup> shoe leather and 10 tons of sole leather.
5. Maximum capacity : 50.000 ft<sup>2</sup> shoe upper leather and 12 tons of sole leather.
6. The market demands is the reason for the lower productivity since the production is done according to the local demands.
7. The production of the tannery :
  - a. Full grain, corrected grain upper leather ( pigment finish )
  - b. Sole vegetable tanned leather, insole splitsBoth products are locally used.

Technical Research :

1. The soaking process is not done properly, since the pit used for soaking, is not large enough and the percentage between the hide and water in the soaking process which is usually 400 % <sup>water</sup> (this percentage is not working, causing in sufficient soaking operation which is the principle to have good quality leather.

2. The revolution of the liming drum is very high, since the R.P.M. of liming drum should not be more than 2 - 4 rounds per minute. This high revolution in the liming drum is one of the causes of loose grain which is quite clear in the finished product.
3. The low speed of the retanning and fatliquoring drum causes also in proper fat liquoring operation.
4. The splitting machine is not working properly and needs a lot of maintenance.  
Also the Samming machine is very old and completely out of order and it causes a lot of harm to the leather and should be stopped completely.
5. The drying operation of the corrected grain leather is not done properly, since the leather is left to dry in the direct sun over inclined tables causing reduction in size without any need and this should be changed.  
The drying of full grain leather is well done and no need for further change.
6. The staking machine is very old and it needs some mechanical arrangements in order not to cause any harm to the finished leather.
7. The running formul for the production of full and corrected grain is using several chemicals without any need and this causes weast of meny.  
Also the p.H. of the pickling operation is very low and it should be raised to be between 3 - 3.5.
8. The sole leather produced is not bad according to the local market but still far away - as all the sole leather produced in Indonesian still far away from the International standard.
9. The corrected grain leather produced is not bad but the full grain leather has a very loose grain i.e. no tight grain, also bad fulness and softness.

Technical Advices :

1. The number of hides should be reduced in every pit in the soaking operation to be only 30 - 35 hides in one pit soaking for 24 hours.  
Or in case of the necessary to put 70 hides in the pit for soaking, then next day these hides should be resoaked again in a drum for 1 - 2 hours but the revolution of the drum should not exceed 2 - 4 R.P.M.
2. The R.P.M. of the delimiting and Bating pickling, and tanning drum should be arranged to be from 6 - 8 r.p.m.  
Also that of retaning and fatliquoring should be changed to be 10 - 14 R.P.M.
3. The p.H. of the pickling operation must end between 3 - 3.5 max and not lower than that.
4. The samming machine should be stopped completely from work and until it is completely renewed, saw dust could be used as explained to the tannery.  
Also the splitting machine must be in a good condition since this will effect the final appearance of the leather ( i.e Unequal thickness ).
5. The drying of the corrected grain leather should be done by nailing which will give an increase in area per side not less than  $\frac{1}{4}$  ft<sup>2</sup>.  
It is true that the quality of the produced leather will be lowered, but this could be recovered easily by good staking and finishing.
6. The tannery is in true need to replace the following machines in the following order :
  - a. The Spliting Machine
  - b. The flashing machine
  - c. The samming machine
  - d. The Shaving machine
  - e. The Staking machineAlso a new Hydrolic press with new fashioned plates - especially for corrected grain leather - is required.

With respect to the sole leather produced, the quality can be easily increased by increasing the concentration of the final tanning drum to be between 8 - 10° Be instead of 5 - 6° Be as it is now also the running time of the leather in this concentrated solution should be between 8 - 12 day and not 4 days as now.

By this process good quality sole leather is produced with higher weight which means more selling price for every side as the sole leather is sold by weight.

The above recommendations has been given to the tannery. The following is some formulas recommended to improve the quality of the produced leather with the present possibilities as requested by the tannery :

1. Formula for the production of full grain leather
2. Formula for the production of corrected grain leather
3. Formula for the production of sole leather
4. Two formulas for impregnation before finishing

Beame House work and chrome Tanning Suitable for both full grain and corrected grain upper leather.

Raw material : Wet salted cattle hides

Soak : 4 hours to remove the dirt with normal water - then fresh bath with 200 - 500<sup>gm</sup> Cismollan 8H ( or Molescall C ) per cubic meter water.  
Total soaking time 24 hours.  
Percentages based on salted weight.

Liming : 250 % water  
( In drum ) 1.5 % Sodium sulphide conc 60/62%  
3 % Hydrated lime  
Move for 30 min, stop for 2 hours  
+1.5 % Sodium sulphide conc 60/62%  
Move for 15 min, then briefly every hour.  
Total liming time : 24 hour.  
Rinse for 15 - 20 min, with water, flesh, split to 3.0 - 3.5 mm. Soadd if necessary, weigh.  
Percentages based on pelt weight.

Rinse : for 10 - 15 min

Delimiting and bate

( drum )

: 300% water 35°C  
0.5 - 0.8 % Sodium bisulphite powder  
0.8 - 1 % Ammonium sulphate  
0.1 - 0.2 % formic acid 85% ( diluted with  
10 parts water, addition in several  
portions )  
run for 20 min.  
+ 0.5 % of a bating Agent ( oropon OR )  
Add products undissolved 40 min  
phinal pH 8.0 - 8.5 cut edge tested  
with phenol phthalein : Inner zone  
about 1/3 pink

Pickle

( drum 12 - 16 )

: 50 % water  
5 % common salt  
1 % Calcium formate  
run for 10 min at least 5°C.  
+ 1.2 - 1.4% sulphuric acid 66°C  
10 % water

leave overnight in the pickle liquor move 10 min next morning.

pH of float 3.4 - 3.6

cut edge reacts Yellow to Yellowish  
green to bromocresol green.

Tanning in the pickle liquor +

10 % Chromosal B ( or chromitan B )  
undissolved run for 30 min.

Basification

: 1.2% Soda ash  
0.5% Sodium sulphite  
10 % water  
Add slowly in 1 hour  
further running time 6 hours  
final pH of float 3.6 - 3.8 Horse up  
leather, same, shave, weigh.

The above method can be used for both full and corrected grain upper leather.

I. Retannage for full grain upper leather

A)

Material : Chrome - tanned cattle hides percentages based on shaved weight

- Washing : 250 % water 50 ( closed drum )  
run for 10 min drain the float
- Retanning : 100 % water 50<sup>o</sup>C  
5 % ChromosalB( or chromitan B )  
run for 15 min  
+ 2 % Tanigan PAK  
run for 60 min  
+ 1 % Coripol BZN ( emulsified 1 : 5 )  
run for 10 min  
+ 2 % Tanigan OS  
2 % Retingan R7  
run for 45 min  
pH float 4.3 - 4.6 drain the float
- Washing : 250 % Water 60<sup>o</sup>C ( closed drum )  
drain the float
- Dyeing : 100 % water 60<sup>o</sup> C  
1 % Dyestuff  
dissolved 1 : 20 in hot water  
run for 20 min
- Fat liquoring 4.0 % Lipoderm liquor II  
1.5 % Unsulphonated fish oil  
run for 30 min  
+ 0.2 % formic acid 85 % ( diluted 1 : 10 )  
run for 10 min  
+ 1 % Tanigan OS  
run for 10 min.  
pH of liquor approx 4.5  
drain the float  
fill drum with water and rinse for 5 - 10 min  
horse up overnight  
Suspension drying with samming and setting out.

B. Another formula for full grain upper leather :

- Material : Chrome tanned cattle hides  
percentages based on shaved weight.  
wash or Rinse at 30<sup>o</sup> C

Retannage

- 80 % water
- 1 % Lipoderm liquor SA  
run for 10 min
- + 2.5 % Relugan G T 50  
run for 60 min
- 4 % Chromosal B ( chromitan B )
- 2 % Implenal AP  
run for 30 min  
pH 4.8
- + 1 % Nutrigan
- 1 % Sodium formate  
run for 30 min
- 4 % Basyntan D
- 3 % mimosa extract  
run for 60 min.  
pH 4.5

wash or rinse at 40° C

Dyeing and fat liquoring :

- 100 % water 60° C
- x % Dyestuff  
run for 10 min
- + 1 % Lipoderm OK  
run for 20 min
- + x % dyestuff  
run for 10 min
- + 3 % Lipoderm liquor 1
- 3 % Lipoderm liquor SA
- 1 % Lipoderm liquor SK
- 2 % Lipoderm liquor SO  
run for 40 min
- + 0.5 % formic acid 85%  
run for 15 min

Wash or Rinse, Horse up - Set out, dry - finish as usual

No.8 : The quality of dyestuff used should be divided into 2 portion, were lipamin OK is added im between.



II. Retanning of corrected grain upper leather :

- Material : Chrome tanned cattle hides.  
percentages based on shaved weight.
- Washing : 250 % water 40<sup>o</sup> C ( closed drum )  
run for 10 min - drain the float
- Retannage : 100 % water 50<sup>o</sup> C  
4 % chromosal B ( or chromitan B )  
1 % Calcium formate  
1 % Sodium bicarbonate  
run for 60 min  
pH float 4.2 - 4.5  
+ 2 % Tanigan GS  
+ 3 % mimosa extract  
add together undissolved  
run for 45 min  
pH float 4 - 4.5  
drain the float
- Washing : 250 % water 50<sup>o</sup> C ( closed drum )  
run for 10 min  
drain the float
- Fat liquoring : 100 % water 50<sup>o</sup> C  
2 % Lipoderm liquor 1  
3 % Lipoderm liquor SA  
1 % Lipamin liquor S0  
emulsify all the fat liquoring agents together -  
run for 30 min.  
wash or Rinse - horse up overnight - dry -

III. Formulas for Vegetable tanned sole leather :

A. A pit pretannage / Rapid drum main tannage system.

Deliming :

The method used is not important as long as deliming is carried to the point where the cut section is colourless to phenolphthalein.

A pit method suggested is overnight deliming in pit containing.

5 % Sodium bisulphite ( 40% ) on pelt weight.

Wash ten minutes in running water.

Pretannage :

The rinse liquor from the previous pack drummed is made up to pit volume to give liquor to goods ratio of 3 : 1

Acidify with formic acid to 3.2 pH ( this normally requires about 1.25% on limed pelt weight )

The pack of washed delimed pelt is left in the pretanning pit for 48 hours. Pile one day before drumming.

Drum tannage :

All percentage addition are calculated on limed pelt weight.

Transfer goods to drum.

Add 15 % Spraydried Mimosa powder

15 % water - drum for 1 hour

Add 15 % Spraydried Mimosa powder

drum 5 hours

Add 10 % Spraydried Mimosa powder

drum until fully penetrated.

Usual drumming time 36 hours. This is of course depending on local condition.

Ideally the drum should run at 4 r.p.m. Over heating must be avoided.

Add 50 % water

1 % formic acid

drum 20 minutes

Remove goods and pile 1 - 2 days, finish to suit desired production. ( as described in the following formula )

Transfer the rinse liquor from the drum for the next pack to be pit pretanned.

The movement of the goods is as follows : delimed pelt to pretannage pit to pile, to tannage drum.

B. By using syntans as pretanning Agents :

Re - liming : in pits 2 - 3 days

De - liming : 150 % water

1.5 % Ammonium sulphate

1.5 Sodium Bisulphite

run for 4 hours

1/3 pink with ph.ph

wash well for one hour,

drum 150 % water

2-3 % Tanigan CH ( Bayer ) the percentage of Tanigan CH is calculated on the pelt weight dissolved in 4 parts water and added in 2 - 3 portions at half hour -

Run for 1 - 2 hours until the liquor is completely exhausted.

Transfer to the concentrated drum containing.

Tanning solution of 4 - 5<sup>o</sup>Be consisting of either mimosa alone or mimosa and Quebracho extract.

After 2 - 3 days the concentration of the tanning solution should be increase to 8 - 10<sup>o</sup>Be run for further 6 - 8 days until complete tanning.

( The running time can be reduced according to the final hardness required. i.e the more running time, the more hard and firm leather is produced ).

Age for 24 hours.

fixation and fat liquoring and Bleaching :

The percentages on the samed weight :

50 % water

0.5- 1 % magnesium sulphate

1 % glucose

3 - 4 % mimosa powder

1.5 - 2 % Basyntan F.C.B.I.3 ( B.A.S.F.)

All these products to be added after dissolving in water.

run for 45 minutes add

0.5 - 1 % Asulgan K ( B.A.S.F.) ( diluted 1 : 2 )

run for 30 minutes

Add 1 % Lipoderm liquor 1

( diluted 1 : 2 )

run for 10 - 20 minutes

Pile overnight, set out. oil off, dry slowly, moisten and roll.

N.B. :

1. Equivalent to Tanigan CH ( Bayer ) is B<sub>2</sub>asyntan P ( B.A.S.F.) and Tanichor H N special ( Hockest )
2. Equivalent to Basyntan F.C.B.I.3 ( B.A.S.F.) is Tanigan BL ( Bayer )
3. The object of adding fixing agents is to convert the unbound tannins in leather into such a form that they can not be removed by washing.

C. In case of absence of Pretanning syntans, the pretanning process can be done as follows :

After partial deliming and washing, the pelt is transferred to a used mangrove solution, run for 2 - 3 hours then for 24 hours in a new solution of 5% mangrove then continue as before in the concentrated tanning solution.

IV. Formulas for Impregnation :

A. After buffing the leather with 280 Buffing paper, remove dust, give one pad from the following mixture solution :

150 parts Eukanol driver PI

150 parts water

300 parts Eukanol Binder IM

pile the leather overnight, plate for 1 min, then rubuff once more with 500 buffing paper - remove dust and finish normally.

B. Use the same system as before but the Impregnation mixture is consisting from :

250 parts coriel Binder SR

680 parts water

70 parts Amollan PR

mix all together - use the same steps as above.

