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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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(R) LEATHER INDUSTRY PREPARATION MISSION*,
BANGLADESH.
SI/BGD/76/809.

Terminal report

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

Based on the work of Bo Lunden, leather industry adviser

United Nations Industrial Development Organization
Vienna

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Explanatory Notes

The following abbreviations have been used in this report:

BCIC	-	Bangladesh Chemical Industries Corporation
BCSIR	-	Bangladesh Council of Scientific and Industrial Research
EPB	-	The Export Promotion Bureau
sq.ft.	-	square feet
m^2	-	square metre

1 crore = 10,000,000

1 lakh = 100,000

During the period of the project the Bangladesh Taka has slowly increased its value compared to the US dollar,

from 1 US$ = 15.55 Taka to 1 US$ = 15.0 Taka.

SUMMARY

A detailed study of the Leather Industry in Bangladesh has been carried out during the period 1/2 - 31/10 1977.

The tanning industry consists of a large number of small tanneries, mainly located in Dacca, and a few larger and more modern factories, most of them in Chittagong. Generally, their production machines are rundown, often inoperative and unreparable.

An ample supply of raw hides and skins are available, especially cow hides and goat skins. The former are usually of a rather low quality, but the goat skins, although just as the cow hides comparatively small and thin, belong to the best in the world as to the grainside. There is, however, much to be wanted in the field of the treatment of the raw hides and skins, from the slaughter and curing to the grading and marketing.

Almost all goat skins and most of the cow hides are exported in a tanned condition, but only as Wet Blues, one of the first stages in the leather making process. Intermediate, such as crust or ready-to-finish leathers and later completely finished leathers, which can be sold on the world market, is at present beyond the reach of the industry, due to lack of machines, technology, working skills, managerial abilities as well as marketing knowledge.

Also the leather goods manufacturing industries demonstrate to a great extent the same lack of skills, know-how and equipment necessary for an efficient, economic and qualitatively acceptable production.

It is recommended to make a concerted attack on these problems by implementing a UNDP, strongly industry oriented, technical assistance project, such as described in Annex IV. It is suggested that the Institute of Leather Technology, Hazaribagh, Dacca, which today is only training technicians at relatively low levels, should be reorganized and provided with new facilities to take up all activities required for an efficient technical assistance to ensure a favourable development of the Leather Industry in Bangladesh.

In the public sector the BCIC (Bangladesh Chemical Industries Corporation) tanneries have also been studied with the intention of finding ways to aid them in transferring them into profitable units, balancing, modernizing and rationalizing their production facilities. The recent government decision to disinvest all these tanneries terminated the work.

Dacca Leather Complex, the tannery cum shoe factory proposed to be erected by the government, was aided from a technical point of view all through the negotiations for its implementation by a foreign company. This offer was finally rejected, primarily out of economic considerations. Recommendations as to how such a project as the Dacca Leather Complex should be planned and executed are outlined, as are recommendations about a possible alternative of slowly developing the public sector tanneries from present factories into a modern leather complex.

C O N T E N T S

INTRODUCTION

Project background.

The project originated in a suggestion made by Mr. R. Millar, UNDP, Dacca during his visit to UNIDO, Vienna on 3 July 1975.

The first Five-Year Plan, approved in November 1973, aimed at increasing the leather production more than 170% - from approximately 62 to about 169 million square feet -, an increase partly to be achieved by better utilization of existing and by creating new production facilities.

Bangladesh has sufficient raw hides and skins to sustain a healthy and rather large leather industry. The raw material, however, except for a small part converted into relatively low grade finished leathers for the local market, is processed almost exclusively into Wet Blues, which is only one of the first steps in the leather making process. An important development, not the least from an economic point of view, would be the conversion of all or most of the Wet Blues into finished leather.

Yearly about 2.5 million cattle hides and 6.5 million goat skins are available in the country. The cattle hides as a rule are small and thin and suffer from damages to the grain as well as the flesh side. The goat skins, even if generally also small and thin, are on the other hand otherwise of a very good quality possessing a fine, smooth grain usually free from grain damages.

Some 170 tanneries are found in the country, most of them small with very little of mechanical equipment. About 70 "cottage tanneries" have no such equipment at all, but only pits and tanner's beams. None of the factories can be said to be large and none is really modern in processing or equipment. Only a very few tanneries have some modern machines and this is especially the case when considering leather finishing.

Except for 10 plants in Chittagong and 2-3 at other places in the country all the tanneries are situated in the Hazaribagh area of Dacca. When Bangladesh was established 30 important tanneries were abandoned by their owners and subsequently nationalized by the government. Today Bangladesh Chemical Industries Corporation (BCIC) under the supervision of the Ministry of Industries are operating 7 of these tanneries in Dacca and 3 in Chittagong, while some of the others have been disinvested.

BCIC is negotiating the establishment with bilateral financing of a leather complex cum shoe factory to produce finished leathers for export and shoes primarily for the local market.

There are only a few mechanized shoe factories in the country, but a large number of small units producing all kinds of shoes, including high fashion types, by simple hand methods. More to be termed handicraft industries, a few, small factories tan reptile and other wild animal skins and manufacture thereof handbags, wallets, writing pads etc. for the local and tourist trade and exceptionally also for export.

With the large supply of hides and skins, so far only partly processed in the country, and with an abundant supply of manpower the leather and leather goods manufacturing industries are considered to have very good prospects for further development. Such a development will favourably and substantially influence the economy of the country.

A FAO mission (Report of a HIDES, SKINS AND ANIMAL BY-PRODUCTS MISSION TO SELECTED COUNTRIES IN ASIA (BANGLADESH); Food and Agriculture Organization of the United Nations; Rome, 1976) who visited Bangladesh in 1975, underlined the importance of the development in the sector, especially stressing the need of improvements in the treatment of the hides and skins and by-products utilization. Projects for a Research, Development cum Training Centre for Hides, Skins, Leather and Allied Byproducts, for Quality improvement of hides and skins - their grading, standardization and marketing and for the Upgrading and strengthening of the Institute of Leather Technology, Dacca were proposed.

The mission suggested that the nationalized tanneries should be amalgamated into a few economically viable units pooling available resources and also that the government should go slow on the proposed leather cum shoe factory, first carefully studying the sector, especially as to the availability and supply of raw materials.

Official arrangements.

The present project was authorized on 14 December 1976 and attached to the Industries Division of the Ministry of Industries to work closely with the Dacca Leather Complex of BCIC. Total UNDP contribution was US$ 26,800. The project started 26 January 1977 and terminated 8 November 1977.

Objectives

The major objective of the project is to assist the Government of Bangladesh in the formulation and preparation of a project for assistance to the leather industry sector in Bangladesh.

The Job Description, as amended by the Project Data Sheet, is attached as Annex I.

FINDINGS

The tanning Industry

The tanneries.

The leather tanning industry of Bangladesh is still in its early stage of development. With the exception of one or two small units no tanneries existed in the area during the colonial period. Almost all hides and skins collected there were shipped west, usually to the many tanneries in Calcutta, to be processed predominantly into so called East Indian Kips and Goat skins, both types vegetable tanned. After the separation from India, however, a local tanning industry developed rapidly, aided greatly by the influx of displaced tanners from Punjab and also by the establishment of subsidiary companies to already existing tanneries in the then West Pakistan. Several units were set up in the Hazaribagh area in Dacca, some in Chittagong and a few in other parts of the country. Most tanneries in Dacca were small family operations, but soon some bigger factories were also established and this was especially the case in Chittagong. The number of units

grew in a very short period and it was estimated that just before independence there were more than 200 hundred tanneries in the region.

The struggle for independence also affected the tanning industry. Some 30 tanneries, among them some of the most productive, were abandoned by their non-bengali owners and were subsequently taken over by the government. Later, after a period of being organized as Bangladesh Tanning Corporation (BTC), they were brought under the management of Bangladesh Chemical Industries Corporation (BCIC), which now operates 9 of them, having closed down or disinvested the rest (see BCIC Tanneries). Some of the private tanneries have also closed down, a few new ones have been added, but as a result, it is today estimated that about 170 tanneries are in operation more or less regularly. Of these, 100 are recognized by the government and can as such apply for licences to import necessary tanning materials and other chemicals. In the private sector most factories belong to Bangladesh Tanners' Association, which has a membership of 139 companies. 71 of these are exporting and 68 are producing for the local market only. Apart from some ten tanneries in Chittagong, among which, however, are the largest and best equipped in the country, and a few in other towns, i.e. Jessore, Bogra and Mymensingh, the other factories are concentrated in Dacca, all in the Hazaribagh area. In 1976 a few of the most progressive and best equipped tanneries, 4 in Chittagong and 1 in Jessore, formed Bangladesh Leather Manufacturing Association in order to organize those tanneries which intend and may have the facilities to produce crust and finished leathers for export. The government have approved plans of a few private enterprises to build some modern tanneries able to make finished upper leathers in exportable qualities and quantities. The government

has also authorized BCIC to build a fairly large tannery cum shoe factory (See Dacca Leather Complex).

The tanneries are very varied as to size, processing, technological standard, equipment, management, markets etc. The quite small units, so called cottage tanneries, do not possess any mechanical equipment whatsoever. The hides are chemically treated in concrete-lined pits and all operations like fleshing and dehairing/scudding are done with hand tools on tanners' beam or, as in the case of the setting-out, on smooth stone slabs. The somewhat larger, but still very small tanneries have, besides the pits, some motor-driven paddles and drums for the chemical treatments. The mechanical work is also there done by hand. The small to medium sized plants own some machines, but unfortunately most of these have been so badly maintained as to be inoperative now. In many factories could be seen a great number of such machines - for fleshing, shaving, staking, buffing, glazing etc. - almost all rusted, broken down and in most cases unreparable. Very often, and this due to its importance for the production of Wet Blues, the only machine in operating condition in a plant is the fleshing machine. Even so, most of the hides and skins are still fleshed by hand. Few shaving machines are at work in the whole country and those that are have no precision. The maintenance even at the best factories is rather poor and consequently the machines are usually in a bad condition. One exception is a factory in Chittagong, which with the aid of a foreign technician is slowly renovating and enlarging its machinery.

Regarding the further processing from Wet Blues to finished leather it is clear that only a couple of factories, all in Chittagong, possess such machines that reasonably modern processing methods can be used. No plant, however, has all necessary machines for the production of high quality finished leather, which can be exported at acceptable prices. In the other factories the finished leathers are produced without any mechanical means, except perhaps a glazing machine.

A few of the best equipped factories in Chittagong have been idle for several years or have at most only been working intermittently. During such circumstances the machines will undoubtedly detoriate and in the end they will be inoperable or even later unreparable. Whatever the reasons it is to be regretted from a national economic point of view that such a situation is allowed to continue.

