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FINAL REPORT
For
UNIDO

Project No: XA/ERI/03/620

Establishment of the Industrial Development Service Centre (IDSC): Transfer of a Professional Training System for Leather-based Industries

Project No: XA/ERI/03/620

FINAL REPORT

For

United Nations Industrial Development Organisation
(UNIDO)
Director, General Services Section Branch
Division of Administration
PO Box 300, Vienna, A-1400
Austria

by

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and
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ABSTRACT

Project No: XA/ERI/03/620

This Final Report covers recommendations to UNIDO in regard to the establishment of the Eritrean Industrial Development Service Centre (IDSC). Broadly speaking two topics are covered:

- Production of appropriate materials for leather and footwear training
- Recommendations for the management structure and operation of IDSC

A number of experts are providing reports to UNIDO with regard to IDSC. It is strongly recommended that all of the reports be consolidated as soon as possible and a workable business plan for IDSC prepared and implemented.

Section I – Production of Appropriate Training Materials for Leather Tanners and Footwear Manufacturers:

The following course materials were produced for leather and footwear training at IDSC:

- Computer Assisted Technology Training (CATT) Modules (5)
- An Introduction to Leather Course
- 'The Craft of Leather Manufacture' - Operative Level Leather Making Course
- The Control and Management of Quality Course
- Training Programme for Sewing Machinists
- Training Programme for Leather Cutters
- Supplementary Closing Training Packages
- Training Programme on Under-Pinning Shoe Making Knowledge
- Training Programme on Aspects of Supervision
- Guidance on Course Implementation and Instructor Manual (Leather and Footwear)
- Videos (2)
- Glossary and Standards (2)
- Reference Books (3)
- Reference Manuals (4)
- Supporting Materials

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Recommendations for Leather Training

1. Appoint an expert for 6 – 12 month period (preferably 12).
2. Sponsor an individual to be trained for 12 months in leather technology and teacher training at a reputed school (the British School of Leather Technology - BSLT - is recommended).
3. Basic underpinning theoretical knowledge is required.
4. Use a block release approach to training.
5. UNIDO/MTI give some thought to equipping a finishing area at IDSC.
6. Consider providing basic test equipment.

Recommendations for Footwear Training

1. Staff from the ISDC to undertake skills audit of companies to ascertain their training requirements.
2. The initial Closing training should fall into one of three categories:
   - Developing the skills of the existing sewing machinists to meet the quality standards of the target market.
   - Training non-machinists in operating a range of closing machinery.
   - Multi-skilling existing competent operatives to do more than one operation, leading to a more flexible, versatile workforce.
3. All new closing recruits to be trained to be multi-skilled.
4. After a period in the factories they return to IDSC for operation specific training.
5. A survey should be carried out to check which type of sewing machines are being used for each operation. Retraining may be needed accordingly.
6. Attention must be given to planning for the continuity of trainers upon completion of existing contracts.
7. Due to the limitations in training only one instructor in the UK, it is recommended that UNIDO gives consideration to a trainer from BLC and Tresham visiting IDSC once it is in operation.

General Recommendations Made to Tanners and Footwear Manufacturers

1. Don't extend production to fit the time available - if it can be done in half a day only take half a day to do it.

2. Use the remaining time to improve housekeeping, carry out on-site training, look at quality control, health & safety etc.
3. Don't take on new staff unless essential – gain orders, increase business THEN take on new people and train.
4. Seek external technical assistance (UNIDO to help?) to ensure product is marketable.
5. Implement technical advice given.
6. Assess market possibilities and develop a marketing plan.
7. Implement marketing plan (external assistance required?).

Section II – Development, Management and Operation of the Industrial Development Service Centre (IDSC):

Refurbishment Recommendations

Architect drawings for IDSC had been provided by UNIDO prior to visiting Eritrea. A visit was then made to the existing buildings that are to be refurbished to provide a suitable training and service facility. The recommendations made by the four consultants to the architect were:

1. Increase the width of the store in the hangar by 2 metres – 1 metre into each training area.
2. Increase the length of the store in the hangar by 1 metre into the hall area.
3. Move doors to other end of store to improve accessibility.
4. Remove doorway leading from hall as now unnecessary.
5. Move doors to other end of lecture rooms.
6. Remove doorways leading from lecture rooms to staff rooms as now unnecessary.
7. Include windows in staff rooms.

Organisational Structure Recommendations

The key recommendations in regard to organisational structure and operational planning are:

1. IDSC should be a commercial but non-profit making organisation with all surplus re-invested into the centre.
2. IDSC structure should be simple with the minimum of bureaucracy.

3. A Governing Body representing all 3 industrial sectors should be established immediately with responsibility for policy and strategy decision making.
4. The Governing Body should oversee the appointment, as soon as possible, of the IDSC Manager who will be given responsibility for overseeing the refurbishment programme, promoting IDSC during the establishment phase and day to day management of the centre.
5. IDSC should aspire to be 100% self supporting.
6. IDSC should be a membership-based organisation with companies paying an annual fee, giving a predictable base income stream.
7. Non- members should be encouraged to use the services of IDSC but members would be charged at a preferential rate.
8. Marketing of the centre must take high priority and continuous feedback should be sought from the companies using IDSC to ensure that industry needs are being met.
9. Personnel must be kept to a minimum to keep overheads low, some individuals could have dual roles, eg, accounts/administration.

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1.0 Introduction

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The overall objective of the UNIDO project is to enhance the capabilities of the Eritrean leather-based industry as it is the priority export-oriented sector of the country. The objective of this contract is to establish substantive capacity of IDSC making it capable to provide professional training services for the local leather, footwear and leathergoods industry.

This Final Report covers recommendations to UNIDO in regard to the establishment of the Eritrean Industrial Development Service Centre (IDSC) and details the training materials that have been produced by BLC Leather Technology Centre Ltd, UK and Tresham Institute Footwear Centre, UK to be utilised by IDSC. Broadly speaking the report is in two sections:

- **Section I - Production of appropriate materials for leather and footwear training**
- **Section II - Recommendations for the management structure and operation of IDSC**

The authors, Christine Powley-Williams (BLC) and Richard Coles (Tresham) were given access, for reference purposes, to a number of reports prepared by other consultants. The intention in this Final Report is not to duplicate information given in these earlier reports, but to add further information/opinion or develop the concepts detailed. The reports referred to are:

- 'Report by Anthony Clothier on Eritrean Leather Industry 30 November – 8 December 1999'
- 'US/ERI/00/141/11-51 Technical Report – Ferenc Schmel, 2001'
- 'Skill and Business Development Centre – Sennai Accounting and Consulting, 2003'
- Report by Institution Building Expert - Sahasraneman, November 2003

During the authors' visit to Eritrea, 17-21 November 2003, two other UNIDO consultants were in attendance, Peter Wilson a garment/textile expert (UK) and Alfredo Martinelli a management/footwear expert (Italy). For the majority of the visit all four consultants worked together to achieve optimum results.

Meetings were held with:

The Eritrean Ministry for Trade and Industry (MTI)

The architect responsible for designing the IDSC building plans

The Eritrean Leather and Allied Industries Association (ELAIA)

Visits were made to:

Keih Bahri Tannery

Asmara Pickling Tannery

Petros Araya Tannery

T Baatai and Sons Tannery

Asmara Leather Products

Nuguse Shoe Factory

Hadera and Sons Shoe Factory

Steef Quality Shoes

Dahlak – Share Company

BINI Shoe Factory

Selam Shoe Factory

Presentation given at:

'Africa Industrialization Day – Industrial Development in Eritrea' 20 November 2003

Current Industrial Situation

As previously reported by Sahasraneman all companies (tanners and footwear manufacturers) are working below potential capacity with the majority of products supplying the Eritrean domestic market which faces strong competition from Chinese imports. There is minimal export business, predominantly Italy for leather and other African countries for footwear. Employees are paid a weekly or monthly rate rather than incentivised pay. Consequently the production is extended to fit the time available, for example, it is possible to produce 1000 pairs of shoes per day but there are instances of only 50 pairs being produced in the same timescale.