REPORT VISIT TO  
CV. DARMA KUSUMA  
SEMARANG ( CENTRAL JAVA )  
14 / 4 / 1977.-

Discussion with

1. Mr. TRESNA ATMADJA  
Owner and Managing Director.
2. Mr. S A R W O N O  
Technical Manager.

Findings :

1. Number of drums : 7 drums
2. Number of worker : 30 workers
3. Working capacity : 25,000 pieces of sheep or goat skins/month
4. Maximum capacity : 50,000 pieces of sheep or goat skins/month  
nowadays the tannery has completely stoped the production since the prices of the pickled goat is less than the raw hide prices, so the tannery prefer to stop completely the production until the selling prices is high again or the prices of the raw skines is lowered.
5. The tannery is producing pickled sheep and or goat skins.
6. All the production is exported to Europe and well accepted overseas.
7. The tannery is newly build, well arranged.
8. For producing crust skines on a production scale the tannery needs the following :
  - a). Shaving machine
  - b). Staking machine
  - c). Measuring machine.
9. The raw skines is not enough in the market and this is the main reason of the high prices of the raw hides which is at the time being, higher than the solling price in the Europe market.  
As requested by the tannery the following 4 formulas have been given to the owner :

1. The production of crust for shoe upper from goat skins for plate finish.
2. The production of crust for shoe upper from goat skins for glazed finish.
3. Goat Nappa Leather.
4. Lining Leather from sheep.

I. Goat upper Leather for shoes (plated finish).

Soaking, liming, fleshing, scudding (as usual in the tannery).

Deliming and bating :

200 % water at 35°C  
2,5 % Decital N powder  
0,5 % Sodium bisulphite  
run for 30'  
+2 % oropon DR  
run for 2 - 3 hours  
pH 6,2

wash or Rinse at 30 °C

Pickle : 50 % water at 20 °C  
7 % Common salt  
run for 10 min - 5 ° BZ.  
+0,4 % sulphuric acid conc (diluted 1 : 10)  
0,4 % formic acid 85 % (diluted 1 : 10)  
run for 60'min.  
pH 3.7  
+ 2 % chromitan B (or chromozal B)  
run for 2 hours

Drain flort.

Tannage : 40 % water at 30 °C  
5 % chromitan MS  
run for 20 min  
+ 2 % Implenal AP  
run for 5 hours  
pH 3.6

pile, sam, shave, weigh wash or Rinse at 30 °C

Retannage :

Retannage : 50 % water at 40 °C  
4 % Basyntan CD  
run for 40 min  
1 % Nentrigan  
run for 30 min  
pH 4.5 - 5

wash or Rinse at 40 °C.

Dyeing and fatliquoring : 15 % water at 50 °C  
2 % Tannol NNOL  
run for 10 min  
+ 0 - 1.5% Dyestuff  
run for 20 min  
+ 3% Lipoderm liquor SA  
1% Lipoderm liquor I  
0.5 % Lipoderm oil SK  
run for 40 min  
+  
0 - 0.5 % formic acid 85 %  
run for 20 min - pH 3.6.

wash or rinse at 20 °C, pile, set out, dry stake.

Toggle ( or nail )

- N.B. 1). If required without dyeing, no need for addition of the dye and the formic acid.  
2). The fatliquoring agents should be emulsified with - ( 1 : 30 water at 80 °C ).

II. Goat upper Leather for shoes, glazed finished.

material : wet blue goats

To be tanned as example I

Shave to 1 - 1.1 mm, weigh wash or rinse at 30 °C

Retannage : 100 % water at 30 °C  
0.1 % formic acid 85 %  
run for 5 min  
+ 3 % Relugan GT 50  
run for 40 min

+ 1 % sodium formate  
1 % sodium bicarbonate  
run for 40 min  
pH 5

wash or Rinse at 40 °C

Dyeing and fatliquoring : 100 % water at 40 °C  
6 % Basyntan N  
run for 60 min.  
0 - 3 % Dyestuff  
run for 20 min.  
+ 4 % Lipoderm liquor SA  
3 % Lipoderm liquor I  
1 % Lipoderm oil SK  
run for 40 min  
0 - 2 % formic acid 85'  
2 x 10 min + 20 min  
pH 3.5

The fatliquoring agents should be emulsified with water 1 : 30 at 80 °C

Pile, sam, set out, dry Moisten, stake.

Toggle ( or nail ).

### III. Goat nappa leather :

Material : wet blue goat skin  
( Tanning as in example I ).

wash : 300 % water at 40 °C  
0.1 % formic acid 85 %  
run for 10 min  
drain float.

Retannage : 50 % water at 40 °C  
6 % Bastanol CN  
run for 40 min  
+ 2 % Reulgan GT 50  
run for 40 min  
+ 1 % sodium bicarbonate  
2 x 20 min.



1 % sodium formate  
run for 40 min.  
pH 5.5

wash or Rinse at 40 °C

Dyeing and fatliquoring :

100 % water at 40 °C  
1 % Tamol NNOL  
run for 10 min  
3 - 4 % Dyestuff  
run for 30 min.  
4 % Lipoderm liquor SAF  
3 % Lipoderm Liquor 1  
2 % Lipoderm A  
run for 40 min.  
+ 3 % formic acid 85 %  
2 x 10 min .  
+ 1 % Lipamin liquor 50  
run 20 min  
pH 3.8

wash or Rinse at 30 °C

pile, set out, dry, moisten, stake, Mill, Toggle

IV. Chrome tanned sheep lining leather :

Material : chrome - tanned, shaved sheep skins :  
without washing and rinzing

Neutralization and Retanning :

100 - 150% water 30 °C  
3 - 6 % Tanigan oS  
2 - 5 % Mimosa extract undissolved  
0.5 - 1 % Sodium bicarbonate  
run for 45 min  
pH of liquor 4.5  
Rinse at 50 °C for 10 min.

Dyeing and fatliquoring : 200 % water at 50 °C

0 - 3% dyestuff

0 - 15 min.

+ 1 - 2 % Cutizan TMK

0.4 - 0.6 % Bykanol liquor T

0.4 - 0.6 % Sperm oil unsulphited

10 % water of 60 °C for emulsifying  
run for 30 min.

Rinse with cold water for 5 min.

Worse up overnight, sam, set out ,

hang for drying, saw dust, stake, toggle -

( or nail )

---

VISIT REPORT TO  
TJITJADAS LEATHER FACTORIES LTD  
16 MARCH 1977.

B A N D U N G

Manager : CHRIS HARRIMAN

Findings :

1. Number of workers : 40 worker
2. Number of drums : 7
3. Working capacity : 30 Tons / day
4. Maximum capacity : 50 Tons / day

The reason for this drop between maximum and working capacity is :

- a. Lack of capital
- b. Limited local market demands
- c. Fluctuation in prices of raw hides and skins

5. Production

a. Cattle Hides :

Finished shoe upper leather, suede, nooback for shoe uppers, sole leather.

b. Skins

Glove leather, garment, shoe upper, lining leather ( chrome tanned )

6. The hides in stock is for one month and chemicals for 3 months.

Technical Research :

1. For chrome upper leather used in domestic uses, the production is good and no need for further change.
2. The finishing of small skins is not good by stretching the leather the lower base coat ( which is light in colour ) appears.  
The reason for this, is that the skin is not finished on a wooden fram.  
A recommendation should be given that suraying in finishing should be done while the skin is nailed on a wooden frame, i.e while it is stretched, also small wooden fram should be used and no need for big and heavy frams for small skins.

3. The sole leather produced is not good at all, since it is very soft, empty, i.e. No Abrasion Resistance.
4. The reason for this bad sole leather production is the system of vegetable tanning used in the tannery.
5. Strong batting and pickling is carried first before the concentrated Tanning step, and this together with the percentages of tanning materials used, these 2 reasons are the cause of resultant bad production.
6. Setting out by hand is done on a soft wooden frame and this is useless, since the leather still has the wrinkles on its surface.  
A recommendation should be given that setting out should be done on steel or marble table, i.e. ( strong and on a high level ) typical to the table used for setting out of dyed chrome upper leather in the same tannery.  
By this method good surface should be achieved and the result obtained by this method in presence of the expert was a satisfactory one.
7. Nailing of sole leather is completely wrong since Iron Spots ( which is a chemicals reaction between Iron and vegetable tannins ) appears.  
The tannery is then forced to trim all these parts after drying and this means more loss of weight in the final product.

Technical Advice :

1. As said before, setting out of sole leather should be done on a strong high table and not on a wooden frame on the floor.
2. No nailing for sole leather, drying should be done by hanging ( after setting out ).
3. The use of a pretanning system ( either using Syntan Pretannages or exhaust liquor ) is recommended since the protection of the pelt against the action of very strong tanning solution depends on the complete penetration of the substance of the pelt by a pre-tanning agent which prevents the severe dehydrating effect of the powdered vegetable tannins from taking place.  
A secondary effect is that the grain is tanned quickly and sufficiently so that the mechanical action of the drum is resisted and folding, pobble and piping are largely avoided.  
By using syntan Pretannage more uniform distribution of tans and better tan fixation are obtained.

Proposed formula for tanning sole leather :

1. By using syntans as pretanning Agents.

Re - liming : in Pits 2 - 3 days  
De - liming : 150 % water  
1.5 % Ammonium sulphate  
1.5 % Sodium Bisulphite  
run for 4 hours  
1/3 pink with ph.ph

Wash well for one hour,

*Net. 100%*  
150 % water  
2-3 % Tanigan CH ( Bayer ) the percentage of Tanigan CH is calculated on the pelt weight. dissolve in 4 parts water and added in 2 - 3 portions at half hour intervals. Run for 1 - 2 hours until the liquor is completely exhausted.

Transfer to the concentrated drums containing.

Tanning solution of  $4 - 5 \times 10^{-3}$  Be<sup>1</sup> consisting of mimosa and yugan extract.

After 2 - 3 days the concentration of solution should be increased to  $8 - 10 \times 10^{-3}$  Be<sup>1</sup> run for another 6 - 8 days until complete tanning.

( this running time can be reduced according to the final hardness required, i.e the more running time, the more hard and firm leather is produced ).

Age for 24 hours.

Fixation and Fatliquoring and Bleaching :

The Percentages on the same weight :

50 % water  
0.5- 1 % magnesium sulphate  
1 % glucose  
3 - 4 % mimosa powder  
1.5- 2 % basyтан F.C.B.J.3 ( B.A.S.F.)

All these products to be added after dissolving in water.

run for 45 minutes add  
0.5- 1 % Asulgan K ( B.A.S.F) run for 30 minutes add  
1.5- 2 % Fat - liquor ( cationic )  
run for 30 minutes.

Leave lying overnight, set out, air dry, moisten, roll.

N.B.

1. Equivalent to Tanigan CH ( Bayer ) is Basyntan P ( B.A.S.F. ) and Tanichor HN special ( Hockest ).
2. Equivalent to Basyntan F.C.B.J 3 ( B.A.S.F ) is Tanigan BL ( Bayer )
3. The object of adding fixing agents is to convert the unbound tannins in the leather into such a form that they can not be removed by washing.

II. Pretanning using exhausted liquors :

In case of absence of Pretanning syntans, the pretanning process can be done as follows :

After partial deliming and washing, the pelt is transferred to a used Valonea solution, run for 2 - 3 hours, then for 24 hours in a new solution of 5 % valonea, continue as before in the concentrated tanning solution.

REPORT VISIT TO UNIVERSAL TANNERY

16 March 1977

B A N D U N G

Owner and Director : Mr. Ang

Findings :

1. No of Workers : about 70 worker
2. Working Capacity : 25 - 30 Tons of cattle hides / month
3. Maximum capacity : 40 tons of cattle hides / month
4. Production :
  1. Shoe upper leather
  2. Patent leather
  3. Suede from splits

Technical Research :

1. The tannery is well equipped with up-to - date machines, nearly all the drums are in a good working condition ;
2. The flow of production is well arranged and in one line and this means good technical mangment.
3. The final production is good in quality, except the patent leather, which is from my own point of view, below the international standard, but it is used for Domestic reason.
4. Unfortunately the responsible manager of the tannery in absance of the owner refused to answer on some technical question, or giving wrong information. This means that the tannery does not need any technical help still they have some problems to be solved especially their drying system and finishing of polyurethane leather and suede splits.  
And according to their desire, we have to stop talking about any technical points.

—————○—————

REPORT VISIT TO NV.ENIVLI

BANDUNG - WEST JAVA

17 MARCH 1977

Discussion with : Mr. WANG HOA  
Director

Findings :

1. Number of workers : 13 workers
2. Number of drums : 4 drums and 2 paddles
3. Working capacity : 2 tons of cattle hides / month  
( about 20 sides / day )
4. Maximum capacity : 4 tons of cattle hides/month  
( about 40 sides / day)
5. The reason for the drop of production :
  - a. No enough capital
  - b. Market demandes
6. Production :
  - a. Shoe upper leather pigment finish, semi aniline finish
  - b. Suede for upper leather.All the production is used for domestic uses

Technical Research :

1. The drying system is not well done since the leather after setting out by hand is dried on the ground under the direct sun light, then after drying it is nailed again, left in shadow place than staking.  
This type of drying is not good since it allows the leather to shrink quickly creating no tension in the leather.  
Also No good air circulation on both sides of the leather, but only from the upper surface which is actually exposed to the sun, so drying is rapid only from the upper surface and very slow from the other one.
2. The suede upper leather is nice and direct advice has been given in the current formula in Deliming and Wetting back and neutralization. The rest of the formula is good.
3. The shoe upper leather is not bad, but it is empty in the poorer parts of the leather ( bellies, flanks ...etc)



Also loose grain is well observed in the finished leather.

Technical Recommendation :

According to the possibilities present in the tannery the following 3 trials should be done for drying shoe upper leather and the result should be compared with the current process from the following points :

- a. The Quality of the finished leather.
- b. The increase in area size of each piece of leather

Trial Number 1. :

After setting out, nail the leather leave for 4 - 5 hours in the shadow in upright position, then Hang in the sun ( not on the ground ) untill complete drying, stake.

