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INTRAREGIONAL CO-OPERATION IN DEVELOPMENT
OF PLANTATION-BASED FOREST INDUSTRIES

DU/RAF/87/117

Technical report: The Development of Zambia's furniture
and joinery industry in the PTA context*

Prepared for the Preferential Trade Area for Eastern
and Southern African States (PTA)
by the United Nations Industrial Development Organization,
associated agency of the Food and Agriculture Organization
of the United Nations, which acted as executing agency for the
United Nations Development Programme

Based on the work of Stephen J Taylor,
consultant, secondary wood industry

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* This document has not been edited

ABSTRACT

Stephen J Taylor, The Development of Zambia's Furniture and Joinery Industry in the PTA context, January and March 1991

The report reviews the status of Zambia's secondary wood processing industry with respect of market conditions, level of technology, product development and supply and utilization of plantation-based materials, in cross-reference with the situation in the PTA subregion. It outlines opportunities for increased exports and for exchange of experience within the PTA. The report also provides terms of reference of proposed technical assistance activities to be undertaken at subregional and national level aimed at increasing the operative efficiency of the sector.

INTRODUCTION

1. TITLE OF MISSION: Survey of Zambia's secondary wood industries in the PTA context
2. MISSION EFFECTED BY: Stephen J Taylor
Consultant in Secondary Wood Industries
3. PERIOD OF MISSION: 25 January to 27 January 1991
and 27 March to 2 April 1991
4. TITLE AND NUMBER OF PROJECT: Intra-Regional Co-operation in Development of Plantation-based Forest Industries - RAF/87/117 (UNDP-funded regional project)
5. EXECUTING AGENCY: Food and Agricultural Organization of the United Nations (FAO)
6. CO-OPERATING AGENCY: United National Industrial Development Organization (UNIDO)
7. SUB-REGIONAL INSTITUTIONAL RELATIONSHIP: Secretariat of the Preferential Trade Area for Eastern and Southern African States (PTA)
Headquarters: Lusaka, Zambia
8. OBJECTIVES OF MISSION:
 - a) To participate in a survey of existing secondary woodworking enterprises.
 - b) Assess technical, managerial and commercial situation of those enterprises within the PTA context.
 - c) To make recommendations on rationalisation and development of the enterprises (as appropriate)

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CHAPTER I - SUMMARY AND CONCLUSIONS

1. Summary

Zambia is one of the largest countries in the PTA subregion with 74,072,000 ha of land, supporting a population of 8.0 million (1988), 11 m in 2000 and 24 m by 2025. If it is assumed that the movement of population to urban areas continues at the same rate (54% of total population were classified as urban in 1988) then there will be a rapidly increasing demand for furniture (domestic, office and institutional) over the next twenty years.

The industry, as surveyed, will not be able to service this expansion of demand unless there are fundamental changes in its structure and organization. Only one company of the six studied could be described as an industrialized furniture manufacturing unit in any sense comparable with what can be found in a developed country. The remainder, although not necessarily small (in terms of numbers employed) are nevertheless of the machine assisted artisanal type. There is an urgent need to train existing managers/entrepreneurs in modern manufacturing and organization techniques.

There is a small amount of exporting by the parastatal enterprise ZAFFICO who are sending a sample batch of timber mouldings to S Africa. In addition, treated telephone and transmission poles are being exported to Namibia, Botswana and Tanzania. A privately owned particle-board factory is also exporting within the PTA subregion.

2. Conclusions

- 2.1 Zambia's secondary wood products industry is a mixture of state-owned and private enterprises.
- 2.2 The state-owned company ZAFFICO is a vertically integrated business from log-conversion to simple furniture making.
- 2.3 The remaining companies are all quite small (under one hundred employees in each) apart from FURNCOZ LTD which is a very complex, vertically integrated furniture manufacturing company processing not only timber and wood products, but steel (tube, angle, strap), wire (for springs), upholstery foam, kapok and cover fabrics.
- 2.4 All companies used some kilned timber, either from ZAFFICO or from their own private kilns.
- 2.5 There is a very real need for management/technical training in the country. FURNCOZ would be an ideal show-piece for such training.
- 2.6 Additional kilning facilities are being installed by ZAFFICO at its copper-belt sawmills in the Ndola region and one kiln will be particularly suitable for furniture.