As mentioned earlier none of the present tanneries could be called large, when compared with plants in other countries. Although some companies produce large numbers of wet blue hides and skins, the fact that the processing stops at Wet Blues, greatly reduces the significance of these numbers. Thus, for example, the two, from the number of processed hides and skins, most important companies produced in the last fiscal year 1976/77 about 325,000 cow hides plus 180,000 goat skins and 100,000 cow hides plus 750,000 goat skins respectively. In both cases, the number of processed hides and skins would constitute a large tannery, if they were made into finished leathers. However, from the number of people employed, the space and machinery used, etc. they must both of them only be regarded as medium-sized tanneries.

Due to changes inside the industry and unreliable statistics, earlier estimates as to numbers of tanneries etc. have probably been to high. Without a thorough census it is unlikely that the situation will be clarified. In spite of this, from data collected in the industry, an attempt is made in table I to estimate roughly the number of tanneries, to classify them according to size etc., and to calculate their combined capacities. All the figures certainly suffer from errors, but they are given anyhow, since they still impart a useful picture of the industry as a whole.

Table I. Estimate of Tannery Sizes, Numbers and Capacities.

Tannery Size	Equipment	Number	Installed Capacities Thousand pieces per year: Wet Blue Goat	Wet Blue Cow	Finished Sole	Finished Cow
Medium-large	Few modern machines	15	14 000	2 000	100	600
Medium-small	Slightly mechanised	25	8 000	1 500	100	250
Small	A few drums	60	5 000	3 500	200	250
Cottage type	Handtools only	70	-	-	300	-
All types		170	27 000	7 000	700	1 100

A few comments are necessary :

- The figures collected are highly approximate and reflect often very rough estimates.
- Many companies grossly over-estimate their capacities.

- When the tanner makes his estimates he often calculates with all possible ways of carrying through the processes - if done usually detrimental to the quality - such as using pits parallel with drums.
- Many, if not all, tanneries have to work intermittently because of the fluctuating supply of raw hides and skins. During such conditions a much higher capacity is needed than if the factory could work at a constant rate of production.

The cottage and small tanneries employ each only a handful of people, usually composed of family members. Only in 5-6 factories are found more than 100 workers and the upper limit is about 350. BCIC tanneries employ about 1,100 workers and staff in the tanneries and 150 staff members in the regional and main offices combined. The private sector need proportionally much less staff. All in all, it may be estimated that 4,000 - 4,500 people, workers and staff, are employed in the Leather tanning industry of Bangladesh.

An ample supply of water is important to a tannery. The factories, which have their own wells, do not seem to have any problem, but those, which buy their water from the city, are hit both by the rather high price and the somewhat erratic supply. As to the effluent, all the tanneries, unrestrained by any regulations, are able to discharge their used and polluted factory waters into available drains and streams without treatment. It is obvious that this situation cannot remain unchanged indefinitely, but as yet no steps to regulate the discharge have been taken by the authorities.

Only the largest tanneries have factory buildings of bricks or concrete. All other plants use shed-like constructions, which, however, in the circumstances - climatic, economical as well as technical - must be regarded as acceptable, although improvements would be highly desirable.

Processing

The methods used in Bangladesh to tan hide materials are more or less similar to those commonly employed elsewhere. Due to differences in equipment they vary, however, very much in details. Also the chemical processes and recipes, even in making the same end product, may differ widely; some recipes are very old, some fairly new. Different types of processes are of course necessary for different kinds of leather. In Annex II will be found a simple flow chart showing generally employed tanning process with special reference to conditions in Bangladesh.

Most of the cow hides and almost all goat skins are processed into "Wet Blues", which is only the first step in the making of chrome-tanned upper leathers. The hair is removed and the first, basic tanning is done with chrome-salts giving a bluish colour to the still moist, semi-tanned leather. Some cow hides are also in Bangladesh further processed through a number of operations, as retanning, dyeing, fatliquoring and drying, into semi-finished, "crust" leathers, sometimes by adding a few operations into ready-to-finish leathers. These are all intermediate leather products, not yet finished, but having a substantial added value compared to Wet Blues.

The finished leather, today almost exclusively intended for the local market, is usually produced under very primitive conditions. The leather is dried in the sun, nailed to wooden frames. The finish coats, containing coloured pigments or dyes and binders, are then applied manually with a brush. Removed from the frames the leather is glazed in a glazing machine or ironed by hand. The resulting leather is stiff and uneven in its colour and brilliance. It is obvious, that no high quality or even fair finished leather can be produced in this manner. The best of the finished leathers produced today would not be accepted on the international market at prices that would pay for the extra processing costs from Wet Blues to finished leather.

The technical know-how, also among trained personnel, is generally rather outdated and restricted. Often the chemical processes are not well understood. As a result, inappropriate practices and inconsistent applications are frequent. In the case of Wet Blue production some irregularities repeatedly observed are :

- Mistakes are made in calculating proper amount of chemicals according to recipe.
- The weighings are done in a haphazard way - often approximate amount are measured in a bucket by eyesight only.
- The importance of correct temperatures - in bating, for example, but also in other processes - is not fully recognized. Variations load to inconsistent qualities.

- The liming is inadequate, resulting in incomplete pickle and chrome penetration, deficiencies that will later cause grave difficulties in the further processes, especially if, as is common today, very soft leathers are aimed for.
- The fleshing done by hand is uneven, leaving areas still covered by flesh tissues, which later will impede proper and even penetration.
- The chrome tanning is carried out or terminated at too low a pH. During shipping, which usually takes a considerable time, free acid might be released to cause severe damage to the grain.

A very few tanneries practice some test for the control of processes, such as the boiling test. Even pH papers are sometimes found, but the use of these and other control means is generally perfunctory and very seldom leads to any action. Most tanneries do not use any controls at all.

The know-how about the further processes, up to and including finishing is even more limited.

The productivity in all the tanneries is certainly low compared to that found in the industrialized countries. Due to the completely different product mixes it is also useless to try to express the difference in figures - they will never be comparable. As yet the low productivity is also less important because of the low pay scale. The labour cost is very small compared, for example,

to raw hide cost. To many tanners it is therefore highly convenient to keep a large working force to be able to produce at peak, w' n the supply of hides and skins is abundant.

Raw Materials

The availability of domestic raw hides and skins is the basis for the leather tanning industry. This raw material is, however, only a by-product of the meat production and the numbers available each year do not depend on the demand from the tanning industry, but on meat prices, feeding conditions, ritual sacrifices, etc. The estimates of livestock and slaughterings are very conflicting and no reliable statistics seem to exist. During the struggle for independence a large number of animals, especially cattle, were mass slaughtered, others were destroyed or lost through the storms and floods, all of which has added to the difficulties in evaluating the situation. In recent years the livestock seems to have been rebuilt up to about its former strength, but further expansion of any importance appears improbable without radically changed feeding conditions.

The take-off or slaughter of cattle should, however, be possible to increase considerably by better breeding practices. In Bangladesh the take-off appears to represent a little over 10% of the livestock, while in Europe or USA this figure would be between 35% and 42%.

There are four main types of domestic hides and skins: Cattle hides (cow hides and calf skins), Bufalo hides, Goat skins and Sheep skins. The widely differing estimates of livestock numbers and

slaughterings are reflected in table II, which has been collected or deducted from various reports and communications.

Table II. 1976/77 Livestock and Slaughter Estimates (Millions).

	Livestock between	Slaughterings between	Available* Hides or Skins
Cattle	18 and 26	2.1 and 3.1	2.5
Buffalo	0.4 and 0.7	0.05 and 0.16	0.15
Goats	8 and 12	4.5 and 9	6.5
Sheep	0.6 and 0.8	0.2 and 0.5	0.3

* Commonly accepted numbers, used in the trade to express the probable availability.

Because of the poor feeding conditions the cattle in Bangladesh is usually underfed and the animals are comparatively small. The area yield of the cattle hides is ordinarily only little more than half of that of European animals of the same sex and age. This has a positive side in that the substance and the grain of the cow hides are similar to those of large calf skins. Consequently, as such, they should have been very suitable for the production of high class upper leathers of all kinds. They are, however, often much damaged, on the grainside as well as on the flesh side, showing a number of defects caused by wounds, scratches, insects, diseases, uncleanliness, bad flaying and incorrect or late curing. As a result the hides can generally only be used for lower quality types of upper leather, often corrected on the grain or processed into specialty leathers.

A characteristic feature of the cow hides is the more or less pronounced hump below the neck. In a tannery machine such a hump might be cut through by the blades of the cylinders and serious damages caused to the hide. To avoid this it is often necessary to cut the hides into halves, an operation that sometimes reduces the value of the end product, as in the case of garment and furniture leathers.

Better quality hides and skins are usually obtained from the slaughterings in connection with the Qurbani festival as the animals selected for this purpose are treated exceptionally well before being sacrificed.

Some heavy cow and ox hides will of course be found. They are used mainly to produce, chrome-or vegetable-tanned, mechanical leathers. Some are also used for sole leather and heavy upper leather.

The real calf skins, still smaller than the cow hides, are in general much less damaged on the grain side, but they exhibit the usual bad flaying, often with deep cuts on the flesh side, which immediately will reduce their usefulness. Almost all are used for upper leathers of different kinds.

The <u>buffaloes</u> are kept as work beasts and they are much bigger than the cow cattle. The hides are therefore fairly heavy. The grain is very coarse, exhibits many defects and the hump, very pronounced on these animals, greatly interferes in the mechanical processes of making upper leather. The buffalo hides are used to

produce sole or industrial leathers, where the negative features are of less importance. The number of these hides is very small and certainly not great enough to supply all the sole leather that could be sold locally.

From an export point of view, the goat skins are the most important raw material for the tanning industry. The goats are kept on all farms as scavengers and provide an important part of the meat supply. They have a high reproduction rate and the number of skins available each year is therefore fairly great. The take-off may be as high as 80% of the livestock population.

Even these animals, however, are normally very small, the use of the skins will thus be somewhat restricted. They are, for example, very seldom being used for garment leathers, which otherwise is an important outlet for goat skins from other parts of the world. On the other hand, although small and thin, the goat skins must be regarded as among the best quality goat skins existing. Their very fine and tight grain is appreciated everywhere in the trade, they are often undamaged on the grainside, without scratches or pock marks. More than half the skins are pulled instead of being flayed and consequently show very little if any cuts on the fleshside. As in the case of cow hides, the goat skins obtained after the Qurbani festival are generally of a better quality.

The Bangladesh goat skins are primarily used in the industrialised countries to produce high fashion shoe upper and glove leathers of excellent qualities, fetching very good prices on the world market.

Sheep are relatively rare in Bangladesh. The skins, except for those quantities exported, are used mainly by small tanneries, which process them in many different ways to satisfy local demands for shoe linings, glove, garment and fur leathers, to mention a few products.

