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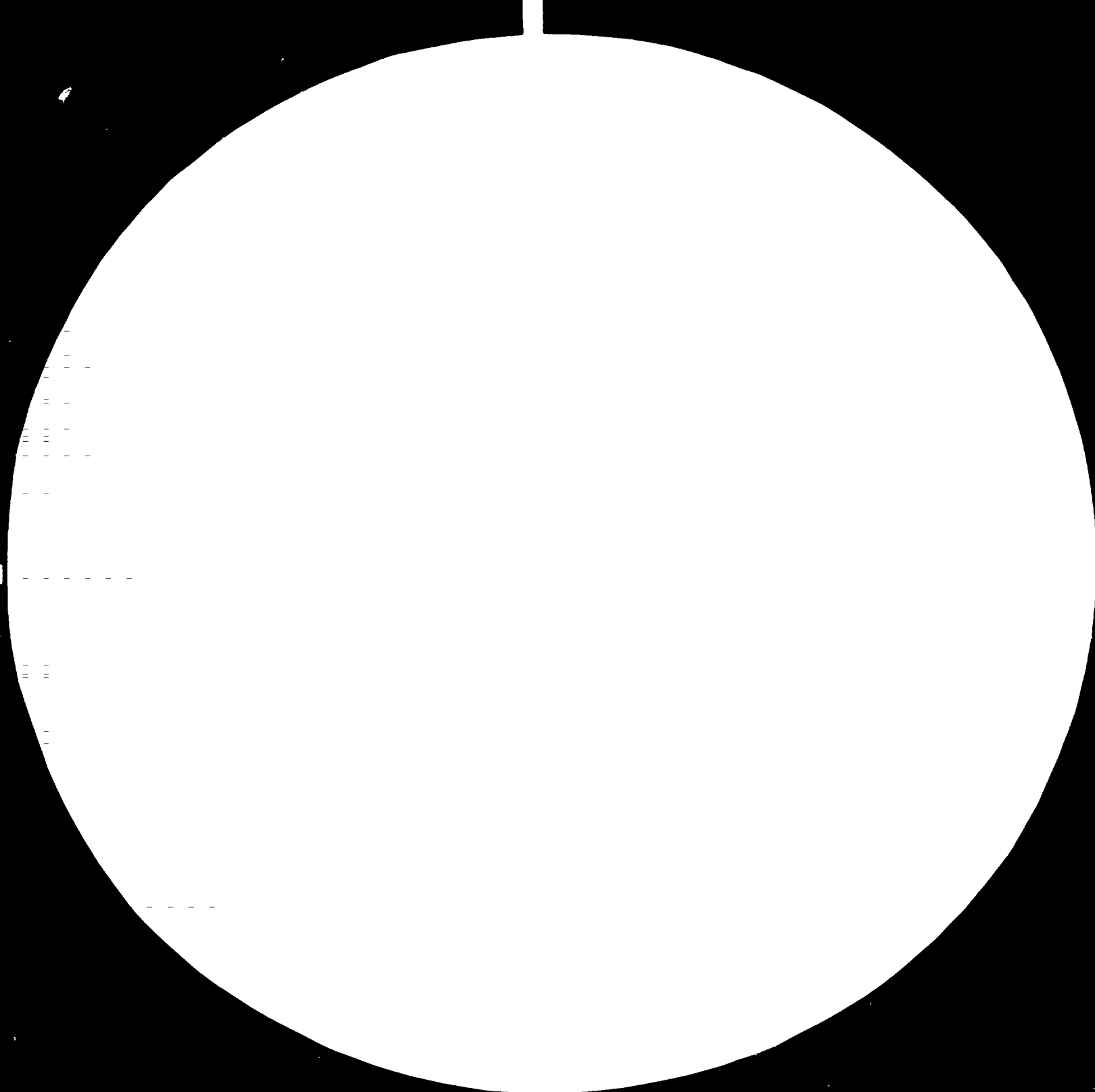
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Microcopy Resolution Test Chart

Resolution Test Chart, 1963 Edition, NBS Monograph 17

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Resolution Test Chart, 1963 Edition, NBS Monograph 17

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DP/ID/SER.B/272
25 June 1980
English

RESTRICTED

LEATHER AND LEATHER PRODUCTS
INDUSTRY .
DP/ETH/74/013 .
ETHIOPIA .

Terminal report

Prepared for the Government of Ethiopia
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of P.B. Buit, adviser in leather manufacturing

United Nations Industrial Development Organization
Vienna

80-41171

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Explanatory notes

Until 1975 the monetary unit of Ethiopia was the Ethiopian dollar (\$Eth). The name was changed to the birr (Br), but the rate in relation to the United States dollar (\$) remained the same, \$1 = Br 2.05.

The following abbreviations have been used in this report:

