



TOGETHER
for a sustainable future

OCCASION

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



TOGETHER
for a sustainable future

DISCLAIMER

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

FAIR USE POLICY

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

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

19915



UNITED
NATIONS
INDUSTRIAL
DEVELOPMENT
ORGANIZATION



REGIONAL AFRICA

HIDES & SKINS, LEATHER AND LEATHER PRODUCTS IMPROVEMENT SCHEME

US/RAF/88/100/11-06B

TECHNICAL REPORT (*)
on a mission to TANZANIA
02-15 August 1992

Based on the work of

Augusto Zink, Tannery Machinery Maintenance Expert

Backstopping officers: Juhani Berg, Aurelia Calabrò
Agro-Based Industries Branch

TABLE OF CONTENTS

	PAGE
Explanatory Notes	3
Abbreviations	3
Abstract	4
Introduction	4
Afro Leather Industries	5
Morogoro Tanneries	5
Production Planned	6
Conclusions	6
Recommendations	7

LIST OF ANNEXES

	annex
job description	1
designs of drains	2-5
lay out of effluent	6
scheme of existing effluent	7
pictures of ALI drums	8-9
fax regarding water availability	10

Explanatory Notes

Explanatory notes

1 US\$ TSH

Abbreviations

ALI
URT
wb

Afro leather Industries
United Republics of Tanzania
wet-blue (half processed hide or skin)

Abstract

Working under the Regional Project US/RAF/88/100 with the goal towards hides and skins, leather and leather products improvement scheme, as Tanzania is included in this project, the machinery maintenance expert was fielded to assemble a drum at Afro Leather Industries Tannery and evaluate the existing effluent treatment plant at Morogoro. This assignment was carried on from the second to the 15.08.92. The objectives were attained and as this is split mission the work will continue on future missions.

Main Conclusions

Whilst in some other countries under this project the assistance is in an advanced stage, in the URT it is just starting. There is a big potential in resources as hides and skins are not being utilized. It should be a must to the government and owners to develop this industry. The work done at ALI was partially carried out due to lack of equipment and because the entrance to the working place was too narrow that a crown to be fitted on the drum could not be placed. This work will have to be done on a future visit once the basement for the drum and a bigger entrance is constructed.

With Morogoro Tanneries, the UNIDO assistance is also required. The assignment here was to evaluate the existing effluent works. This was done and some talks were held with the group that is evaluating the best form of bringing this tannery back to production.

Recommendations

At ALI the work has to continue. Mr. S. Mawji will buy from Europe a number of machines to make finished leathers. This will allow him to upgrade second class wet/blues to crust or soles. Up to now ALI's operations were purely commercial. It is advisable to prepare from now on some labour with experience on machinery maintenance, to build a small mechanical workshop and sanitary installations for labour. Experts will have to visit this Tannery till the works are finished.

At Morogoro, what the effluent mostly needs is the mechanical equipment as the concrete works are in good condition. They should be cleaned and sludges taken away. To start working, the first thing to do is to repair the big lathe at the mechanical workshop. Since it was purchased and assembled in URT, there surely must be spares available for it. A production of 300 hides could easily start after minor adjustments have been done and planning for bigger production is made.

Introduction

The background information of this project is explained on the job description (annex 1). The project activities cover various nations of East Africa as a Regional Project but this report covers specifically the activities of the machine maintenance engineer on this assignment. The

assignment was for a duration of 14 days.

The original objectives are described at the first pages of this report. At ALI the objectives were partially attained and additional work was done because the working space was not prepared. Before starting the assignment two machines had to be removed from the working area and a second drum relocated. All this work was done without proper tools or equipment.

At Morogoro the effluent liquors flow through channels to 6 lagoons measuring 35 x 50 mts. These could further be utilized during upgrading works of the tannery's new lay-out. Meanwhile, two fleshing machines from Svit 2400mm and two sammying machines among the existing equipment could easily be repaired if two new drums owned by the new shareholder are installed in order to enable the factory to start producing around 300 hides a day up to wet. blue if there is proper planning three months from the decision date.