2.7 As with many other countries in Africa, access to foreign exchange to purchase spares and process materials is very difficult and in consequence many pieces of machinery stand idle.

CHAPTER II - FINDINGS

1. Demand and supply of furniture and joinery and general performance of the sector

1.1 The Present Situation

Zambia is one of the most urbanized countries in Africa, but it has also one of the lowest population densities - 10 persons per square kilometre. With an economy highly dependent on its copper mining sector to earn foreign exchange, the country has suffered badly from the fall in world copper prices. This has had a knock-on effect on the economy in general with the consequent socio-economic problems of unemployment and inflation.

Zambia has, along with Kenya, Tanzania, Swaziland, Zimbabwe and Malawi, substantial forest plantations, but at the present time this resource is being badly under-utilized. ZAFFICO, the parastatal Zambian Forestry and Forest Industries Corporation is currently only using about 55% of installed saw-milling capacity. The main problem seems to be a difficulty in extracting the logs due to equipment being old and in a poor state of repair (the foreign exchange problem). With only 0.4 m³ of usable lumber being obtained from 1 m³ of log going into the mills, there is clearly a very high waste factor which has to be carried by the low usable output.

ZAFFICO is exporting treated poles to a number of PTA countries and has an initial contract to export manufactured mouldings (for steel packaging purposes) to S Africa. The Corporation has required payment for its exports to be made in

hard currency and earned some \$150,000 US in 1990. However, it does find the tariff barriers within the PTA (15-30%) a discouragement.

Throughout the secondary wood products industry (with the exception perhaps of the previously mentioned FURNCOZ) there is recognized to be a severe lack of managerial and technical skills and much equipment and machinery is idle for want of spare parts and process materials.

1.2 Future Outlook

With an expanding urban population and a trade liberalization policy the outlook for the industry in the medium to long-term is good. In the short-term, with the current world recession, both the country itself and this industry are facing a very difficult time. For this reason alone, it is important that the secondary wood products industry becomes much more efficient in its organization and in its use of the available resources. Thus the importance of management/technical training programmes of the sort being proposed by UNIDO cannot be overemphasized.

In organizational terms, one company FURNCOZ at Ndola, can show the industry the way forward.

Closer co-operation between the saw-mills and the furniture enterprises would be most beneficial and a workshop/seminar (with both parties being represented) to discuss optimum dimensions and grading qualities of the forest industries output, is highly desirable.

2. External Trade in Wood Based Products

2.1 The present situation

Of the enterprises surveyed only one was actively engaged in exporting wood-based products on a reasonably regular basis - ZAFFICO. Their exports consisted principally of treated p.c.l.s for telephone or power line use; however, they were also fulfilling a pilot contract to supply South Africa with machine moulded plantation timber. From time to time other of the companies seen had effected exports of a limited number of products (eg doors) to S Africa. It was reported to the consultant that a privately-owned particle-board plant at Ndcla was exporting some of its board within the PTA area, but he has not been able to confirm this.

2.2 Future Development

Taking the industry as a whole, there is no reason why, given appropriate incentives, there should not be an expansion of its export capability if not in finished products (assembled furniture) then in components for assembly in the recipient country. Both FURNCOZ and ZAFFICO (see ANNEX I) have the capability, but a serious study would need to be made of the other PTA countries furniture/joinery needs, if such exports are to become anything more than irregular ad hoc contracts.

3. Review of Production Facilities

An examination of the company details in ANNEX I will show that, with one exception, the secondary wood products industry is in an intermediate stage between craft (artisanal) manufacturing methods and true industrialized production. There exists a good range of basic machinery (unfortunately many pieces of equipment are inoperable for want of spare parts; but which tend to be used as adjuncts to hand manufacturing methods. Thus whilst the machinery may be used to produce, for instance, mortices and tenons for jointing purposes, actual assembly invariably requires hand fitting. A lack of detailed parts drawings, the absence of good jigs and accurately measuring instruments, a 'carpentry' rather than 'cabinet' method all contribute to the inefficient production and resource utilization that characterises this stage of a furniture industry's development.

In all cases of the enterprises visited, the owner/manager was conscious that there was scope for improvement, aware of waste of materials and manpower and anxious to do something about it - but lack of knowledge, of proper management training etc prevented them from achieving the desired objective.