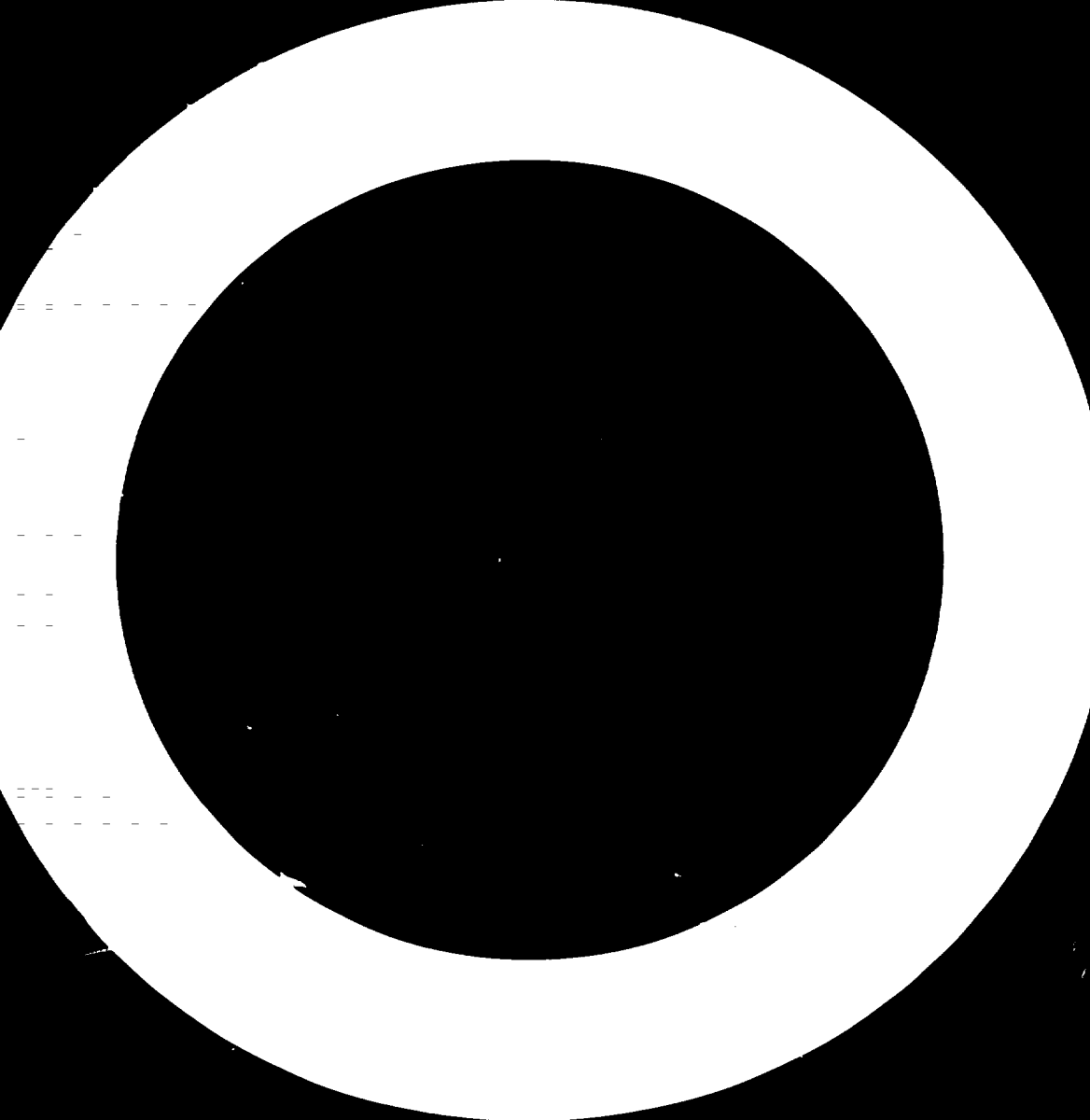
HASIDA	Handicrafts and Small Industries Development Agency
NLSC	National Leather and Shoe Corporation
NPC	National Productivity Centre

ABSTRACT

This project, the second phase of a project in Ethiopia beginning in August 1973 as IS/ETH/71/809, Leather Technologist and Marketing Expert (Leather and Leather Products), continued from August 1975 to December 1979 under the designation DP/ETH/74/013, Adviser in Leather Manufacturing. In the first phase the expert had concentrated on leather manufacturing and marketing assistance to the newly established Ethiopian Tannery, while during the second phase he was transferred to the National Leather & Shoe Corporation (NLSC) where he served all the tanneries which came under government control in February 1975. His objectives were to bring the overall technical performance up to date, including manpower development and marketing.

Except for Darnar (Awash Tannery) all tanneries had low technical standards, with few qualified staff; much time had to be devoted to assisting on the factory-floor, dismantling machines and carrying out repairs. There were production problems, quality was poor and market outlets were limited. The-expert's assistance in standardization of product lines and finding buyers in the export market helped re-establish the tanneries' popularity after nationalization.

The expert recommended that the tanneries should concentrate on production and export of semi-processed leather, especially goat-skins, which accounted for half of the annual supply of raw skins. Improvements should be made in the standard of finished leather products, and the tanneries should concentrate on finishing. There should be training programmes for high-level technical personnel. The by-products industry should be developed. Additional capacity should be created by expanding^{at} the sources of raw materials rather than expanding existing tanneries. Finally, wattle and acacia plantations and extraction plants should be developed as a step towards self-sufficiency in the production of vegetable tanning materials.



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INTRODUCTION

In his assignment in Ethiopia on UNDP/UNIDO project IS/ETH/71/809, Leather Technologist and Marketing Expert (Leather and Leather Products), in the period from August 1973 to August 1975, the expert carried out the following duties:

- (a) Summarized the data pertinent to the existing situation and future plans regarding the leather and leather products sub-sector with particular emphasis on the effect of the government tannery which was completed in 1973/74;
- (b) Co-ordinated the raw hides and skins improvement programme of the Livestock and Meat Board supported by the World Bank and the Food and Agricultural Organization (FAO) in order to achieve a consistent sub-sectoral study;
- (c) Advised, based on the outcome of the sub-sectoral study referred to above, on the appropriate steps to be taken for the optimum utilization of the tannery, with due consideration to the recommended product mix and marketing thereof;
- (d) Assisted in organizing a marketing unit for the tannery and trained local counterparts in all aspects of the technique of marketing and export of various types of leather;
- (e) Advised the Government on measures to implement the recommendations arrived at in the sub-sectoral study.

The expert concentrated during this assignment on leather manufacturing and marketing assistance to the newly established Ethiopian Tannery.

In August 1975 the assignment was extended and is covered by the present report DP/ETH/74/013 (Adviser in Leather Manufacturing). The expert's services were also extended to include assistance to the entire leather and leather products sector in Ethiopia (see Job Description in annex I, dated 9 March 1976). The expert assisted extensively in bringing the overall technical performance up-to-date, including manpower development and marketing in the tanneries owned by the Government.