Trial Number 2

After setting out, nail leave for 4 - 5 hours in a shadow place, then transfer the wooden fram ( with the leather ) to the sun untill complete drying, stake.

Trial Number 3

Set out, Hang in the sun ( for about 50% dry ) then nail leave in a shadow place untill complete drying, stake.

According to the request of the tannery the following formulas is Recommended :

I. Neutralization and Retanning for Chrome upper leather :

Material : Chrome - tanned cattle hides, percentages based on shawed weight.

Washing : 200% Water 40<sup>o</sup>C run for 15 min drain float.

Neutralization : 100% water of 40<sup>o</sup>C  
and 1% Calcium formate

Retannage 1 - 2% Tanigan P2  
0.2 - 0.5% Sodium bicarbonate run for 30 min  
add 2 - 4% Mimosa extract  
2% Tanigan OS  
run for 45 min p.h of liquor 4.2 - 4.5 cut edge reacts  
an even green to bluish green to bromocresol green.

2 Rinse at 50 - 60<sup>o</sup>C

Continue dyeing and fat liquoring as usual, but increase the % of fat liquoring agents used to be total 5 - 6% and not only 3% as used now.

II. Nappa side Leather :

Retanning dyeing, fat liquoring :

Material :

Chrome - tanned, shave leather, Percentages on shaved weight.

Wash or Rinse at 40°C.

Retannage : 50% water 40°C

0.1% formic acid 85%

run for 10 min

+ 3% Relugan GT 50

run for 60 min

+ 1% Neutrigan

1.5% Sodium formate

run for 30 min pH 5.5

+ 4% Basyntan MN

run for 30 min

+ 5% Lipoderm liquor SAF

3% Lipoderm liquor SA

2.5% Lipoderm A

run for 60 min

(N.B: emulsify the fat liquor first in hot water at about 60°C) wash or Rinse at 25°C.

Dyeing : Without float

3% Luganil brown NGB

0.6 % Luganil Brown NR

0.75% Luganil Brown NT

run for 20 min

+ 150% water 70°C

1% Lipamin OK

run for 10 min

+ 1% Luganil Brown NGB

0.2% Luganil Brown NR

0.25% Luganil Brown NT

run for 10 min

+ 3% formic acid 85%

1.5% Lipamin liquor SO

2x 10 min

+ 20 min pH 3.8

Wash or Rinse at 20°C

Horse up - set out - Air dry - moisten - stake - Mill - dry

III. Impregnation :

To Cover the defect of loose grain, Impregnation should be done according to One of the following formulas:

a. 100 - 150 parts Eukanol driver PI

550 - 150 parts water

250 - 300 parts Eukanol Binder IM mix all together.

After first buffing by 280 paper, one pade coat of the above solution ( lamb-skin pad ) lay in pile overnight, plate ( 1min ), afterwards buff with 500 buffing paper, remove dust finish normally.

b. 250 parts Corial Binder SR

680 parts water

70 parts Amollan PR

mix all together, use the same process as above, finish as normal.

VISIT REPORT TO GARUT

ON 17 MARCH 1977.

In Garut about 60 km away from Bandung, a group of primitive work shops producing leather. ( about 70 work shops ).

The name of a tannery can not be applied, yet they are still producing leather.

No drums, no machines every thing is done with a very primitive way.

The number of workers is ranging from 2 till 12 workers in every shop.

The hides is soaked in a pit maximum 2 hides / day.

Splitting is done by hand, ( figure I ) which is very slow, inaccurate, primitive process.

The motion of hides in an open drum is done by the legs of the worker either in deliming, bating, pickling or even in the chrome tanning process (figure II ).

Conceqmently No Chemical Control with respect to measuring ph or degree Be' or any other kind of chemical tests used in the leather tanning process.

Even staking is done by hand on a wooden holder ( figure III ).

The resultant leather is hard, stiff, empty, dead feeling not regular in thickness, but according to the possibilities present in these primitive work shops, the leather produced seems to be a miracle.

Visiting some of these work shops, which are typically identical, discussion was done in details in only two of them :

I. AJAT RAHYAT work shop ( this is the name of the owner and of the work shop)

- a. Number of workers : 10 worker
- b. Working capacity : 2 cattle hides / day
- c. Production : chrome upper and lining leather.
- d. Formula used : The formula is not bad except in :
  - 1. No any chemical control is done during the tanning process even for the temp. of water.
  - 2. The percentages of chrome and fat liquor used is very small and less than enough. ( They use only 5 % chrome powder and 2 % fat liquor agents ).
- e. The work shop is working like this since 30 years, and ALL the production, which is of very low quality, is seled and used for domestic uses.

f. The work shop is suffering from the lack of capital and this applies to all of them.

## II. YUSEF Work Shop

( The name of the owner and the work shop )

- a. Number of worker : 8 worker
- b. Working capacity : 2 cattle hides / day
- c. Production : chrome upper and lining leather.
- d. They all use the same formula also with out any type of chemical control.

Recommendation was given to these owners that a type of association should be done between the owner, to control the prices of buying the raw hides and also the saling priceses of the finished product.

A Recommendation should be given to the Indonesian Government that a big project through B.I.P.I.K. should be held in that part of Garut especially that all these work shops exists together in one place.

These project should start first by bringing the nessecary machines used in tanning industry as a first step in rebuilding up a new modern tannery in this place instead of 70 primitive work shopes.

REPORT VISIT TO  
" HAKA SURABAYA LEATHER "  
HAKA I TANNERY  
SURABAYA  
9 / 5 / 1977.

---

Discussion with : 1. Mr. H. Aminullah/ Thalib/ Karim.  
President Director.  
2. Mr. Alimin An ( Technical Director ).

Findings :

1. Number of drums : 6 drums used for soaking, liming and tanning.
2. Number of pits : 4 pits used for reliming.
3. Number of workers : 105 workers.
4. Working capacity : 50.000 pieces of sheep and goat skins per month.
5. Maximum capacity : 100.000 pieces of sheep and goat skins per month.
6. Production : The tannery is producing the following
  - a. Pickled sheep and goat skins.
  - b. Wet blue sheep and goat skins.
  - c. Washable leather from goat skins.

All the production are exported mainly to Japan.

Technical Research and Recommendation :

1. All the production of the tannery is for exportation.
2. The production is of good quality and well accepted by the customers overseas.
3. The tannery is well arranged & the flow of production is good.
4. No any technical comment since all the production is well accepted overseas.

-----&&&&-----

REPORT VISIT TO  
"HAKA SURABAYA LEATHER"  
HAKA II TANNERY  
SURABAYA  
16 / 5 / 1977.

---

Discussion with : 1. Mr. Alimin An ( Technical Director ).  
2. Mr. Samsu ( Manager ).  
3. Mr. Zain ( Technical production ).

Findings.

1. Number of drums : 8 drums used as follows :  
3 drums for liming.  
4 drums for tanning.  
1 Hide process.

The tannery will increase the number of drums to be :

17 drums as follows :  
3 drums for liming.  
7 drums for tanning.  
6 drums for Dyeing and fat liquoring.  
1 Hide process.

2. Number of pits : 6 pits used for soaking and reliming.
3. Number of workers : 64 workers.
4. Working capacity : 240.000 ft<sup>2</sup> of pickled and wet blue cattle hides.
5. Maximun capacity : 450.000 ft<sup>2</sup> of pickled and wet blue cattle hides.
6. The resone for this drop of production which is about 50% - is the lack of hides with suitable prices to be exported.
7. All the production is exported to Japan and Europe.

Technical Research and Recommendations :

1. The soaking process is not well done. Advice has been given to

- the tannery about the process of soaking and how it should be done properly especially by making presoaking first for - 4 hours, then changing the water and continue soaking for another 20 hours with fresh water containing anticeptices.
2. In spite of the unproper soaking, the production of tannery is very good and well accepted overseas.
  3. The tannery is very big and completely new.  
It is very well equipped with up-to date machines and the number and productivity of those machines are much more higher than the present production of the tannery.
  4. The machines had been arranged in an unproper manner and this is in the future will cause irregular flow of production.
  5. This tannery with such new and modern machines can produce easily crust leather of high quality which will be much more profitable to the tannery than producing pickled or wet blue hides.
  6. The tannery can be considered as the biggest and the most modern tannery all over Indonesia.

And according to the request of the tannery the following formules are given :

- I. Two formules for producing full grain upper leather.
- II. Two formules for producing crust leather.
- III. Formules for producing suede upper leather for shoes from cattle hides.
- I. Formula for producing full grain upper leather.

<u>Material</u>	: Wet salted cattle hides.
<u>S o a k</u>	: 4 hours to remove the dirt. Fresh bath with 200 - 500 gm cismollan BH ( or Mollescal C ) per cubic meter water total soak time 24 hours. Percentages based on salted weight.
<u>Liming ( drum )</u>	: 250 % water.. 1.5 % Sodium sulphide conc 60/62 %.



2 - 3 % Hydrated lime.

Move for 30 min. - stop for 2 hours.

+ 1.5 % Sodium sulphide conc: 60/62 %

Move for 15 min, then briefly every hour. Total liming time 24 hours.

Rinse for 15 - 20 min with water at 25° C, flesh, split to 3-3.5 min. Scudd if necessary, weigh.

Percentages based on pelt weight.

Rinse for 10 - 15 min raising temperature from 25 to 35° C.

Deliming and Batting : 300 % water 35° C.

0.5 - 0.8% Sodium bisulphite powder.

0.8 - 1 % Ammonium sulphate.

0.1 - 0.2% Formic acid 85 %

diluted with 10 parts water

( addition in several portions )

run for 20 min.

+ 0.5% Oropom OR

Add products undissolved

run for 25 - 40 min.

Final pH 8 - 8.5

Cut edge tested with phenol

phthalein - inner zone about

1/3 pink.

Pickling : 50 % Water 25° C.

( Drum 12 - 16 r.p.m. ) 5 % Common salt.

1 % Calcium formate. run 10 min  
at least 5° Be.---

+ 1.2 - 1.4% Sulphuric acid 66° Be.

10 % Water.

Run for 1 - 2 hours.

If necessary overnight in the pickle liquor.

Move 10 min next morning.

pH of float 3.4 - 3.6

Cut edge reacts yellow to yellowish green to bromocresol green.

Tannage in the pickle liquor : Add in the some bath :

+ 10 % Chromosal B undissolved  
run for 30 min.

Basification

1.2 % Soda ash.  
0.5 % Sodium sulphite.  
10 % water.

To be added slowly in 1 hour.

Further running time about 6 hours.

Final pH of float 3.6 - 3.8

Horse up leather, same, shave weight.

The above process can be used for both full grain and corrected grain leather, the difference will be only in the retanning and fat-liquoring process :

A. Retanning for full grain leather.

Material : Chrome - tanned cattle hides as mentioned before :  
Percentages based on shaved weight.

Washing : 250 % water 50° C ( closed drum ) for 10 min  
drain float.

Retanning : 100 % water.  
5 % Baychrom A  
run for 15 min.  
+ 2 % Tanigan pAK  
run for 60 min.  
+ 1 % Coripol BZN ( emulsified 1 : 5 ).  
run for 10 min.  
+ 2 % Tanigan OS  
2 % Retingan R7  
run for 45 min.  
pH float 4.3 - 4.6 drain the float.

Washing : 250 % water at 60° C.  
( closed drum ).  
run for 10 min.  
drain the float.

Dyeing : 100 % water at 60° C.  
1 % Dyestuff ( dissolved 1 : 20 in hot  
water )  
run for 20 min.

Fat - Liquoring : + 2.5 - 3 % Sultafonol LAC.  
1.5 - 2 % Coripol BZN  
0.5 % Baykanol liquor T  
( Emulsified with water 70°C ).  
0.5 % Coripol ICA  
run for 30 min.  
+ 0.2 % Formic acid 85 %  
( Diluted 1 : 10 ).  
run for 10 min.  
pH of liquor approx 4.5  
drain the float.  
Fill the drum with water  
at 25 - 30° C  
water and rinse 5 - 10 min  
Horse up overnight.  
Suspension drying - with samming  
and setting out.

B. Another formula for Retanning of full grain leather.

Material : Chrome tanned cattle hide : Percentages  
on shaved weight.  
wash or rinse at 40° C.

Retannage : 100 % water at 40° C.  
4 % chromitan B ( undissolved ).  
2 % lutan B ( undissolved ).  
run for 40 min.  
+ 1 % Sodium formate ( undissolved ).  
1 % Neutrigan ( undissolved ).  
run for 40 min.  
pH 4  
Wash or rinse at 40° C.

- Dyeing and fatliquoring : 100 % water 50° C.  
1 % Dyestuff ( dissolved ).  
Run for 30 min.
- + 4 % Lipoderm liquor 2 ( Emulsified  
with water at 70° C ).
- 2 % Lipoderm liquor SA ( Emulsified  
with water at 70° C ).  
run for 30 min.
- + 4 % Basyntan MK ( undissolved )  
run for 40 min.  
pH 4
- + 1 % Lipamin liquor SO ( Emulsified  
in hot water ).
- 0.5 % Formic acid 85 %  
run for 20 min - pH 3.4  
Wash or Rinse at 25° C.  
Horse up - set out - Vacuum  
dry for 1 min - suspension.  
dry - moisten - stake - toggle  
( or nail ).

II. Formula for crust leather.

Formula A

- Material : Chrome tanned cattle hides.  
Percentages based on shaved weight.
- Washing : 200 % water at 40° C.  
run for 15 min.  
drain float.

