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**CONSULTANCY SERVICES
TO THE
APPLIED RESEARCH AND
EXPERIMENTAL CENTRE
FOR THE LEATHER AND
LEATHER GOODS INDUSTRY
AT ULAN BATOR**

IS/MON/75/004

**MONGOLIAN
PEOPLE'S REPUBLIC**

TERMINAL REPORT

Prepared for the
Government of the Mongolian People's Republic by the
United Nations Industrial Development Organization,
executing agency for the
United Nations Development Programme



United Nations Industrial Development Organization

United Nations Development Programme

CONSULTANCY SERVICES TO THE APPLIED RESEARCH AND
EXPERIMENTAL CENTRE FOR THE LEATHER AND LEATHER

GOODS INDUSTRY AT ULAN BATOR

IS/MON/75/004

MONGOLIAN PEOPLE'S REPUBLIC

Project findings and recommendations

Prepared for the Government of the Mongolian People's Republic
by the United Nations Industrial Development Organisation,
executing agency for the United Nations Development Programme

Based on the work of Waldemar Steigerwald,
expert in leather and fur technology

United Nations Industrial Development Organisation

Vienna, 1976

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ABSTRACT

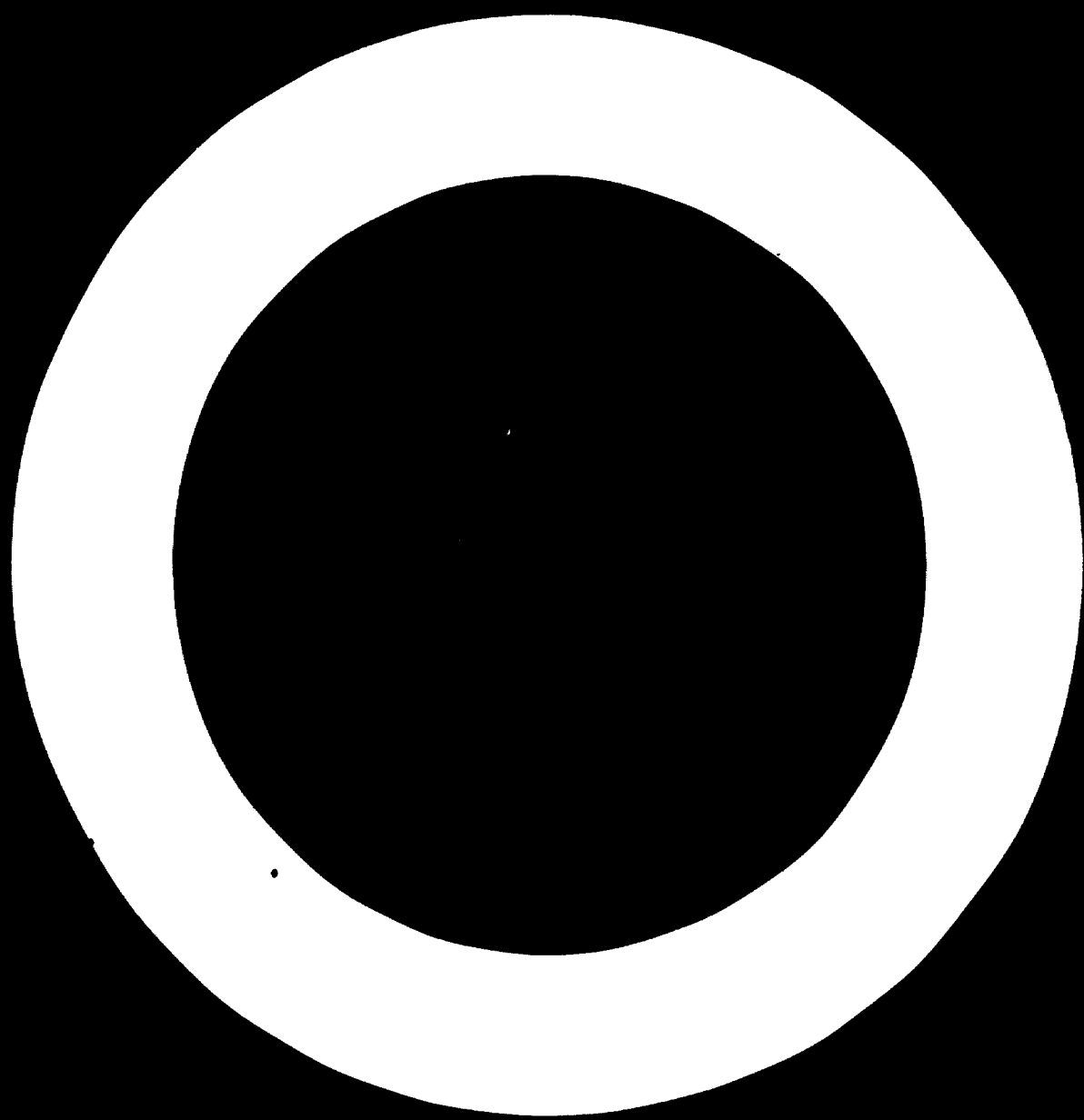
The project "Consultancy Services to the Applied Research and Experimental Centre for the Leather and Leather Goods Industry at Ulan Bator" (IS/MON/75/004) was one of a series of technical assistance projects provided to the Centre by the United Nations Development Programme (UNDP).