In the Tripartite Review of the project on 28 March 1977 (see annex II), it was unanimously agreed that an integrated leather and leather products development project, supported by UNDP and UNIDO, be established, and that the expert's assignment be further extended to assist in preparing this project.

RECOMMENDATIONS

A. Development of the industry

Various improvements have been made to up-grade the technical and processing standards of the leather industry. Improvements introduced to date can be utilized only if such efforts are continued on a regular basis. Now that most tanneries are technically able to operate efficiently, emphasis should be put on the acquisition of know-how in the production of leather of acceptable quality. In this respect, the following recommendations are put forward.

1. The tanneries should concentrate on the production and export of semi-processed leather. It is important to develop know-how in the processing of goatskins, which are not well received by the tanneries although goatskins account for about one half of the annual supply of raw skins.
2. Substantial improvements need to be made in bringing up to standard the quality of finished leather produced in Ethiopia. The expert's preoccupation in areas other than finishing has limited his contribution in this regard, although some important and successful steps have been taken in the Ethiopian Tannery. It is felt important that the tanneries concentrate on finishing aspects of their operations in view of the fact that it will also be possible to export finished leather when required international standards are achieved. It is important therefore, for tanneries to begin looking at possibilities of marketing their finished leather. This is a long and difficult process, so they should begin immediately.
3. The development of manpower, especially high-level technical personnel, should be high on the agenda of training programmes. This will enable the Ethiopian leather industry to achieve results on international leather markets.
4. Active consideration should be given to the development of the leather products industry and the by-products industry.
5. The development of the leather industry in terms of creating additional capacity and related programmes needs to be taken seriously. In this respect it is necessary to think in terms of new capacities at the source of raw materials rather than in expanding existing tanneries.
6. An intensive follow-up of the development of wattle and acacia plantations, with the subsequent installation of extraction plants should be made. This would be an important step towards self-sufficiency in the production of vegetable tanning materials.

B. Future United Nations assistance

Ethiopia is one of the countries in the world which receives extensive UNDP/UNIDO/FAO assistance in the leather and leather products industry. The extensive nature of assistance needed, makes it essential to ensure a co-ordinated programme with inter-agency support. In relation to future UNIDO assistance, therefore, the expert points out:

(a) Inter-agency co-ordination of activities should be clearly worked out. Lack of co-ordination can lead to duplication of effort and waste of time and funds. To avoid such a situation regular contacts should be mandatory. In the case of Ethiopia these concern activities in NLSC, NPC and the Ministry of Agriculture for the co-ordination of programmes relating to the improvement and collection of hides and skins;

(b) A serious problem in developing countries such as Ethiopia is the inability to hire highly qualified technical manpower because of lack of funds. While operational assistance (OPAS) in the form of supplementary assistance in providing additional monetary resources can possibly be used in such cases, the programme is not well-known in Ethiopia. The Government should be encouraged to use OPAS. The expert believes this would be the most practical way of solving Ethiopia's problems in the leather and leather products industry;

(c) Successful implementation of country programme projects depends on follow-up on a regular basis by the relevant authorities. It is essential that UNIDO is involved in preparing these follow-up programmes. This is especially true of such projects as ETH/78/001 where it is necessary to keep the project under constant review and to follow-up the activities of the experts assigned. Information on the results of these follow-ups must be sent to all concerned;

(d) Active dissemination of information relating to various United Nations assistance programmes such as Technical Co-operation among Developing Countries (TCDC) should be made in order that such programmes give the best results.

I. ASSISTANCE TO GOVERNMENT TANNERIES

The expert's primary task was to make a complete evaluation of technical conditions of the tanneries with a view to establishing the status of machinery and equipment so that a sound plan of phased replacements, bottle-neck removals and additional equipment including expansion programmes could be worked out. It was also necessary to place emphasis on upgrading the standards relating to technology, improvement of plant layout and the training of manpower at all levels of operation. It was essential to work towards standardization of process formulas with particular reference to quality and the grading of both raw and finished leather. Work control methods had to be introduced while at the same time a detailed orientation was given to the staff on the effects of quality of output in the tanneries.

Each plant had its own peculiarities, and as such it is necessary to discuss them one by one.

Modjo (Dofan) Tannery

This tannery was initially equipped to process crocodile skins to the crust stage. However, this practice was discontinued in favour of the production of sheepskins in crust form, exclusively for the export market. The tannery had only one buyer in Europe and the crust sheepskins were made to suit the specific requirements of this client. Daily production averaged 1,000 skins, with considerable variation in quality. After nationalization, other buyers were needed because the sole buyer discontinued purchases. Although samples were sent out, the effort was unsuccessful owing to poor processing standards and inconsistent product quality.

As a result the expert undertook process development work which he later introduced in the tannery with a diversified product-mix including pickle, wet-blue chrome and crust. Suitable technology that would enable the tannery to produce acceptable quality had also to be introduced. Any improvements in this direction had to include the training of manpower and the re-orientation of the process technology. Basic standards related to grading and selection had to be introduced first.

A programme of replacement and the introduction of new machinery and equipment had to be considered in order to make the plant viable. New fleshing machines and other equipment had to be ordered as a matter of priority.

a system of frame toggling was introduced while at the same time, an order was placed for the purchase of a modern toggle drying unit. The immediate impact of this investment was a substantial increase in efficiency, consistency in product quality and increased profits in the financial operations. In short, healthy production results and larger markets were achieved. The tannery's daily output has now reached 3,000 skins.

Ethiopian Pickling and Tanning

The situation in this tannery was similar to that discussed above. The tannery had failed to survive the pressure of the international market both in terms of quality and delivery due to its poor know-how and technology. The confidence of the international market was lost and the operation of the tannery had come to a virtual standstill.

To put this tannery back into operation, the expert had to re-organize its operations entirely. Extensive experimental work had to be carried out before the tannery could re-establish itself in the international markets. After nearly eight months of effort, the tannery was successful in re-introducing itself on the international market and has now become one of the most viable plants. A further evaluation of machinery and equipment was carried out, and a new and better process flow and layout was introduced.