Afro Leather Industries Tannery

Nothing had changed at this tannery since the expert's previous visit on May the 25th 1992. The production of the tannery is almost nil and the machines are still in the boxes in which they came. The effluent is also not working. The fleshing and the setting out machines were moved to a different area and a drum was brought down and taken to a new basement previously prepared for it. The drum was then assembled but the crown wheel could not be fitted as the entrance not big enough for the crown to pass thorough. (Annexes 8 and 9 are pictures of both drums.) It was arranged with Mr. Mawji that this work will be finished once the old and the new buildings are connected together. Once the new building is finished, then the wall between both buildings will be demolished as the new building will have wider doors allowing a forklift to enter. Also a ramp will be built at this entrance. This will allow us to move the machines to new basements according to the new lay-out. Once these works are finished, Mr. Mawji will request for the return of the expert.

Morogoro Tanneries

The effluent plant was designed by "CIRD PROMPROBKT". It starts from inside the main buildings with independent drain channels for chrome, lime, sanitary liquors and rainwater. (see annexes 2, 3, 4, 5, designs S-1-001/2/3/7). Inside the factory these drains are deeply constructed. A new design will be built on an upper level. Once outside, the effluents flow independently to the station for solid separation through a line of channels and pipes that have to be cleaned and unclogged. At this station, the bars to separate solids are oxidized. The civil work is in good condition and allows easy installation of two brush screens. Behind them exists the place to fit the boxes for the debris and also a bridge remains which was used to carry a 500 kg. lift who carried out of the groove the box with debris. This could also be repaired on site and a new lift could be reinstalled. The liquors flow then into two big covered basins 2x6x2mts. These basins are at ground level and at the side of the pumping station. At this station no

equipment is remaining but a couple of scrap-pumps used to deliver the liquors once dosified with chemicals to the next pit. Besides these pumps the dosification pumps are still available. They were used to inject ferric sulphate in one basin and lime cream in the other.

From this place, the liquors were mixed at the next pit. This one is 25 x 15 mts with four separations inside forcing the effluent to flow in "S". It reaches a level of 2,3 mts. and was used for homogenization and aeration. After aeration, the liquors overflow out of a smaller pit through a channel to a sludge precipitation tank, round shaped, 7.80m inside diameter and 6 mts deep strong baton construction apparently in good condition but full of sludges. Around the upper entrance, another channel and from it the supernatant flows to the Morogoro Council treatment plant. (Not operating.) Near this sludge precipitation tank, two more tanks were built. The first one, 4,60 mts diameter and 4 mts deep with a smaller rectangular tank attached to it 1 mt. square and two mts. deep. (Apparently for chrome precipitation.) The third tank also round shaped, 3.90 mts diameter and 5.50 mts deep is for domestic waste. (See annexes 6 and 7 with schematic drawings.)

Production Planned

The following particulars refer to production planned once Morogoro starts its operations:

1st year	1000 hides	2000 skins
2nd year	2000 hides	4000 skins
3rd year	2500 hides	6000 skins

80% wet blue, up to 20% finished leather

Water availability; 2000 cm per day from the Ngerengere river even during dry season (annex 10).

Conclusions

It may sound repetitive but the URT with its hides and skins production is another potential giant emerging in Africa. Up to now, ALI, Morogoro, Moshi or any other company dealing with hides are developing very slowly but this will change as the government policies are changing towards an open market economy.

With donor countries' assistance and private initiatives, 1993 could be the "taking off" year for leather industries. After one year of producing leather, no hide or skin should go out of the country dry or salted but at least in wet blue. Also wet blue stage should only be a short period and the aim must be to product crust at least. The internal market is also growing and right now a demand exists on finish leather.

As raw material is so cheap (compared to international markets), there is a good possibility to provide cheap leather shoes to the local market made from upgraded hides. Everything is available, raw material, labor, new

tanneries coming up and a huge potential of machines to produce shoes and leathers. Once the tanneries start production for the local market, hundreds of small scale handicrafts and workshops and some bigger industries will emerge.

Recommendations

To Morogoro new management

- 1 Repair the lathe and the workshop machines immediately.
- 2 Proceed to repair the new hydraulic equipment at the stores both fleshing machines Svit 2400mm ww. but giving priority to one of them to start working as soon as possible.
- 3 At the same time adjust or repair at least one sammying machine from the 5 exist' g.
- 4 Instal the drums that have arrived so that with the Items 1 to 4 in around 3 months, Morogoro could start producing a daily batch of 250 to 300 hides a day. The lower quality hides could be worked up to finished material. This will allow to train a group of workers and develop the working sequence whilst the factory itself is being rehabilitated for bigger production. Once the new construction is finished the drums could start working as the machines are relocated to their final place. The remaining basement can be used for vegetable tanning drums.
- 5 Once units 2,3,4 are working proceed to repair in site the finishing machines. They are so many that this work should not interfere with the small production of finish leathers or main rehabilitation programme.
- 6 This expert met during his visit the carpenter that used to work at Morogoro. He has done some drums for another industry and his work is good. He is able to build in plant the drums for retanning if Morogoro buys the proper wood. On previous reports is a reference to 5 new chains and gear boxes in good condition that will save foreign currency. Other drums should be imported as everything is needed.