The expert worked in the Applied Research and Experimental Centre for the Leather and Leather Goods Industry at Ulan Bator in the Mongolian People's Republic. The mission lasted six months, from 27 April 1976 to 22 October 1976. The United Nations Industrial Development Organization (UNIDO) was the executing agency. UNDP contributed \$US 23,700 toward the project.

The purpose of the project was to provide scientific and technical assistance to the staff of the Centre. As part of his duties, the expert trained research workers and laboratory assistants in systematic research and experimental projects, according to the work plan of the Centre. He also worked on the production technology of fur from animal skins, including sheep skins, and trained laboratory analysts. Lectures were delivered to the personnel of the leather department and to the engineers of the leather complex.

The expert's recommendations were as follows:

1. The biggest problem for the Centre is that of technical personnel and it is necessary to obtain the services of international specialists.
 2. The fur industry is more remunerative than other branches of the skins industry and efforts should be made to fully utilize available fur resources.
 3. Efforts should be made to develop the leather clothes industry.
- He also made several short- and long-term recommendations concerning equipment, training of staff, use of resources, and the improvement of production technology.



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INTRODUCTION

The project "Consultancy Services to the Applied Research and Experimental Centre for the Leather and Leather Goods Industry at Ulan Bator" (IS/MON/75/004) was one of a series of technical assistance projects provided to the Centre by the United Nations Development Programme (UNDP).

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The Applied Research and Experimental Centre for the Leather and Leather Goods Industry was completed in June 1975. It has three departments:

Leather technology sector

Footwear and fancy goods technology sector

Physico-mechanical and chemical analysis sector

and two pilot workshops: one for leather; the other for footwear and fancy goods.

The expert worked in the leather technology sector where there are two laboratories: one for raw materials (furs, skins and hides, and fur production technology); the other for leather technology.

His experimental work in tanning and dyeing processes was carried out in the leather workshop which is equipped with all the necessary machinery for leather production but none for fur production.

UNIDO fellowships for training abroad were provided for 16 specialists, all of whom had completed their training. Eleven of them are working in the Centre; five have left. The distribution of their fields of study was as follows:

Organization of research work in leather production	5 fellows
Organization of research work in footwear and fancy goods production	4 fellows
New manufacturing methods and research work in raw materials	2 fellows
Problems of economics, organization of research institutions and information services	5 fellows

The research workers are not only concerned with work scheduled by the Centre, but also with problems of the Ministry of Light Industry and of the Food Industry and work for the Leather and Footwear Association.

Recommendations made by the expert are given at the end of the report.

I. FINDINGS

The expert developed and improved the technology of small-scale production, (dressing, dyeing and finishing) for the following raw skins: terlagan (marmot), kid, lamb, sheep, camel, galiac, calf, susliki, pony, fox, korsak, squirrel, kolinsky, solongoi, musquash, and burunduki.

He provided assistance in the formulation of research topics, such as:

(a) The development of technology of leather for shoe uppers and of zircon-tanning of hides for sole leather;

(b) The tanning technology of bovine splits for shoe uppers.