Tannery of Addis

Although this plant had good technical management under a qualified technician, plant and machinery were too old. As a result, the expert's main concern was the preparation of a detailed plan for replacement of machinery and equipment, the removal of bottle-necks within the plant and a complete review of the process layout. The new process layout resulted in the tannery processing 3,000 skins per day without affecting the production of hides. In most cases the expert took charge in preparing the processing layout and in the installation of machinery and equipment. In addition, the expert undertook a number of technical activities such as the introduction of smooth and embossed grain leather, particularly of low-grade hides for shoe uppers and lining leather, and the introduction of pickled and wet-blue chrome goatskins for export markets.

Awash Tannery

Among the tanneries which came under the control of the National Leather and Shoe Corporation (NLSC), Awash Tannery was better organized, having an established market reputation both at home and abroad for its finished bovine leather and pickled sheepskins. Like other tanneries, machinery and equipment were old and required immediate attention. The process technology was inefficient and resulted in inconsistency in the quality of leather produced both from hides and from skins. Detailed proposals were made in order to improve the tannery's operations. The technical manager, who was among the best-qualified leather technologists, and the expert, carried out a detailed evaluation of the plant in preparing recommendations for improving the plant's technology and overall performance. Detailed proposals were made to implement a programme of major replacement and changes in technology over three budgetary phases. Among the proposals for the implementation of the proposed programme is a new department for the production of skins up to the crust stage.

Qay Bahir (Baldini) and Asmara Pickling and Tanning

Although, little has been achieved in these tanneries, mainly because of the situation prevailing in Asmara where they are located, the expert has introduced some improvements in technology, manpower and the upgrading of machine conditions.

As the situation in Asmara improved, the expert concentrated on a detailed analysis of material requirements, standardization and implementation of process formulae, and preparation of standards on grading and selection. Direct assistance was also given to junior level management staff who were actually responsible for running the plant. It is encouraging to note that a considerable improvement was seen in the year during which the expert assisted at the plant.

Combolcha Tannery

A major effort by the expert caused a complete revival of the Combolcha Tannery which had been closed in 1972. The expert, along with his NLSC counterparts, prepared a detailed plan of action to recommence operations, and this was accepted by the Government authorities in 1977. A detailed outline of processing technology, management and manpower structure for the plant including a production programme of 3,000 pieces of wet blue-chrome goatskins per day, entirely for the export market was also undertaken. A number of modifications

had to be carried out on the machinery and equipment, as this plant was originally meant to process hides in the wet blue stage. It was proposed to process goatskins because the Combolcha area is famous for Bati goatskins.

A trial production in August 1978 was carried out, followed by a market survey at the International Leather Fair. It was encouraging to see the tannery acquiring confirmed initial orders to cover its first three months of production, which began during November 1978. The expert spent three weeks assisting the tannery in various aspects of its operations, including the introduction of process technology and know-how, selection, grading, training of manpower, establishment of process sheets and control records, and successfully implementing tannery works control methods. It is to be noted that this plant is considered to be most efficiently operated.

Ethiopian Tannery

Initially, the tannery received technical assistance provided in the INVESTA (Czechoslovakia) contract while the expert's services were related to assisting the tannery in the technology, manpower training, overall organization of production, selection and other areas. At a later stage, only three Czechoslovakian technicians were assigned to the tannery, and this meant further involvement by the expert on a number of critical issues related to production. Among the areas where the expert's contribution had a major impact on the tannery's performance were the implementation of his recommendations for the purchase of sole leather processing equipment, and vacuum drier and curtain coating machines.

Three months were spent in regular visits to the tannery to carry out production responsibilities to finish over 500,000 sq ft of leather, supposedly of lower-grade crust, which had accumulated. This leather gave encouraging results, and the efforts to produce it played a positive role in building up the confidence of the Ethiopian technical staff. In addition, it created a regular market for the Ethiopian Tannery's finished leather.

After successful trial lots were put through in the production of hunting suede leather from lower-grade cattle hides, the Ethiopian Tannery acquired regular outlets for this product, in both domestic and export markets. The introduction of this processing technology helped the tannery to clear its large stocks of wet blue sides.

As a result of discussions with overseas buyers, the expert assisted the tannery in areas related to technology, grading standards, and standardization of packaging. This assistance was important in following-up contacts on international markets.

A. Survey of job evaluation and classification

The evaluation and classification of jobs was among the primary tasks to be undertaken by NLSC once all the tanneries were under its control. A detailed study on manpower and job structures, including job descriptions and specifications, had to be undertaken.

The expert, with two Ethiopian technical managers, prepared detailed job descriptions along with a technical evaluation. This evaluation was useful to the NLSC and to the tanneries for collective bargaining purposes. The study is also now used in the recruitment of new workers.

B. Manpower development for the leather industry

As most tanneries had no trained personnel, special efforts had to be made in the leather sector to improve the qualifications of the manpower available. This problem was acutely felt when expatriate-run factories were transferred to NLSC.

The concern of the expert involved the introduction of training programmes that produced quick results because the tanneries had to continue operating despite the shortage of trained workers. Training activities between August 1974 and April 1979 were entirely sponsored by this project, in close co-operation with ILO project ETH/67/509, National Productivity Centre (NPC) staff and technical managers from the tanneries. Details of the courses covered in the various training programmes and overseas training are shown in annexes III and IV.

Considerable emphasis was placed on training operative level staff and junior level technicians. As no funds were available for courses overseas for higher level trainees in leather technology, the expert initiated successful contacts with donor countries and was able to acquire scholarships on a bilateral basis. With support from implementing agencies, the expert was also successful in convincing the authorities at the Higher Education Commission to reserve a number of scholarships for leather and shoe technology. His efforts

resulted in nine Ethiopians going overseas for higher level training. It is worthwhile also to note that the manpower development programme in project ETH/78/001 was initiated by the expert with the help of implementing agencies.