Due to National Commission employees of 18-40 are not available generally. The people working in production are either over 40 (which is regarded as 'old' by the managers interviewed) or are young or married women.

Despite the problems of limited market access to potential employees, some of the people currently employed exhibited a high level of skill, for example, hand lasters working in the footwear manufacturers. Also, the number of people currently employed is judged to be sufficient for current levels of production.

Observations of equipment and production methods demonstrated that process control was very poor. 'Lack of new equipment' was raised as an issue by managers. Generally the existing equipment would be satisfactory for the tasks required, it was control of the equipment that was the root of quality problems. In two instances (one tanner, one footwear) brand new equipment was available but not in use.

In the footwear production units there seemed to be an unnecessarily high amount of benchwork, such as preparation for stitching. The impact of this is to lower the minimum skills level required of the machinists.

During the brief visits to tanners and footwear manufacturers it was noted that many aspects of production could be improved with technical assistance leading to a more consistent, marketable product.

2.0 Section I – Selection of Appropriate Training Materials for Leather Tanners and Footwear Manufacturers

2.1 INVENTORY OF LEATHER AND FOOTWEAR TRAINING PACKAGES AND MATERIALS SUPPLIED:

LEATHER

1. Computer Assisted Technology Training (CATT) Modules (5):

- 1 CD-ROM containing all modules

2. An Introduction to Leather Course

- 1 Master copy manual
- 1 Extra copy manual
- 1 CD-ROM containing manual and presentation materials

3. 'The Craft of Leather Manufacture' - Basic Operative Level Leather Making Course (Modified Distance Learning Package)

- 1 Master copy manual

4. The Control and Management of Quality Course

- 1 Master copy manual
- 1 CD-ROM containing manual and presentation materials

5. Supporting Materials

i. An Introduction to Leather Video

ii. An Introduction to the Science of Leather Manufacture Video

iii. Reference manuals in the following subjects:

- Rawstock to Wet Blue
- Post Tanning
- Finishing
- Clean Technology and Waste Management (2 volumes)

iv. Book - Leather Technician's Handbook by J H Sharphouse

v. Book - Leather Under the Microscope by B M Haines

vi. Book - The Complete Guide to Quick and Easy Marketing that Works by D N Russell

vii. Book - International Glossary of Leather Terms by International Council of Tanners

viii. British Standard Glossary of Leather Terms BS 2780: 1983

ix. 5 Leather swatches demonstrating animal grain patterns

x. 5 Leather swatches demonstrating leather types

xi. 8 Plastic bottles for chemicals and labels

xii. 1 Calfskin leather

6. Guidance on Course Implementation and Instructor Manual (Leather and Footwear)

- 1 Master copy manual
- 1 CD-ROM containing manual

FOOTWEAR

7. Training Programme for Sewing Machinists

- 1 Master copy manual

8. Training Programme for Leather Cutters

- 1 Master copy manual

9. Supplementary Closing Training Packages

- 1 Master copy manual

10. Training Programme on Under-Pinning Shoe Making Knowledge

- 1 Master copy manual

11. Training Programme on Aspects of Supervision

- 1 Master copy manual

2.2. Leather Learning Materials

The following training packages and supporting materials have been produced and transferred to IDSC as the basis of its leather training portfolio:

2.2.1. Computer Assisted Technology Training (CATT)

BLC together with Telos Aleff have created a family of multimedia information programs which bring leather technology to life and make it available to a wide range of people associated with the leather industry. A set of CATT programs have been supplied to IDSC that can be made available to companies and individuals via the Information Centre.

The programs cover the entire range of processes and associated operations from rawstock to finished leather including the environmental control of all processing. They provide an unrivalled comprehensive and authoritative resource for:

- Training and education
- Reference and support
- Process control and monitoring
- Problem solving in production

There are four CATT training courses on:

- Rawstock to wet blue
- Wet blue to dyed crust
- Finishing processes
- Clean technology and waste management

A leather technology self assessment module covering all four programs has also been produced. This contains over 200 questions and can be used as a self assessment of the understanding of the contents of the modules, or as a more formal assessment as part of a structured training program.

2.2.2. An Introduction to Leather Course

This is a one day course, which would be an ideal introduction to any of the other training courses – including footwear and marketing. It assumes no knowledge of leather making and covers raw materials, structure of hides and skins, a brief overview of leather making, leather types and definitions, testing and making leather to meet a specification.

2.2.3. The Craft of Leather Manufacture Course

This is a basic level course for operatives that encompasses 4 units of study:

- Where does leather making begin?
- Want to be a tanner?
- Making the most of leather?
- Safety at work?

The material is based on a distance learning format and would provide a sound foundation for individuals who have little formal training. A 6 - 12 month study period would probably be necessary to complete this course.

2.2.4. The Control and Management of Quality Course

A course suitable for supervisors and managers can be provided to look at aspects of quality control and problem solving. Bearing in mind the technical problems that are apparent in the tanneries this package is recommended. It could form part of a week long training session for supervisors and managers tackling commercial issues.

2.2.5. Supporting Materials

A variety of supporting materials have been produced which can be used purely for reference purposes or for demonstration activities during the courses. Some materials are suitable for use in a number of courses:

i. An Introduction to Leather Video
ii. An Introduction to the Science of Leather Manufacture Video
iii. Reference manuals in the following subjects:

- Rawstock to Wet Blue
- Post Tanning
- Finishing
- Clean Technology and Waste Management (2 volumes)

iv. Book - Leather Technician's Handbook by J H Sharphouse

v. Book - Leather Under the Microscope by B M Haines

vi. Book - The Complete Guide to Quick and Easy Marketing that Works by D N Russell

vii. Book - International Glossary of Leather Terms by International Council of Tanners

viii. British Standard Glossary of Leather Terms BS 2780: 1983

ix. 5 Leather swatches demonstrating animal grain patterns

x. 5 Leather swatches demonstrating leather types

xi. 8 Plastic bottles for chemicals and labels

xii. 1 Calfskin leather

Tanners and footwear manufacturers can also assist by keeping examples of problems encountered. It is often easier to learn by observing what NOT to do!

A list of reference publications has been included in Appendix II as possible suggestions for the Information Centre. Help can be given with sourcing the publications that are still available in print.

2.3. Guidance on Course Implementation and Instructor Manual (Leather and Footwear)

A manual has been prepared to be used for all training courses - leather and footwear. It is in two parts:

- Course Implementation
- Instructor Guidance

Part 1 - Course Implementation

This part of the manual has been produced to give guidance on the peripheral activities that are part of running training courses. Although the production and transfer of training courses is a priority in this contract it will be of little value if a number of critical factors are not

developed. These factors can be summarised as the 3 M's –Management, Marketing & Monitoring.

Management – A great deal of organisation is required to ensure that the courses run smoothly and to the satisfaction of the attendees. Guidance is given on the day to day practicalities of running multiple training courses.

Marketing – IDSC may have the best training courses in the world but if no-one knows that they exist all previous efforts will be a waste of time. Guidance is given on developing a marketing strategy appropriate to the conditions in Eritrea. This is supported by the enclosed book 'The Complete Guide to Quick and Easy Marketing that Works' by D N Russell.

Monitoring – It is imperative that the quality of the courses is established and maintained or else the training will be devalued. Guidance is given on course assessment and certification etc.

Part 2 - Instructor Guidance

Sections relating to the various training courses have been prepared to 'Train the Trainer'. These give guidance to IDSC professionals who will be responsible for delivering the training courses and will be demonstrated during the Ermias's visit to the UK.

The information provided includes suggested course agendas and timings and tutor and mentor guidance that is generic in its nature.