4. Product Design

As with other countries within the PTA subregion, Zambia's furniture manufacturers produce a wide range of products for their domestic market - from carcass bedroom and dining room furniture to fully upholstered settees and chairs. In most cases the designs are (usually) copies of other (often S African)

countries products. The exception, in part at least, is FURNCOZ who do have a design/drawing office facility enabling them to develop their own designs. However, there is, as elsewhere in the subregion, little in the way of unique products suitable for exportation and which cannot be competitively copied by a potential importing country within the PTA area.

The industry as a whole is not yet at the stage of being able to offer, in either design or quality, a manufacturing facility to consumers in other countries, but note should be taken of the exception "Furncoz".

5. Timber Utilization

The industry is still using indigenous hardwoods, but an increasing amount of plantation timber (pine and eucalyptus) is finding its way into furniture. There is also an increasing awareness of man-made materials - particle-board, block-board. One problem raised by a number of manufacturers was that the lumber currently being produced by the state industry, ZAFFICO, is not only too narrow in width, but not of economic thickness for their purpose, nor of a suitable and reliable quality. It should be said, however, that the log converters are aware of (particularly) the dimensionally small logs they are converting, but seem unable to obtain a good supply of suitably large logs (although these are said to exist in the plantations).

It is difficult to understand why this problem should exist when saw-mills are said to be operating at only just above 50% of installed capacity.

Whatever the reason, this situation would seem to indicate that a conference between the saw-millers and their furniture manufacturing customers to thrash out problems would be a useful first step towards establishing acceptable dimensional and quality standards of this raw material.

6. The Development of the Secondary Wood Industry

As has been indicated, the outlook for the industry is in the longer term a good one with an expanding urban population and an economy recovering from a deterioration brought about by a down-turn in world trade. However, there is much that could be done in the short term to revive the industry.

A thorough survey of all manufacturing concerns to establish exactly what machinery exists and whether working or not and, in the latter case, what parts at what cost could get them operating again. The provision of foreign currency for such spares would, of course, be essential. In addition, management/technical training must also be provided to ensure that working machinery is properly used (in a technical sense) and that effective planning and control makes efficient use of such equipment and the other resources available to the industry.

A reduction in waste starting at the saw mills and, by design development and production planning continued on the shopfloor of the furniture factory could ensure a significant reduction in real costs. This would lead to an increase in effective demand for furniture products and, therefore, for the raw material from the forests.

7. Training

Despite its current problems, the Zambian furniture industry as a whole is optimistic about its future. One way in which it sees itself being able to develop is to become more efficient in its use of the resources available to it - manpower, capital (machinery and equipment) material - this the industry recognizes is a managerial/organization problem. Thus management training which introduces ideas and concepts directed towards efficient resource utilization would be welcomed. Such training, if supplemented by the training of technical staff in the capabilities of the machinery and equipment already in existence, should produce significant benefits in quite a short time.

Chapter III following outlines the sort of training that both initially, and in a follow-up situation should produce measurable improvements in the furniture manufacturing processes.

CHAPTER III - RECOMMENDED FOLLOW UP

OBJECTIVES	OUTPUTS	MAIN ACTIVITIES	INPUTS
Objective 1 To expand the manufacturing know-how of an initial group of managerial staff in the furniture and joinery industry sector from Zambia and the other PTA countries aimed at optimizing the benefits of industrialized wood processing.	<p>Output 1.1</p> <p>60 plant managers and production supervisors gained an appreciation of all critical aspects involved in the serial production of standard furniture and joinery, towards increasing productivity, quality standards and overall operative efficiency. The areas of expanded know-how include: selection of machinery; selection of cutting tools; inter-changeability of parts and quality control; product costing; tool and machine maintenance; general techniques of surface staining and coating; plant layout; product design as applied to industrialized production; quality standard specification. (Objective 1 and Activities 1.1 to 1.3 refer)</p>	<p>Activity 1.1</p> <p>To survey proposed host facilities in Kenya and Malawi in order to discuss further arrangements, prepare a Tentative Work Programme and specifications of production namely: Tools (such as quality control instruments, Jig saws, circular, special cutting tools, etc.) to be purchased under the project for seminar demonstration work.</p> <p>Activity 1.2</p> <p>To prepare terms of reference for the lectures and final Work Programme.</p> <p>Activity 1.3</p> <p>To conduct a general Seminar of two weeks each with 10 participants at each location in Malawi and Kenya.</p>	
Objective 2 To provide a basis for: (a) An increasingly relevant role on the part of Polytechnics and Technical Schools in Zambia and the other PTA countries in stimulating a proper transition of the furniture and joinery sector from artisan methods to the industrial system; and (b) A permanent reference source on plant operation for the management of furniture and joinery plants.	<p>Output 2.1</p> <p>Produce a set of Woodworking Training/Reference Manuals covering the main topics dealt with in Output 1 above. (Activities 2.1 and 2.2 refer)</p>	<p>Activity 2.1</p> <p>Collect and review Woodworking Text Books dealing with Industrial Furniture in the Polytechnics and Technical Schools in the PTA.</p> <p>Activity 2.2</p> <p>Adaptation of existing UNIDCO Woodworking manual and preparation of new ones, as required, to cover the topics in Output 1.1</p>	1 2 3 4