C. Research and development

Although the amount of work that had to be accomplished left little time for research and development, modest achievements were made in introducing ideas fostering self-sufficiency in certain tannery chemical inputs. Prominent in this respect were efforts in carrying out experiments at Modjo to assess the possibility of growing acacia nelotica and wattle. In both cases, substantial advances have been made insofar as the pilot wattle plantations at Debre Zeit as well as at the Modjo and Ethiopian tanneries have shown encouraging results. Interest was also shown by the forestry authorities who were involved in the wattle plantation at Debre Zeit. A list of reports and papers prepared by the expert in the course of the project is shown in annex V.

In order to produce national standards, the expert carried out a detailed survey of the technical aspects of leather produced in Ethiopia. This activity was sponsored by the Ethiopian Standards Institute (ESI) and the draft is now ready for final approval by its executive board.

D. Assistance to shoe plants

Although the shoe industry did not fall within the expert's sphere of activities, assistance with regard to the adaptability of the leather supply was made regularly. One Ethiopian was sent to England for training as a shoe technologist, and a sound basis was laid towards the long-term development of manpower in this sector. An extensive training programme has been included in the leather and leather products development project, ETH/78/001.

E. Assistance to other agencies

Direct assistance to organizations involved in the overall development of the hide and skin industry was given when the expert went on a mission to Bahir Dar to make an extensive study of rural tanneries. A study was made jointly by the NPC and the Handicraft and Small Industries Development Agency (HASIDA). The investigations included chemical and physical analysis of treated hides and skins as well as processing techniques in the cottage tanneries. This revealed that the hides and skins in these tanneries had no

leather qualities beyond the simple surface oil treatment which provided their flexibility. Based on these results, improved tanning methods suitable for the rural tanneries were developed at the NPC Leather Workshop; these may now be introduced to the rural tanneries with the help of HASIDA.

II. INTEGRATED LEATHER AND LEATHER PRODUCTS DEVELOPMENT

Long service by the expert in the leather manufacturing industry in Ethiopia revealed that much more needed to be done to develop the entire leather sector of the economy. This meant that leather manufacturing should be seen in the context of developing the leather and leather products industry in order for the country to obtain a maximum gain in terms of value added. It was also felt that for an integrated project, all manufacturing aspects of leather and leather products would be important. These included technology, proper maintenance and high-level manpower development. The need for a long-term programme of development were constantly emphasized, and the expert noted that his efforts in this respect were successful in that the authorities concerned gave unreserved support to his proposals (see annex II). The expert is pleased that a long-term development project could emerge from an initial assignment limited to only one plant, and feels that perhaps this is the most rewarding aspect of his stay in the country. The salient features of the integrated leather and leather products development project included:

- (a) The assessment of indigenous resources and skills in order to make the best use of these resources;
- (b) The improvement of the quality of raw hides and skins with a view to developing quality standards for leather and leather products acceptable in both domestic and foreign markets;
- (c) The development of a systematized collection network;
- (d) The preparation of the groundwork for the above long-term objective. It was felt necessary to include the following objectives in the proposed Leather and Leather Products Development Project:
 - (i) The development of a nucleus of trained and experienced management experts as well as technologists;
 - (ii) The assessment of the technical capabilities of the leather and leather products sector with a view to establishing maintenance and replacement needs of the sector and to prepare the required schedules of implementation;
 - (iii) The adaptation of processing techniques to suit local conditions, in particular, raw material quality and characteristics;
 - (iv) The utilization of potential usable wastes that have previously been thrown away;
 - (v) The development of new capacities within the sector with a view to greater gains in value added;
 - (vi) The development of sound marketing strategies both at home and overseas.

These tasks required the concerted efforts of a group of experienced experts in the field, as opposed to the over-extended services of a single adviser. This meant that experts with a firm background in the fields of leather manufacturing, tannery machinery maintenance engineering, shoe technology, shoe designing, shoe machinery maintenance engineering, and marketing, as well as an expert in raw hides and skins, would be needed to implement the proposed programme for the integrated development of the leather and leather products sector in Ethiopia.

Names of organizations, agencies etc., to whom the expert provided assistance are shown in annex VI.

III. PROJECT FINDINGS

A. State of leather and leather products industry

There are no reliable statistics on livestock population and annual off-take. It is estimated that livestock numbers and annual slaughter have remained essentially the same over the last six and half years of the project.

In terms of raw material availability, between 11 million and 13 million skins reach the market each year. The improvement in the supply of raw skins indicates that the significance to the economy of this trade is now better understood than it was at the start of the project. A similar situation applies to the supply of hides, in that marketable supply presently surpasses 1 million annually.

B. Quality of raw material

Improvements with respect to quality are better perceived by analysing the different types of raw hides and skins that enter the market (see table 1).

Table 1. Quality structure of Ethiopian hides and skins

Description	1973		1978/79	
	(pieces)	(%)	(pieces)	(%)
<u>Cattle hides</u>				
Butchery	276 048	18.1	305 365	34.2
Ordinary	1 252 497	81.9	585 057	65.7
<u>Sheepskins</u>				
Butchery	2 935 048	90.9	4 770 050	92.3
Ordinary	293 193	9.1	372 118	7.2
<u>Goatskins</u>				
Bati genuine	2 712 580	62.4	4 325 348	87.3
Bati type and ordinary	1 634 002	37.6	627 515	12.7

As shown in table 1, substantial improvements in quality have been made. The share of butchery hides in the trade in raw hides has increased from 18% in 1973 to 34% in 1978/79. On the other hand, the share of ordinary hides has declined from 82% to 66% during the same period. The improvement in sheepskins, although not significant, is slight. This may be explained by the fact

that sheepskins had a longer tradition of trade than cattle hides or goatskins, where substantial improvements have been noted. The change in the quality of goatskins traded is enormous, an increase in the share of Bati genuine of 25%. This improvement is as a result of concerted and successful efforts by all concerned.