The expert developed and put into operation methods of chemical-analytical and technological control in the leather industry and of practical control of oxidation dyes.

He drew up a list of impregnating materials for increasing the qualities of shoe uppers and detailed the technical conditions for aniline-leather. He also developed and improved the technology of small-scale processes in furs production of sheep, calf and pony skins on the basis of the application of new chemical and fermentation preparations.

He worked out degreasing methods for sheep skins by the use of solvents such as benzene and tri (trichloroethylene).

II. CONCLUSIONS

The newly-organized scientific Centre is furnished with the latest instruments, equipment and apparatus for small-scale production testing. In addition, the pilot leather and footwear workshops make it possible to implement new techniques and continue small-scale production.

1. The biggest problem for the Centre is that of technical personnel. Most of the personnel who were recruited during recent years had no experience in research work and were not familiar with the new production and laboratory equipment. It is necessary to establish an exchange of specialists between the Centre and corresponding institutions in countries that would co-operate with Mongolia in the improvement of the leather and footwear industry.

2. The full potential of fur production in Mongolia is not being realized. There is one small factory in Darhan and another in Ulan Bator, both small and with old equipment. It is necessary to build further factories with modern equipment in order to fully utilize the available fur resources.

Since the fur industry is far more remunerative than other branches of the skins industry - shoe production, production of leather etc. - it would be advisable to concentrate on this aspect.

3. Within the leather-clothes industry the goods produced are not of a high quality, the leather is hard and the styles rather old-fashioned. An effort should be made to improve the quality of the clothes and to up-date styles.

4. Since the costs involved in the running of a leather-clothes producing factory are not high (machinery is relatively cheap and wages relatively low since the work is, on the whole, not specialized) and because this field is a remunerative one, efforts should be made to develop this industry.

III. RECOMMENDATIONS

Short-term recommendations

1. The leather workshop should be equipped with machinery for fur production, and the acquisition of the following is recommended:

Sawdust drum

Fleshing machine or "banjo" circular saw

Shearing machine

Ironing machinery

Stretching machinery

2. Staff should be trained as specialists in the field of designing, manufacturing and making-up of leather and fur clothing.

3. Two members of the staff should be trained as specialists in the processing and finishing of furs.

4. Techniques in solvent degreasing and the use of surface active agents in fur processing should be improved.

5. The technology of chrome powder tanning should be developed and improved.

6. The technology for the production of sawdust, preferably from beech trees, for the fur industry should be developed and improved.

7. Kid skin at present used as a lining leather in shoe production, should also be used in the manufacture of gloves and clothing.

Long-term recommendations

1. An inventory should be made of the available raw materials for the fur industry.

2. An inventory should be made of splits for the leather industry.

3. The technology of production of high quality splits for leather and clothing should be developed.

4. Production technology should be improved to produce sheepskin clothes of a high quality and in modern colours.

5. A techno-economic base for the establishment of a new fur factory should be developed.

6. Two two-year courses should be organized at the Centre for foremen specializing in (a) leather and furs; and (b) footwear and fancy goods. Two foreign specialists should be engaged to run these courses with Mongolian research workers as assistants.

Annex I

JOB DESCRIPTION

IS/MON/75/004/11-01/06

POST TITLE Research engineer in the field of leather technology

DURATION Six months

DATE REQUIRED Last quarter of 1975

DUTY STATION Ulan Bator

PURPOSE OF PROJECT To provide scientific and technical assistance to the staff of the Applied Research and Experimental Centre for the Leather and Leather Goods Industry in solving the most important research problems relating to the improvement of leather footwear and leather products technology

DUTIES The specialist will work at the newly organized scientific Centre, furnished with the latest instruments, equipment and apparatus for small-scale production testing. The Centre has some trained Mongolian specialists on its staff, but they are very few in number and, like those who have been recently recruited, they require guidance from qualified experts, especially when dealing with new problem areas. Accordingly, the expert's primary task will be to make available all his expertise, to solve existing problems as well as to give general assistance in this field of specialization. Areas to be given particular attention include long-term developments in the fur and leather industry, trends in technical progress, new research methods, and familiarization with advances in the sector as a whole and with specific reference to: "The development of a rational technology for the production of leather from cattle raw hides combining improved quality, greater selection of products and effective use of raw material". Specifically the expert will be expected to:

1. Organize experimental projects in this direction.
2. Carry out a practical analysis of the methods, instructions and special features prevailing in the production of leather from this kind of raw material in Mongolia.