2.4. Selection and Training of Leather Trainers

Currently there is no provision made for appointing a leather technologist to train the employees in the tanning industry. Sahasraneman has suggested that a long term leather expert be appointed for at least six months to carry out practical training in the tanneries.

Whilst there is some merit in this suggestion it does not really address the problem of future training in the companies – it appears to be a very short term 'fix'.

A two stage approach will be more beneficial and will provide continuity in the future:

- Stage I – appoint an expert for 6 – 12 month period (preferably 12)

- Stage II – sponsor an individual to be trained for 12 months in leather technology and teacher training at a reputed school (the British School of Leather Technology - BSLT - is recommended)

The individual sponsored would return at the end of 12 months and then hold the position of leather trainer at IDSC.

During the visit to Eritrea contact was made with two individuals who might prove to be ideal candidates to educate at BSLT. The first was the Production Head at Keih Bahri Tannery, Michael Ghebru. He has technical knowledge and exhibits a desire to learn. The biggest difficulty is the fact he is a key employee at a tannery that is currently experiencing problems trying to maintain quality. These problems would be exacerbated by removing a person who understands the production process.

The second individual is situated at MTI, Solomon Tesfamarian. Although currently working outside of the leather sector he actually is a qualified leather technologist (Higher Diploma in Leather Technology) having studied at BSLT during 1982-84. His full leather experience since that time is not fully known, but he could study to MSc level in one year at BSLT which would not only enable him to become a trainer, but would also enable him to provide technical assistance to the tanners. Again, there may be political issues in regard to appointing this individual.

2.5. Training Needs of the Leather Industry

Poor process control was very obvious during the visits to the tanneries, leading to poor quality, inconsistent leather being produced. A number of footwear companies complained about the quality of the leather that they were receiving and which were variable in softness/firmness and were easily marked during the toe lasting process. A number of samples were taken to carry out a few basic tests at BLC. The wet rubfastness was very poor indeed although the finish adhesion was good. The difference in softness noted was outside of normal tolerance. Complaints had been made about tear strength but the samples tested passed without difficulty. (See **Appendix I – Brief Technical Report of Footwear Leather**).

The skill level is low and the majority of employees have little formal education. Operative training needs to be predominantly of a practical nature but basic underpinning theoretical knowledge is also required. Supervisory and management level theoretical training is also required.

For the tannery operatives the most appropriate model for training is known in Europe as 'Block Release'. This would entail the trainees spending one week per month at IDSC carrying out basic level theoretical training. They would then return to their respective tanneries for the next 3 weeks to put the theory into practice. As there are only a small number of tanneries the leather trainer would then be able to spend time at each tannery (0.5-1.0 days per week) overseeing the progress of the trainees. Joint practical sessions could also take place using the UNIDO sample drum.

During discussions with the tannery managers it was stressed that companies are looking to give added value to existing products and hence are hoping to produce more finished leathers. This is the part of the leather making process that is most likely to lead to performance failure of the leather in use. It is also one place where errors are very likely to occur. It is recommended that UNIDO/MTI give some thought to equipping a finishing area at IDSC with a simple spray booth and extraction, hand held spray guns, a sink and preparation area so that practical finishing training can be taught in the future.

An addition to this would be to provide some basic test equipment such as rubfastness, flexing, finish adhesion etc, although it is appreciated that there might be provision for this at the Eritrean Standards Institute.

2.6. Recommendations for Leather Training

1. Appoint an expert for 6 – 12 month period (preferably 12).
2. Sponsor an individual to be trained for 12 months in leather technology and teacher training at a reputed school (the British School of Leather Technology - BSLT - is recommended).
3. Basic underpinning theoretical knowledge is required.
4. Use a block release approach to training.
5. UNIDO/MTI give some thought to equipping a finishing area at IDSC.
6. Consider providing basic test equipment.

Footwear

2.7. Footwear Learning Materials

The following training packages and supporting materials have been produced and transferred to IDSC as the basis of its footwear training portfolio:

2.7.1. Training Programme for Sewing Machinists and Leather Cutters

UNIDO has already purchased materials for use in the training of leather cutters and sewing machinists.

- Analytical training of Leather Cutters employed in footwear factories.
- Analytical training of Sewing machinists employed in footwear factories.

Both training packages produced by TechnOrg Consulting, Budapest Hungary.

Copies of the instructor's manuals and support materials for both systems were brought back to the UK. An initial inspection raised some doubts as to their effectiveness so they were examined in close detail highlighting the relative value of each section and offering viable more 'user-friendly' workable alternatives to the students and trainers as appropriate.

There is a need for information on the non-sewing operations that can be met by modifying modules available within the Footwear Centre at Tresham Institute.

2.7.2. Supplementary Closing Training Packages

A training package has also been produced to cover the non-sewing closing operations.

2.7.3. Training Programme on Under-Pinning Shoe Making Knowledge

There is also a need for under-pinning shoe making knowledge. This was produced by adapting modules already in existence at Tresham.

2.7.4. Training Programme on Aspects of Supervision

Training materials are also provided on aspects of supervision that may be offered as 'one off' self financing courses. This generic course could be offered to leather, footwear or garment students.

2.8. Selection and Training of Footwear Trainers

Two young people, Mr Ermias Hadera of Hadera and Sons, and Mr Mussie from Selam Shoes have been contracted by UNIDO to become the footwear trainers at the IDSC for a period of 2 years. As part of the Eritrea visit both Ermias and Mussie were visited in their respective companies plus Richard Coles had a long conversation with them both at the reception after the conference for the African Industrialisation Day. In his opinion they are both very capable young men, already possessing a good practical knowledge of footwear manufacture and some experience of training in factory on a 'one to one' basis. He believes that they are most suitable candidates to develop as trainers.

Both candidates had been booked onto a three-month footwear course starting on 12th January 2003 at Leicester College in the UK to enhance their shoemaking skills. On returning to the UK Richard Coles contacted the course tutor and informed him of the candidates' level of expertise, and detailed the plans for them on their return to Eritrea. Unfortunately only Ermias Hadera was granted an entry and study visa to the UK. He commenced his training in January as planned and will complete his study on 2 April 2004.

One concern is that there will be a modern, equipped centre in Eritrea with instructors who have a good knowledge of footwear manufacture but no expertise in the organisation and training of groups of people. What is missing is an element of 'Training the Trainers'.

Part of BLC's contract with UNIDO is to **demonstrate** the learning materials to representatives from the IDSC. To achieve the maximum benefit from all the work done so far the trainer/s should have a period of time spent learning **how** to deliver the training.

In the UK Richard Coles is responsible for the day to day running of a footwear training centre based in Wellingborough, Northamptonshire. As well as training international students on full time courses, Tresham trains people for the local high quality footwear companies such as Edward Green, Church & Co, Loake Bros, and Alfred Sargent.

After discussions during meetings with ELAIA and MTI it has been agreed that Ermias Hadera, upon completion of his footwear studies at Leicester, should go to the footwear

training centre at Wellingborough to learn about the practicalities of running such a centre and training groups of students. It is planned that Ermias will shadow the lecturers as they prepare for and deliver the classes. Also, under the supervision of the lecturers, Ermias will be responsible for the delivery of some classes to the students at the centre, thereby gaining practical, supervised experience of training.

Ermias has also spent a day in February at BLC as a participant on an Understanding Leather Course. He will return to BLC in April to spend a number of days learning how to use the leather training materials in preparation for his return to IDSC.

Due to the limitations in training only one instructor in the UK, it is recommended that UNIDO gives consideration to a trainer from BLC and Tresham visiting IDSC once it is in operation to give further advice on the delivery of the training packages supplied and guidance on the management of courses. It is envisaged that an intensive one week programme in Asmara by two instructors would prove beneficial for minimal cost. This is outside the remit of the current contract with UNIDO.

2.9. Training Needs of the Footwear Industry

Currently the Eritrean footwear industry finds itself working well below capacity. As the operatives are being paid on a day/monthly rate irrespective of production, so the time taken to process the footwear has expanded to fill the time available.