Neutralization and

- Retannage : 100 % water at 40° C.  
1 % Calcium formate.  
1-2 % Tanigan P2  
0.2-0.5 % Sodium bicarbonate.  
run for 30 min.
- + 5 % Mimosa extract powder.  
2 % Tanigan OS  
run for 45 min.

pH of liquor 4.2 - 4.5

Cut edge reacts an even

green to bluish green to bromocreasol green

Rinse at 50 - 60° C. for 10 min.

Dyeing : 100 % water at 50 - 60° C.  
0-1.5 % Dyestuff ( dissolved 1 : 20 hot water ).

Fat liquoring: 4-5 % Sulphonated fish oil.

1-2 % Raw fish oil.

run for 45 min.

pH of the liquor 4 - 4.5

rinse leather cold for 5 min horse up overnight,

sam set out - Vacuum dry.

Formula B :

Material : Chrome tanned cattle hides  
Percentages on shaved weight.

Wash : 300 % water at 30°C.  
0.3 % acetic acid 6° Be

run for 10 min.

drain float.

Neutralization: 100 % water at 30° C

2 % Tamol GA

1 % Sodium formate

Added undissolved

run for 45 min.

pH 4.5

wash or rinse at 30° C.

Retannage : 30 % water at 40° C

4 % Mimosa extract powder

3 % Relugan A

2 % Basyntan C2

All added undissolved.

2 % Lipoderm liquor 1

3 % Lipoderm liquor SA

1 % Lipamin liquor SO

All added after emulsified with hot water.

10 % water at 70° C

Run for 60 min

pH 3.8

wash or rinse at 25° C

Horse up - set out - Vacuum dry - moisten - Stake - Vacuum redry.

III. Formula for suede upper leather for shoes using cattle hides.

Material :

Chrome tanned, shaved cattle hides.

Percentages on shaved weight.

Retannages : Without washing and rinsing :

60 - 100 % water 60 - 70° C

6 - 8 % Chromasal B undissolved

1.5 - 2 % Sodium bicarbonate undissolved

run for 1.5 - 2 hours

rinse at 35° C for 10 min.

Neutralization : 200 % water 35° C

1 % Calcium formate ( undissolved ).

1-2 % Sodium bicarbonate ( undissolved ).

run for 1 - 1.5 hours.

pH of loat 5.5 - 6

The leathers must be completely neutralized

Cut with bromocresol green blue throughout.

Rinse : at 50° C for 10 min.

Pre-fat liquoring : 100 - 200 % water 60° C

( Normal ) 0.5 - 1 % Baykanol liquor T

1.5 - 3 % Cutisan TME

run for 30 - 40 min.

Another process for pre - fat liquoring for writing and silky - shine effect :

100 - 200 % Water.

3 - 5 % Blancorol KNB

0.5 % Coripol ICA

run for 30 - 40 min.

Horse up leather overnight, possibly sam, suspension dry at 30° C or Vacuum dry, pile up, saw dust, stake or mill, buff :

N.B.

1. In case of using vacuum drying the fat quantities have to be increased by 20 - 30 %.
2. Buffing is carried out in various directions with abrasive paper of the following grads :

Side suede : buffing ( 180 - 220 ).  
rebuffing ( 320 - 360 ).

Wetting Back : Percentages based on dry weight  
600 - 800 % water 60° C.  
1 - 2 % Ammonia tech.  
0.5 % Baymol A  
run for 2 - 3 hours.  
If necessary leave overnight.  
run off float.-  
rinse at 55 - 60° C for 10 min.

Dyeing : 600 - 800 % water 55 - 60°C.  
1 - 2 % Ammonia tech.  
8 - 12 % dyestuff  
dissolved in hot water  
running time untill penetration  
of dyestuff - approx 90 min.  
+ 8 - 12 % Formic acid 85 %  
diluted with 10 parts water  
run for 30 - 45 min  
rinse at 50°C for 5 min.

Fat - liquoring : 1.5 - 2.5 % Cutisan TNK  
( Normal )  
addition 30 min before  
acidification

After treatment : ( for witting and silky - shine effects )

400 - 600 % water at 50° C.

2 - 4 % Persiderm SI

1 - 1.5 % Persoftal WKF

0.4 - 0.8 % Glycerine.

Without rinsing, horse up leather  
overnight, dry saw dust or condition,  
mill toggle, buff with 320 to 400 grade paper  
remove buffing dust, mill.

REPORT VISIT TO  
" WONOCOLO TANNERY "  
SURABAYA - EAST JAVA

10/5/1977.

---

This tannery belongs to the regional Governments Industry of East Java " Aneka Group Carma ".

Discussion with :

1. Mr. : Syahrial,  
Director.
2. Mr. : Setiardi,  
Technical Manager.

Findings :

1. Number of drums : 18 drums + 10 pits ( used for soaking and Reliming ).
2. Number of workers : 110 workers.
3. Working Capacity : 125,000 ft<sup>2</sup>/month.
4. Maximum Capacity : 300,000 ft<sup>2</sup>/month.
5. Production :
  - a. Pickled and Wet Blue sheep and goat skins.
  - b. Pickled and Wet Blue cattle hides.
  - c. Crust Leather.
  - d. Full grain and corrected grain upper leather.
  - e. Sole Leather.
6. The tannery is working only according to the market demands and when there is no demand the tannery will completely stop the production. During the time of the visit the production was completely stopped and the whole tannery was not operating.
7. The cost price of the leather produced is very high causing either direct loss, or the tannery is forced to sell the finished leather with high prices which is not accepted by the market.

Technical Research :

1. The tannery is very big, but the machines present are very old - working since 1912 and some of the machines present are very primitive.



With such kinds of machines it is very difficult to produce leather of good quality.

The tannery is starting to buy some machines such as splitting machine and staking machine.

It should be mentioned that either shaving or buffing machine is much more important to the tannery in the time being than the staking machine which could be bought in an advanced step.

2. The finished leather already present in the tannery is of bad quality since the leather has :
  - a. Hard and empty feeling.
  - b. Loose grain.
  - c. Empty bellies and flanks.
3. The tannery is using expensive chemicals for producing low quality leather. Better results and much more cheap price could be reached by other formulas.

Technical Advice :

1. Technical Advice has been given to lower the price of the produced pickled cattle hides.
  2. Also technical Advice has been given to up grade the quality of the army leather, namely by using 3 % Mimosa powder together with 2 % Yugan extract, also by using a mix of sulphonated and unsulphonated fish oil by 4 - 5 % and 2 % respectively.
  3. According to the request of the tannery the following formulas is recommended :
    - I. Two formulas for producing full grain upper leather.
    - II. Two formulas for producing corrected grain upper leather.
    - III. Two formulas for impregnation.
- I. Formulas for producing full grain upper leather.

Material : Wet salted cattle hides.

Soak : 4 hours to remove the dirt.

Fresh bath with 200 - 500 gm. Cismollan BH ( or Mollescal C ) per cubic meter water, total soak time 24 hours.

Percentages based on salted weight.

Liming (drum) :

- 250 % Water.
  - 1.5 % Sodium Sulphide conc. 60 / 62 %.
  - 2 - 3 % Hydrated lime.
- Move for 30 min - stop for 2 hours.
- + 1.5 % Sodium Sulphide conc. 60 / 62 %.
- Move for 15 min, then briefly every hour.  
Total liming time 24 hours.  
Rinse for 15 - 20 min. with water at 25°C.  
flesh, split to 3 - 3.5 mm.  
Scud if necessary, weigh.  
Percentages based on pelt weigh.  
Rinse for 10 - 15 min. raising temperature  
from 25 to 35°C.

Deliming and Batting :

- 300 % Water 35°C.
  - 0.5 - 0.8 % Sodium bisulphite powder.
  - 0.8 - 1 % Ammonium Sulphate.
  - 0.1 - 0.2 % Formic acid 85 %
- Diluted with 10 parts water ( addition in  
several portions ).  
Run for 20 min.
- + 0.5 % Oropon OR.
- Add products undissolved 25 - 40 min.  
Final pH 8 - 8.5  
Cut edge tested with Phenol Phethalein -  
inner zone about 1/3 pink.

Pickling :

( drum 12 - 16 r.p.m. ).

- 50 % Water 25°C.
  - 5 % Common salt.
  - 1 % Calcium Formate.
- Run 10 min.  
at least 5°C.

+ 1.2 - 1.4 % Sulphuric acid 66°Be.  
10 % Water.  
Run for 1 - 2 hours.

If necessary overnight in the pickle liquor.

Move 10 min next morning.

pH of float 3.4 - 3.6.

Cut edge reacts yellow to yellowish green to bromocrezol green.

Tannage in the pickle liquor :

Add in the same bath :

+ 10 % Chromosal B indissolved.  
Run for 30 min.

Basification :

+ 1.2 % Soda Ash.  
0.5 % Sodium Sulphite.  
10 % Water.

To be added slowly in 1 hour.  
Further running time about 6 hours  
Final pH of float 3.6 - 3.8  
Horse up leather, same, shave  
weigh.

The above process can be used for both full grain and corrected grain leather, the difference will be only in the retanning and fat-liquoring process :

A. Retanning for full grain leather :

Material :

Chrome tanned cattle hides as mentioned before :

Percentages based on shaves weight

Washing :

250 % Water 50°C (closed drum) for 10 min.  
Drain float.

Retanning :

100 % Water.  
5 % Bychrom A.  
Run for 15 min.  
+ 2 % Tanigan PAK.  
Run for 60 min.  
+ 1 % Cripol BZN (emulsified 1 : 5 ).

Run for 10 min.

+ 2 % Tanigan OS.  
2 % Retingan R7.

Run for 45 min.  
pH float 4.3 - 4.6 , drain the float.

Washing : 250 % Water at 60°C (closed drum ).  
Run for 10 min.  
Drain the float.

Dyeing : 100 % Water at 60°C.  
1 % Dyestuff(dissolved 1 : 20 in hot water).  
Run for 20 min.

Fat-liquoring :

+2.5 -3 % Sultafonol LAC.  
1.5 - 2 % Cripol BZN.  
0.5 % Bycanol Liquor T (emulsified with water 70°C ).  
0.5 % Coripol ICA  
Run for 30 min.

+ 0.2 % Formic acid 85 % ( diluted 1 : 10 ).  
Run for 10 min.  
pH of liquor approx. 4.5.  
Drain the float.  
Fill the drum with water at 25 - 30°C  
water and rinse 5 - 10 min, horse up  
overnight.  
Suspension drying with samming and set-  
ting out.

B. Another formula for Retanning of full grain leather :

Material : Chrome tanned cattle hide :  
Percentages on shaved weight.  
Wash or rinse at 40°C

Retannage :

100	%	Water at 40°C.
4	%	Chromitan B ( undissolved ).
2	%	Lutan B ( undissolved ).
		Run for 40 min.
+	1	% Sodium formate ( undissolved ).
	1	% Neutrigan ( undissolved ).
		Run for 40 min.
		pH 4.
		Wash or rinse at 40°C.

Dyeing and fat-liquoring :

100	%	Water 50°C.
1	%	Dyestuff ( dissolved )
		Run for 30 min.
+	4	% Lipoderm Liquor 2 ) emulsified
	2	% Lipoderm Liquor SA } with water at
		70°C.
		Run for 30 min.
+	4	% Basyntan MK ( undissolved ).
		Run for 40 min.
		pH 4.
+	1	% Lipamin Liquor SO ( emulsified in
		hot water )
0.5	%	Formic acid 85 %.
		Run for 10 min.
		pH 3.4.
		Wash or rinse at 25°C.
		Horse up - set out - vacuum dry.
		for 1 min - suspension dry - moisten
		stake - toggle ( or nail )

II. Formula for Retanning of corrected grain leather :

Formula ( A ).

Material :

Chrome tanned cattle hides.  
Percentages based on shaved weight.

Washing :

200	%	Water at 40°C.
		Run for 15 min.
		Drain float.

Neutralization and Relannage :

100	%	Water at 40°C.
1	%	Calcium formate.
1- 2	%	Tanigan P2.
0.2 - 0.5%		Sodium Bicarbonate.
		Run for 30 min.
+	5	% Mimosa extract powder.
	2	% Tanigan OS.
		Run for 45 min.
		pH of liquor 4.2 - 4.5
		Cut edge reacts an even green to bluish green to bromocreasol green.
		Rinse at 50 - 60°C for 10 min.

Dyeing :

100	%	Water at 50 - 60°C.
0.5 - 1.5	%	Dyestuff ( dissolved 1 : 20 hot water ).

Fat-liquoring :

4 - 5	%	Sulphonated fish oil.
1 - 2	%	Raw fish oil.
		Run for 45 min.
		pH of the liquor 4 - 4.5
		Rinse leather cold for 5 min
		horse up overnight, sam-set out-dry.

Formula B .

Material :

Chrome tanned cattle hides.  
Percentages on shaved weight

Wash :

300	%	Water at 30°C.
0.3	%	Acetic acid 6°Be.
		Run for 10 min.
		Drain float.

Neutralization :

100	%	Water at 30°C.
2	%	Tamol GA.
1	%	Sodium formate.
		Added undissolved, run for 45 min
		pH 4.5.

Wash or rinse at 30°C.

Retannage :

30 %	Water at 40°C.
4 %	Mimosa extract powder.
3 %	Relugan A.
2 %	Basyntan C2.

All added undissolved.

2 %	Lipoderm liquor 1.
3 %	Lipoderm liquor SA.
1 %	Lipamin liquor SO.

All added after emulsified with hot water.

10 % water at 70°C.  
run for 60 min.  
pH 3.8.  
wash or rinse at 25°C.  
horse up - set out - vacuum dry - moisture  
stake - vacuum redry - Buff.

### III. Impregnation.

Formula A.

100-150	parts Eukanol driver Pl.
550-650	parts water.
250-300	parts Eukanol Binder IM.

Mix all together.

After Buffing the leather with 280 - 320 buffing paper, one pad coat of the above solution ( Lamb skin pad ) pile overnight. Plate ( 1 min ), rebuff with 480 - 500 buffing paper remove dust, finish as usual.