Hide Market Conditions

To avoid damages due to putrefaction before delivering them to the tanneries the fresh hides are treated with common salt. Thus cured, the salted or wet salted hides or skins, as they are now called, may under special conditions be kept almost indefinitely before processing them further. The curing is effected either by the slaughterer or by the hide collectors, but if not properly done or if the hides are kept in stock under bad conditions - high temperatures and humidities are particularly dangerous - curing damages may appear that will eventually lower the quality to a marked degree. Such curing faults can be observed rather frequently in the tanneries.

It is estimated, that only 10- 15% of all slaughterings take place in approved, municiple slaughterhouses. The majority of the animals are killed at any convenient place in the villages or at the shed of a butcher. The hides are flayed rather carelessly and in most cases the by-products, such as blood, bones, horns and hooves are going completely to waste. In some slaughterhouses the Agriculture Marketing Directorate keep trained personnel to help in improving the flaying. Some results have been achieved, but there is still a lot to be done.

In Dacca there is one cattle slaughterhouse at Hazaribagh and one goat slaughterhouse in the old town. Both are owned by the Municipality, but rented out on a yearly basis to an operator, who has put in the highest bid for the use of the facilities. These consist in reality only of a large concrete floor with channels for the drainage of blood etc., a rack with hooks for suspending the whole or part of the animal, a simple roof covering the premises and a supply of water. The owner of an animal pays a straight fee for the killing and flaying and he will remove both meat and hide or skin, usually selling the latter to a hide collector. There exists a regulation forbidding private slaughterings, but under present conditions this is impossible to enforce.

Before independence a much needed, modern slaughterhouse was projected by Dacca Municipality. The equipment was bought and, on the site selected just outside the city, some buildings were erected. Because of the intervening struggle for independence the work was stopped and has not yet been started again. Much of the equipment has in the meantime deteriorated through rust etc., and it is very difficult to find a way to determine how much can be used and how much must be replaced. A rapid solution to this problem is very much needed.

There being very few regular slaughter houses, the hides and skins are bought piecemeal from all over the country by collectors, who will in his turn sell to another, bigger collector and so on, until the hides and skins, sometimes after having passed several middlemen, reach the hide market. The knowledge of how to handle and cure hide material is very limited, especially at the first

stages of the collecting process, and it is thus easily understood, that a lot of hides and skins must be badly damaged through putrifaction, sun burns, etc. on their way to the tanneries. How much, that is lost this way is of course impossible to establish, but well-informed sources estimate the losses to be up to 30% of the total value of the hides and skins.

At the hide market the raw stock is made up into lots, usually of very mixed sizes and qualities. The tanner, in purchasing lots of these kinds, will have great difficulties in assessing them and much guess-work and gambling is involved. The lack of proper grading and also bad trade practices often employed are keenly felt by many tanners. It is significant, that some of the most successful Wet Blue tanners are former hide dealers.

The hides and skins represent for the tanner the greater part of is production costs and much capital is needed to buy and stock this raw material. This is the case in normal times, but when the prices are soaring, which happens frequently in this very much fluctuating market, the lack of capital and the obtaining of bank or other credits pose a very real problem. Comparing the capacities of the tanneries with the supply, it is evident that there are not enough hides and skins in Bangladesh to keep the Industry running all the time, except at a low capacity utilization. The competition for the hides and skins is consequently at all times very keen.

Industry Performance.

Already before independence the tanneries of the region had started to export Wet Blues to the world market, but much finished upper leathers was also sent to Pakistan. Unfortunately it is impossible to identify how much of the leather was finished and how much was Wet Blues. At present practically 100% of the exported leather is Wet Blue. The following table summarizes the total production of the tanning industry during a few recent years.

Table III. Leather Production (all numbers in million)

Type of leather	Capacity	1973	1974	Jan-June 75
Finished upper leather, sq.ft.	23.8	3.3	5.73	4.17
Vegetable sole leather, lbs	3.23	0.88	2.21	0.82
Industrial leather, lbs	0.1	0.16	0.25	0.02
Wet Blue leather, sq.ft.	50	33.04	36.80	12.51
-" - (Export Sales sq.ft.		24.99	31.30	19.72)
- " - (" " Taka		95.13	144.45	31.23

The export of wet blue leathers will be elaborated below. As to finished upper leather, calculating the need from the local leather shoe industry it also seems probable, that yearly some 4 to 5 million square feet or at the most 300,000 cow hides are processed at present.

In the official statistics the volume of leathers, when stated, is expressed in cwt (nearly 50 kgs) or in tons, both rather useless in the case of leather. It would have been much more convenient, if the volume was expressed both in area (either sq.ft. or m^2) and in

in the case of leather. It would have been much more convenient, if the volume was expressed both in area (either sq.ft. or m^2) and in pieces - preferably the former if it is possible to give only one figure. Often the types are also mixed or confused and earlier there were no separate figures for goat skins, which all made it very difficult to analyse the situation. To obtain a better basis for the estimates a detailed study of the wet blue leather export during the year 76/77 was carried out, the relevant documents made available through the Secretary, Statistics Division, Ministry of Planning. From this study table IV has been compiled.

Table IV. Wet Blue Leather Export 1/7 1976 - 30/6 1977

Leather type	Tons	Thousand Pieces	Thousand Square feet	Thousand Taka
Wet Blue Cow & Calf	5 499	2 088	46 662	336 565
" " Goat	5 317	4 575	16 904	242 891
" " Sheep	93	158	710	6 367
Total	10 909	6 821	63 276	586 023

From this table the following is calculated :

Table V. Conversion Factors 1976/77 (AVERAGE)

Leather type	Kgs/Piece	Kgs/Sq.ft	Sq.ft./piece
Wet Blue Cow & Calf	4.1	0.18	22.3
" " Goat	0.51	0.14	3.7
" " Sheep	0.59	0.13	4.5

The conversion factors have to be used with care; water content, degree of fleshing and trimming, selection, sizes etc. may change them considerably. Still, assuming that they are roughly correct, it is possible to find some further information from the official statistics. Rearranging the figures from Bangladesh Bureau of Statistics, and adding those found above for 1976/77, the following table is obtained (Round figures indicate numbers arrived at with the help of the conversion factors above.)

Table VI. Wet Blue Leather Exports, last five years

	Year	1973/74	1974/75	1975/76	1976/77
Value	Cow & Calf	47 983	52 046	165 217	336 565
Thousand	Goat	128 387	132 496	310 204	242 891
Taka	Sheep	*	*	6 156	6 367
	Total	176 370	184 542	481 577	586 023
Net	Cow & Calf	5 218	5 429	8 340	8 499
Weight	Goat	3 201	3 023	3 568	2 317
Tons	Sheep	*	*	123	93
	Total	8 419	8 452	12 049	10 909
Number	Cow & Calf	1 270	1 320	2 030	2 088
Thousand	Goat	6 300	5 900	7 000	4 575
Pieces	Sheep	*	*	210	158
	Total	7 570	7 220	9 240	6 821
Area	Cow & Calf	29 000	30 000	46 000	46 662
Thousand	Goat	23 000	22 000	26 000	16 904
Square feet	Sheep	*	*		
	Total	52 000	52 000	63 000	64 276
Average	Cow & Calf	1.7	1.7	3.6	7.21
Price	Goat	5.5	6.0	11.9	14.37
Tk/Sq.ft.	Sheep	*	*	6.5	8.97

(*) Sheep are added to Goat.

Another interesting result of the study of 76/77 exports was a table of countries of destination :

Table VII. Destinations of Wet Blue Leathers in 1976/77.

Country	Thousand Pieces of Wet Blue			Million Taka
	Cow & Calf	Goat	Sheep	
Italy	1 599	994	110	312
USSR	3	1 308	-	85
France	110	1 280	33	70
UK	215	12	-	35
Germany, Federal Republic of	50	187	2	18
Rumania	38	150	-	15
Japan	3	126	5	9
Bulgaria	27	78	-	8
Spain	-	144	8	8
Czechoslovakia	14	45	-	5
8 other countries	29	251	-	21
Total	2 088	4 575	168	586

Italy is by far the biggest purchaser, in value taking more than half of the wet blue products. This is quite natural, recognizing that Italy is a very important shoe-making country. As to goat skins, however, both the USSR and France have been importing bigger quantities. In these countries, and especially in the USSR, the goat skins are used primarily for glove leather, which fact points to the need of thinking not only of shoe upper leathers when contemplating a product mix of finished leathers.

From the study a list could also be compiled, showing the distribution of the exports between the local producers. Of the 68 exporters probably 3 or 4 were trading companies, buying up wet blue leather from different tanneries and exporting them under their own name.

Table VIII. 1976/77 Wet Blue Leather Export Distribution between Companies.

Number of Companies	Range in million Taka
2	65 - 70 each
5+	20 - 35 "
12	10 - 20 "
36	1 - 10 "
10	0.1- 1 "
3	0 - 0.1 "

(+) BCIC, counted as one company, is included here, but was selling products from 9 tanneries 1976-77.

Costs

Typical, average 1976/77 production costs for Wet Blue Goat skins and Cow hides are shown in Table IX. As reiterated earlier the export prices have fluctuated very much during this period and so have the raw hide and skin prices. It must also be remembered that costs may differ relatively widely between different tanneries etc.

Table IX. Costs of Wet Blue Production in Taka/Sq.ft. and in % of Total.

	Goat Skins		Cow Hides	
	Taka	%	Taka	%
Raw materials, Hide & Skin	13.10	91.0	5.60	77.7
" " Chemicals, etc.	0.85	5.9	1.25	17.4
Wages & Salaries	0.12	0.8	0.12	1.7
Energy, Water etc.	0.01	0.1	0.01	0.1
Interests	0.02	0.1	0.02	0.3
Overhead, Selling expenses	0.30	2.1	0.20	2.8
Total Manufacturing costs	14.4	100	7.2	100

It is quite obvious that the raw materials costs are totally dominating, representing about 97 and 91% of total costs for goat skins and cow hides respectively. In the case of goat skins, these alone represent more than 90% and even for cow hides the equivalent figure is more than 75%. All other costs are accordingly unimportant compared to even small fluctuations in the hide or skin prices.

Only a few chemicals, i.e. common salt, lime and sulfuric acid, of those necessary for the tanning processes are obtainable locally in Bangladesh. All the rest, which include the most important ones, must be imported, mainly from Europe. The Federal Republic of Germany is the biggest supplier of the different kinds of tanning materials. Some important materials as chrome salt are also sometimes obtained from India and China, although the European chemicals are preferred as more consistent in their compositions. The prices for imported chemicals vary very much depending on quality, shipping distance and country of origin. Generally speaking, the imported chemicals cost CIF 50-100% more than in Europe or USA because of shipping costs, risk premiums etc. To the prices must be added the import duty, ranging usually from 55 to 115%. For the chemicals used in the tanneries the average import duty comes out at about 100%. On top of this, however, must further be added a sales tax of 20%. The locally produced chemicals are up to five times as expensive as in western countries, but, as shown, their total cost is still very small compared to the hide or skin cost.