CHAPTER III - RECOMMENDED FOLLOW UP

OBJECTIVES	OUTPUTS	MAIN ACTIVITIES	THIRTEEN
Objective 3 To provide a decision-making basis for the rehabilitation of Zambia's existing production lines for the manufacture of panel-based furniture in view of their potential PTA options; complementary role.	Output 3.1 Produced reports with an appraisal of the constraints preventing the full utilization of the existing machinery at the plants surveyed. The reports are also to provide details and cost of corrective steps to be taken to rehabilitate the equipment which is not in operating condition. (Activity 3.1 refers)	Activity 3.1 To conduct a survey of the panel line machinery and provide a full inventory of the machinery and accessories available.	1
	Output 3.2 Produced a pre-feasibility study for setting up a typical self-contained furniture manufacturing operation based on the type of panel-line equipment available. The study will include: survey of general market conditions; definition of typical products to be produced; material input requirements; general factory building requirements; general ancillary equipment needs; manpower requirements; general assessment of financial viability; details of further technical assistance requirements. (Activities 3.1 to 3.5 refer)	Activity 3.2 To collect and analyze the local data necessary for the preparation of a pre-feasibility study.	1
		Activity 3.3 To adopt, for the purpose of preparing a pre-feasibility study, a typical panel-based modular furniture system suitable for a wide range of uses (wardrobes, bookcases, living room and dining room cabinets, etc).	1
		Activity 3.4 To prepare a typical pre-feasibility study on the basis of the above.	1
		Activity 3.5 To elaborate details of technical assistance required to start regular serial production of panel-based furniture.	1