C. The tanning industry

Capacity and capacity utilization

The new Government tannery at Modjo and the reactivation of Combolcha Tannery more than doubled the capacity of the leather industry in Ethiopia. Substantial gains have also been made, in absolute terms, in the quantity of hides and skins processed annually. In this respect, the number increased from 1.9 million at the start of the project to 4.1 million. Cattle hides have increased from 230,000 pieces to 320,000 pieces per annum. The relatively slow growth in the production of hides may be explained by the corresponding growth of the domestic leather shoe industry.

In terms of percentage utilization of existing capacities, substantial excess capacity exists. As shown in table 2, capacity utilization for hides in 1978/79 is 51% while it was only 38% for skins. Such a low level of capacity utilization is mainly attributable to the sub-optimal operation in the Ethiopian Tannery, which accounts for about half of the capacity of the leather industry.

Table 2. Production and capacity utilization, 1978/79

Description	Production (thousand pieces)	Capacity (thousand pieces)	Capacity utilization (%)
Cattle hides	320	628	51
Sheepskins and goatskins	4 100	10 800	38

Technical standing

As noted earlier, substantial improvements have been made in machinery and equipment by way of replacements, bottle-neck removals and additions to existing facilities. These improvements have helped towards the improved technical and technological standing of most of the tanneries. In addition, suitable process technologies have been introduced in most of the plants.

Most of the tanneries now have a sound technical and technological base, although this does not mean that there is no room for further improvements.

Trained manpower

Efforts in manpower development need not be repeated as sufficient has already been said about activities in this area. The stock of trained manpower in the leather industry had increased substantially. Efforts in this regard would have even more impact when the training programmes are completed. The return from overseas of high-level leather technologists will further reinforce the strength of the industry.

An interesting aspect of the expert's services was the fact that conventional counterpart training was found to be difficult to apply. This was because training activities extended over all aspects of leather manufacturing whereas manpower did not exist to qualify for the post of counterpart. The expert had to concentrate on building-up a reliable stock of manpower on the grounds that this would create a sound basis for future development. This was shown to be practical when the counterpart component of the leather products development project was worked out. The stock of manpower developed during the course of the expert's assignment thus made it easier to recruit counterparts with the required qualifications. Without the earlier preparations, the follow-up project DP/ETH/001 (Leather and Leather Products Development) which began in September 1979 would have been difficult to implement.

D. Trade in raw and processed hides and skins

Structure of trade in raw and processed hides and skins

Substantial increases have been recorded during the last few years in the volume of trade both in raw and in processed hides and skins. Trade in raw hides and skins increased from 515,000 and 6.97 million pieces respectively in 1974/75 to 644,000 and 9.98 million pieces in 1978/79. The trade in processed hides and skins, on the other hand, grew from 232,000 and 1.9 million pieces to 320,000 and 4.1 million pieces hides and skins. The 1978/79 figures are shown in table 3.

Table 3. Trade in raw and processed hides and skins, 1978/79

Description	Quantity (thousand pieces)	Proportion of total (%)
<u>Hides</u>		
Processed	320	33
Raw	544	67
Total	964	100
<u>Skins</u>		
Processed	4 100	29
Raw	9 980	71
Total	14 080	100

The percentage share of processed hides and skins has remained substantially the same, but the small growth of 2% in the share of processed raw hides and skins over raw hides and skins results from the fact that traders of raw hides and skins still maintain an upper hand in the collection network. Furthermore, there are still no clear government policies encouraging the growth of the processing industry and, in terms of network efficiency, exporters of raw hides and skins seem to be more organized. Important progress has, however, been made recently by government tanneries in a more organized collection system for the purchase of hides and skins. Efforts are now being taken to establish purchase centres in the main raw hides and skins markets. The results of this aggressive purchasing policy on the part of the tanneries has been favourable in that they are now in a better position to acquire the quality and quantity of raw materials needed. Network efficiency has improved a lot, but much, however, remains to be done to mitigate the strong competition between the raw and processing sectors.

E. Agency support

During project implementation, encouraging back-stopping support was received from United Nations Industrial Development Organization (UNIDO), Vienna, as well as from United Nations Development Programme (UNDP), Addis Ababa.

F. Government support

The Ethiopian Government and the implementing agencies have given the necessary support in all the project activities. The support received from the implementing agencies includes financing of air travel to missions abroad, internal travel within Ethiopia, and secretarial and administrative assistance.

Annex I
JOB DESCRIPTION
DP/ETH/74/013
(9 March 1976)

POST TITLE: Adviser in Leather Manufacturing

DURATION: One year

DATE REQUIRED: As soon as possible

DUTY STATION: Addis Ababa, with travel both within and outside the country

PURPOSE OF PROJECT: To advise and assist the Ministry of National Resources Development and particularly the management of the state-owned leather industry

DUTIES: The expert will be expected to:

1. Assess the present pattern and output of leather production in Ethiopia and evaluate the management structure of the government-owned enterprises.
2. Plan the growth of the sub-sector on a long-term basis and suggest appropriate measures for the timely implementation of plans.
3. Programme on short-term, supervision and improvement of manufacturing in all its aspects (raw material purchase, actual production, storage, packaging and management); including co-ordination of the activities of the various government-owned tanneries and furthering quality control measures, especially with a view to increasing the export of semi-finished and finished leather products.
5. Carry out experimental work for improving Ethiopian production techniques in co-operation with the CEM/UNDP/ILO leather workshop.
6. Plan the manpower for the sub-sector and arrange training in tanning and quality control in co-operation with the CEM/UNDP/ILO workshop.
7. 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: Extensive practical experience in leather industry technology with a reasonable background of marketing and export of various types of semi-processed and finished leathers. Experience of working in leather industries in developing countries an asset.