All tanneries registered with the Ministry of Industry may obtain <u>import licences</u> for necessary chemicals up to a certain amount.

Most tanneries, must, however, also buy additional chemicals imported against licences acquired through export performances. Almost all the cottage and other small tanneries buy their tanning materials and other chemicals in this way from exporting tanneries.

Other costs like energy and water are more expensive, but not extremely so, than in the industrialized countries. Depreciation (10% is allowed on fixed capital) is of course very low due to the generally primitive factory buildings and simple production machines. Packaging and shipping costs are relatively high. For exports wooden crates lined with polyethylene films have been used and still the shipping lines consider Wet Blues packed in this way as "dirty goods", which will be among the last to come abroad. For this reason shipments of wet blue leather might have to wait a long time in Chittagong before being loaded which besides delivery problems also causes increased costs.

Incentives.

Incentives for the export of non-traditional items like leather (including Wet Blues) have been in use for quite some time. Although there was a sales tax of 20% on raw hide and skins, Export Performance Licences (XPL),were also granted, releasing 20% of the exported value for imports of other materials. Furthermore, the duties on imported chemicals were paid back (draw backs) according to a flat rate of 0.2 and 0.36 Taka/Sq.ft. of goat and cow wet blue leather respectively.

In July 1977 these conditions were changed in order to try to induce the tanners to process the hides and skins further. The sales tax has remained and on all wet blue leather a 10% export duty is levied. The 20% XPL for the wet blue leather also remains, but instead a 40% XPL is granted on the exports of crust and finished leathers and on manufactured goods. The draw backs for wet blue leather have been cancelled, but for crust and finished leathers they will be granted according to actual value of the import duties paid, usually in the range of 0.7 - 0.8 Taka/sq.ft.

Profitability.

The production of Wet Blues is really only another and better way to present and grade the raw hides and skins. That the change has been highly profitable from a national point of view is quite evident from a look at the situation before the Wet Blue epoch and at the export sales development before and after independence. For the individual tanner, who is exporting, profit and loss is entirely dependent on the relation between raw hide and skin prices and the sales.prices achieved, plus the gain that can be made through the import licences, obtained as export incentive (XPL:s). As a matter of fact, be it the producers on the farm, the hide collectors or the hide dealers, it is the people in the raw hide and skin supply chain that have had the greatest advantage of this development. The raw hide prices per unit have reached a level very near to, or sometimes higher than that of the wet blue export prices. This situation has forced the tanner into being primarily a dealer. Buying raw material, selling the wet blue leathers and using the import licences advantageously

is more important for his profit, than any action he can take in the tannery itself. It is therefore also easy to explain the evident lack of interest in better processing methods, productivity, development and the like.

Future Outlook - Marketing considerations.

Domestic demand in Bangladesh will probably grow at a slow rate. Taking into account the necessarily slow increase in earning power and the relatively high prices of leather products, which prices are very unlikely to decrease since the high cost of the raw hides is and will be predominant, it will certainly take a long time for the demand to grow to such proportions that sophisticated machines etc., for this reason alone, would have to be introduced. Available buffalo hides, lower selection cow hides and a great part of the sheep skins will also in the future be tanned and finished for the local shoe and leather goods manufacturing industries.

On the export market there can be seen no great changes as to the wet blue leather, since almost all available hides and skins are now processed and the prices have reached more or less those normal to the world market's. Certainly improvements, especially in quality and process consistency, could and should be aimed for, improvements that surely would lead to significantly higher prices.

The real changes, however, would take place if further processing would be carried out to any greater extent, in the first place into crust or ready-to-finish and later into finished leathers.

The advantages would be obvious: above all added value and as a consequency increased foreign exchange earnings, but also better classification of the hides and skins, less shipping weight and easier packaging - "clean goods". Nevertheless there are some aspects of such a new marketing situation, which has to be recognized. Further processing will sharply narrow the possibilities of utilization in the countries of destination, resulting in a smaller market to explore and more competition to deal with. The negative influence of the great distance to the significant markets will also grow considerably. The Bangladesh goat skins, for example, fetch very good prices as wet blues because they can be made into very high class fashion leathers in special finishes and colours and thereby still be profitable. To accomplish this, however, a close cooperation between the tanner and the customer and very short delivery and shipping times are necessary conditions, which are extremely difficult if not impossible to attain in this country. The methods used for the production of the high fashion leathers are very sophisticated and the workers highly skilled. The further processing of goat skins is thus to be approached cautiously and with the understanding, that to reach an acceptable level in Bangladesh will require much time, great efforts, new technical know-how and skills and comparatively large investments in new machinery.

In the case of cow hides, further processing should certainly be profitable, in the first stage to crust and later to completely finished leathers. The raw material is of a lower quality and consequently the wet blues fetch comparatively low prices on the world market. Finished leathers, properly processed, although

generally not expected to fetch very high prices due to circumstances already described, should nevertheless bring in a considerably increased amount of foreign exchange. Even in this case, improved and new technologies and machines are required.

The economic gains for the country in finishing its cow hides can be roughly calculated from a typical costs/sales estimation, such as the one in Table X. The estimation has to be used cautiously - as shown earlier the prices of all kinds of leather have been fluctuating very much this year and at the same time it must be realized, that the costs may vary much between different tanneries.

Table X. Costs/Sales estimation (August 1977).

	Cow Hide Leathers		
Costs in Taka/Sq.ft.	Wet Blue	Crust	Finished
Hide material	7.50	7.50	7.50
Chemicals etc.	1.25	2.20	3.25
Wages, salaries	0.15	0.30	0.85
Other inputs	0.20	0.35	0.55
Manufacturing profit	0	1.85	2.95
Export prices	9.1	12.2	15.1

In the fiscal year 1976/77 was exported 46.7 million sq.ft. wet blue cow and calf leather, bringing in 336.6 million Taka in foreign exchange earnings (table IV). Using the above ratio between export prices, which can be done to calculate approximate figures, the same amount of crust or finished leather should have brought

in 451 and 559 million taka, i.e. increased foreign exchange earnings of 114 and 222 million taka respectively.

Recognizing that the goat finishing is a more complicated matter, in the long range even that should be possible to accomplish. In such a case the total export earnings in today's prices, and also taking into account other measures in the treatment of raw hides and skins, should eventually reach and pass 1 billion taka - from present 586 million taka.

In the private industry the interest for further processing is evident. The experiments in this field have so far, however, hardly been encouraging, because of the low qualities achieved. It is obvious, and almost all interested parties agree to this, that new technical methods have to be introduced and this can only be done through a technical aid program with experts from abroad. Joint ventures with a partner having extensive technical and marketing knowledge would in this sense be by far the best solution in any individual case.

Leather Goods Production.

There are 5 so called mechanized shoe factories in Bangladesh. The biggest, member of a well-known international chain of shoe factories and shoe shops, has a large, well equipped and managed factory, producing about 6,000 pairs of leather and 4,500 non-leather shoes per day. The shoes are very simple in design and composition, the 200-300 pairs per day of high fashion shoes sold by the company are manufactured for them by small units, employing only a few workers each.

The design and techniques necessary has been taught by the purchasing company who has also set the quality standard to be followed.

The other mechanized factories are not producing up to their capacities for several reasons; lack of capital, technology, management experience, maintenance etc. Some are very much run-down with rusted and inoperable machines. Again the lack of proper maintenance is an obvious problem.

As to the small units, most of them are located in the old town, Dacca, but many are also found in other towns of the country. No statistics exists as to their number, but in Dacca alone there are believed to be more than a thousand of such small family factories, producing all kinds of leather and non-leather footwear. Typically, the daily production of high fashion leather shoes, for example, in such a unit would be between 7 and 15 pairs. It is estimated that all in all about 2-3 million pairs of all kinds of leather footwear is produced annually in Bangladesh.

A few small factories produce leather goods: travel bags, hand bags, wallets, beauty boxes and so on for the local market and the tourist trade. Some factories also carry out tanning of reptile and other wild animal skins for their own leather goods production. The processes employed are usually either primitive, vegetable or simple, alum tannages. Some of them also export pickled skins, such as water snake, in quite big quantities.

Although sometimes very much in demand by tourists, the leather goods articles mentioned are usually of a fairly poor workmanship and the tannages of a low quality. Without doubt could much better economic results be obtained from the raw materials in question : snakes, lizards, crocodiles, fur skins etc. with proper tanning and manufacturing methods and skills. Even in this area technical assistance is in great need.

Related Activities.

Export Promotion Bureau (EPB).

Created to aid the exporters in their relations with foreign buyers on one hand and the government authorities on the other, this government agency has a special department for leather and this department has made, and is making efforts that are very much appreciated by the trade, the tanning industry as well as the leather goods manufacturing industries. This year the government has also decided to give EPB an autonomous status, which will facilitate its decision making and its cooperation with industry etc.

EPB promotes goods from Bangladesh through fairs and exhibitions abroad, through trade delegations to different countries and by other means. Leather and leather goods are often involved in these activities. The bureau has repeatedly pointed out the deficiencies inside the leather industry, more or less agreeing with those observed here, and has also underscored the importance of inducing the tanning industry to process the hides and skins further.

In its "Proposed Export Policy 1977-80, June 11, 1977, EPB", the bureau has suggested a series of measures for the development of the leather industry and its trade. The industry-related proposals are very similar to those of this report.

Research and Development (R&D) - BCSIR.

No tannery in Bangladesh has any R&D department. As to more sophisticated research this is understandable under the circumstances, but at least the larger tanneries should have had some organized development work going on. The little that is being done is always carried out by the technical manager in charge directly in the factory.

For the tanning industry as a whole some R&D work is carried out by the Bangladesh Council of Scientific and Industrial Research (BCSIR) in Dacca. In its laboratories at Mirpur Road, Dhanmondi is also found a Leather Technology Division, employing a staff of four and five helpers. There are some testing and pilot plant machines, but for a more organized R&D work the division is too poorly staffed and the equipment totally inadequate. In spite of this, some 15 industrial processes have been developed earlier and leased to industry. At the moment, however, these activities are more or less dormant. The work has mainly concerned

- isolating tanning materials from indigenous trees or their bark
- utilization of same for different tanning purposes
- processes to manufacture industrial leathers
- use of hide and leather wastes.

BCSIR has had plans to enlarge the leather division and to diversify its activities. A site for new laboratory buildings at Nayarhat, about twentythree miles northwest of Dacca, had been selected and 1.1 million Taka have already been spent on the project. The government, however, suspended the project in 1972 due to economic difficulties. In 1976 a revision of the project was undertaken and this revision is now under discussion.