CHAPTER III - RECOMMENDED FOLLOW-UP

OBJECTIVES	OUTPUTS	MAIN ACTIVITIES	INPUTS
Objective 4			
To provide the basis for the improvement of tool maintenance methods of the furniture and joinery industry in Zambia and in the other PTA countries in order to attain: longer life span of costly imported machine cutting tools; greater bility to produce of machined parts; reduced safety hazards in the use of machinery; and reduced material reject rate.	Output 4.1 Three Project Profiles on the setting up of tool maintenance units within small- and medium-scale furniture/joinery plants, or as self-contained Tool Maintenance Centres. The Profiles include: workshop layout; specifications and estimated cost of machinery, accessories and suppliers for a two-year operation; specifications of storage arrangement for tools and supplies; lighting requirements, etc. (Activity 4.5 applies)	Activity 4.1 To survey the tool maintenance workshop of the Warea Furniture Factory and the WUARC Tool Maintenance Centre of Addis Ababa which, being representative in the PTA of well-equipped tool maintenance facilities for the furniture and joinery industry qualify for hosting the Tool Maintenance Training Courses.	
	Output 4.2 Trained 24 senior technicians in carrying out the maintenance of machine cutting tools in use in the furniture/joinery industry such as: planing knives, moulding cutters, routing cutters, standard circular saw blades, carbide tipped circular saw blades, blades for band resawing, mortising chains, square chisel mortiser bits, and boring pits. The participants would subsequently act as counterparts in similar courses to be conducted at a national level. (Activities 4.1, 4.2, 4.3, and 4.4 refer)	Activity 4.2 To prepare specifications of supplies and accessories to be purchased for the purpose of conducting the training courses.	
	Output 4.3 Extended utilization of the Project Profiles and Data Sheets prepared for the training course for the benefit of the PTA furniture/joinery industry as a whole. (Activity 4.6 refers)	Activity 4.3 To prepare training Data Sheets and visual aids as a basic for conducting the maintenance courses.	
Objective 5		Activity 4.4 To conduct 3 training courses on Tool Maintenance Techniques of one month duration each for 8 PTA trainees at a time.	
To extend the capability of efficiently utilizing, in Zambia and in other PTA countries fast growing plantation timber species (such as <i>Ficus petiolaris</i> , <i>Eucalyptus</i> spp and <i>Cupressus lusitanica</i>) in the furniture and joinery industry as well as in building construction.	Output 5.1 Report on the use of Eucalyptus in the PTA and overseas for the production of furniture, joinery, structural building components and wood-based panels. (Activities 5.1, 5.2, 5.3 and 5.6 refer)	Activity 4.5 To prepare Project Profile and a reference on the setting up of tool maintenance units.	
	Output 5.2 Manual on standard wood treatment and wood processing requirements of Eucalyptus, Pine and Cypress, to cover subjects such as: kiln drying; cutting speeds; cutting-tool geometry with respect to main wood machining operations; choice of surface coating material and methods; dipping against blue stain and pressure treatment of Pine; choice of adhesives for standard and structure applications; choice and dimensioning of joints in chair manufacture. The manual shall also propose a set of minimum quality standards for furniture intended for intra-PTA trade and for government contracts. (Activities 5.4 and 5.6 refer)	Activity 4.6 To reproduce and distribute widely, in the secondary woodprocessing industry, the Project Profile and Data Sheets prepared under the project.	
	Output 5.3 Reference Manual on the design of standard roof trusses made of Pine and Cypress, and on the design and fabrication of roof trusses made of Eucalyptus poles as practised in Ethiopia. (Activities 5.5 and 5.6 refer)	Activity 5.1 Review the experience gained by the International Timber Group in Blantyre, Malawi and PS Woodwork PTV, Mbabane, Swaziland, in the manufacture of furniture components, joinery and structural building components made of laminated Eucalyptus.	
		Activity 5.2 Review the experience gained by ETHARCO and ECACFO plants in Addis Ababa, Ethiopia in the manufacture of fibreboard and particle board made of Eucalyptus.	
		Activity 5.3 Compile information on overseas experience in the utilization of Eucalyptus in the primary and secondary wood processing industry.	
		Activity 5.4 Compile information from African and overseas research institutions, including Bureau of Standards, on woodprocessing requirements and durability and performance standards as applicable to the use of Eucalyptus, Pine and Cypress in furniture and joinery production and structural building applications.	
		Activity 5.5 Compile information from African research institutions and ministries of works on the use of Pine, Cypress, and Eucalyptus in the design and fabrication of roof trusses.	
		Activity 5.6 To reproduce the report and manuals under outputs 5.1, 5.2 and 5.3 for wide distribution to the industry, wood research institutions and ministries of work in the PTA.	

CHAPTER III - RECOMMENDED FOLLOW-UP

OBJECTIVES	OUTPUTS	MAIN ACTIVITIES	INPUTS
Objective 6.1 To enable the saw-milling forest industry to become more aware of: a) The dimensional needs of the furniture/timber engineering industries in respect of solid timber, particle board, plywood, fibre-board. b) The importance of appropriate and reliable quality grading. c) The critical importance of adequately kilned (seasoned) timber in furniture construction. d) An opportunity to obtain a higher price for some of its output.	Output 6.1 <p>15 Influential forest products managers will better appreciate the needs of the secondary wood products industries (and in satisfying such needs be able to obtain a premium price for the material).</p> Output 6.2 <p>15 Secondary wood products managers will be better able to design products to utilize more efficiently the better quality and more suitable output of the saw-millers. They will themselves better appreciate the benefits to themselves and the final consumers arising from the use of properly kilned timber.</p> Output 6.3 <p>General an on-going dialogue between these producers (the saw-millers) and their consumers (the down-stream wood products industries).</p>	Activity 6.1 <p>Survey the saw-milling industry in the PTA countries to select personnel able to be articulate on the process of selection and conversion of both softwood (and as appropriate) hardwood logs and prepared to listen to the needs of the downstream industries.</p> Activity 6.2 <p>Select from previously surveyed secondary wood products industry suitable managers able to articulate their material needs (in quality terms) and prepared to listen to and consider the problems of the foresters.</p> Activity 6.3 <p>Select suitable wood-science trained personnel able to present technical information comprehendingly.</p> Activity 6.4 <p>Conduct a prototype seminar of 30 participants in one of the PTA countries.</p>	
Objective 6.2 a) To make the secondary wood products industry aware of the natural and physical constraints of the basic material that the millers have to process. b) To familiarise them with the advantages/disadvantages of using man-made board. c) To re-emphasise the benefits derivable from the use of properly seasoned (kilned) timber.			