3. Propose the best possible technological approach for the period immediately ahead, taking into account the conditions prevailing at the cattle-hide processing facility now under construction, determine the direction of future research and measures for producing top quality leather.
4. Familiarize the staff of the Centre with modern advances applicable to further work and instruct them in the performance of all the physical, chemical and mechanical tests required to carry out this work.

QUALIFICATIONS

Highly qualified leather specialist with professional experience at a scientific research institution and a knowledge of the special features involved in the production of leather from cattle hides, the organization and conduct of research activities, and the physical and chemical testing methods employed at modern scientific facilities of the leather-footwear industry.

LANGUAGE

Russian

**BACKGROUND
INFORMATION**

The Mongolian leather-footwear industry occupies a leading position in the national economy. In recent years, some progress has been made in increasing the output and export of leather, and leather articles, and in improving the quality and expanding the range of goods offered. Advanced new methods for the production of leather goods have also been introduced. The Government is engaged in an effort to implement measures designed to upgrade the quality and wider selection of these articles. One of these measures has been the construction and organization of the Applied Research and Experimental Centre for the Leather and Leather Goods Industry, a UNIDO (UNDP) technical assistance project. As a result of this project, Mongolia has been provided with a modern scientific institution furnished with the latest technological equipment and staffed with a certain number of trained Mongolian specialists capable of carrying out the kind of applied scientific work the fur and leather industry requires at this time. However, these staff members are too few in number and their research experience too limited to enable them to carry out the full range of tasks with which the industry has charged the Centre. This newly-formed scientific institution therefore has a need for far-ranging external assistance - assistance which, like the project itself, will also be administered by means of intergovernmental agreements, the exchange of experience with institutions working in allied fields in other countries etc.

Annex II

STAFF OF THE CENTRE AND THE DUTIES ASSIGNED TO
THEM IN RELATION TO THE PROJECT

Director of the Centre: A. Yumjee

Chief of sector of
leather technologies: Tserenchimed

Chief engineer: Gerelsuren

<u>Task</u>	<u>Responsible executor</u>
The development of progressive technology of fur production from kid, lamb, camel, calf and marmot skins	Dash-bal
The introduction of new methods of testing dyes for fur (oxidation and acid dyes)	Dash-bal
To provide assistance to begin running the laboratories' modern apparatus (viscosimeter, photocolormeter)	Dash-bal Chimeddorj
Recommendation of methods of analysis and testing of raw skins, the semi-manufactured article, and the supervision of leather processing and processing of skins and leather	Dash-bal Chimeddorj Khorgolkhun
To provide assistance with the development of new assortments of leather from cattlehide (split leather)	Chimeddorj Tserenchimed
The improvement of fur production technologies from sheepskins with progressive degreasing methods	Dash-bal
Topics of progressive fur production technologies and effective methods of tanning leather and fur raw materials	Workers of the sector
A study of the optimal parameter of drumming, ironing and oiling in fur production from sheepskins	Dash-bal
To familiarize the staff of the leather sector with modern advances applicable to further work	Workers of the sector

Annex III

LECTURES DELIVERED TO THE PERSONNEL OF THE CENTRE AND TO THE
ENGINEERS AND TECHNICIANS OF THE LEATHER COMPLEX

1. The development of the furs industry in the Polish People's Republic.
2. Progressive fur production technologies and the latest technological equipment.
3. Methods of chemical-analytical and technological control in the leather and fur industry.
4. Organization of production in the field of ready-made clothing.
5. Methods for standardizing the main types of fur skins.

Note: Some of these lectures were followed by seminars and practical studies.