For production to increase the industry has got to look towards exporting the majority of its production. The work being produced may be acceptable to the local market, but it is not in general of a sufficiently high standard for export, certainly not to European markets.

The companies cannot afford to take on any more labour to be trained.

At a meeting with ELAIA it was agreed that given the circumstances detailed above the first training need is to 'up skill' the existing workforce.

This training should fall into one of three categories:

- Developing the skills of the existing sewing machinists to meet the quality standards of the target market.
- Training non-machinists in operating a range of closing machinery.
- Multi-skilling existing competent operatives to do more than one operation, leading to a more flexible, versatile workforce.

It is proposed that either the ISDC manager, or the trainers, ascertain what the exact training needs are by undertaking a skills audit of each company.

This proposal means that while production is low the companies do not have to recruit more labour to train. Also there should be an improvement in the quality of the product making it more marketable. Additionally, when the companies move back onto full production they will have a pool of skilled labour, and it will be easier for them to recruit "green" labour and train them to do the less skilled jobs such as benchwork.

The question was put to the ELAIA members. "When you get back onto full production how would you like IDSC to train the new recruits to your companies?"

The following model was agreed:

- All new recruits into the closing area would be trained in the ISDC to a level of competency on all closing operations. Stitching and non-stitching.
- They would then return to the companies for an agreed period of time.

This will give the company an opportunity to assess the trainees' abilities in a "real work" situation. The company can then choose, for each trainee, which particular operation they wish to have their skills developed in, on their return to the ISDC for advanced skills training in one particular operation.

It may be that the company needs operatives with just a basic skill level, or they may decide a trainee has reached their optimum skill level and would not benefit from further skills training. In either case the trainee would not return to the centre for advanced training.

It is expected that the ISDC trainers will monitor the trainees' progress while they are in the factories. In some circumstances it may be necessary for the trainee to return to the centre for remedial work.

Closing Machinery

To satisfactorily close an upper a combination of sewing machines should be used:

- When stitching sections together which lay flat a flat bed sewing machine should be used.
- When stitching together the partially assembled uppers which have shape, or for example attaching a back-strap a post machine should be used. So that the shape of the upper may be maintained by working around the post of the sewing machine.

Two points arise:

- Richard Coles is of the opinion that a reason for quality suffering is that the factories are using flat bed machines to do operations when a post machine would be more suitable. Recommendation – if UNIDO are going to employ footwear experts in the future they should look into this.
- At present UNIDO has only purchased one post machine for the training centre. Recommendation – a minimum of six post machines should be purchased so that the correct machines can be used for each operation.

Note – this is one observation from visiting the shoe factories. Other points were noted which could improve the quality of the product which were outside the scope of this project.

As previously stated the two appointed trainers are on an initial 2 year contract with UNIDO. The implication being that either their contracts will need extending at the termination of this period or they will return to their industry positions. If the latter is the case, then suitable replacements will need to be trained in the interim period.

2.10. Recommendations for Footwear Training

1. Staff from the ISDC to undertake skills audit of companies to ascertain their training requirements.

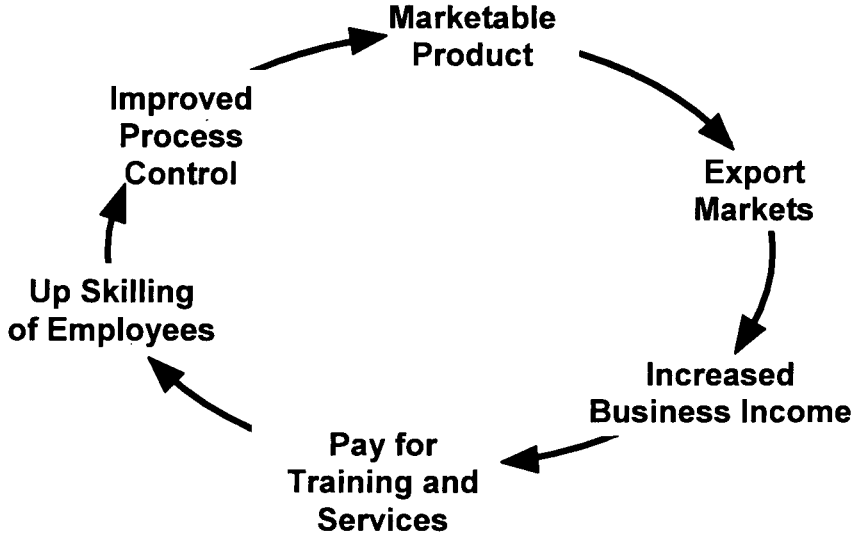
2. The initial Closing training should fall into one of three categories:
    - Developing the skills of the existing sewing machinists to meet the quality standards of the target market.
    - Training non-machinists in operating a range of closing machinery.
    - Multi-skilling existing competent operatives to do more than one operation, leading to a more flexible, versatile workforce.
3. All new closing recruits to be trained to be multi-skilled.
4. After a period in the factories they return to IDSC for operation specific training.
5. A survey is carried out to check which types of sewing machines are being used for each operation. Retraining may be needed accordingly.
6. Attention must be given to planning for the continuity of trainers upon completion of existing contracts.
7. Due to the limitations in training only one instructor in the UK, it is recommended that UNIDO gives consideration to a trainer from BLC and Tresham visiting IDSC once it is in operation.

3.0 General Recommendations Made to Tanners and Footwear Manufacturers

A meeting was held on 20 November 2003 with members of ELAIA (see **Appendix III – List of Attendees at ELAIA Meeting**). Discussions covered training needs, product development, marketing and technical assistance. The training needs have been detailed earlier. All topics are very strongly inter-related and there was general agreement that the quality of products, leather or footwear, needs to be greatly improved if there is to be any move outside of the local Eritrean market.

The following cycle was discussed. A marketable product is a **must** to achieve export markets. With new markets established businesses increase income and start to grow, this enables the companies to afford to pay for training and other business development services from IDSC. Training will increase the skills level of employees and consequently enable them to improve the control of the process parameters. Improved process control, in turn, will help to produce a more consistent, higher quality product. The biggest problem facing the ELAIA members is 'How to break into the Circle of Improvement?'

Diagram Detailing the Circle of Improvement



Two things are necessary to do this:

- Technical assistance to improve the quality of the existing product
- Identification of target markets and an active marketing campaign

It was pointed out that it will be at least six months until IDSC is ready to start training employees so in the interim period steps can be taken to make improvements. The following recommendations were made:

1. Don't extend production to fit the time available - if it can be done in half a day only take half a day to do it .
2. Use the remaining time to improve housekeeping, carry out on-site training, look at quality control, health & safety etc.
3. Don't take on new staff unless essential – gain orders, increase business THEN take on new people and train.
4. Seek external technical assistance (UNIDO to help?) to ensure product is marketable.
5. Implement technical advice given.
6. Assess market possibilities and develop a marketing plan.
7. Implement marketing plan (external assistance required?).

A comment was made referring to the fact that a number of experts are providing reports to UNIDO. It is strongly recommended that all of the reports be consolidated as soon as possible and a workable business plan for IDSC prepared and implemented.

4.0 Section II – Development, Management and Operation of the Industrial Development Service Centre (IDSC)

4.1. The Refurbishment Programme and Plans

Architect drawings for IDSC produced by Amanuel Ghebray Associates had been provided by UNIDO prior to visiting Eritrea. A visit was then made to the existing buildings that are to be refurbished to provide a suitable training and service facility. The first phase of building works has been approved to commence in January 2004 and will comprise of refurbishment of the large building known as the 'hangar' and provision of toilets adjacent to another building known as the 'workshop'.

During the visit the hangar and a building containing four classrooms were inspected. It was felt that, subject to a thorough clean and check of the electrical supply and condition of lighting, the classrooms could be used in the near future. When inspecting the hangar in relation to the building plans there was a concern about the area to be dedicated as a store. The store did not appear large enough to house the materials necessary for both garment and footwear training (rolls of leather and fabrics, cut parts, manufacturing components) and access to this area was also queried.