ANNEX I

FURNCOZ LTD
NDOLA

Mr A B Munyima - Technical and Production Director

This is a private company (part of the Vitafoam Group) manufacturing a very comprehensive range of domestic and office furniture.

Products -

Dining room, bedroom occasional furniture, office desking, metal furniture, beds, mattresses, springs, upholstery.

Markets -

Zambia.

Production Process -

Large batch (mass) production by machinery of standard products using interchangeable components. Extensive use of jigs, detail drawings and accurate measuring and checking devices. Vertically integrated manufacturing.

Material -

Indigenous hardwoods (Muqwa/Muninga). Plantation timber (Pine and Eucalyptus), particle-board, plywood, steel tube, plate, strap, wire, flock, upholstery fabrics, polyurethane foam.

Timber Conversion Factor:

not available.

Moisture Content -

10-12% (own kilns)

Machinery -

the most comprehensive range of equipment seen anywhere in Africa, lacking only the most modern Computer Numerically Controlled (CNC) machines. The company has its own sawmill for conversion of some of its raw material.

No of employees -

560 production workers.

Problems -

Foreign exchange.

Note:

This company's manufacturing techniques, organization and management is on a par with that of the Wilgro (Wilson Group) company in Zimbabwe. Its range of activities is arguably the most comprehensive of those surveyed by the specialist consultant.

ANNEX I

MUKATASHA FURNITURE
LUSAKA

Mr Patel - Managing Director

A privately owned company supplying joinery components to the domestic and office building trade.

<u>Products</u> -	principally joinery mouldings - skirting, covings, tongue and groove, etc. Also market a range of doors (not of own manufacture).
<u>Markets</u> -	Lusaka.
<u>Production Process</u> -	Machining of joinery mouldings.
<u>Material</u> -	principally plantation pine and eucalyptus.
<u>Timber Conversion Factor:</u>	Not available, but seems to be little waste.
<u>Moisture Content</u> -	Not available.
<u>Machinery</u> -	a selection of basic woodworking machinery.
<u>No of employees</u> -	Approximately 25.
<u>Product costing</u> -	not available.
<u>Problems</u> -	Foreign exchange for spare parts. Reliable deliveries of raw material.

ANNEX I

ZAFFICO (Zambia Forestry and Forest Industries Corporation Limited)

NDOLA

Mr S F Kufakwandi - Managing Director

Zaffico is a parastatal organization concerned with the conversion and commercial marketing of timber produced by the Forestry Commission in its pine and eucalyptus plantations.

Products -

Creosote and CCA treated poles, truss rafters, joinery mouldings, school desks, table/benches, chairs, pre-fabricated housing components, pallets, door and door frames.

Markets -

Some exports (poles and mouldings) to S Africa and within the PTA region, but bulk of sales in Zambia to other state institutions and the construction industry.

Production Process -

Apart from the timber treatment process, the bulk of manufacture is by machine-assisted artisanal techniques, nailed rather than glued joints.

Material -

Pine and Eucalyptus from Forestry plantations.

Timber Conversion Factor:

60% waste (log to lumber) plus 40% (?) lumber to final product.

Moisture Content -

where kilned 10-12% (additional kilns being installed)

Machinery -

apart from the saw-milling operation and the timber treatment plant, most of the machinery there is a good selection of basic wood-working machinery plus some intermediate stage equipment (4 and 5 cutter moulding machines).

No of employees -

750 in total on the KITWE site (including the saw-milling operators)

Product costing -

not available.

Problems -

Foreign exchange for spare parts.
Under-utilization of manufacturing capacity.