Formula B.

250	Parts Corial Binder SR.
680	Parts water.
70	Parts Amollan PR.

Mix all together, use the same process as above.-

---

REPORT VISIT TO  
RACHBINI - LEATHER TANNERY  
SURABAYA - EAST JAVA

10 - 5 - 1977

Discussion with : Mr. H.A. RUSJOY RACHBINI  
Owner and Director

Findings :

1. Number of drums : 15 drums + 3 pits for soaking
2. Number of workers : 144 workers
3. Maximum capacity : 5,000 pieces of pickled skins  
(sheep or goat ) per day  
and  
5,000 pickled cattle hides / day

4. The working capacity: 75% of the above quantity.

The tannery is on the way to work with full capacity.

5. Production :
- a. pickled and wet blue cattle hides
  - b. pickled and wet blue sheep skins
  - c. Crust leather from cattle hides
- the above 3 products are for exportation
- d. full grain and corrected grain upper leather
  - e. Sole leather

These 2 products are for domestic uses.

Technical Research :

1. The tannery is newly build on 1974, very well arranged and controlled.
2. All the necessary chemical tests are well done
3. The production of pickled and wet blue cattle hides and skins are very good and well accepted over seas also the crust leather is very nice and no any technical comment.
4. The full grain and corrected grain are produced from the rejected hides after pickling and before chrome tanning and inspite of this fact, these product are of nice quality especially the corrected grain.
5. The sole leather produced are of a good quality inspite also of the fact that they are produced from the rejected hides, the vegetable tanning process is well done also the finishing of the sole leather is very nice.



6. Generally speaking, the above tannery can be considered as one of the best tanneries in Indonesia and have a very good prospect for the future since it has already started to export crust leather to England with great success.
7. The tannery is already exporting to several countries all over the world namely to :  
Holland - U.S.A. - France - Germany - Japan - Australia - Spain  
- Hongkong ( The countries has been arranged according to the quantity of the leather exported to each of them ).
8. The tannery has a big chance in the future to export finished leather of a very good quality.

REPORT VISIT TO  
C.V. WONOSARI  
SURABAYA 11/5/1977

---

Discussion with :

Mr. Harry Sjoufron  
Managing Director

Findings :

1. Number of drums : 16 drums
2. Number of pits : 35 pits (for soaking and vegetable tanning)  
12 pits for leaching vegetable extracts.
3. Number of workers : 100 worker
4. Maximum capacity : 500.000 ft<sup>2</sup> of pickled cattle hides per  
month and  
120.000 pieces of sheep and goat pickled  
skines per month

In case of producing wet blue either from cattle hides or skins  
this maximum capacity will be reduced to 70% from the above mentioned  
figures.

5. Working capacity : About 40% of the maximum capacity
6. The production is mainly for exportation (about 90%) and only 10%  
as lining leather (from skins) and sole leather from low quality  
cattle hides.  
. These lining and sole leather is for local market.
7. The production either as pickled or wet blue (for cattle hides and  
skins) are very good and well accepted overseas and no any technical  
comment can be said.

The tannery is already exporting to :

U.S.A. - France - Japan - Germany - Holland - Italy - Spain - Australia -  
Sweden - Finland - Hongkong - Portugal - Taiwan.

Technical Research :

1. As mentioned above the normal main production of the tannery  
which is pickled and wet blue of hides and skins are very  
good and the technical process used in the production is very nice

and consequently all the production is well accepted overseas by the importers.

2. The sole leather produced which is used for local market is not bad, but the tannery is very anxious to develop this kind of product and to up grade the quality.
3. The tannery can be considered as TWO tanneries, one is very old either drums or machines, and the other one is completely new drums and new fleshing machine.

Advice has been given to the owner to separate completely these 2 tanneries the old one should be only for producing sole leather, and the new one for the production of pickled and wet blue (Hides and Skines).

Since there is a very big space still unoccupied in the new tannery, there is a very good chance to enlarge it and also produce crust leather as a first step to complete it to finished leather.

For producing crust leather and according to the available possibilities the tannery needs a new splitting, shaving and stacking machines. Also it is preferable to have a vacuum dryer together with samming and setting out machines. With these machines the tannery will be able to produce high quality crust leather which is for sure much more profitable to the tannery and to the country than producing pickled and wet blue.

By separating the tannery into 2, the internal arrangement and the quality control can be done much more easily than now.

Also the production of sole leather can be increased easily since all the present equipments will be only used for vegetable tanned leather.

Technical advice :

1. No any technical comment can be said on the production of pickled or wet blue.
2. The sole leather produced is not bad but it is still away from the normal standards.

Direct advice has been given to the tannery to up grade the quality by increasing the time of hanging the leather in the different pits.

Also to increase the concentration of the tanning material in the concentrated drum, and the time of revolution must also be increased until complete tanning takes place.

According to the request of the tannery the following formulas are given :

1. Formula for chrome tanned sheep lining leather
2. Formula for goat lining leather plate finish.

3. Formula for sheep glove leather.
4. Formula for crust clothing suede from goat skins.
5. Formula for crust shoe upper from goat skins.
6. Formula for crust leather from cattle hides (2 formulas)
7. Formula for vegetable tanned sole leather (2 formulas)
8. Formula for finishing of sole leather (2 formulas)

I. Chrome tanned sheep lining leather :

Material :

Chrome tanned, shaved sheep skins (as done in the tannery) percentages on shaved weight.

Without washing and rinsing.

Neutralization and Retannage :

- 100 - 150% water 30° C
  - 3 - 6% tanigan OS
  - 1 - 4% mimosa extract powder (undissolved)
  - 0.5 - 1% sodium Bicarbonate
- run for 45 min.  
pH of liquor approx 4.5.

Rinse for 10 min at 50° C.

Dyeing and fat liquoring :

- 200% water 50°C
  - 0 - 3% dyestuff
  - 0 - 15 min
  - + 1 - 2% Cutisan TNK
  - 0.4 - 0.6% Baykanol liquor T
  - 0.4 - 0.6% Sperm oil unsulphonated
  - 10% Water of 60°C for emulsifying run
- for 30 min.  
acidify as may required.

Rinse cold water for 5 min.

horse up overnight, sam. set out, hang for drying, saw dust, stake nail (or Toggle) and finish.

II. Goat lining leather, plated finish :

Material :

Chrome tanned shaved goat skins (as done in the tannery) percentages

on the shaved weight.

Rinse at 40°C.

Neutralization : 100% water at 40°C  
1% Sodium bicarbonate  
1% Sodium formate  
run for 60 min

wash or rinse at 40°C.

Retannage : 100% water at 40°C  
10% Basyntan MK  
run for 60 min  
4% Lipoderm Liquor SAF  
2% Lipoderm Liquor 2  
run for 60 min  
+ 0.1% Formic acid 85%  
run for 10 min.

wash or rinse at 20°C

Horse up - set out - dry - pile - moisten - stake - dry once more

Finish :

Pigment Finish : 100 parts pigment colour  
300 parts water  
350 parts lepton Binder M  
30 parts Amollan L  
2 - 3 spray coats

Top coat : 100 parts corial EM finish LS  
50 parts water  
1 spray coat.plate at 80°C

### III. Sheep glove leather, semianiline finish :

Soaking, liming, deliming and bating as done in the tannery :

The pH of the deliming and bating bath should be about 8.2.

wash or rinse at 20°C.

Pickling : 80% water at 20°C  
8% common salt  
run for 10 min  
+ 0.2% formic acid 85%  
0.5% sulphuric acid conc  
run for 2 hours - pH 3.8.

leave standing over night.

Tannage : 50% residual liquor  
7% chromitan NA powder  
4% Lipoderm liquor 2  
2% Lipoderm liquor A  
run for 2 hours  
pH 4.0.

pile - sam, shave to 0.4. - 0.5. mm  
Weigh (Percentages on the shaved wight).

Neutralization : 150% water at 30° C  
2% Neutrigan  
run for 30 min  
+ 1% sodium acetate  
run for 90 min

wash or rinse at 20°C - Pile - set out - dry - moisten - stake - Buff  
(from the flesh side)

weigh (Percentages on the dry weigh)

Wetting Back : 1000% water at 50 °C  
1% lipoderm A  
1% Ammonia tech  
run for 1 hour  
pH 5.5.

Drain float :

Dyeing : 800% water at 50°C  
2% ammonia technical  
run for 20 min.  
+ 3% Tamol NNOL  
run for 10 min  
+ 6% Dyestuff  
run for 60 min  
+ 4% Lipoderm Liquor SAF  
2% Lipoderm A  
run for 30 min  
+ 4% Formic acid 85%  
2 x 10 min + 20 min

wash or rinse at 40°C.

Fixation : 600% water at 40°C  
0.5% Formic acid 85%  
run for 10 min  
+ 1% Relugan B  
run for 20 min  
pH 3.8.

wash or Rinse at 20°C - Set out - dry - Moisten - stake

Finish :

Pigment coat : 50 Parts pigment colour  
235 parts water  
100 parts Eukesolar Dyes liquid  
15 parts Eukesol Binder S  
150 parts Corial Binder OHN  
400 part. water  
2 parts ammonia 25%  
40 parts Eukesol ground P  
one spray coat plat at 70°C  
one spray coat

Top coat : 60 parts corial EM Finish FN  
40 parts corial EM Top LS  
50 parts water  
50 parts siligen HS 10%  
one spray coat, plushweel

IV. Clothing Suede : (Crust)

Material : wet blue goat skins

Percentages on shaved weight :

washing : 200% water 50°C  
0.5% Baymol A (dilute 1 : 5 at 50°C)  
run for 20 min  
drain

Retannage : 50% water 40%  
0.5% Formic acid 85%  
(dilute 1 : 10)  
run for 15 min  
pH of float 3 - 3.2.

+ 1% Coripol D X F  
5% water at 70°C for emulsifying  
run for 15 min  
+ 4 - 6% Blancorol AC undissolved  
run for 60 min  
+ 100% water at 40°C  
run for 10 min  
pH of float 3.6 - 3.8  
drain

Neutralization :

50% water at 40°C  
3% Tanigan PC undissolved  
run for 30 min  
+ 2 - 4% Retingan R6 undissolved  
2 - 4% Tanigan QF undissolved  
run for 45 min  
+ 100% water 60°C  
run for 10 min  
pH of float 4.8 - 5.2

Rinsing :

water 60°C

Fat Liquoring :

100% water 60°C  
3% Cutisan TMU  
10% water 70°C for emulsifying  
run for 30 min

Rinsing :

water at 20°C  
run for 5 min  
horse up overnight  
set out, suspension dry  
condition, stake, buff

V. Crust shoe upper, from goat skins :

Material :

Chrome tanned goat skins (as already done in the tannery)  
shave to 1 mm

weigh - wash or Rinse at 30°C

Retannage : 50% water at 40°C

4% Basyntan CD  
run for 40 min



+ 1% Neutrigan  
run for 30 min  
pH 4.5 - 5

wash or Rinse at 40°C.

Dyeing and Fatliquoring :

150% water at 50°C  
2% Tamol NNOL  
run for 10 min  
+ 1.5% Dyestuff  
run for 20 min  
+ 3% Lipoderm Liquor SA  
1% Lipoderm Liquor 1  
0.5% Lipoderm oil SK  
run for 40 min  
+ 0.5% Formic acid 85%  
run for 20 min  
pH 3.6.

wash or Rinse at 20°C - Pile - Set Out - Dry - Moisten - Stake -  
Dry (Nail or Toggel).

V. Crust leather from cattle hides :

Formula (A)

Material :

Chrome tanned cattle hide (as done in the tannery)

Rinse with 200% water at 40°C for 10 min drain float:

Neutralization and Retanning :

40% water  
2% Tanigan PC  
2% Tanigan OS  
3% Mimosa extract  
run for 40 min - pH 4.4.  
+ 200% water 60°C  
run for 10 min  
drain float.

Dying and Fat Liquoring :

80% water at 60°C  
1% Dyestuff (according to the colour re-  
quired)

run for 20 min  
4 - 5% lipoderm liquor 2  
1 - 2% Unsulphonated oil  
run for 40 min pH 4 - 4.4  
+ 0.5% Formic acid 85% (1 : 10)  
run for 15 min - pH 3.4.  
rinse at 20°C for 5 min

horse up, set out on grain and flesh side, toggle in wet condition,  
dry at room temp. condition (saw dust) stake vacuum dry.

Formula (B) for crust leather :

Material :

Chrome tanned cattle hides (as done in the tannery). Percentages on  
shaved weight rinse with running water for 10 min.

Retanning and Fatliquoring : 150% water 60°C

3% Tanigan OS  
2% Tanigan 3 LN  
0.5% Sodium Bicarbonate  
4 - 5% Lipoderm Liquor 2  
1% Tamol GA  
run for 90 min

Pile for 48 hours, toggle (or nail) until dry, condition with saw  
dust, stake.

VII. Formulas for Producing Vegetable tanned sole leather :

Formula (A)

Deliming : 150% water  
1.5 - 2% Ammonium sulphate  
2 - 3% Sodium bisulphite  
run for 3 - 4 hours until complete  
deliming wash for further one hour.

Pretannage :

The rinse liquor from the previous pack drumed is made up to pit  
volume to give a liquor to goods ratio of 3 : 1. Acidify with formic  
acid to pH 3.2 (This requires normally about 1.25% Formic acid on  
limed pelt weight). The average strength of this pit is 2 - 3° Re.  
The pelt is left in this pit for 48 hours. Pile one day before  
drumming.

Drum Tannage (4 - 6 r.p.m.)

All percentage additions are calculated on limed pelt weight.

Transferegoods to drum :

Add 15% Spraydried Mimosa powder

15% water

Drum 1 hour

Add 15% spraydried Mimosa powder

Drum 5 hours.