To Afro Leather Industries

- 1 Finish the civil works as soon as possible.
- 2 Prepare installation of electricity, water and compressed air for the new drum. Try to buy a set of spanners from 12 to 36 mm and a jack (8 tons) as this will be needed for installation of other machines.
- 3 The tap which labor uses to wash before going home is placed directly underneath the overhead watertank and the used water has no drainage. The continuous humidity of this place could weaken the basement of the overhead tank and even the borehole that is also very near. It would be advisable for security reasons and hygienic purposes to build a proper place with

drainage, shower and more than one tap.

- 4 Check if the overhead tank has enough capacity for the new lay out.

To UNIDO and to the authorities

Seldom so many positive factors for development are gathered together. At least Ali, Moshi, Morogoro, three names, three companies with a potential for a private entrepreneur (in case Moshi's privatizing comes to reality) as the three entrepreneurs have the link to foreign markets, the economic capacity and the know-how.

The social importance in development in Morogoro and Moshi - the operating tanneries will generate other smaller works around it. Besides there is no need to start from the beginning as the infrastructure already exists. More explanation is not required. The recommendation of this expert is for the authorities, to facilitate by any means the realization of these projects and to UNIDO to make an effort to consider these projects if possible for further assistance during the second phase. Both Moshi and Morogoro once privatized will need more drums, a new fleshing machine and a throughfeed sammying machine. The assistance of Unido to this projects could not only be with experts but standardizing the machinery types delivered making it easier for UNIDO and the supplier to give a better service, to prepare workmanship and the possibility to train engineers abroad at lower cost.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

24 July 1991

JOB DESCRIPTION
US/RAF/98/100/11-06B/J13104

Post Title: Leather Machinery Maintenance Expert

Duration: 12 months

Date Required: September 1991

Duty Station: Nairobi, Kenya with travel within Ethiopia, Kenya, Malawi, Somalia, Sudan, Tanzania, Zambia and Zimbabwe as may be required.

Purpose of the Project:

The project is designed to establish a regional pilot scheme and to demonstrate, in practical terms, the process of hides and skins improvement from butchering and flaying to conservation, grading and collection and to act as catalyst to national authorities to introduce incentives for improved performance. To rehabilitate existing infrastructures and selected leather tanning and processing plants by increasing their efficiency and capacity utilization, upgrading technical standards, operational methods and skills, product quality and marketing performance, as well as knowledge of those attached to these industries at various levels, starting from primary producers.

Duties:

The expert will be attached to the UNIDO project team of the Regional Hides and Skins, Leather and Leather Products Improvement Scheme with headquarters in Nairobi. Under the technical supervision of the UNIDO IO/T/AGRO Leather Unit in Vienna and the UNIDO Chief Technical Adviser in Nairobi and in co-operation with the national project authorities the expert is, according to the established work plan, expected to:

1. Assist selected tanneries in the countries participating in the Scheme in repairing and/or adjusting their machines and in preparing lists of spare parts to be requisitioned as required; supervise the installation of machines delivered during project life; and give special attention to safety at work;
2. Provide technical inputs for guidelines and maintenance manuals etc., to be translated into local languages for use as teaching aids in seminars and/or reference manuals in the daily work of tanneries.

3. Participate in the rehabilitation studies to be prepared for selected tanneries and provide the technical inputs on the machinery, equipment and maintenance aspects for these studies;
4. Participate in the rehabilitation programme of the selected tanneries and assist and advise in the implementation of the recommendations provided by the rehabilitation studies concerning machinery installation and maintenance aspects. Specifically assist in the installation at the Sagana Tanneries of the tannery machinery and equipment supplied under the Regional Tannery Rehabilitation project US/RAF/88/102;

The expert will also be expected to prepare a technical report setting out his findings and recommendations to the Governments on further action which might be taken.