Annex IV

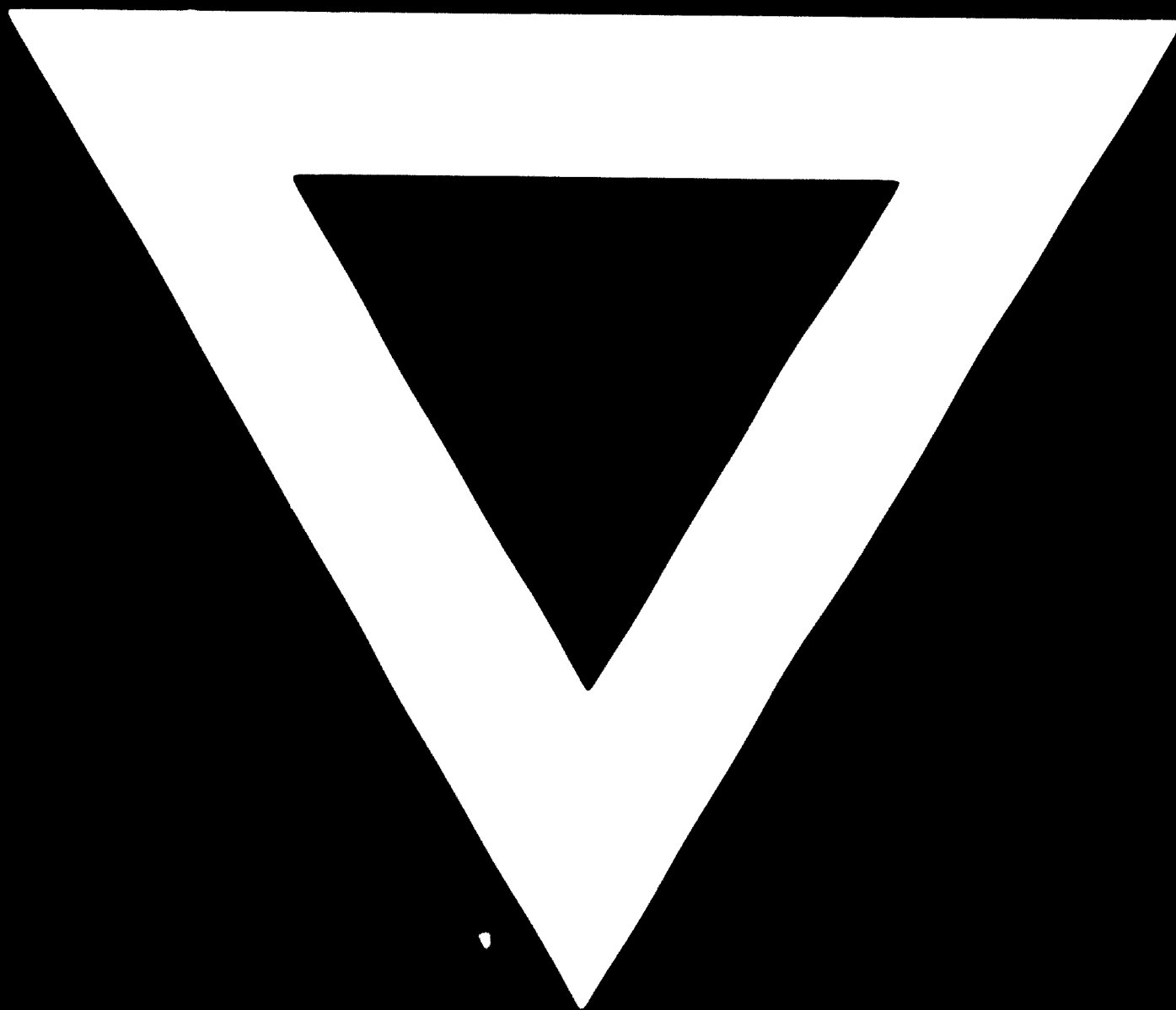
TECHNICAL DOCUMENTATION GIVEN TO THE CENTRE

The Centre was provided with technical documentation on the following subjects:

1. Methods of fur production from calf and foal skins.
2. Methods of fur production from fox and otter skins.
3. Fur production technology for sheep skins with progressive degreasing methods.
4. Progressive technology for manufacturing and dyeing marmot skins as luxury furs.
5. Methods for colouring the sueded woollen (double face) sheepskin with metal-containing dyes.



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