Add 10% Spray dried mimosa powder

Drum untill fully penetrated

Usual drumming time 36 hours

Add 50% water

1% Formic Acid

Drum for 20 min

pile the leather for 1 - 2 days.

Transfer the rinse liquor from the drum for the next pack to be pit pretanned.

Formula B :

After partial deliming with ammonium sulphat and sodium bisulphite :  
wash well for one hour :

drain float : 150% water

4% Tanigan CH (or equivalent)

calculated on the pelt weight dissolved in 4 parts water and added in 2 - 3 portions at half hour intervals.

Run for 1 - 2 hours untill the liquor is completely exhausted.

Transfer the pretanned pelts to the pit with Acacia solution of 3 - 4° Be, After 2 - 3 days, the leather is transfered to the concentrated tanning drum of 8 - 10° Be consisting of mimosa alone or together with Yugan extract.

The concentration of the tanning drum should be increased after one or 2 days later in order the degree Be should be kept always arround 8 - 10° Be untill complete Tanning.

The running time of the concentrated drum can be reduced according to

the final hardness required i.e. the more running time, the more hard and firm leather is produced.

Age for 24 - 48 hours.

Then immerse in a washing pit of clean cold water for an hour (To remove the tan from the immediate surface). Bleaching and oiling can be done with one of the following formulas.

VIII. Bleaching and oiling of vegetable tanned sole leather :

Formula (A)

Load drum with sammed stock : (drum running 10 - 12 r.p.m.)

Percentages on sammed weight

- add 2% Bleach syntan (Basyntan F.C.B.I<sub>3</sub>)  
run for 25 min
- add 2% Epson salts  
2% Liquid glucose  
drum for 25 min
- add 0.5% Oxalic acid  
2% of filler compound (Asulgan K or Kaoline)  
drum for 20 min
- add 2% of mixed sulphated oil and fish oil ( 1 : 3)  
drum for 40 min

Pile overnight, set out, dry slowly, moisten and roll

Formula B :

Drum sammed stock. Percentages based on sammed weights :

- Drum . 1 - 2% Epson salt  
1 - 2% Glucose  
3 - 5% Powdered tanning extract  
1 - 2% Basyntan F.C.B.I<sub>3</sub>.  
Drum for 40 min
- Add 0.5 - 1% Asulgan K (diluted 1 : 2)  
Drum for 30 min
- Add 1% Lipoderm liquor SAF (diluted 1 : 2)

Pile overnight, set out, dry slowly, moisten and roll.

---

REPORT VISIT TO  
PT. PAGINA CITA ( ANUGERAH)  
TWO TANNERIES  
MALANG - EAST JAVA  
12/5/1977.

---

Discussion with :

1. Mr. : Gunawan Nugroho, Managing Director.
2. Mr. : P. Nugroho, General Manager.

Findings:

The company consists of 2 completely separated tanneries :

- A. Very old Tannery.
- B. Completely new Tannery.

The above tanneries are separated by a distance of 9 km. and both of them are producing sole leather with nearly the same system.

A. The old Tannery.

1. Number of drums : 6 drums.
2. Number of pits : 33 pits used as follows :
  - 3 soaking pits.
  - 4 liming pits.
  - 6 leaching pits.
  - 20 tanning pits.
3. Number of workers : 25 workers.
4. Maximum capacity : 22 tons of sole leather.  
from cow and buffalo hides.
5. Working capacity : 15 tons of sole leather.
6. The reason of the drop in production is a matter of internal arrangement so giving all stress and possibilities to the new tannery.
7. The tannery is using the system of pretanning in pits (using simple kind of rocker to move the hides ).

The hides are transferred through different pits with different concentrations of tanning material after pretanning is completed about 4 days - the leather is transferred to another concentrated pits using the suspender system in such a manner that the leather are not hauled and only the liquors are transferred from one pit to another.

The tanning process is completed in drum with 10 - 14°Be' of Mimosa and Yugan extracts for 4 days followed by normal finishing.

8. The production is of low grade sole leather, since the tannery is using hides from Timor island which is of a very low quality ( very bad flaying, and very bad preserved, causing lot of defects to the hides ).
9. The sole leather, away from the surface defects of the hides, is not bad but is still as all the Indonesian sole leather, still very soft inspite that the tannery is using very concentrated tanning material in the final drum process for 4 days which is quite enough to fill the leather with the necessary tanning materials. The reason of the softness of the leather is the big quantities of fats in the reoiling process done by hand.

Technical recommendations has been given to each tannery separately, which are nearly the same for both tanneries ( followed latter ).

#### B. The New Tannery.

This tannery is completely new working since less than one year. It is build on a very big area and only small part of the total building is used which gives the chance for further expansion. Advice has been given to start producing pickled and wet blue cattle hides for exportation. This needs only the addition of one or two drums according to the capacity required.

In case of the production of crust leather then only shaving and staking machines are required beside the new drums mentioned above.

After all that, there will be left a very big space for adding a complete new line for finishing upper leather.

Finding :

1. Number of drums : 8 drums.
2. Number of pits : 30 pits used as follows :  
20 pits for tanning.  
10 pits for soaking and liming.
3. Number of workers : 12 workers.
4. Maximum capacity : 50 tons of sole leather.
5. Working capacity : 10 tons of sole leather.
6. The reason for the drop of production that the tannery is still in the beging of the production and it is a mater of time to work with the maximum capacity.
7. The tannery is producing sole leather of good quality, using hides from Bali which is quite suitable for the production of sole leather.  
Also the process used is good which is simply a pretanning process in a pit using simple type of rocker frames then to the concentrated tanning drums until complete tanning.

Technical Advice.

The following advices has been given to be used in both tanneries since the process used are nearly the same :

1. The hides has to be presoaked first in fresh water for a period of maximum 4 hours, then the water is drained off, and the main soak starts with completely new fresh bath containing the antiseptices and wetting agents.
2. After complete tanning, the tanned leather must be piled for 24 - 48 hours on the ground. Then washing in a pit of pure water for 1 - 2 hours together with 1/2 - 1 kg. of Oxalic acid in order to remove the tan from the immediate surface.  
The presence of Oxalic acid will help in bleaching.

3. It is quite suitable to incorporate a small percentages of a bleaching system into the oiling drum, such as Basyntan F.C.B.I.3 or equivalent.
4. There is no need to add more oil by hand on the surface except when flexible sole leather is needed.

Recommended formula for finishing :

Percentages based on samed weight.

<u>Drums</u>	1 - 2 %	Epsom salt.
	1 - 2 %	Glocose.
	4 %	Powdered tanning extract.
	2 %	Bleaching Syntan ( Basyntan F.C.B.I.3.)
		Drum for 40 min.
	<b>Add :</b>	
	1 %	Asulgan K ( diluted 1 : 2 ).
		Drum for 30 min.
	<b>Add :</b>	
	2 %	of mixed Sulphonated oil and fish oil
		( 1 : 3 ).
		Drum for 15 min.
		Finish as usual.-

-----○-----○-----



REPORT VISIT TOPT. KASINMALANG - 13,14 - 5/1977

Discussion with : 1. Mr. ICHWAN ZACHARIA  
 Owner and Director  
 2. Mr. PAUL ZACHARIA  
 Technical Manager.

Findings :

1. Number of drums : 15 drum
2. Number of workers : 70 worker
3. Maximum capacity : 30 tons of sole leather and  
 60,000 ft<sup>2</sup> of shoe upper leather
4. Working capacity : 10 tons of sole leather and  
 20,000 ft<sup>2</sup> of shoe upper leather
5. The reason for the drop of production is the lack of capital also no  
 enough Vegetable tanning materials especially Acacie which is locally  
 produced.
6. The production of the tannery :
  - a. Sole leather
  - b. Embossed upper leather.

All the production is for local market and very well accepted from the customers.

Technical Research :

1. The sole leather produced in the tannery is of a very high quality and  
 up to the International standard.  
 The process used in the Vegetable tanning process is completely right and  
 all the necessary technical tests and the chemical control operations  
 are perfectly done.
2. The tannery are very well arranged and the flow of production is very good  
 this means very good and scientific management.

3. The tannery is very well equipped with the necessary machines it is true that the machines present are not completely new but they are working in very good manner.
4. The tannery has a big possibility for exportation especially of sole leather which is not yet exported from any other tannery all over Indonesia and efforts should be done in order that the production of this tannery should be known in the world market ( Paris Fair ).
5. The chrome upper leather ( embossed ) produced in the tannery is good but not to the level of the sole leather. Advice has been given to the tannery to start producing crust leather which will be after some trials up to exportation standard.

And according to the request of the tannery, following is formulas for:  
Producing Crust leather from cattle hides.

Formula 1 :

Material : Chrome tanned cattle hides - as done in the tannery.  
(with especial care of piling the chrome tanned leather after the process of chrome tanning as already explained to the tannery ).

Wash : ( Percentages on shaved weight )  
250% water 50° C  
0,5% Bayamol A ( 1 : 5 )  
run for 10 min drain float.

Retanning : 150% water 60°C  
5% Baychrome A  
2% Tanigen P A K  
1.5% Sodium formate  
added together undissolved run for 75 min  
pH of the liquor 4 - 4,3  
rinse at 60°C for 10 min  
drain float.

Fat liquoring :

150% water at 60°C  
4% coripol B Z N  
4% coripol D x F  
to be diluted 1 : 4 run for 30 min.

add 5% Tanigan OS undissolved  
run for 30 min  
pH liquor 4.2 - 4.5  
rinse at 25°C for 5 min.

Hoarse up over night, set out slightly, vacuum drying for 2 min, hang up to complete drying, condition stake - vacuum drying for 1 - 2 min.

Formula II for Producing Crust leather from cattle hides :

Material : Chrome tanned cattle hides (as done in the tannery)  
Percentages on shaved weight.

Retanning and fat liquoring :

150% water at 60°C  
3-4 % Tanigan OS  
1 -2% Tanigan 3 LN  
0.5% Sodium Bicarbonate  
4-5% Lipoderm liquor 2  
1% Tamol GA  
run for 90 min.

Pile for 48 hours, toggle (or nail ) until complete dryness, condition with saw dust, stake.

Formula III for Producing Crust leather from cattle hides :

Material : Chrome tanned cattle hides as done in the tannery.  
Percentages on the shaved weight  
Wash or Rinse at 35°C

Retannage : 80% water  
1% Lipoderm liquor SA  
run for 10 min.  
+ 2.5% Relugan GT 50  
run for 60 min  
+ 4% Chromitan B  
2% Implenal AP  
run for 30 min  
pH 4.8  
+ 1% Neutrigan  
1% Sodium formate  
run for 30 min

2% Basynten D

2% Mimosa extract

run for 60 min - pH 4.4

Wash or Rinse at 40°C

Fat liquoring : 100% water at 60°C

3% Lipoderm liquor 1

3% Lipoderm liquor SA

1% Lipoderm oil SK

2% Lipamin Liquor SO

run for 40 min.

N.B. :

Another fat liquoring process for the same retannage :

100% water at 60°C

5% Lipoderm liquor 2

1-2 % Unsulphonated fish oil

run for 40 min.

Wash or Rinse at 20°C

Hoarse up - Set out - dry, condition and stake.

In my opinion that this tannery should be assisted to a big extent in order to keep this perfect standard of production which I feel is very important to Indonesia as a whole.

The tannery should be given all possible assistance in order to start also exportation of sole leather since it is the only tannery in all over Indonesia which is producing sole leather up to the International standard.

REPORT VISIT TO  
PT. WANGSA BRATA  
SURABAYA - EAST JAVA  
17 - 5 - 1977

Discussion with :

1. Mr. Wong Soen TJIANG  
General Manager
2. Mr. Liem Hong Kling  
Technical Manager.

Finding :

1. Number of drums : 9 big drums + 2 small ones
2. Number of pits : 2 for soaking  
9 for vegetable tanning
3. Number of workers : 60 worker
4. Working capacity : 60.000 ft2 of shoe upper leather
5. Maximum capacity : 80.000 ft2 of shoe upper leather
6. Production :
  - a. full grain upper leather
  - b. corrected grain upper leather
  - c. embossed leather
  - d. Suede hunting leather
  - e. Insole splites

All the production is for the local market.

Technical Research :

1. The tannery is well arranged and the flow of production is good - All the necessary chemical control tests is well done and observed.
2. The production is of a good quality and well accepted in the market and no any technical observations can be said except that the splitting machine is not working properly causing an unequal thickness in the finished leather. This defect can be easily recovered if the tannery repair its splitting machine or much more better to have a completely new machine. The tannery is already renewing its machines, having already a new Vacuum dryer.

The rest of the machines are not old, working in good condition except the splitting machine as mentioned above.

Technical Advice :

1. The tannery should start producing Crust leather for exportation. The trials already done in the tannery on a small scale, is good and promising. This kind of production can be up graded especially after using the new Vacum dryer in the drying operations instead of the old system of drying which was using locally made Vacum dryer (only hot plate without cover ).
2. Advice has been given to the tannery on the different ways of using the Vacum dryer in order to get the maximum benefit of this important machine.
3. Also recommendation has been given to the tannery on the retanning and fat liquoring operations which is suitable to be used together with the Vacum dryer and especially those especial kinds of fat liquoring agents which is usually recommended in such cases.

Report Visit to  
P.T. SUMBER SETIA  
PROBOLINGGO - 18/5/77

---

Discussion with :

- 1). Mr.: JUSUF SUSANTO  
Owner and Director
- 2). Mr.: EDDY SUSANTO  
Technical Manager

Findings :

- 1). Number of drums : 13 drum
- 2). Number of Pits : 16 pits
- 3). Number of Workers : 56 workwe
- 4). Maximum capacity : 100,000 ft<sup>2</sup> of leather/month  
and  
8 Tons of sole leather/month
- 5). Working capacity : 50,000 ft<sup>2</sup> of upper leather/month  
and  
5 Tons of sole leather/month.
- 6). The reason of the drop in production is :
  - a). The high prices of raw hides
  - b). Market demands
  - c). The blocking of the capital since the customers pays usually after a period of 4 - 8 months.
- 7). Production :
  - a). Full grain upper leather
  - b). Corrected grain upper leather
  - c). Embossed upper leather
  - d). Lining leather
  - e). Sols leather
  - f). Insole splites

All the production is for the local market.