LANGUAGE: English

**BACKGROUND
INFORMATION:**

Ethiopia has an estimated livestock of 26.2 million cattle, 12.7 million sheep and 11.3 million goats, the leather and allied industries represent a most valuable asset to the national economy. The annual production figures for hides and skins are estimated at some 2.7 million cattle hides, 7 million sheepskins and 7 million goatskins. The export of raw hides and skins constitutes the second most important item of the local Ethiopian export industry and in 1969 reached an export value of almost \$Eth 30 million. Estimated annual export figures (in quantity) are 1 million cattle hides and 5.5 million sheepskins. A new Government tannery has been established at Edgersa, 70 km outside Addis Ababa. The production capacity of this tannery is 330,000 cattle hides, 750,000 sheepskins and 600,000 goatskins, which almost doubles the existing production capacity of the leather industry in Ethiopia. It is intended that the new tannery will produce leathers mainly for the export market. In view of the importance of the leather and leather products sub-sector for the Ethiopian economy, the Government is trying to develop a framework for a consistent and sustained policy for the balanced development of this sub-sector as a whole.

Annex II

AMENDED WORK PLAN

Project ETH/74/013

(28 March 1977)

1. Assess existing technical and technological situation of the leather industry, as distinct from the leather goods industry, and recommend plans for future developments.
2. Establish guides for tanneries under the Corporation for the selection of raw hides and skins, taking into consideration standards set by the National Standards Institute.
3. Assist in the organization of the raw skins and hides purchasing units of tanneries under the Corporation.
4. Advise and assist in introducing appropriate technology for the different stages of semi-processed and different types of finished leather produced by the tanneries under the Corporation, including the provision of standard operation manuals.
5. Advise on machinery and equipment requirements for replacements, expansion programmes and new projects that may be undertaken by the Corporation.
6. Assist in the standardization of chemicals used by the tanneries under the Corporation.
7. Follow-up and ensure the effective implementation of improvements introduced in the different tanneries.
8. Assist in the Corporation's effort to establish an accurate costing system for production of leather.
9. Assist in the development of skilled manpower required by the tanneries.
10. Advise on domestic and export marketing of leather.
11. Advise all other tanneries that may not fall under the National Leather and Shoe Corporation.
12. At the request of the Government, the available UNIDO experts, together with the Corporation, should draw up a long-term consolidated project covering the needs of the leather and leather products sector.

Annex III
TRAINING COURSES CONDUCTED AT NPC/ILO LEATHER WORKSHOP
 (August 1974-April 1979)

Type of course	Period of training	Awash Tannery	Asmara Pickling	Combolcha Tannery	Ethiopian Pickling	Ethiopian Tannery	Modjo Tannery	Tannery of Addis Bahir	Qey Private	Total	
Certificate in leather technology	1 year August 1974- August 1975	-	-	-	-	10	-	-	-	5	15
Certificate in leather technology	6 months December 1976- May 1977	2	1	-	1	7	-	5	1	4	21
Graders and selectors	2 weeks November 1977- November 1978	6	-	-	2	9	3	-	1	-	21
Operative level training in leather processing	2 weeks March 1978	4	-	-	3	-	3	-	-	-	10
Operative level training in leather processing	2 weeks June-July 1978	-	-	-	-	7	3	5	-	-	15
Operative level training in leather processing	2 weeks November- December 1978	-	-	1	1	9	3	9	-	-	23
Operative level training in leather processing	2 weeks March-April 1979	-	-	-	2	6	-	6	-	1	15
Total		12	1	1	9	48	12	25	2	10	120

Note: Training programmes conducted later than April 1979 were implemented by NPC national staff and the ILO expert, who arrived during July 1979.

Annex IV

OVERSEAS TRAINING COMPLETED, ON-GOING AND PIPELINE:
LEATHER AND SHOE SECTORS

Area of training	Number of trainees	Country of training	Financing source	Number of candidates and plant
Leather technology diploma, 3 years (completed)	2	UK	Government of UK	Ethiopian Tannery (2)
Leather technology higher level diploma, 5 years, beginning 1978 (on-going)	4	USSR	Government of USSR	Ethiopian Tannery (4)
Leather technology certificate, 1 year 1978 (completed)	1	India	Government of India	Modjo Tannery (1)
Leather technology diploma, 3 years, beginning 1979 (on-going)	2	Federal Republic of Germany	Government of the Federal Republic of Germany	Awash (1) Ethiopia Pickling (1)
Shoe technology (on-going)	1	UK	Government of UK	Rubber and Canvas (1)
Budget and system analysis, post-graduate course, 1 year (on-going)	1	UK	Government of UK	NLSC (1)
Shoe technology designing, higher diploma, 2-3 years and in-plant training (pipeline)	5	Pipeline	UNIDO, ETH/78/001	Tikur Abay (1) Anbessa (2) Rubber and Canvas (2)
Leather technology higher diploma, 2-3 years and in-plant training (pipeline)	5	Pipeline	UNIDO, ETH/78/001	Ethiopian Tannery (2) Awash Tannery (2) Qey Bahir (1)
Shoe machinery engineering, 3-4 months, in-plant training (planned February 1980)	3	Federal Republic of Germany, UK	UNIDO, ETH/78/001	Tikur Abay (1) Rubber and Canvas (1) Anbessa (1)
Tannery machinery engineering, 3-4 months (planned April 1980)	3	Italy, UK, Czechoslovakia	UNIDO ETH/78/001	Awash Tannery (1) Ethiopian Tannery (1) Modjo Tannery (1)

Shoe production, 1 year, in-plant (pipeline)	1	Czechoslovakia	Government of Czechoslovakia	Tikur Abay (1)
Leather production, 1 year, in-plant (pipeline)	1	Czechoslovakia	Government of Czechoslovakia	Tannery of Addis (1)
Tannery maintenance, boiler and compressor training	2	Czechoslovakia	Government of Czechoslovakia	Ethiopian Tannery (2)
Industrial management	1	Czechoslovakia	Government of Czechoslovakia	Modjo Tannery (1)
Shoe technology certificate, 1 year	1	India	Government of India	Dahlak (1)
Leather technology	1	India	Government of India	Ethiopian Tannery (1)