Training - The Institute of Leather Technology

The institute, located in Hazaribagh, is devoted only to the teaching of students in the leather technologies. It has, however, a large ground, excellent buildings with class rooms, laboratories and offices, a lecture hall, which has never been used, and a very good tannery building with a nearly complete range of tanning machines (pilot plant). Unfortunately, due to the almost negligible use of the machines and the inadequate maintenance, most of the machines and other equipment, as drums and paddles, are inoperable. Funds for maintaining the machines and for buying necessary raw materials to run them have also been much too small. Thus, this year only 10,000 and 30,000 Taka were granted for these purposes, which of course is far short of what is necessary to keep machines and equipment in reasonable working conditions. By t is time much of the equipment has also become outdated and obsolete through the rapid technical developments of later years. Apart from these circumstances the machinery at the institute by far surpasses most of those of the largest tanneries in Bangladesh and it must be regarded as a near tragedy that the equipment cannot be used to a better purpose.

The institute offers three different courses: a 3-year diploma and a 2-year certificate course in leather technology and a one-year course for technicians in shoe and leather goods manufacturing. Last year for the first time since independence, the students from the 3-year diploma course were examined. The total number of students at the institute is at the moment 105.

Unfortunately, due to lack of competent teachers in the speciality of leather technology, the rather low educational level of the student's body in general and the lack of physical facilities in laboratories and pilot plant, the students leaving the institute cannot be regarded as leather technologists of international standard. To be able to assist in the much needed conversion of the tanning industry of Bangladesh into a modern and efficient industry, the teaching and training at the institute must be upgraded.

Only the principal, Ph.D. in tanning chemistry from the University of Leeds, and his assistant are trained in the science of leather. Most of the teaching staff of 10 are university graduates in chemistry, business administration or the like. A few are leather technicians of a rather low level from Dacca or Madras. To this could be added five specialist workers who are instructors in the pilot plant.

Dacca Leather Complex.

The then Bangladesh Tanneries Corporation, when originally organised, made plans to establish 3 integrated tanneries cum shoe factories. Two of these were included in the first Five-Year Plan of 1973. At the end of 1975 a revised plan, with cost increases up to

that date taken into account, for one of the factories to be established in Dacca (Tongi) was approved and 266 million Taka, with a foreign exchange component of 117 million Taka, were allocated for the project by the government on the basis of tentative but specific figures supplied by the Czechoslovak company INVESTA. An agreement was signed in December 1975 with this company for the purpose of obtaining, at a cost of £Stg 147,000, a complete and comprehensive project document for the proposed leather complex, to be followed by an offer of the necessary machines, equipment and services for the implementation. The documents were to be delivered after 6 months, but due to delays for various reasons they were not received in Dacca before February 1977, which almost coincided with the arrival of the negotiating team from Investa.

The leather complex was to be designed for the following product mix and yearly capacities :

Tannery	Number of Hides/Skins	Square feet of Finished Leathers
Corrected grain, smooth	156,000	3,120,000
" " embossed	120,000	2,400,000
Full grain	24,000	480,000
Total Cow Side leather	300,000	6,000,000
Black glazed kid	225,000	900,000
Dyed kid skins	375,000	1,500,000
Lining leathers	150,000	600,000
Total Goat Skin leather	750,000	3,000,000
Total cow hide and goat skin leather		9,000,000

Shoe factory	Pairs	Upper leather required sq.ft.
Shoes	180,000	450,000
Sandals	225,000	225,000
Military Boots	100,000	300,000
In total	505,000	975,000

Analysing the proposal from a technical and marketing point of view, the following comments could be made :

i) The machinery was technologically sound and adequate for the proposed production, but

- in both tannery and shoe factory there would be large, at some points huge, overcapacities, i.e. too many or productionwise too big production machines were proposed,
- some of recent, universally accepted, technical improvements in machines were not incorporated, e.g. hide liming mixers, retanning/dyeing machines, vacuum driers, stone polishing machines, recycling systems.

ii) The production lines were designed to be as highly mechanized as possible, the machines as such as well as the internal transports. In a country with large underemployment in industry the main feature should have been to use manual work wherever possible without risking the product quality.

iii) It is very doubtful if the suggested product mix represents a good solution. The Bangladesh cow hides, for example, are generally very small and thin and are thus less suited for corrected side leathers to which types the cow hide production line was specifically geared. In the case of the goat

skins it can be questioned if the rather large percentage of small skins are best suited for shoe upper leather. Making them into glove leathers etc. would surely be more profitable. A radical change in the product mix would, however, obviously be difficult to accomplish.

iv) The auxiliar departments, Laboratories, Maintenance, Boiler plant, etc. were all designed to be absolutely self-contained. This would give enormous overcapacities for work that very often would be only intermittent. Much of the activities could just as well - or almost just as well - be carried out at existing or proposed facilities outside the leather complex. For a plant of this size the auxiliary departments must be regarded as excessively large.

v) Also the services, especially as to the number of foreign specialists for the supervision, installation and training of local management and labour, seem excessive indeed. Less than half the proposed number should be able to carry out these tasks successfully.

It is regretable, that a neutral specialist, well versed in the international leather trade, technically and economically, was not available to help in preparing the basic specifications for the complex, above all in defining the product mix. Such a preparatory work would have been essential for a proper selection of technologies, machines, etc.

During the extended technical discussions the cost factors, i.e. the prices for machines and services were not mentioned, a fact which often caused difficulties, as quality is intimately related to price

even in this case. When the quotation for the foreign component of the complex was released, it was found to be 257 million Taka, an increase of 120% over the estimate of December 1975 at 117 million Taka. Later, after some reduction in production machines and auxiliary equipment following the technical discussions, the offer was reduced to 148 million Taka. Bought on the world market under the same conditions, the cost of as nearly the same equipment and services as possible was estimated at 127 million Taka. It is, however, clear that a factory with the same capacity could be built much cheaper and still, as to the tannery part, be more flexible in its product mix and just as modern, although not as mechanized, as in the Czechoslovak proposal. Such a factory, including the shoe factory and necessary services for its erection and starting-up period, could probably be built with a foreign exchange component of less than 75 million Taka.

In assessing the viability of the proposed leather complex, which is more or less the same as to assess the viability of the tannery part, there were two possibilities to consider :

- If, as was originally anticipated, the Czechoslovak or its affiliates agreed to lift the whole leather production at a reasonable, predetermined price, e.g. on a cost plus basis, the viability of the project would be incontestable and would need no discussion.

- If, on the other hand, the production was to be sold on the international market under normal competitive conditions, the case would be quite different. Due to the difficulties in estimating sales prices for the proposed products, the

majority of which would be of types not much represented in today's market and consequently would probably fetch low prices, it was impossible to make a meaningful profit/loss calculation. An estimation of the capital costs were instead illuminating. Taking the investment for the tannery alone to be 121 and 127 million Taka in foreign and local currency respectively, assuming a repayment period of 12 years and 5% interest (average of 10%) for the foreign and 10% interest only in the local component, the total yearly capital cost would be about 28.8 million Taka. Calculating with a yearly production and sale of 8.1 million square feet of finished leathers, which represent an optimistic 90% of proposed capacity, the capital cost alone would burden each square foot with about 5.5 Taka or 23 cent. This is an incredibly high figure, which by itself would make it very unlikely indeed, that the leathers could be sold at a profit on the world market.

BCIC after reviewing all factors, technical, financial as well as commercial, decided later not to accept the Investa offer, especially in view of the government being able to utilise the Czechoslovak credit for other important purposes.

During the negotiating period, advice concerning possible or alternative solutions to different questions, for example concerning production mix, production lines, organization, factory lay-out, commercial considerations, technologies, machines and costings, was provided to the management of BCIC and the Leather Complex.

Especially, in considering other sources for the machines, technologies and services to the leather complex, it was proposed a schedule to be followed by the prospective supplier in consultation with the investigating team. The foreign firm/organization should

i) define an appropriate product mix, based on available raw hides and skins and existing export market requirements,

ii) formulate the technologies to be used in producing the accepted product mix,

iii) design the plant and specify the production and auxiliary machines most suitable for the purpose, taking the basic process concepts, optimum techno/economic factors and flexibilities as to future changes in the product mix into consideration,

iv) execute and/or control the purchasing of all the necessary machines and equipment from abroad,

v) supply basic specifications and/or drawings for buildings and equipments to be constructed and made locally,

vi) provide technical and other assistance for the building of the plants, installation of machines and equipments, training of technical personnel and labour and running of the factories for a predetermined time,

vii) give capacity and product quality guarantees,

viii) assist in marketing the finished products in the EEC and other foreign markets,

ix) specify and elaborate the above undertakings in a Project Document.

BCIC tanneries.

During the struggle for independence some 30 tanneries were abandoned by their non-bengali owners. They were taken over by the government and organized in Bangladesh Tannery Corporation. This corporation was later in 1976 amalgamated with other industries to form Bangladesh Chemical Industries Corporation (BCIC). Two groups were constituted, the Dacca Leather Group and the Chittagong Leather Group, each under a general manager. Early it was found that 6 tanneries had not been working for a long time and were therefore closed down definitely. During the following years the production was concentrated to still fewer units and the superfluous plants were put up for disinvestment. Today Dacca Leather Group is operating 6 and Chittagong Leather Group 3 tanneries. In principle it has been decided by the government to disinvest also these tanneries.

The operational results of the nationalized tanneries have been disappointing. The yearly production targets, although much below actual capacities, have never been reached except on one or two occasions. The table in Annex III demonstrates clearly the situation. Without rather big subsidies in one form or the other their position would have been untenable. The reasons for this are several :

- Already from the beginning most or all units had heavy financial obligations to the banks and financing the different purchases seemed always to pose grave difficulties.
- In most cases an excessively large labour force had to be paid, irrespective of production volume.
- A very cumbersome organization structure, each unit having its own manager as well as its own technical and administrative staff, but still rigidly controlled as to all real decisions by the central organisation of BCIC. An adjustment in a processing recipe, for example, often so necessary for the preservation of product quality, involving a change in type or amount of chemicals to be used, would cause a lot of problems and excessive paper work because of the existing, rigid instructions that had to be followed.
- The run-down conditions of the plants. Many of the drums and paddles were dried out, rusted and inoperative. The majority of other machines, e.g. fleshing, shaving, staking, buffing, glazing machines, were also inoperative

and usually also unreparable. The maintenance had been very bad and is still unsatisfactory.

- The lack of technically trained and experienced tanners as well as of managers with an intimate knowledge of the leather trade. The earlier owners in these respects left a vacuum difficult to fill. Several of the tanneries were each provided with a young graduated chemist as technical manager, but without training in leather technology and without proper backing, they have not yet been able to produce desired results, although they have been working with the best intentions.

The question of the balancing, modernizing, and rationalizing (BMR) of the different tanneries was originally decided to be analyzed in detail. All the tanneries in Dacca and Chittagong were visited and thoroughly studied. Starting with the Dacca Leather Group tentative solutions were discussed with the general manager, such as a concentration of the production to one or two units, at the same time pooling the resources of machines, other facilities and the manpower. A provisional list of new machines for present production as well as for a cautious development into high quality finished leathers was compiled and a suitable location and lay-out of an appropriate factory was discussed.