Technical Research Recommendations :

- 1). The tannery is very old, the machines is working since 1938 most of the machines are not working properly especially the splitting machine causing irregular thickness in the finished leather. The tannery should start having new machines which for sure will improve the quality of the finished leather to a big extent.
- 2). The piling of the chrome tanned leather after chrome tanning is done in a very bad manner causing marks which is quite clear in the finished product.  
The right way of piling the leather has been explained to the tannery.
- 3). The drying operation for chrome tanned leather is not well done. The leather is left for more than 10 minutes to dry over the hot plate of the locally made vacum dryer and this is a long time and it effects the grain of the leather.  
Advice has been given to the tannery to shorten this time to only 5 minutes than hang up to complete drying.
- 4). With respect to the sole leather produced, the quality is bad and far away from normal standards.  
Lot of skrinking areas are present on the surface,  
The reason of this phenomenon is the high pH value of the pretanning pits ( pH less than 2 ).  
Advice has been given to the tannery that the pH in the pretanning process should be about 4 - 5 especially that the conc of the pretanning pits is starting from 1 %Be until 4 %Be.  
This conc is very good for pretanning but the pH as said before has to be adjusted.
- 5). The finished sole leather is very soft. The reason is that after pretanning in pits, the leather is transfered to a drum of 5 %Be for one day only.  
This is not good. Advice has been given to the tannery that the conc of the final tanning solution should be from 8 - 10 %Be and



the drumming time should not be less than 4 - 5 days until complete tanning.

The hardness of the produced leather can be increased or decreased by controlling the drumming time in the conc drum. The more drumming time with conc solution, the more hard and firm leather will be produced and vice versa.

6). The colour of the sole leather produced is not nice.

Advice has been given to the tannery that after aging the tanned leather for 24 - 48 hours, wash the leather by rinsing in pits with cold clean water with little oxalic acid leave the leather in this pit for 1 - 2 hours, then bleach - after samming - as follows :

Percentages on sammed weights :

Drum :            2 % Epsom salts  
                     1 % glucose  
                     5 % Mimosa extract  
                     2 % Basyntan F.C.B.I3

Drum for 40 minutes.

Add            1 % Asulgan K  
Drum for 30 minutes.

Add            2 % mixed sulphonated oil and fish oil ( 1 : 3 )

Drum for 10 minutes.

---

REPORT VISIT TO KILANG KULIT

" LENG TAT "

MEDAN - NORTH SUMATERA

20/4/1977

---

Discussion was held with

Mr. K. Darwin

Technical Director.

Findings :

1. Number of drums : 4 drums
2. Number of workers : about 30
3. Number of pits : 14 pits (4 pits for vegetable tanning  
5 pits for liming of sole leather  
2 pits for soaking  
3 pits for Reliming and Washing).
4. Working capacity : 10 Tons of cattle hides / month  
(50% for chrome upper + 50% for sole leather)
5. Maximum capacity : 30 Tons of cattle hides / month  
The weight of one piece of cattle hide is about  
7 Kg dry weight.
6. The only reason for the drop of the production is the lack of capital,  
since the raw cattle hides in quite enough and the local market is buying  
all the production of the tannery inspite of the quality since it is the  
only tannery producing upper leather in all Medan.
7. The tannery is producing upper leather full grain and corrected grain, also  
sole leather.

The quality of the upper leather is not so good, since their exist in the  
finished leather:

- a. loose grain
- b. Empty Bellies and flanks
- c. Lot of wrinkles.

The sole leather produced is bad since :

- a. Very soft i.e. no enough tanning material inside the leather causing  
very bad abration resistance.
- b. The colour is very dark redish brown
- c. Lot of vegetable patches exists over the surface.

but as said before that inspite of all these deffects the production is already solled to the local market without any difficulty.

8. The machines present in the tannery is very old and not operating in a good manner.

According to the technical director, the tannery wants to have new machines but the problem is the lake of capital which the tannery is suffering from.

Technical Research and Recommendations :

A. Chrome upper leather :

1. The soaking operation is not well done, the quantity of water in the pit is not enough compared to the quantity of the soaked raw hides. The amount of water used should be 5 - 6 times the weight of the wet-salted hides.  
It is essential to soak the hides well, if the tannery wants to obtain uniformly tanned and good quality leather of good strength and flexibility.
2. The fat liquoring operation is not well done and a recommendation has been given to the tannery about the way of emulsifying the fat liquoring agents, also about the temperature of fat liquoring bath which should be about 60 - 80° C.  
The pH after neutralization should be adjusted to be between 4.8. - 5.2. and this should be well controlled.
3. Using the curent formula the quantity of the retanning agent used - namely Relugan G.T. 50 and Easytan DLE this quaranties should be increased to be up to 5% and 4% respectively, since the bad retanning is the cause of the empty bellies present in the finished leather.
4. No setting out after retanning and fat liquoring and this effects the surface of the finished leather.  
Recommendation has been given to the tannery about the necessity of that important operation and how it should be done ( as shown in the picture).
5. The nailing operation is also not well done, the leather should be well stretched to over come as much as possible the wrinkles present on the surface.

B. Vegetable tanned leather :

1. The liming process is done by putting the hides in a pit with Calcium hydroxide only for 4 - 6 days without adding Sodium sulphide.  
To shorten the time of liming a recommendation has been given to the tannery to add 1 - 2% sodium sulphide solution with continuous moving of the hides.
2. Pure water is used as " reliming ".  
Technically speaking reliming means liming once more and this is usually done by putting the pelts in a pit containing lime solution of 3 - 4% and the pelts is left for 2 - 3 days according to the weight and the thickness of the leather produced.
3. According to the running formula of the vegetable tanning no delimiting and washing, but the leather is transferred from the pits with pure water directly to the tanning pits containing Mangrove only ( average tan content = 36% ).

The leather is moved daily until complete tanning which always takes about 3 months.

This is very slow process and it has to be changed to a quick tanning process.

The main advantages to be gained by shorting the duration of a pit tanning by carrying out the main tanning in drums following the preliminary tanning in pits, are the savings in time, with consequent reduction of interest on capital tied up in hides in process.

Also the elimination from the tanyard of some at least of the large and costly pools of strong tan liquor, which while standing are subject to tan losses by oxidation and micro-biological action.

According to the request of the tannery and its wish to work with the quick tanning process the following three formulas can be recommended and it is up to the tannery to use any one according to its possibilities and local demand.

Formulas for vegetable tanning :

- I. The delimited pelt is pit tanned initially and then liquor drummed.  
Duration from limed pelt to the end of the tanning process is about 10 - 12 days exclusive of final piling.

Cold soluble and semi soluble Quebracho are the constituents of this tanning in the proportion of 2 : 1.

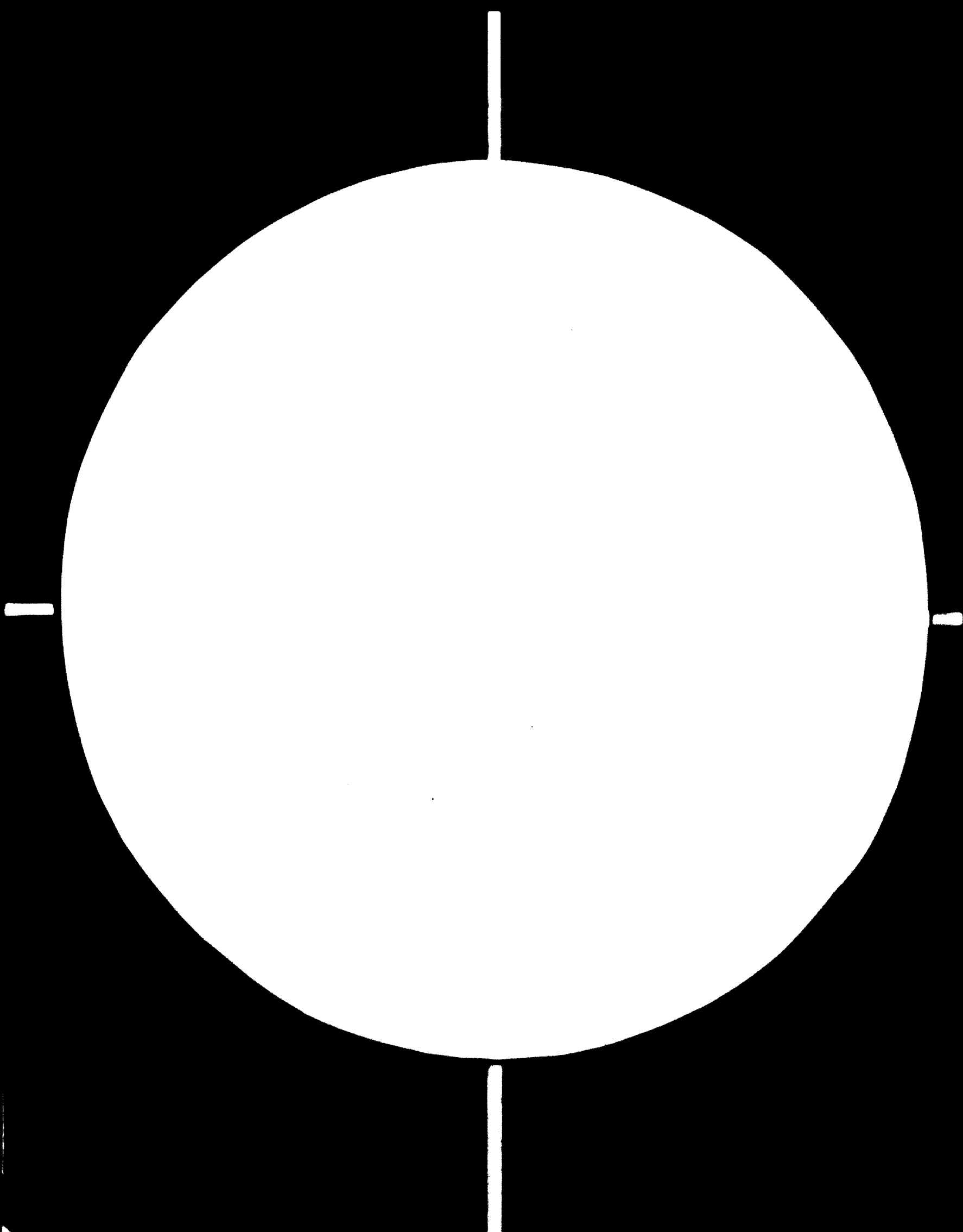
For delimiting a drum system is generally used drum with : 15% water

0.7 - 0.9% ammonium sulphate

**C-688**

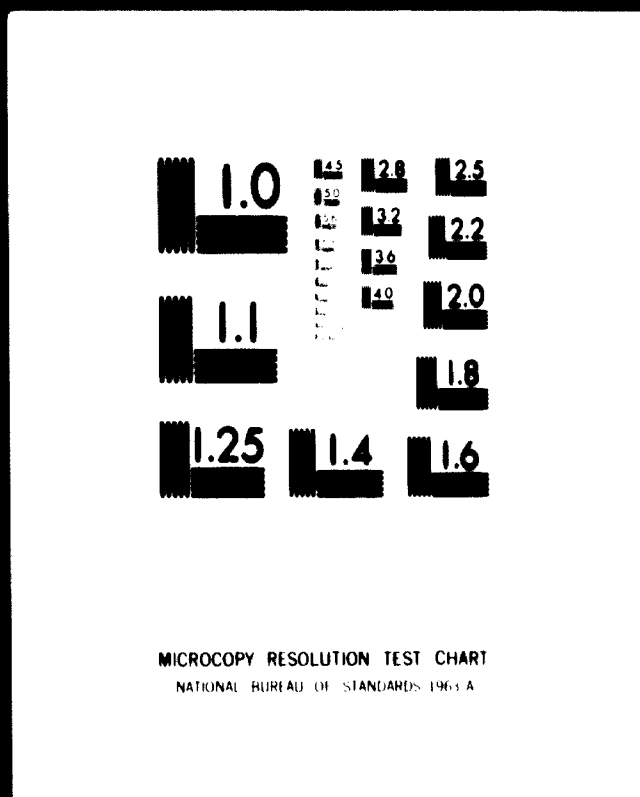


**78.11.22**



# 4 OF 4

# 08178



24x  
B

The pelt is  $\frac{1}{2}$  -  $\frac{2}{3}$  delimed

The liquor is run off and the drum refilled with water.

drum with 0.5 - 1 % Sodium bisulphite powder run for 2 hours when deliming should be complete.

The tannage takes place in 3 stages :

- (a). Colour pit
- (b) Tanning in pits
- (c) Tanning in drum

(a). The colouring pit :

The delimed pelt is placed in the colouring pit for 24 hours where the strength is 2 - 3° Be, then strengthened from the main tanning set after several packs have passed through.

(b) Tanning in pits :

The pelt from the colour pit is taken to a liquor circulating set of pits containing liquors of 7 - 9° Be, where it remains without handling until completely penetrated. The extract used is cold soluble Quebracho and the time taken to achieve penetration is 6 - 7 days. The strength of this main liquor is kept at a constant level by adding new extract when ever a new pack is brought in from the colouring pit. This is achieved either by hanging bags of solid extract in the circulating liquor or by dissolving spraydried powder in a spare pit in the circulating set.

(c) Tannage in the drum :

Generally speaking the drum liquor is 13 - 16° Be made from cold soluble and semi-soluble Quebracho extracts in the proportion of 2 : 1 using a float of about 100%.

Temperature is held at 38 - 40° C as near as possible by regulating the speed of rotation and the size of the float.