A meeting was requested with the local architect to discuss the concerns whilst remaining conscious of the need for the plans to be tendered with local builders as quickly as possible, and not wishing to adversely affect the cost of carrying out the work.

The architect explained that the store indicated on the drawings was not intended to be a main storage area. The intention is that the workshop will be developed to include this storage in a later phase of the refurbishment. Both Richard Coles and Peter Wilson agreed that this would cause problems in supplying the training areas with work and felt it would be more appropriate to increase the size of the store in the hangar. As the hangar is so large this would not have a detrimental effect on the footwear and garment training areas.

If the two side doors into the store were then moved it would be easier to move materials in and out of the store and would remove the need to have an interconnecting door from the 'hall' – saving the purchase of a door.

It was also suggested that if the doors on the two lecture rooms and staff rooms were moved there would not be a requirement for interconnecting doors between them – saving the cost of a further two doors and freeing up wall space which may be needed. It was also suggested that windows were included in the staff rooms to allow trainers to observe the training areas.

4.2. Refurbishment Recommendations

The recommendations made by the four consultants to the architect were:

1. Increase the width of the store in the hangar by 2 metres – 1 metre into each training area
2. Increase the length of the store in the hangar by 1 metre into the hall area
3. Move doors to other end of store to improve accessibility
4. Remove doorway leading from hall as now unnecessary
5. Move doors to other end of lecture rooms
6. Remove doorways leading from lecture rooms to staff rooms as now unnecessary
7. Include windows in staff rooms

The architect agreed to revise the drawings and submit the revisions to UNIDO for final approval. He anticipated that a builder could be selected and contracted by the end of 2003. He also estimated that Phase I of the refurbishment would commence in January 2004 as originally planned and would be completed by the end of June 2004. He felt it unrealistic to expect completion in less than 6 months.

4.3. Proposed Organisational Structure of IDSC

The authors were requested by UNIDO to give a recommendation of a model organisational structure and operational plan for IDSC. Meetings and discussions were held with the Ministry of Trade and Industry, tanners, footwear manufacturers and leathergoods manufacturers. The consensus of opinion was in favour of keeping the organisational structure simple with the minimum of bureaucracy whilst giving equal emphasis to the three key sectors: leather, footwear/leathergoods and garments/textiles.

It was also stated that the IDSC should be a commercial but non-profit making organisation; ultimately any surplus made should be re-invested into the business to allow it to grow and become self sustainable.

It is proposed that IDSC should be a membership-based organisation with membership being drawn from companies within the leather and apparel sectors.

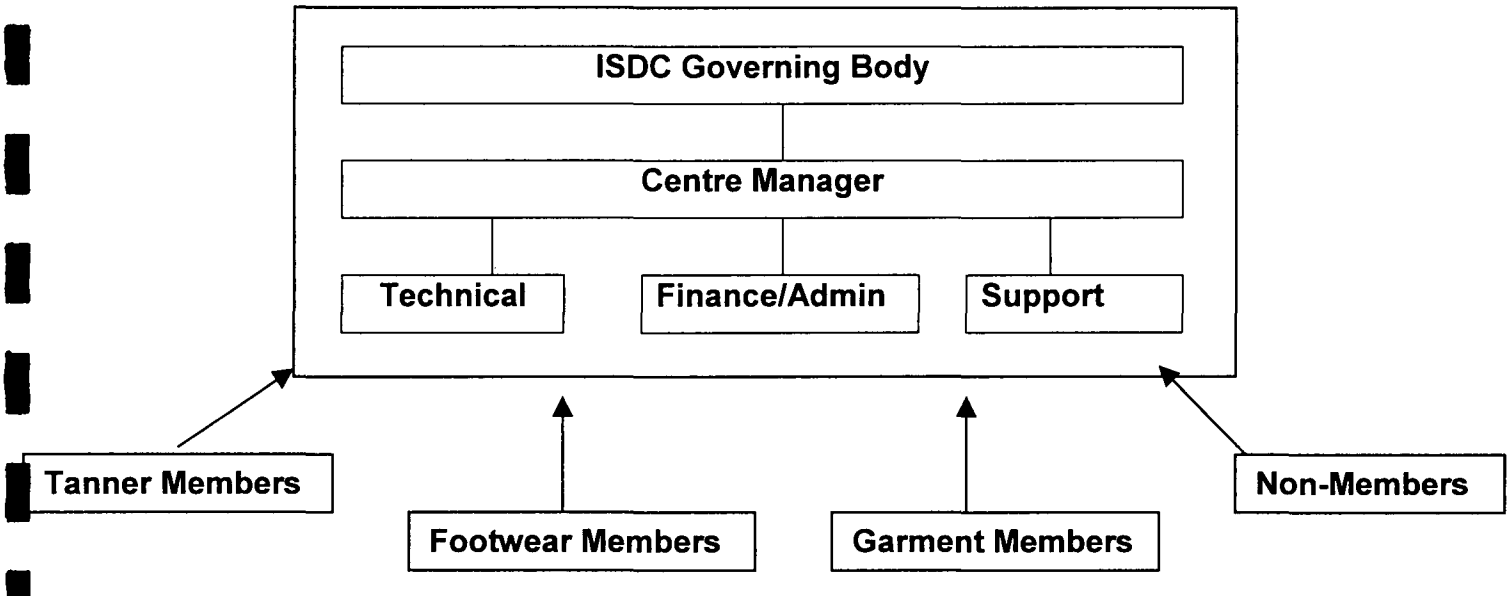
The organisational and operational model proposed is, in fact, very similar to the business model used by BLC – a commercial, non-profit making membership-based organisation which has successfully offered multiple services to tanners, manufacturers and retailers for over 80 years.

4.3.1. IDSC Governing Body

It is proposed that IDSC policy and strategy be determined by a Governing Body (Executive Board?) with the following composition in the initial period:

- MTI representative
- UNIDO representative
- Tanner industrial representative
- Footwear industrial representative
- Garment industrial representative
- Centre Manager

Diagram of Proposed Organisational Structure for IDSC



Each of the industrial representatives should hold a position on the Governing Body for a maximum of two years and should be elected/selected via Trade Associations such as ELAIA. Re-election would be necessary to continue beyond this two year term.

The Governing Body should have a revolving Chairman and Vice Chairman. It is recommended that the Chairman be selected from the industrial representatives. Normally the position of Chairman should be held for one year but the initial Chairman should be appointed for two years to allow continuity during the establishment and start up of the business.

During the early years representation from MTI and UNIDO would be necessary although it is thought that this input could be reduced as the centre becomes increasingly self supporting. Provision should be made to co-opt other members to the Governing Body as deemed necessary, for example, assistance from the Ministry of Education or Chamber of Commerce may be needed during the establishment phase.

It is recommended that the Governing Body is established immediately as it should take responsibility for overseeing the project management aspects of the refurbishment. During this period it may be necessary for the members to meet on a weekly basis; changing to monthly meetings once the centre is up and running.

4.3.2. The Centre Manager

IDSC will need a Manager for the day to day running of the business. Once the Governing Body is established its first task should be to oversee the appointment of a manager. The manager can then take responsibility for working with the architect and building contractors to ensure that the refurbishment meets the agreed schedules. The manager would report directly to the Governing Body and seek guidance where needed.

During the building phase the manager can start to promote the IDSC and its services to the local business community – there will be no business if there are no customers to use it! During this period the manager should liaise with companies and carry out training needs audits to identify the priority of staff training. This will also be the time to advertise and appoint additional staff (see 4.3.4).