Concurrently, in order to bring immediate technical assistance to the Government tanneries, a small seminar was organized at one of the plants in Dacca, where all the management staff, from the group general manager to the individual technical managers, were present. Processing methods and their ramifications for the production of Wet Blues, for cow hides as well as for goat skins, were discussed in detail. Underlaying

principles were explained and causes of bad results commented upon. Simple, but effective processing and quality control methods were described.

After the official decision by Government to disinvest all existing tannery units these activities were terminated.

CONCLUSIONS and RECOMMENDATIONS.

The leather Industry in general.

It is very evident from the foregoing that comprehensive technical assistance to the leather and allied industries in Bangladesh is greatly in need. In this context it is recommended

1. That the proposals as described in the attached Draft Project Document (Annex IV) are implemented as rapidly as possible.

The Public Sector Leather Industries.

As has been mentioned earlier, the government intends (a) to build and run a fairly large tannery cum shoe factory (leather complex) and (b) to disinvest existing nationalized tanneries.

These decisions seem well founded. On one hand the leather industry must develop more rapidly than up to now and one way would certainly be to establish a modern tannery, importing necessary machines, know-how etc. for a decisive change of the situation. In the process all the problems, headaches and mistakes as well as the economic uncertainties, especially as to the marketing of the products, always connected with such an undertaking, have to be accepted. On

the other hand, the existing, nationalized tanneries are run-down, do not possess neither the physical facilities nor the technical and managerial knowledge and experience needed. A clean break and a completely new start could look like the best solution in the actual situation. If this alternative is selected a planning/executing team should be appointed soonest and a leather specialist with a thorough international leather industry experience, technical as well as commercial, should be employed to aid the team in all its activities. This would reduce the risk of mistakes caused by national, company or personal prejudices, which are often unwittingly encountered in such circumstances. The team would gain experience so that later it would be able to discuss and negotiate effectively with prospective collaborators or sellers of machines, services etc. In the planning of a leather complex as discussed, it is thus recommended

2. that the following procedure is followed :

- A small team, headed by the general manager to be of the complex, accompanied by an international leather specialist, is sent to Italy, France, Germany, Federal Republic of, the United Kingdom and perhaps one or two of the Benelux or Nordic countries on a 6 weeks' tour to study

  i) the use made in these countries of Bangladesh Wet Blue cow hides and goatskins of different selections and sizes,

  ii) the prices obtained for the finished leathers,

  iii) appropriate technologies and machines for a production of similar types,

iv) possiblo cooperation with European tanneries and shoe factories, also keeping joint ventures in mind.

In spite of what has been said above, there is also another approach which certainly would save considerable amounts of money, in local as well as in foreign currencies, which would probably not unduly delay the desired development of the industry and which should therefore be considered carefully. Such an approach would comprise several coordinated steps, most of them discussed earlier. Thus the first steps would be the same as those suggested for the implementation of a leather complex. In case this alternative is selected it is recommended

3. that the following procedure is followed :

- Recommendation 2. is implemented.
- A comprehensive step by step plan is simultaneous devised and executed, in principle comprising the following phases :

i) Modernizing and concentrating the present production to two or three adjacent tanneries.

ii) Acquiring a few new machines for a small production of crust and ready-to-finish leathers. (These should be exportable with a greater added value than the Wet Blues).

iii) Adding a small finishing plant, sufficiently equipped for high class work and starting making finished leathers initially for the local

market, using modern technology but reject Wet Blues or Crust, that had not been possible to export. (Gaining experience, it should be possible in a fairly short time to make exportable finished leathers. The finishing machines, just as the earlier few machines, could be acquired through a comparatively modest investment, but the experience gained should be invaluable).

iv) Planning and executing the transfer of equipment and personnel to the new leather complex. (The planning/executing team with the aid of the leather specialist should now also be experienced enough themselves to plan, project and execute the complete leather complex. Needed then would of course be clerical staff and other local specialists could and should be called in when necessary, e.g. civil engineers, electric engineers, etc. The new or otherwise useful machines and other equipment from the old plant should be transferred to the new complex and the production phased over. The installation work could be effected by specialists from the machine suppliers, but for the training of technicians and for the running-in period a certain number of foreign technicians would be necessary. Through the earlier work, however, a small cadre of locally trained workers and technicians would be available, a fact that would make these tasks considerably easier to carry out. If a UNDP-project of assistance to the leather industry should be implemented, its experts would of course be available for consultations and help at all phases of the execution of such a plan).

Annex I

J O B D E S C R I P T I O N

SI/BGD/76/809/11-01/31.7.D

POST TITLE	**Leather Industry Adviser**
DURATION	**Six months**
DATE REQUIRED	**As soon as possible**
DUTY STATION	**Dacca**
PURPOSE OF PROJECT	**To assist the Government of Bangladesh in the formulation and preparation of a project for assistance to the leather industry sector in Bangladesh.**
DUTIES	**The expert will be attached to the Industries Division of the Ministry of Industries and will specifically be expected to:** **1. Assess the situation of the entire leather industry sector in Bangladesh and identify the need for assistance to the leather producing, as well as to the leather utilizing industries.** **2. Review the existing facilities and work programme of the Leather Development Institute in Dacca as well as its future development plans and identify the need for assistance to this institute.** **3. Work out details of the technical assistance needed to the entire leather industry sector including the Leather Development Institute and prepare a project proposal for such assistance.** **4. Prepare a first draft of the project document for this project.** **The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the Government on further actions which might be taken.**
QUALIFICATIONS	**Leather Industry Adviser with extensive experience in the leather industry field, including experience working as a United Nations expert, as well as familiarity with UNDP requirements for the preparation of project documents for large-scale projects.**
LANGUAGE	**English**

Annex II

CHART of TANNERY PROCESSES (commonly employed - variations exist)

Note: FLESHING (in Capitals) - Operation performed by hand or in machine.
soaking (small letters) - Wet process performed in drum, paddle, pit, etc.

[WET BLUES] - Intermediate or finished product.

(Slaughtering and Flaying)

[Fresh (green) Hides and Skins]

(Curing)

[Wet-salted or Dried Hides and Skins]

soaking dehairing liming FLESHING SCUDDING SPLITTING

[Limed Stock]

deliming bating

pickling chrome-tanning SAMMYING SAMMYING SHAVING veg-tanning

[WET BLUES]

fatliquoring DRYING
retanning greasing
dyeing STUFFING
DRYING SETTING-OUT

neutralizing retanning fatliquoring
dyeing SAMMYING SETTING-OUT DRYING

[CHROME LEATHER CRUST]

[VEGETABLE LEATHER CRUST]

CONDITIONING STAKING (BUFFING)

[READY TO FINISH LEATHERS]

FLESHSIDE BUFFING BRUSH-coating SPRAY-coating DRYING
DRYING IRONING/PLATING GLAZING ROLLING

[VELOUR LEATHERS]

[FULL GRAIN or CORRECTED GRAIN CHROME UPPER LEATHERS]

[VEGETABLE UPPER LEATHERS]

[SOLE LEATHER]

TRIMMING MEASURING/WEIGHING GRADING PACKING DISPATCHING

Annex AII

BCIC TANNERIES 1972-1977, CAPACITY, TARGET, PRODUCTION AND SALE

(In thousand hide and skins)

Note: E = Export;, L = Local Sale; NR = Not Recorded.

Name of Company	Products	Installed Capacity	Target	1/7 1972-30/6 1973 Production	Sale	1/7 1973-30/6 1974 Production	Sale	1/7 1974-30/6 1975 Production	Sale	1/7 1975-30/6 1976 Production	Sale	1/7 1976-30/6 1977 Production	Sale
Dacca Group													
Bangladesh Chrome Tannery	Wet Blue Cow Hides	40	24	15	4.9 E	1.2	- E	1.4	6 E	2.6	8.7 E	17	10 E
	" " Goat Skins	500	300	532	268.3 E	70.7	163 E	166.1	198.2 E	61.5	58.5 E	39.2	52 E
	Cow Sole Leather	20	9	-	4.4 L	-	- L	0.3	0.5 L	0.3	2.2 L	2.6	3 L
Bengal National Tannery	Wet Blue Cow Hides	-	-	30	27 E	8.7	10.0 E	3.3	10.9 E	-	1 E	-	- E
	" " Goat Skins	750	450	218	196 E	264.8	157.2 E	229.3	226.1 E	86	106.5 E	186.7	110 E
	Cow Sole Leather	-	-	-	0.7 L	-	- L	-	0.4 L	0.4	0.3 L	-	- L
Dilkusha Tannery	Wet Blue Cow Hides	60	36	36	22 E	12.5	11.4 E	11.5	17 E	13.6	4 E	22	27 E
	" " Goat Skins	300	180	18	5.5 E	50.3	9 E	179.2	155 E	18	10 E	23	28 E
	Finished Cow Leather	-	-	0.7	1.7 L	0.9	- L	0.2	- L	-	-	-	-
	Cow Sole Leather	-	-	0.2	0.9 L	0.1	0.1 L	0.2	0.1 L	0.1	0.2 L	-	-
East Bengal Tennery	Wet Blue Cow Hides	60	36	24	15 E	10.6	- E	7.6	11.7 E	2.7	10.3 E	17	12.5 E
	" " Goat Skins	300	180	52	33 E	37.4	32.2 E	102.6	80 E	16.3	43.5 E	40	2 E
	Finished Cow Leather	50	17.2	-	0.7 L	0.6	- L	-	0.5 L	-	1.2 L	3.1	2.2 L
National Tennery	Wet Blue Cow Hides	60	36	29	16.7 E	21.3	9.7 E	6.4	5.7 E	11	42.5 E	30.9	21 E
	" " Goat Skins	500	300	330	200.3 E	276.7	175.2 E	247.8	304 E	50.4	96 E	83.6	89 E
Hafiz Tannery	Industriel Leather	15	9	0.8	NR L	0.7	NR L	2.5	NR L	1.8	NR L	2.5	NR L
Chittagong Group													
Madina Tennery	Wet Blue Cow Hides	60	45	33	34.6 E	21.8	5 E	26.5	15.2 E	13	55.2 E	43.1	41 E
	" " Goat Skins	1,000	300	193	169.6 E	195.9	187 E	156.2	135.5 E	63	66 E	58.7	64 E
	Finished Cow Leather	25	6.5	-	- L	0.1	10.5 L	-	- L	-	1.7 L	2.5	4.5 L
Orient Tannery	Wet Blue Cow Hides	40	24	10	2.7 E	9.7	- E	10.2	6.5 E	12.8	22 E	26.8	24.5 E
	" " Goat Skins	400	240	74	69 E	34.5	27 E	30.4	27.4 E	40.2	28 E	25.6	15 E
	Finished Cow Leather	25	15	2.3	4.2 L	1.6	0.9 L	-	1.7 L	-	-	-	-
	Cow Sole Leather	-	-	-	1 L	-	-	-	-	-	-	-	-
Modern Pickers	Wet Blue Cow Hides	-	-	2.9	1.8 E	-	-	-	-	-	-	-	-
	Finished Cow Leather	-	-	-	- L	0.4	- L	-	-	-	-	-	-
	Industrial Leather	12.5	7.5	1.1	NR L	2.6	NR L	1.6	NR L	1.8	NR L	3	NR L

Source: BCIC

Annex IV

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

BANGLADESH

Draft Project Document

Title : Leather Industries Development

Number : Duration: Two and a half years

Primary Function: Direct Support

Secondary Function: Institution-building

Sector (Govt class) Industries (UNDP class and code): Industries (35)

Subsector (Govt class): Leather Industries (UNDP class and code): Establishment and extension of manufacturing industries (3521)

Government Implementing Agency :

Estimated Starting Date: April 1978

Government Inputs _____ (in Kind)
(Taka)

UNDP Inputs 1,213,750
(US Dollars)

Signed: _____
on behalf of the Government

Date _____

_____
on behalf of the Executing Agency

Date _____

_____
on behalf of the
UNITED NATIONS DEVELOPMENT PROGRAMME

Date _____

PART I Legal Context

This project document shall be the instrument (therein referred to as a Plan of Operation) envisaged in Article I, paragraph 2, of the Agreement between the Government of Bangladesh (GOB) and the United Nations Development Programme concerning Technical Assistance under the Special Fund sector of the United Nations Development Programme, signed by the parties on 12 and 31 July 1972.