The goods are drummed for 16 - 20 hours, running the drums for 3 - 4 hours periods at 6 - 9 R.p.m.

The final strength is usually about 13° Be.

1 - 2% powdered Sodium Bisulphite is added to the drum for each addition extract, which usually amounts to 35% on the limed weight, made in two additions.

After drumming, the leather is piled for 48 hours to complete tan fixation.



The drum liquor, after strengthening, is used again and then filtered. The filtered liquor, with or without the addition of water, is used for mending the colour set.

The finishing process follows after a normal type of filling and drum oiling (as described in the third formula following).

II. A pit Pretannage / Rapid drum main tannage system :

The method used is not important as long as deliming is carried to the point where the cut section is colourless to phenolphthalein.

A pit method suggested is overnight deliming in pit containing :

5% Sodium bisulphite (40%) on pelt weight  
wash ten minutes in running water.

Pretannage :

The rinse liquor from the previous pack drummed is made up to pit volume to give a liquor to goods ratio of 3 : 1.

Acidify with formic acid to 3.2. pH (this normally requires about 1.25% on limed pelt weight).

The pack of washed delimed pelts is left in the pretanning pit for 48 hours.

Pile one day before drumming.

Drum tannage :

All percentage addition are calculated on limed pelt weight.

Transfer goods to drum.

Add 15% spraydried Mimosa powder

15% water drum for 1 hour.

Add 15% spraydried Mimosa powder

drum 5 hours.

Add 10% spraydried mimosa powder - drum until fully penetrated.

Usual drumming time 36 hours. This is, of course, depending on local conditions.

Ideally the drum should run at 4 r.p.m. Overheating must be avoided.

Add 50% water

1% Formic acid

drum 20 minutes

Remove goods and pile 1 - 2 days. Finish to suit desired production, as (in the following formula).

Transfer the rinse liquor from the drum for the next pack to be pit pretanned.

The movement of the goods is as follows : delimed pelt to pretannage pit, to tannage drum.

II. By using syntans as pretanning agents :

Re-liming : in pits 2 - 3 days

De-liming : 150 % water

1.5% Ammonium sulphate

1.5% Sodium Bisulphate

run for 4 hours

1/3 pink with ph.ph

wash well for one hour,

drum

150% water

2 - 3% Tanigan cH (Bayer) the percentage of Tanigan cH is calculated on the pelt weight dissolve in 4 parts water and added in 2 - 3 portions at half hour intervals.

Run for 1 - 2 hours until the liquor is completely exhausted.

Transfer to the concentrated drum containing,

Tanning solution of 4 - 5°Be consisting of either mimosa alone or mimosa and Quebracho extract.

After 2 - 3 days the concentration of the tanning solution should be increased to 8 - 10°Be run for further 6 - 8 days until complete tanning.

( The running time can be reduced according to the final hardness required i.e the more running time the more hard and firm leather is produced )

Age for <4 hours.

Fixation and Fatliquoring and Bleaching :

The Percentages on the same weight :

50% water

0.5 - 1% magnesium sulphate

1% glucose

3 - 4% mimosa powder

1.5 - 2% Basyntan F.C.B.I.3 ( B.A.S.F. )

All these products to be added after dissolving in water run for 45 minutes

add 0.5 - 1% Asulgan K (B.A.S.F.) ( diluted 1 : 2 )

run for 30 minutes

Add 1 % Lipoderm liquor 1

( diluted 1 : 2 )

run for 10 - 20 minutes.

File overnight, set out, oil off, dry slowly, moisten and roll.

N.B. :

1. Equivalent to Tanigan cH ( Bayer ) is Basyntan P ( B.A.S.F. ) and Tanichor

H N

special (Hockest)

2. Equivalent to Basyntan F.C.B.I. 3 (B.A.S.F.) is Tanigan HL (Bayer).
3. The object of adding fixing agents is to convert the unbound tannins in the leather into such a form that they can not be removed by washing.
4. In case of absence of Pretanning syntans, the pretanning process can be done as follows :

After partial deliming and washing, the pelt is transferred to a used mangrove solution, run for 2 - 3 hours then for 24 hours in a new solution of 5% mangrove then continue as before in the concentrated tanning solution.

Formulas for Retanning chrome upper leather :

One of the following Formulas can be used to improve the quality of the upper leather already production the tannery.

Formula I

From liming untill chrome tanning as done now in the tannery :

Shave well to the required thickness :

wash or rinse at 30° C

Retannage :           80% water 30°C  
                          1% Lipoderm Liquor SA  
                          run for min.  
      add           25% Relugan GT 50  
                          run for 60 min  
      add           4% chromitan B  
                          2% Implenal AP  
                          run for 30 min  
                          pH 4.8  
      add           1% Neutrigan  
                          1% Sodium formate  
                          run for 30 min  
      add           4% Basyntan D  
                          3% mimosa extract powder  
                          run for 60 min  
                          pH 4.4.

wash or Rinse at 40° C then continue dyeing and fatliquoring as the current formula in the tannery.

Formula II :

Material : chrome tanned cattle hides, percentage based on shaved weight:

washing : 250% water 40°C (closed drum)  
run for 10 min  
drain the float.

Retannage : 100% water 50°C  
4% chromosal B  
1% Calcium Formate  
1% Sodium bicarbonate  
run for 60 min  
pH float 4.2. - 4.5.  
+2% Tanigan OS  
3-5% Mimosa extract powder  
add together undissolved  
run for 45 min  
pH of float 4 - 4.5.  
drain the float

washing : 250% water 50°C (closed drum)  
run for 10 min  
drain the float

Then continue dyeing and fat liquoring as the current formula in the tannery.  
It should be mentioned that the tannery under investigation should be helped  
and big intensives must be given since it is the only big tannery in Medan  
and nearly in all Sumatera.

The other 2 tanneries present producing only sole leather and in a very primitive  
way and their production is very bad compared to any normal sole leather produ-  
ced all our Indonesia.

REPORT VISIT TO  
SUNGAI AGUL  
MEDAN - NORTH SUMATERA  
21 / 4 / 1977.

---

Owner : LIONG MIN ON

Findings :

1. Number of pits : 23 pits used as follows :
  - 7 pits for liming
  - 6 pits for washing
  - 10 pits for vegetable tanning
2. Number of workers : 12 worker
3. Production : 10 cattle hides is soaked every day and the total production is estimated to be between 100 - 150 side of sole leather per month ( The tannery is producing sole leather only)

4. Process used in production:

Since their is no drums in the tannery, all the processes is done in the pits, the hides in the liming pits with lime only i.e No. Sodium sulphide, staying still for 3 weeks then removed to the tanning pits containing mangrove only as tanning material.

After complete tanning ( which is tested only by the colour of the cut in the leather ), the leather is hanged untill complete dryness, then Rolling on a very old Rolling machine.

Technical comment :

The tannery is very old, working since 1945, very primitive and producing very low quality of sole leather.

No any chemical control, no measuring of degree Be' or pH control,

No drums, the splitting machine present ( which is very old ) is used only for fleshing Buffalo hides.

Fleshing is done before liming by hand in a very primitive way. The process used is very primitive and according to the low possibilities present in the tannery, this process can not be changed.

The production is of very low quality, and far away from any reasonable measurement, very soft bad looking sole leather. In spite of all that, all the production is sold to the local market.

No any technical advice can be given.

REPORT VISIT TO ADIKA SARI

Medan - North Sumatera

21 - 4 - 1977

Owner : YOK FA CONG

Findings :

1. Number of pits : 10 pits used as follows  
2 pits for liming  
4 pits for washing  
4 pits for Vegetable tanning
2. Number of workers : 10 workers
3. Production : 10 - 20 cattle hides is soaked every day, giving about 200 - 300 sides vegetable tanned sole leather per month ( the tannery is producing sole leather only)

4. Process used in production :

Because of the absence of drums in the tannery, all the tanning operation, starting from soaking until complete tanning, all these processes are done in pits.

Soaking is done in presence of lime for 3 weekes, followed by washing and deharing. The pelts is then transfered to pits containing tanning solution of Mangrove only, left in these pits from 3 - 8 months until complete tanning. The end of the tanning operation is controled only by making a cut in leather. Then the leather is left to dry by hanging in the air then finished on the Rolling machine.

Technical comment :

The tannery is very primitive, very old, working with that system since 1946 until now.

No chemical control, no measuring of degree Be' also no pH control.

No drums, no any machine except very old rolling machine.

The production is very bad, very soft sole leather with a bad looking colour also bad looking surface.

According to the possibilities of the tannery, no possible advance could be reached. So no any technical advice can be given since the tannery has no tendency for further changment as all the production of that low quality sole leather is already solled in the local market.

REPORT VISIT TO NV.SINAR BARU

MEDAN - NORTH SUMATERA

21 - 4 - 1977.

Discouision with : Mr. THOMSON'L. TOBING  
Vice Director

The meeting have been held in his office followed by visit to the tannery. The tannery has been established since 1957. Starting production in the year 1959. The tannery has been stoped completely after few months, since their was no good technicians to work in the tannery.

So the machines have been repacked again and transfered to a closed store together with the drums.

The building of the tannery is very nice and still new till now.

The internal arrangement of the previous places of the machines is also very good, but unluckly the tannery is not working inspite of the true need of a good big tannery to over come the demands of Medan especially and all Sumatera.

The machines present in the tannery, already repacked, includes the following:

1. Two tanning drums 2.5 x 2.5m complete with their necessary equipments.
2. Car leather roller ( pressure up to 50.000 kg )
3. Automatic Boge compressor Unit.
4. Glazing machine with level bed
5. Staking machine with level bed
6. Plate Graining and Ironning machine with 3 graining plate
7. Rotary Samming - Press
8. Shaving Machine
9. Band - knife - splitting machine
10. Boarding - machine

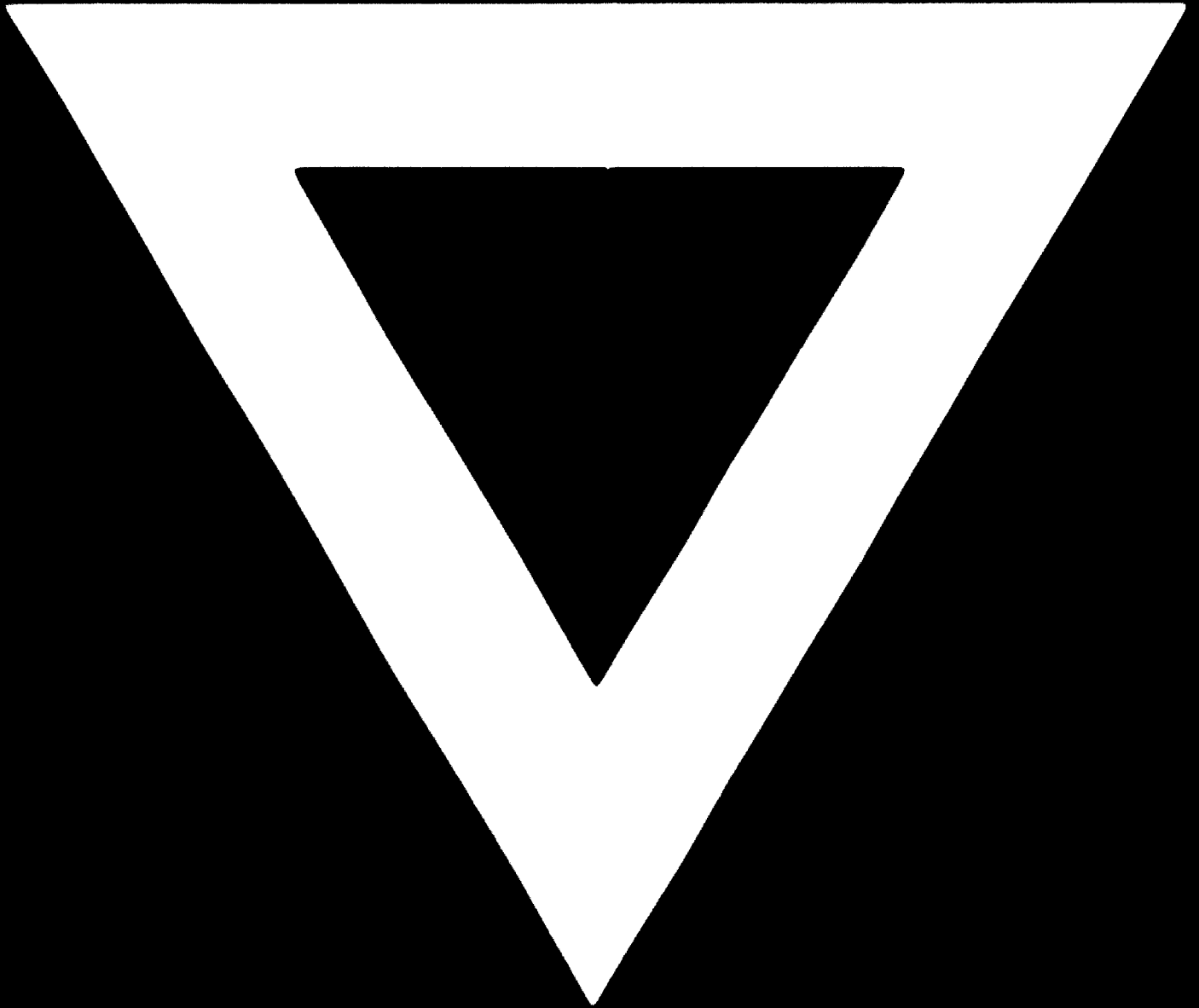
All the above machine combined with their electric motors, also every machine with its spare parts.

In my opinion that such a tannery with this possibilities must be helped by any means to start again because of the true need of such a big tannery especially in Medan were all the tanneries presentare very small and producing low quality leather.



We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards even though the best possible copy was used for preparing the master fiche.

**C-688**



**78.11.22**