4.3.3. Income Generation

In the first instance IDSC will require significant external funding to carry out the most basic of services. Personnel costs and overheads such as the cost of utilities (lighting, power, heating/air conditioning etc) will need to be provided either by UNIDO, MTI or a combination of both. If the recommendations given are implemented and the national customer based are prepared to pay for the services then the centre could progress towards becoming self supporting. Having said that, it is highly likely that external funding (UNIDO, MTI) will be needed in the longer term. For example, the authors' respective organisations, despite being well established businesses with a large number of companies using the services offered, rely on external funding from sources such as the European Social Fund, European Commission research support, UK government etc.

Although provision of training will be a major income stream for IDSC it is unlikely that the centre will get full subscription to the training courses from the time the centre opens. This business will have to grow in reputation and the local companies will have to see the benefits of the training to ensure repeat business. It is anticipated that training courses may have to run at 40-50% capacity during the start up period after the centre opens. Therefore, it is imperative that other sources of income generation are considered.

Possible services that could be offered by IDSC include:

- Training – operative, supervisory and management
- Marketing assistance
- Technical assistance
- Product development
- Specialist workshops
- Assistance with sourcing raw material
- Pattern grading and pattern production
- Information Centre
- Tools, attachments and folders library
- Specialised online internet access
- Sell products that companies must have, trading licences etc.

It is envisaged that IDSC should be a membership-based organisation with companies paying an annual fee to 'belong' to IDSC in exchange for some basic services such as access to the Information Centre, monthly newsheet, telephone Helpline. This would give IDSC a predictable base income stream. Additional income is then generated by providing companies with more specific services, such as training, marketing assistance, pattern grading.

The services are offered to members at preferential rates, there may also be some services which are 'exclusive' to members only to act as an incentive for companies to become members. Companies who did not wish to become members can still avail themselves of the various services but will pay a higher rate to do so.

There are a number of options for determining fees including:

- Differential membership rates based on 'packages' of services received
- Membership rates based on a % of the payroll including a proportional 'quota' of services
- Flat fee membership then 'Pay as You Go' preferential rates for individual services
- Non-Member paying for individual services as required at a higher rate

The membership concept is difficult to implement as the benefits are not always tangible. BLC experience in places such as China, India, Pakistan and Egypt is that membership is often problematical. To ensure the success of IDSC there will be a need to encourage companies to turn to IDSC as the first point of help. This will take time to develop as it was noted during discussions that many companies appear reluctant to ask for assistance but would prefer to struggle on alone. This may be a cultural attitude, or simply, that help has never been easily available before. Whatever the reason companies will need to see a very direct and real benefit from the services offered by IDSC if they are to support the centre in the long term.

Marketing of the centre must take high priority and continuous feedback should be sought from the companies using IDSC to ensure that industry needs are being met. This will also help to determine what new services are needed as the centre develops and expands.

Funding based on taxation of local businesses is a more secure way of funding IDSC but this leads to inefficiency and declining confidence and support in the centre. Whatever method of income generation is decided on there will be a problem of achieving a critical mass of companies to use the centre and make it viable. It is predicted that even in the most optimistic scenario that substantial external support will be needed.

The following table is given as an author opinion of the potential % income streams in the first five years of IDSC operating. The figures are based on brief discussions with companies. Alfredo Martinelli has been tasked with providing a more detailed breakdown and recommendation in his report on managing IDSC.

Predicted 5 Year Income Streams

	Year 1 (%)	**Year 2 (%)**	**Year 3 (%)**	**Year 4 (%)**	**Year 5 (%)**
Membership	5	7	10	10	10
Training	15	20	30	35	40
Other Services	5	8	10	15	20
External (UNIDO/MTI etc)	75	65	50	40	30
TOTAL	100	100	100	100	100

4.3.4. Personnel Requirements

It is recommended that personnel requirements be kept to a minimum as staffing will be the largest cost to the business. It will be easier to recruit new people as IDSC develops rather than try and find suitable work for excess staff. In some cases if the individual is selected carefully he/she will be able to perform more than one function. For example, in the short term, technical assistance / consulting could be provided by the trainers as they will be technically competent people. There will not be sufficient work for a full-time accountant but a suitable candidate could deal with the day to day accounts and also manage the office and administrative duties.

Broadly speaking personnel will fall into three categories – Management, Technical and Support. In year 1 it is anticipated that the following personnel level will meet the demands placed upon IDSC:

Job Title	Number	Monthly Salary (*Nakfa)	Annual Salary (*Nakfa)
MANAGEMENT			
IDSC Manager	1	2500	30000
Finance/administrator	1	1500	18000
Secretary (part-time)	1	600	7200
Total	**3**	**4,600**	**55,200**
TECHNICAL			
Footwear trainer	2	3000 (1500 x 2)	36000
Garment trainer	2	3000 (1500 x 2)	36000
Leather trainer	1	1500	18000
Technician/stores	2	2400 (1200 x 2)	28800
Total	**7**	**9,900**	**118,800**
SUPPORT			
Maintenance	1	1500	18000
Total	**1**	**1,500**	**18,000**
GRAND TOTAL	**11**	**16,000**	**192,000**

*** 1 US $ = 13.5 Nakfa**

No provision has been made at this point for appointing a cleaner. The reason for this is good housekeeping should be instilled into the trainees and it would be standard practice for trainees to clean and tidy their own work areas. If more general cleaning is required then a part-time appointment should suffice in the first instance.

The salary figures given are the same as those given in Sahasraneman's report. During the debriefing meeting at MTI Mr Teddesse Woldeyohannes and Mr Kiflemarian Zerom agreed that the salaries given by Sahasraneman section 4.7 were comparable to government run institutions, but stated that they were lower than individuals would receive in similar level jobs in industry. It is suggested that it may be necessary to offer higher level salaries to attract staff of the calibre needed for a centre that has credibility with local industry. It also reduces the risk of industry 'poaching' experienced IDSC personnel. Sahasraneman has used these elevated figures in Table 3 section 8.2. of his report.

4.4. Organisational Structure Recommendations

The key recommendations made in regard to organisational structure and planning are:

1. IDSC should be a commercial but non-profit making organisation with all profit re-invested into the centre.
2. IDSC structure should be simple with the minimum of bureaucracy.
3. A Governing Body representing all 3 industrial sectors should be established immediately with responsibility for policy and strategy decision making.
4. The Governing Body should oversee the appointment, as soon as possible, of the IDSC Manager who will be given responsibility for overseeing the refurbishment programme, promoting IDSC during the establishment phase and day to day management of IDSC
5. IDSC should aspire to be 100% self supporting.
6. IDSC should be a membership-based organisation with companies paying an annual fee, giving a predictable base income stream.
7. Non- members should be encouraged to use the services of IDSC but members would be charged at a preferential rate.
8. Marketing of the centre must take high priority and continuous feedback should be sought from the companies using IDSC to ensure that industry needs are being met.
9. Personnel must be kept to a minimum to keep overheads low, some individuals could have dual roles, eg, accounts/administration.

Appendix I – Brief Technical Report of Footwear Leather

Testing of leather

Samples received

3 leather cuttings, sampling location unknown referenced as follows:-

- Small embossed.
- Large embossed.
- Large smooth.

Work requested

To carry out the following tests on the leather cuttings:

- Embossed – compare softness.
- Large embossed - tear strength.
- Smooth - Finish adhesion.
  Wet rub fastness.
  Dry rub fastness.
  Tear strength.
  Chromium VI.

Work carried out

The leather samples have been tested as described above.

Where necessary the leather was conditioned and tested at 20°C±2°C and 65%±5% relative humidity.

The results obtained have been tabulated on the following page:-

Testing of embossed leather sample

Test	Method	Sample Result
Softness	IUP 36: 2001	Small embossed sample: 2.25 mm Large embossed sample: 1.47 mm
Tear strength	IUP 8:2001	Large embossed sample: 213.4 N

Testing of smooth leather sample

Test	Method	Sample Result
Finish adhesion	ISO 11644:1993	6.0 N/10mm
Colour fastness to dry rubbing[1]	BSEN ISO 11640:1998	Staining: 4 Colour change: 4
Colour fastness to wet rubbing[1]	BSEN ISO 11640:1998	Staining: 1 Colour change: 2-3 loss of finish
Tear strength	IUP 8:2001	187.6 N
Chromium VI	IUC 18:2003	None detected (< 3mg/kg)

1 Key to Grey Scale

Rating 5	No change in appearance
Rating 4	Slight change in appearance
Rating 3	Moderate change in appearance
Rating 2	Marked change in appearance
Rating 1	Very marked change in appearance.