PART II A. Development objectives

The long-term objectives of this project will be to build up a leather industry in Bangladesh with the ability, with the use of locally available raw materials, to produce finished leather and manufactured leather goods, a large part of which will be exported and thus help increase the country's foreign exchange earnings.

PART IIB. Immediate objectives

- to improve the quality of all kinds of leather through correct and better production methods.
- to facilitate marketing efforts through establishing well defined categories (grades/selections) of the products.
- a continuous increase in the local production of semi-processed and finished products.
- to assist expanding and improving the Institute of Leather Technology at Hazaribagh to serve the industry as well as Government Departments in fields relating to leather.

PART IIC. Special consideration

Not applicable.

PART IID. Background and Justification

The first Five-Year Plan, approved in November 1973, aimed at increasing the leather production more than 170% - from approximately 62 to 169 million square feet - an increase partly to be achieved by better utilization of existing and by the creation of new production facilities.

Bangladesh has sufficient raw hides and skins to sustain a healthy and rather large leather industry. The raw materials, however, except for a small part manufactured into relatively low grade finished leathers for the local market, is processed almost exclusively into Wet Blues, which is only one of the first steps in the leather making process. Yearly about 2.5 million cattle hides and 6.5 million goatskins, besides relatively small amount of buffalo hides and sheep skins, are available in the country. The cattle hides as a rule are small and thin and suffer from damage to the grain as well as the flesh side. The goatskins, although generally also small and thin, are on the other hand otherwise of a very good quality, possessing a fine, smooth grain usually free from grain damage

Some 170 tanneries are found in the country, most of them small with very little mechanical equipment. About 70 "cottage tanneries" have no such equipment at all, but only pits and tanner's beams. None of the factories can be said to be large and none is really

modern in processing or equipment. Only a very few tanneries have some modern machines and this is especially the case when considering leather finishing. The existing machines are also usually in bad shape. Most of them are inoperative and many even irreparable. No tannery in Bangladesh today has facilities, neither as to machines, nor to know-how to be able to produce finished leather acceptable on the international market.

Except for 10 plants in Chittagong and 2-3 at other places in the country all the tanneries are situated in the Hazaribagh area of Dacca. When Bangladesh was established, 30 important tanneries were abandoned by their owners and subsequently nationalized by the government. Today Bangladesh Chemical Industries Corporation (BCIC) under the supervision of the Ministry of Industries is operating 7 of these tanneries in Dacca and 3 in Chittagong, while some of the others have been disinvested.

There are only a few mechanized shoe factories in the country. With one exception these are under-utilized and their machines are in very poor condition because of bad maintenance, especially during the extended periods when they were standing idle. A large number of very small units produce all kinds of shoes including high fashion types, by simple hand methods. Disregarding leather quality, which for reasons already given is rather poor, and taking existing conditions into account, the quality is sometimes suprisingly good, but there remains much to be done to reach a uniformly acceptable level.

It is the policy of the government that indigenous raw materials should be utilized to the utmost, earning more foreign exchange at export by attaining greatest possible added value. The government is also aware of the big opportunities which exist in this respect if raw hides and skins were converted into finished leathers and even further into manufactured leather goods. In the fiscal year 1976/77 exports of wet blue leathers were bringing in 58.6 crores taka (586 million taka or about 38.5 million US dollars) in foreign exchange. With wet blues converted into finished leathers, this amount would probably have been more than 100 crore taka with added export earnings of more than 40 crore taka.

To capture at least part of the possible added value the Government is considering the establishment of a fairly large complex, leather tannery cum shoe factory, but it also recognizes the need of immediate technical assistance to the whole industry to achieve maximum results.

A FAO mission (Report of a HIDES, SKINS AND ANIMAL BY-PRODUCTS MISSION TO SELECTED COUNTRIES IN ASIA (BANGLADESH); Food and Agriculture Organization of the United Nations; Rome, 1976) who visited Bangladesh in 1975 underlined the importance of the development in the sector, especially stressing the need for improvements in the treatment of the hides and skins and by-products utilization. Projects for a Research, Development cum Training Centre for Hides, Skins, Leather and Allied By-Products, for Quality improvement of hides and skins - their grading,

standardization and marketing and for the upgrading and strengthening of the Institute of Leather Technology, Dacca were proposed.

Similarly a World Bank mission in December 1975 and March 1976 (Report No. 1219-BD:, Bangladesh: Survey of Steel, Pulp and Paper and Leather Tanning Industries, November 30, 1976; Industrial Projects Department, Document of the World Bank) strongly advocated a technical assistance programme to help the industry in converting from wet blue to crust and finished leathers.

A thorough understanding of the marketing problems is vital for a favourable development of the industry's exports. To this end the government is implementing a project a t the Export Promotion Bureau (EPB) - BGD/05/48 - Integrated Programme of Technical Cooperation for Trade Promotion of Bangladesh, executed by International Trade Centre, UNCTAD/GATT (ITC) and financed by the Swedish International Development Authority (SIDA), which project will provide Advisers on marketing of four specific groups, among them leather products.

Export Promotion Bureau has also in its "Proposed Export Policy 1977-78", June 11, 1977, EPB proposed a series of measures for the development of the leather industry and trade, in its industry-related part similar to those expounded elsewhere.

A UNIDO Leather industry preparatory mission, BCD/76/809/A/51/37, studied the leather industry in Bangladesh from February to November 1977. The mission made a detailed survey in all respects, identified the needs for technical assistance and proposed measures to ensure a satisfactory development of the industry. The present project is the outcome of these proposals.

Justification

The project relates to the primarily technological support needs of the Bangladesh Leather Industry in moving from only processing wet blue hides and skins to produce finished leathers for the export market and at the same time to the improvement of raw materials, machines, production methods and end products.

The Government has decided to channel all technical assistance to the leather industry through the Institute of Leather Technology at Hazaribagh, Dacca. This institute is now concerned only with the training of technicians for the leather and leather goods industries, providing training courses of various lengths. It has a fairly large area at its disposal, a building containing several classrooms and offices as well as laboratories, a separate lecture hall (never used) and a large pilot plant building. The pilot plant was originally equipped with almost all the machines needed for normal tannery work, but for several reasons most of these are now unusable and to a great extent also irreparable. The equipment has also to a considerable extent become outdated and obsolete through the rapid technological developments of later years.

institute will be reorganized under the Ministry of Industry and receive adequate resources in personnel, equipment and operation funds to be able to carry out its increased and added duties.

Besides providing training courses the institute will in the future also provide technical assistance directly in the factories, carry out industry-related applied research and development work (R&D) and give general services in the field to government and industry.

The in plant technical assistance, the upgrading of the teaching capabilities of the institute, the training of its staff to be able to cope with the added duties and the provision of machines and equipment for its pilot plants and laboratories are urgently needed and the purpose of the project is to provide the necessary assistance to this effect.

PART IIE Outputs

- improved quality of raw hides and skins
- improved quality of leather products
- a relatively larger part of the production in the form of semi-processed and finished products,
- a number of trained personnel at different levels
- an expanded and improved Institute of Leather Technology which will serve the whole industry as well as Government departments for requirements as to research and development

technical assistance, quality control, training, marketing documentation, and statistics.

- institutional framework for cooperation between the Institute and Industry.

PART IIF. Activities

1. Direct in-plant technical assistance will be provided,

   - to improve the quality of raw hides and skins,
   - to improve present production with present machinery,
   - to introduce new methods and assist in selecting machinery for further processing (,e.g to crust and finished leather and shoes).

- to aid in establishing proper and practical processing controls and quality standards,
- to help the factories in getting unoperational machines working and in establishing good maintenance practices,
- to train at work industry employed personnel.

2. The institute would endeavour to train technologists and technicians at all levels:

   - at graduate and postgraduate level by supplying facilities for special studies and work in cooperation with appropriate universities
   - at intermediate level by providing a 2 year diploma course to approximately the same standard as City and Guilds of London Institute or equivalent International Standard.
   - at foreman level by arranging courses in different specialities for technicians,
   - at workers level by work training on processing machines.

3. Applied R&D work, thoroughly industry-related, would be carried out

   - to adjust new processing methods and recipes to Bangladesh conditions,
   - to solve factory processing problems, especially concerning new products,
   - to work out complete processes for special products,
   - to adopt indigenous chemicals and other raw materials to established or new processes,
   - to facilitate the use of animal by-products.

4. General services to industry and government agencies would be available

- to perform physical and chemical tests and quality control on raw materials and products,
- to inform on technical literature, other documentation and relevant statistics,
- to carry out technical and marketing surveys
- to provide other desirable and pertinent services

The organization of the Institute itself, the curricula for its training courses and the activities to be carried out, would be planned in detail in the project's initial phase and for this specific purpose, a specialist will be brought in for a shorter period.

The active staff will be aided and trained by the UNDP experts intheir respective fields.

Fellowships will be provided to selected personnel for technical education and training abroad.