Qualifications: A leather machinery maintenance specialist with suitable academic background, i.e. university level education in engineering and/or technical college training from a recognized leather technology institute. Several years of experience in machinery installation and maintenance. The expert should be capable of carrying out ad hoc repairs of various types of tannery machinery and also be able to prepare plans for preventive maintenance and organize spare parts procurement systems. Some experience with shoe industry machinery and previous work with international organizations are an asset.

Language: English.

Background Information: The Third Consultation on the Leather and Leather Products Industry (Innsbruck, Austria, April 1981) recommended, that an integrated programme approach at the national level, with appropriate variations to meet the specific needs of individual developing countries, could provide a relevant framework for international co-operation for the development of the full potential of the raw hides and skins and the leather products industry.

It was also recommended that "Given the objectives of the Industrial Development Decade for Africa and the situation of the leather and leather products industry in that region, the Industrial Development Board should consider the convening of a regional consultation in Africa preceded by the meeting of a group of experts that would identify areas of international co-operation".

Consequently UNIDO started the project Integrated Development Programme of the Leather and Leather Products Industry in Africa

(NA/RAF/85/610) and the terminal report of this project (IPCT.5 of 20/10/1986) formed the main background paper for the Regional Meeting on the Leather and Leather Products Industry in Africa, Alexandria, Egypt, January 1987.

The Alexandria meeting focussed on the constraints and shortcomings experienced in the African leather industry as a whole and emphasized the need, as a first priority measure, to upgrade the quality of raw hides and skins and to improve the collection systems. As a follow-up the proposed scheme was presented to the First Session of the FAO Intergovernmental Sub-Group on Hides and Skins, convened in Rome, 21-23 January 1987, and was as such welcomed and accepted. For the implementation of the integrated sectoral improvement scheme UNIDO was entrusted to seek the required funds. After receiving the approval and support of many African countries, it was agreed that eight East-African countries should be grouped under the envisaged improvement scheme programme.

This grouping was decided on the grounds that there are many similarities and close ties between the countries of the group. The livestock population is very similar and the type and inherent quality of the hides and skins are nearly identical. The hides and skins improvement schemes established during the colonial times have the same type of structure.

The sectoral development level of the countries within the region differs widely. However, in spite of the different economic systems employed, one could possibly group Ethiopia, Kenya and Zimbabwe together, representing the more developed countries with Zimbabwe taking the lead. Sudan, Somalia, Tanzania have established leather industries although their tanning and leather products production capacities are underutilized for many reasons. The third group of countries representing Malawi and Zambia, featuring a similar economic system, are naturally newcomers to this field of industry and new plants are being established.

The purpose of the regional umbrella project is to obtain maximum benefits from and utilize in the most economic way possible the international inputs for the participating countries, while catering to their specific needs in individual national projects. This particular structure is justified on the grounds that:

- the national projects to be implemented need a number of common international inputs;
- there should be a maximum of flexibility in responding to individual national needs, and inputs should be provided on both a timely and appropriate basis;
- inputs should be provided in a complementary way between countries, and national institutions should not be overburdened with them in their entirety;

- maximum utilization should be made of various national facilities to serve regional needs.

The overall administration of the scheme and co-ordination of inputs will be done by a project officer, associate expert, at UNIDO headquarters in Vienna. The CTA and his team will be located at the Kenya Industrial Research and Development Institute (KIRDI) Leather Quality Control Laboratory and Pilot Plant in Nairobi, which will serve as regional project headquarters. From these regional headquarters the CTA will supervise the activities of the international experts and sub-contractors, as well as those of the national expert appointed in each country of the region covered by this scheme. Through seminars and workshops at various national institutes information on the technological aspects and issues of the improvement scheme will be disseminated on a regional and country level. It is with the potential economy of utilizing inputs that a core of inputs would be maintained to serve the African region.

The country projects, on the other hand, are concentrating on direct assistance through expert and sub-contract services. This direct assistance will, firstly, be put into effect in the hides and skins improvement sector and, secondly, in the rehabilitation of selected tanneries and leather product industries. Such rehabilitation objects will be subject to a careful rehabilitation study which will establish the base line data and clear rehabilitation outputs. The rehabilitation of suitable objects will also be carried out under the parallel project US/RAF/88/102, Regional Tannery Rehabilitation Scheme.

ZINE.060