Comments

Comparison of softness of two 'identical' footwear leathers showed that the firmer sample fell outside of the acceptable tolerance of +/- 0.5mm.

From the testing carried out, the smooth leather sample showed significant colour transfer to the felt pad after wet rubbing and also significant abrasion to the leather finish.

Finish adhesion and tear strength was good.

All samples tested negative to Cr VI – a potential carcinogen.

Appendix II – Suggested Publications for IDSC Information Centre

Step by Step Pattern Cutting – Frank Jones Noble Footwear, 175 Newchurch Road, Rawtenstall, Lancs, BB4 7SU, UK

Dictionary of Shoemaking Terms – (Available via Frank Jones)

NUM: A19599

TTL: **Leather Technologists Pocket Book**

AUT: Society of Leather Technologists and Chemists (SLTC)

PYR: 1999

ABR: aAut

ABS: This new Pocket Book is intended to assist you in solving the day to day problems which crop up wherever you are working. The authors have tried to condense their knowledge and experience of commonly occurring problems, frequently used - and more obscure tests - into each chapter covering the whole range of leather manufacture from rawstock to finishing. Some of the authors offer short cut testing methods, others give comments based on their experiences with the "Official Methods" and yet others deal with methods that fall outside the scope of the "Methods". Contents include: Preservation of hides and skins by Bailey DG; Modern beamhouse procedures - soaking and liming by Reeder F; Deliming and bating by Reeder F; Chrome tanning - A tanner's view by Dewhurst J; Vegetable tans and tanning by Bickley JC; A guide to the analysis of vegetable and synthetic tannings; Retannage by Wachsmann HM; Dyes and dyeing by Tremlett RJ; Oils, fats, waxes and fatliquors by Waite T; Leather finishing by Wood G; Application methods by Osgood M; Tannery effluents and their treatment by Corning D; Costing by Blakey R; Quality control test methods by Hakimoglu I; Colour fastness testing and colour measurement by Landmann A; Colour difference and colour matching; Physical testing by Landmann A; Chemical analysis methods for chromium tanning salts by Hakimoglu I; The analysis of leather by Rowley G; Unstrumental methods by Rowley G & Smith J; Atomic absorption spectroscopy by Rowley G; Microscopy by Bugby A; Micro-organism control during leather manufacture by Didato D, Bowen J & Hurlow E; Acids, bases and salts by Phillips P; Laboratory practice by Roy RJ.

NUM: A17708

TTL: **Possible defects in leather production: definitions, causes, consequences, remedies and types of leather**

AUT: Gerhard J

PYR: 1997

PGS: 379pp

NUM: A16561

TTL: **Acceptable Quality Standards in the Leather and Footwear Industry**

AUT: United Nations Industrial Development Organisation (UNIDO)

PUB: United Nations Industrial Development Organisation (UNIDO)

JNL: General Studies Series

PYR: 1996

PGS: 97pp

EDN: 1st Ed

ABR: aAut

ABS: Leather users and consumers need a definition of each of the properties and means to control raw materials, processes and the quality of finished products, as well as of leather articles. Quality and quality control play an important role and are the cornerstones on which the good reputation of leather, tanners, leather products manufacturers and traders are built. This publication is intended to inform developing countries about quality control and about recommendations for acceptable quality levels for leather, footwear and leather products. Details of performance required and standards for leather testing are given.

ISBN 92 1 106301 9.

NUM: A13020

TTL: **Fundamentals of Leather Manufacturing**

AUT: Heidemann E

PUB: Eduard Roether KG, Darmstadt, Germany

PYR: 1993

PGS: 647pp

ABR: aAut

ABS: Each chapter attempts to sufficiently cover the theoretical and the practical aspects of each step in the leather making process. Covers: organisation and technical development of the worldwide leather industry; skins and hides in the leather industry, structure and composition; collagen chemistry; fibernetwork mechanics of hides and skins; preservation and beamhouse work; materials made from collagenous tissues by mechanical and chemical treatment; chemical modifications, chemical cleavage, grafting and fixing on supports from hides, hide fibres and gelatine including graft polymerisation; the principle of binding mechanism, binding forces of chemical compounds on collagen; practical and theoretical aspects of tanning; tanning with metal salts; covalent reaction with aldehydes, epoxydes, halogen compounds and other reactive organic compounds; tanning with organic macromolecules; leather dyeing: fastness of leather dyes; interaction with fat, grease penetration, degreasing: hydrophylic-hydrophobic character of hide and leather; machine work in tannery - mechanical treatment of hides and skins, of pelts and of leathers; drying of leather, a fundamental understanding of the leather fibre; finishing; remarks on leather testing and laboratory techniques in leather research; disposing of offals versus clean technology, two ways to cope with the environment challenge.
ISBN 3 7929 0206 0.

NUM: A11737
TTL: **The Fibre Structure of Leather (Sent to IDSC)**
AUT: Leather Conservation Centre
PUB: Leather Conservation Centre, Northampton, UK
PYR: 1981
PRT: (Aug)
PGS: 36pp
ABR: MIL
ABS: Covers: structure of mammalian skins; variation in structure between animal types; variation in grain surface pattern; variation in structure with location; variation in structure introduced by the processing; fibre structure and physical properties of the leather; corium structure and strength; the reaction of the fibre weave to movement of leather; fibre structure influence on break. Photomicrographs provided. Identical publication to Leather under the Microscope.

NUM: A11735

TTL: **Modern Shoemaking**

AUT: Larcombe P (editor)

PUB: SATRA, BLMRA, Northampton, UK

PYR: 1978

VOL: 1

PRT: (11)

PGS: 56pp

ABR: MIL

ABS: Covers: leather manufacture; leather characteristics; footwear - properties; water proofing; testing of leather.

NUM: A11672

TTL: **Chemistry and Technology of Novelty Leather**

AUT: Fuchs KHP

PUB: Food & Agricultural Organisation of the United Nations (FAO), Rome, Italy

PYR: 1976

PGS: 201pp

ABR: VJD

ABS: Book is divided into 3 parts. Part 1: survey of animals used in making novelty leathers (a) reptiles - crocodiles, caimans, lizards, snakes, turtles, tortoises and terrapins (b) amphibians, birds, fish and mammals. Part 2: General chemistry and technology of processing leathers (a) hunting, flaying, transport, preservation, sizing (b) soaking, green-fleshing, liming, deliming, bating, pickling, descaling and bleaching, tanning, neutralisation, retanning, fatliquoring, drying, zirconium tannage, dyeing and finishing. Part 3: Additional instructions for specific skins. Appendices contain photographs.

NUM: A2356

TTL: **The Manufacture of Upper Leather**

AUT: Tuck DH

PUB: Tropical Products Institute, London, UK

JNL: Report of the Tropical Products Institute G134

PYR: 1981

PGS: 160pp

ABR: AWL

ABS: Intended to be part of a series published by Pergamon Press, starting in 1964. The series was to provide a text book for students of leather manufacture and leather science. (See also Gloving, Clothing and Special Leathers by P S Briggs). A section deals with the common processes from beamhouse to tanning, followed by chapters on the production of calf, side, goatskin and specialised upper leathers. The outline processes are well described and the recipes sufficiently realistic to produce the desired leather or to pass the examinations but no text book can provide the practical knowledge, which is essential to produce a commercial leather economically. The book is an excellent introduction to the subject matter but no-one should deceive themselves that here is a ready made cook book to commercial production.