PART IIG. Inputs

A. Government Inputs

1. Personnel

a) Initially, counterparts to the experts of the UNDP-project and the following local technical and research staff should be available

	Initially	Later
- Director of Institute	(1)	(-)
General Leather Technologist	(1)	(1)
Heavy Leather industrial and sole	(1)	(-)
Tanning/dyeing light leather	(1)	(2)
Finishing light leather	(2)	(1)
Quality control laboratory work	(1)	(1)
Hides and skins improvement	(1)	(-)
Animal by-product utilization	(-)	(1)
Indigenous raw materials utilisation	(-)	(1)
Shoe design and pattern cutting	(-)	(1)
Shoe technology	(-)	(1)
Leather goods technology	(1)	(-)
Maintenance	(1)	(1)
	10	10

2. Subcontracts

Not applicable

3. Equipment

Physical structure for the Leather Institute including existing machinery and equipment in p.p. and lab. in Hazaribagh.

Office space for project staff.

Furniture

Office equipment.

B. UNDP Inputs

Personnel

Experts

- Leather Industry Technologist (Team Leader)	2½ years
- Leather Institute Consultant	3 months
- Leather Technologist (Finished)	2 years
- Hide improvement and by-products utilization advisor	1 year
- Maintenance Adviser	1 year
- Shoe production adviser	1 year
- Consultants	12 m/m
Total:	105 m/m

2. Training

The project will provide for the following fellowships :

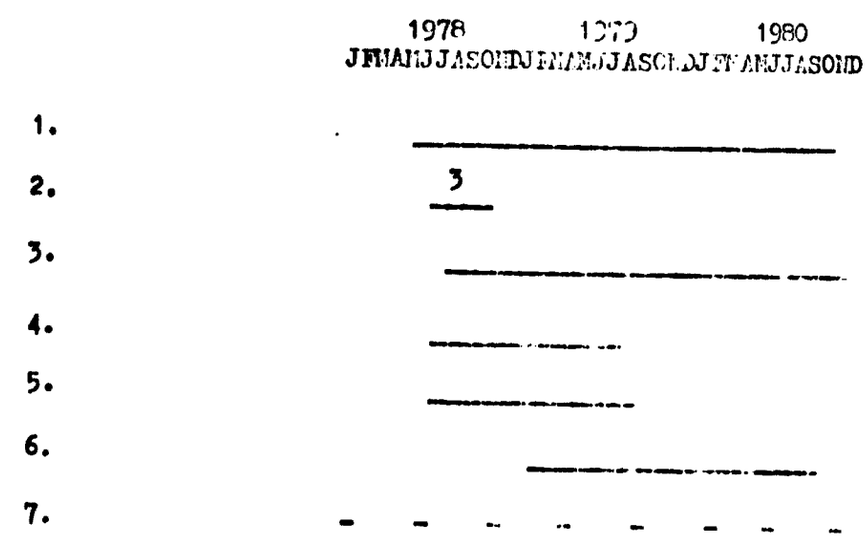
Fellowships

Leather Technology, General	24
" " Heavy L	10
" " Crvtanning	10
" " Finishing	10
" " Chemistry	10
Hide improvement	10
Maintenance	10
Shoe Production	10
Shoe design and pattern	10
leather goods production	10
Total:	114

3. Equipment	Delivery date	Cost US$
Pilot plant		390,000
Physical Testing Lab		40,000
Chemical Laboratory		50,000
Maintenance Shop		25,000
Office Equipment		10,000
Vehicles, 2		15,000
		530,000

PART IIII. Preparation of Work Plan

Bar chart



A detailed work plan for the implementation of the project will be prepared by the team leader in consultation with his counterpart. This will be done at the start of the project, and the plan will be adjusted progressively. The agreed work plan will be attached to the document as annex I and will be considered part of that document.

PART II L. Prior obligations and Prerequisites.

Prior to UNDP approval of this project the Government will have taken the decision and the administrative steps necessary for the Institute of Leather Technology at Hazaribagh to be transferred to the Ministry of Industries and the Ministry of Industries will have an approved budget allocation which fully covers all items in the Government Inputs relating to counterpart staff of this project.

Project Budget Covering UNDP Contribution
(in US dollars)

Country: The People's Republic of Bangladesh

Project No.: BGD/

Project Title: Leather Industries Development

		TOTAL	1978	1979	1980	19__	19__
10	PROJECT PERSONNEL	Man-months	Man-months	Man-months	Man-months	Man-months	Man-months
11	Experts (Team Leader)						
11-01	Leather Ind.Technologist	30	9	12	9		
11-02	Leather Institute Consult.	3	3				
11-03	Leather Techn. (Finished)	24	3	12	9		
11-04	Hide Improvement Adviser	12	3	9			
11-05	Maintenance Adviser	12	3	9			
11-06	Shoe Prod. Adviser	12		3	9		
11-07	Consultants	12	3	6	3		
11-08							
11-09							
11-10							
11-11							
11-12							
11-13							
11-14							
11-15							
11-16							
11-17							
11-18							
11-99	Subtotal	m/m 105 $ 506,400	m/m 24 $ 105,600	m/m 51 $ 244,800	m/m 30 $ 156,000	m/m $	m/m $

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Project Budget Covering UNDP Contribution
(in US dollars)

		TOTAL	1978	1979	1980	19__	19__
12	CMS Experts						
12-01							
12-02							
12-99	Subtotal						
15	Support Personnel	13,000	4,000	5,000	4,000		
15	Duty Travel	13,950	3,150	6,750	4,050		
16	Other Costs (Mission)	5,000		5,000			
18	Prior 197 Expenditures						
19	Component total	538,350	112,750	261,550	164,050		
28	Prior 197 Expenditures						
29	SUBCONTRACT						
30	TRAINING						
31	Individual Fellowships						
32	Group Training						
33	In-Service Training						
38	Prior 197 Expenditures						
39	Component Total	125,400	22,000	66,000	37,400		
48	Prior 197 Expenditures						
49	EQUIPMENT	530,000	400,000	130,000			
58	Prior 197 Expenditures						
59	Miscellaneous	20,000	4,000	6,000	10,000		
90	Subtotal						
97	Cost-Sharing						
99	UNDP Total Contribution	1,213,750	538,750	463,550	211,450		

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LEATHER INSTITUTE

Tentative Specification and Cost of Pilot Plant

Machines/Equipment	Number	US$ CIF
Drums, experimental à 3,000	3	9,000
Paddle, experimental	1	2,000
Tanning m/c, type Hagspiel, smallest	1	10,000
Fleshing m/c, 1800 mm	1	18,000
Splitting m/c, 1800 mm	1	28,000
Sammying m/c, 1800 mm	1	26,000
Shaving m/c, 600 mm	1	10,000
Setting-out m/c reversible, 1500-1800 mm	1	28,000
Toggle drying unit, 10-20 frames	1	20,000
Vacuum dryer	1	25,000
Jaw-staking m/c	1	5,000
Wheel staking m/c	1	2,000
Vibratory staking m/c, 1500 mm	1	28,000
Buffing m/c, 600 mm	1	8,000
Brushing m/c and dust collector	1	9,000
Stone polishing m/c	1	5,000
Spraying gun with compressor etc.	1	11,000
Glazing m/c	1	5,000
Hydraulic plating and embossing press	1	31,000
Platens to above	4	9,000
Equipment for footwear department (to be specified)		50,000
Spares		40,000
Hand tools and small equipment		11,000
Total		390,000

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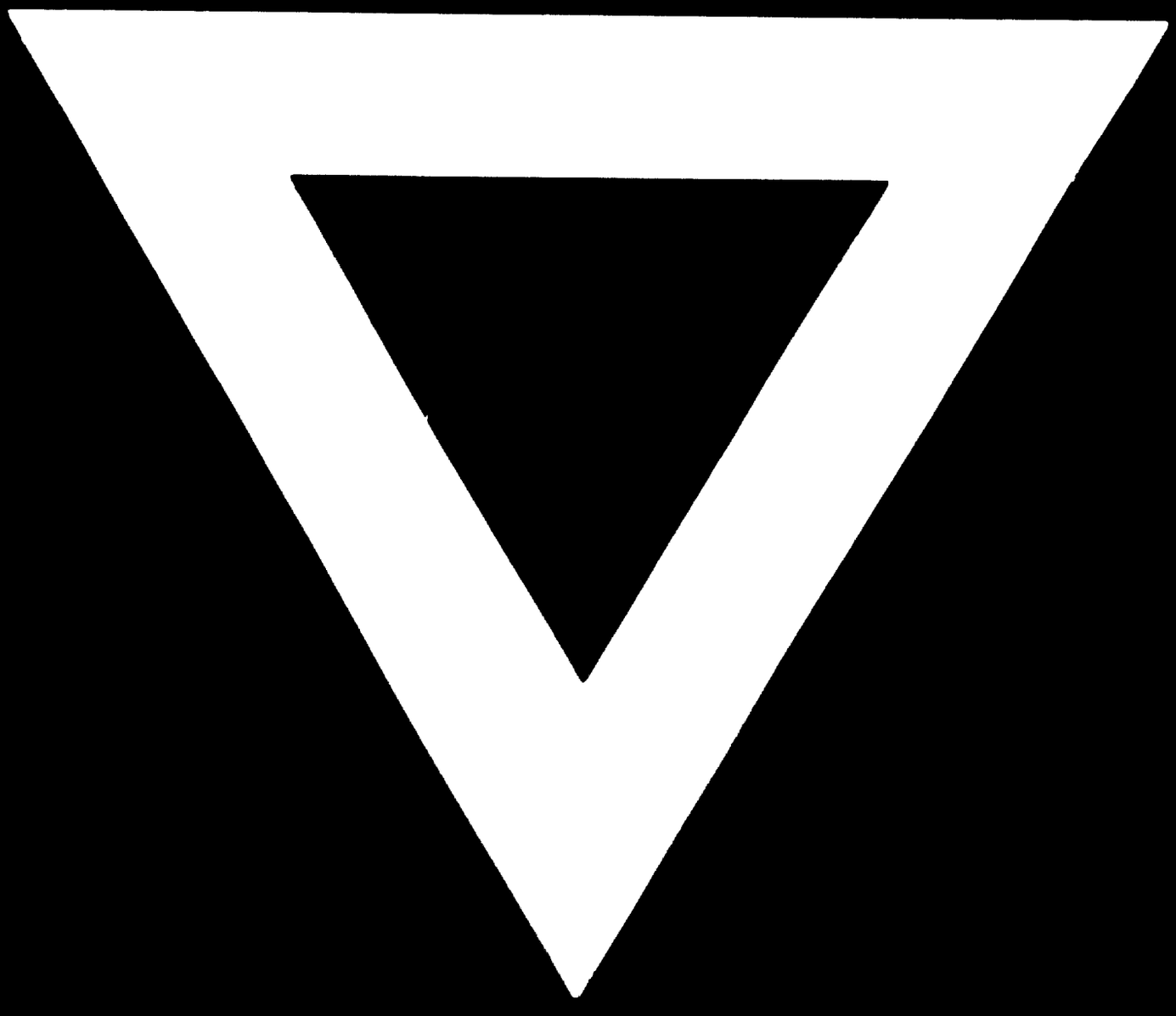

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