Logs too small (diameter).

Lack of technically trained personnel.

Lack of managerially capable personnel.

CHRIS FURNITURE LTD
LUSAKA

Mr C S Nohlovu - Chairman

A privately owned company manufacturing a range of standard products and made to order furniture.

Products - Dining room, bedroom, occasional furniture, doors.

Markets - Lusaka.

Production Process - Batch machined components nominally interchangeable between batches. Some use of jigs.

Material - Principally indigenous hardwoods (Muqwa/Muninga) some use of pine and eucalyptus. Also use particle-board

Timber Conversion Factor: Not available.

Moisture Content - Not available but believed too high, want to acquire a kilning facility.

Machinery - A reasonable selection of basic woodworking machinery some of which are not working due to shortage of foreign exchange to buy spares.

No of employees - not available but estimated at 50.

Product costing - not available.

Problems - Foreign exchange for spare parts.
Reliability of timber supplies.
Shortage of kilned timber.

DWITCH INVESTMENT
LUSAKA

Mr Baldwin Nchite - Managing Director

A privately owned company manufacturing a wide range of domestic furniture using mainly hardwoods, but some pine.

Products - Dining room, bedroom and upholstery.

Markets - Lusaka

Production Process - Machine assisted artisanal, but also manufacture in batches at machining stage. A suggestion of interchangeability of components, but the process seems to be more of selective assembly rather than precision engineering.

Material - Hardwood (Muqwa/Muninga), pine and eucalyptus (for non-show wood components), particle-board.

Timber Conversion Factor: Not available but waste seems high.

Moisture Content - Aim for 10-12% (have a small kiln to supplement bought in kilned timber)

Machinery - A good range of basic woodworking machinery, some relatively new. Several machines inoperable due to lack of spare parts or of process materials.

No of employees - Not available but estimated at 60.

Product costing - not available.

Problems - Foreign exchange for spare parts.
Reliability of timber supplies.

FARMERS WOOD MANUFACTURERS AND TRANSPORTERS LTD
LUSAKA

Mr Antonis Damalis - Director

A private company manufacturing a range of joinery and furniture using hardwoods, softwoods and steel.

<u>Products</u> -	Dining room, bedroom and occasional (carved) furniture, joinery mouldings, window frames, louvred doors and windows.
<u>Markets</u> -	Principally confined to Lusaka.
<u>Production Process</u> -	Batch production of standard joinery mouldings, machine assisted artisanal furniture manufacture.
<u>Material</u> -	Plantation Pine, indigenous hardwoods, steel strap and tube.
<u>Timber Conversion Factor:</u>	Not available.
<u>Moisture Content</u> -	Not available.
<u>Machinery</u> -	a selection of basic woodworking machinery including a large disc log conversion saw. Metal processing equipment for welding and fabrication.
<u>No of employees</u> -	Not available, but estimated at 40.
<u>Product costing</u> -	Not available.
<u>Problems</u> -	Reliability of supply of timber. Spares for broken down equipment. Need for management training. Breakdowns in supply of power and water.

ANNEX II

LIST OF PEOPLE MET AND INSTITUTIONS VISITED

MR S F KUFAKWANDI -	Managing Director, ZAFFICO, NDOLA
MR E C CHISANGA -	Plantations Manager, ZAFFICO, NDOLA
MR J S TEMBO -	Assistant Branch Manager, ZAFFICO, LUSAKA
MR D MUSHAUKWA MUHALU -	Area Marketing Manager (South), ZAFFICO, LUSAKA
MR L C MWILLA -	Branch Manager, ZAFFICO, LUSAKA
MR J S AKAPELWA -	Chief Conservator of Forests, Republic of Zambia, Forest Department, NDOLA
MR A B MUNYIMA -	Technical and Production Director, FURNCOZ, NDOLA
MR GOODSON TUMBA -	Production Manager, FURNCOZ, NDOLA
MR PATEL -	Managing Director, Muktasha Furniture, LUSAKA
MR ANTONIS DAMALIS -	Director, Farmers Wood Manufacturers, LUSAKA
MR C S NDHLOVU -	Chairman, Chris Furniture Ltd, LUSAKA
MR BALDWIN NCHITE -	Managing Director, Dwitch Investment, LUSAKA