NUM: A2355

TTL: **Gloving, clothing and special leathers**

AUT: Briggs PS

PUB: Tropical Products Institute, London, UK

PGS: 166pp

LAN:

ABR: MIL

ABS: Intended to be part of a series published by Pergamon Press, starting in 1964. The series was to provide a text book for students of leather manufacture and leather science. (See also The Manufacture of Upper Leathers by DH Tuck). Covers: introduction and general principles by Briggs PS; fellmongering and pickling by Vivian GW; glove leathers by Palmer NW and Marsden EP; the tannage of clothing leather by Booth H; wool sheepskins by Briggs PS; chamois leather and oil tannages by Sharphouse JH; dressing of vegetable tanned crust leather by Briggs PS; dyeing by Briggs PS; water repellency and waterproofing by Briggs PS; finishing by Briggs PS. ISBN 0 85954 138 X.

NUM: A2193

TTL: **Physical chemistry of leather making**

AUT: Bienkiewicz K

PUB: RE Krieger Publishing Co

PYR: 1983

ABS: This new book updates previous well known treatises on the science of leather making. The scope and content are considerable and it is therefore suited to advanced students. However, the dreadful English and errors in spelling and punctuation mar excellent subject matter.

NUM: A643

TTL: **Skin, Hide and Leather Defects**

AUT: Tancous JJ

PUB: University of Cincinnati Leather Industries of America Laboratory,

Location 14, Ohio 45221-0014, USA

PYR: 1986

PGS: 363pp

EDN: 2nd Ed

ABR: aAut

ABS: Covers: Defects due to natural characteristics of the skin or hide; the effect of diseases on leather; damage caused by parasites of the living animal; mechanically caused defects on the living animal; damages occurring after the death of the animal and before curing the hide; defects in hides and skins due directly or indirectly to curing, storage and shipping; damages occurring in the beamhouse; pickling, degreasing and tanning damages; defects occurring after tannage; defects occurring during storage and/or service; cross sectional views of many of the leather defects discussed histological techniques used for studying defects of hides, skins and leather.

Appendix III – List of Attendees at ELAIA Meeting

Meeting Held Thursday 20 November 2003

Mebratu Haile	ELAIA
Angeset Negusse	Negusse Shoe Factory
Kaleab Netsereab	Dahlak Shoe Co
Abraham Tesfamarian	Semhar Tannery
Haile Arais	Bini Shoe Factory
Ermias Hadera	Hadera Shoe Factory
Semere Petros	Petros Araya Tannery
Davit T Batai	T Batai & Sons Tannery
Ghebre Melles	Dahlak Shoe Company
Feucla Glueldt (?)	Asmara Pickling Tannery
Estifanos Ogbazghi	Quality Shoe Steef
Alfredo Martinelli	CESECA SA
Christine Powley-Williams	BLC Leather Technology Centre Ltd
Richard Coles	Tresham Institute

Appendix IV – Powerpoint Presentation Given at African Industrialisation Day

(See attached Powerpoint file for email version of this report.)

Industrial Development Service Centre (IDSC)

A Project Supported By UNIDO for the Benefit of the Eritrean Leather and Textile Sectors

Aims of the Centre

- To provide training at operative, supervisor and manager levels in:
  - –Leather processing
  - –Footwear manufacture
  - –Garment manufacture

Aims of the Centre

- To provide additional services to meet the needs of the industries such as:
  - – Pattern grading and pattern production
  - – Information centre
  - – Tools, attachments and folders library
  - – Technical assistance
  - – Product development
  - – Marketing assistance
  - – Specialised online internet access
  - – Assistance with raw material sourcing

Current Status of the Project

- Independent expert advisors appointed to recommend:
  - – Management and organisational structure of the centre
  - – Training needs of the sectors
  - – Training programmes to meet the identified needs

Current Status of the Project

- Some machinery for centre already purchased
- Experimental tannery drum installed for training purposes at Petros Tannery
- Final amendments to building plans agreed this week
- Building contractors to be appointed by end of 2003
- Anticipated completion of Phase I of building June 2004
- Two footwear trainers appointed to attend footwear manufacturing course in UK starting January 2004

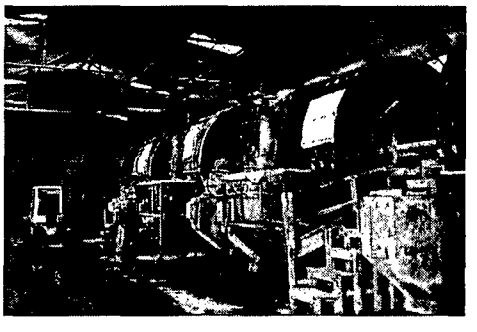
Example of Computer Based Training Material to be Located in IDSC

Appendix V - Pictures Taken during Eritrea Visit 17-21 November 2003

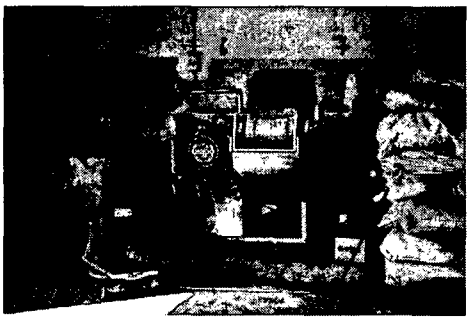
'Wet' blue splits allowed to dry out making them unsuitable for processing into leather

The 'leather mountain' – technical assistance is needed in tanneries and footwear companies

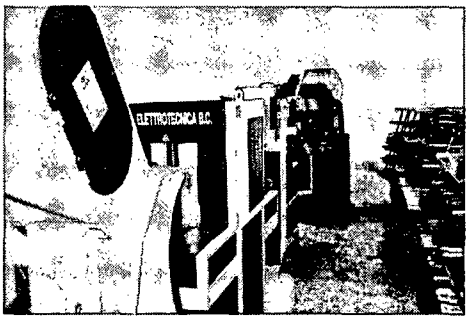
Trimming 'fresh' skins in the heat of the day



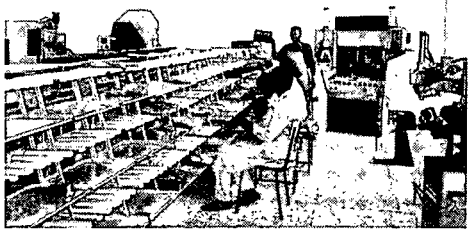
Generally well equipped tan yard, but health & safety aspects were worrying (eg, balancing on forklift forks to add chemicals to drum)

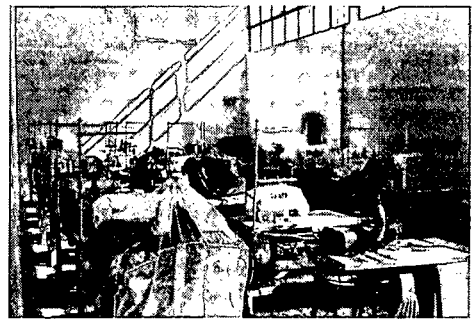


The UNIDO sample drum for practical process training in tanneries - should be utilised by IDSC

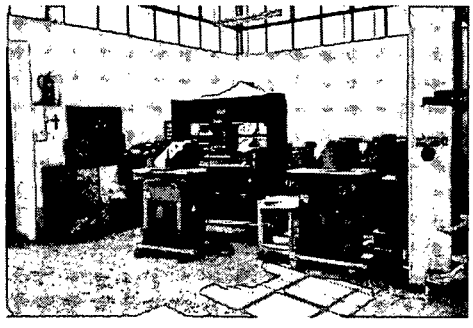


Brand new equipment - but can't afford to run it!





3 Examples that demonstrate suitable equipment available but minimal orders and very few staff



Extensive use of glueing in factories, no obvious use of extraction

Large inconsistencies in lasting process

Problems with damage to leather during toe lasting – high pressure and leather with very poor wet rubfastness properties