Annex V

REPORTS AND PAPERS PREPARED DURING
TECHNICAL ASSISTANCE PROGRAMME

1. Report about padding machine for the Ethiopian Tannery (ET).
2. Evaluation of technological processes and machinery and equipment, hides and skins tannery.
3. Requirements of auxiliary equipment for the Ethiopian Tannery.
4. Evaluation of raw supply and proposed product-mix for the tannery.
5. Thoughts on statistical evaluation of Ethiopian raw material and experimental work for ETSC's planned production.
6. Survey of labour requirements for hides and skins tannery.
7. Qualification requirements, job descriptions for hides and skins tannery.
8. Extracts of statistical information regarding export and import of raw and processed hides and skins.
9. Suggested process outline for hides and skins tannery.
10. Calculations of chemical requirements for hides and skins tannery.
11. Processing and sales outlets for splits production.
12. Utilization of low-grade raw stock from skins tannery.
13. Rapid wearing out spare parts.
14. Training of Ethiopians in leather technology.
15. Usage of water in the tannery.
16. Effluent quantity and BOD/PH estimates.
17. Recruitment of tannery technicians and foremen.
18. Notes regarding discussion on wattle with forestry authority.
19. Estimates regarding solid waste and its disposal.
20. Outline proposals on budget and costing.
21. Tannery production documentation.
22. Manufacture of woven leather.
23. Import duties on leather in Europe.
24. Process formulas developed at ILO/CEM Workshop, including cost.
25. Recruitment for technician training programme as well as various categories of jobs in the tannery.
26. Usage of wool and requirements for Debre Birhan wool factory.
27. Wide-ranging suggestions about the future of the Ethiopian Leather Industry.
28. Visit to International Leather Fair, 1974.
29. Comments on stock economy, additional machinery requirements for the Ethiopian Tannery.

30. Draft chemical tender document including calculations of chemical and consumption material requirements for the tannery.
31. Temperature and humidity records at Edjersa.
32. Recommended drum design features in the tannery.
33. Paste drying - practical aspects and production control.
34. Manufacture of glue and gelatine.
35. Process after chrome tanning.
36. Tanning and retaining agents.
37. Mechanical and practical notes about splitting machine in a tannery.
38. Tannery manager's job description and responsibilities.
39. Report on technical discussions held at Gotwaldov, Czechoslovakia, and final notes on technology, product-mix and material consumption.
40. Requirement of protective clothing.
41. Technical assistance to the Ethiopian Tannery.
42. Plantations at Edjersa.
43. Processing technology, wet blue-chrome - Dofan Tannery.
44. Production of patent leather including costs of production.
45. Initial thoughts on air freight of leather for exports.
46. Sizing and grading of wet blue chrome sheepskins.
47. Report on participation at the International Leather Fair, 1975.
48. Report on mission to Asmara, leather and shoe sector.
49. Production of chamois leather, Modjo Tannery.
50. Course programme and syllabus for training at ILO/NPC Leather Workshop.
51. Job classification, evaluation and description for leather sector.
52. Various notes on evaluation of machinery and equipment requirements as replacements, bottle-neck removal and its justifications: prepared by the expert during six and half years' assignment.
53. Notes on effluent treatment at Tannery of Addis.
54. Layout plan and machinery installation, Tannery of Addis.
55. Report on tannery at Colbolcha.
56. Report on establishment of technical department at NISC.
57. Integrated leather and leather products development, initial outline proposals.
58. Improvement of rural tanning techniques.
59. Draft standards, terminology and test methods, prepared in collaboration with the Ethiopian Standards Institution.
60. Report on trial production at Combolcha Tannery.

61. Technical report on Ethiopian Pickling and Tanning, recommended corrective measures for pickled skins production.
62. Integrated leather and leather products development, final project document.
63. Survey on availability of manpower and proposed counterpart position, ETH/78/001 project related to the plants.
64. A scheme for undertaking survey of raw hides and skins, leather and leather goods industry in Ethiopia.
65. Deterioration of pickled pelts.
66. Study for standardization among tannery plants and innovative tannery technology.
67. Memorandum of Society of Leather Technologists and Associates.
68. Reports on various field trips within and outside Ethiopia.

Annex VI

NAMES OF ORGANIZATIONS, AGENCIES, PLANTS, ETC.,
TO WHOM THE EXPERT PROVIDED ASSISTANCE

National Leather and Shoe Corporation (NLSC) Addis Ababa

Ethiopian Tannery, Addis Ababa (Tannery at Edjersa/Modjo)

Awash Tannery, Addis Ababa

Ethiopian Pickling and Tanning, Addis Ababa

Tannery of Addis, Addis Ababa

Modjo Tannery, Addis Ababa

Combolcha Tannery, Combolcha (Wollo Province)

Asmara Pickling and Tanning, Asmara

Qey Bahir Tannery, Asmara

Two shoe plants under the NLSC:

Anbessa Shoe, Addis Ababa Tikur Abay Shoe Factory, Addis Ababa

The following governmental agencies gave their co-operation and support
in the project activities:

Ministry of Industry

Ministry of Agriculture

Planning Commission

Former Livestock and Meat Board Authority

Former Export Promotion Investment Centre (EPIC)

CEM (Centre for Entrepreneurship and Management) now National
Productivity Centre (NPC)

Forestry Authority

Higher Education Commission

Handicraft and Small Industries Development Authority (HASIDA)

Various embassies in Addis Ababa, who offered bilateral assistance
in training activities for the sector

European Economic Commission

Various chemical manufacturers such as BASF, BAYER, HENKLE, HOECHST
and Richard Hodson, who provided samples of auxiliary products for
training and experiments

Various United Nations specialized agencies, i.e. FAO, ILO, IBRD/World
Bank, UNCTAD

Ethiopian Standards Institution

