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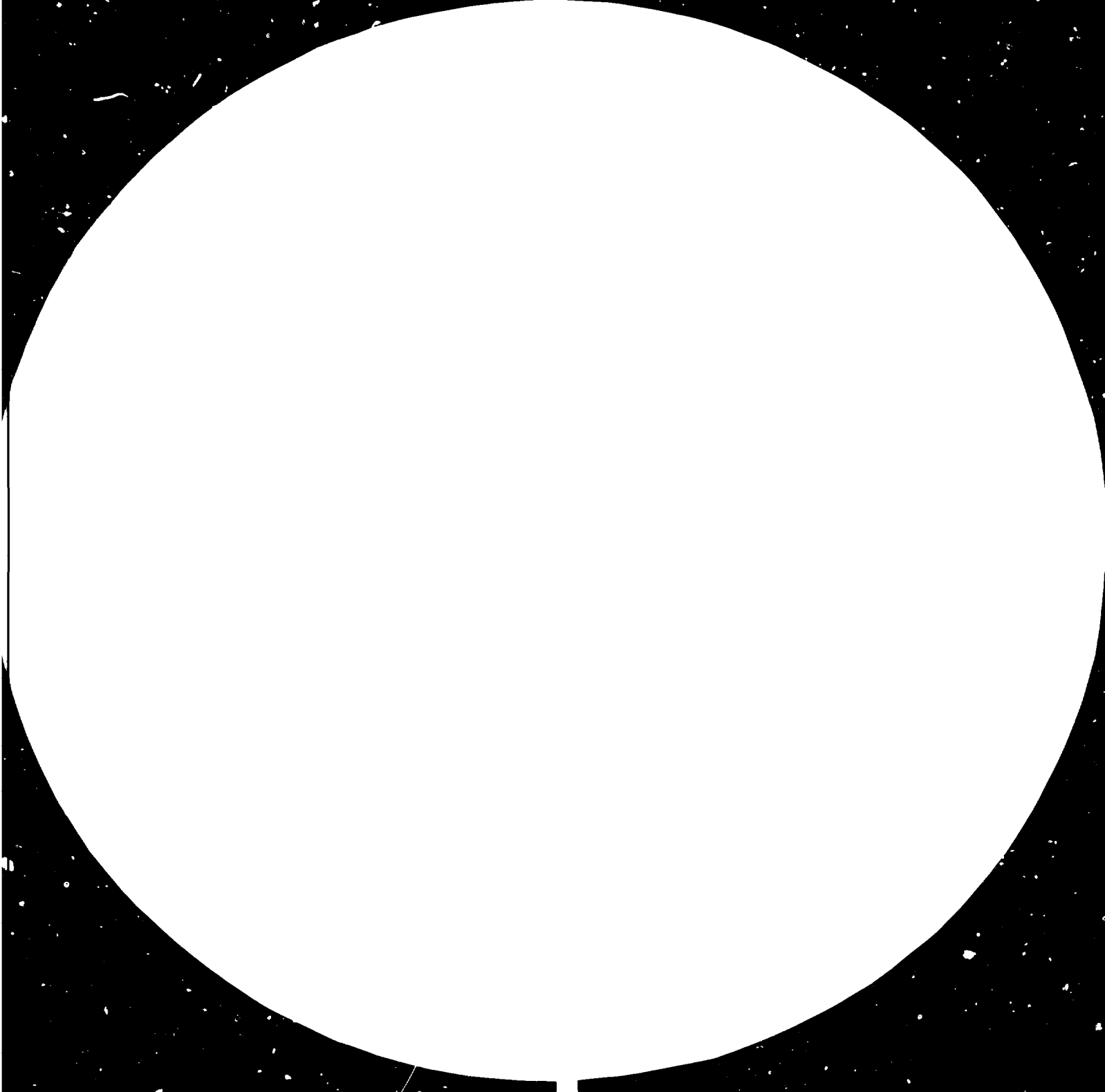
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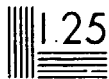
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THE WOODWORKING INDUSTRIES IN TANZANIA *

by

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Present Situation of the Wood Working Industries

- 1.1 The wood-working industry in Tanzania is dominated by sawmilling which produces sawn wood for domestic use and, to a limited extent, for export too. Wood based panel industries also have started, a plywood industry in 1960, a particle board and a fibreboard industry in the early 1970's. In addition, there are various wood processing industries, such as joinery and furniture although on a rather small scale. At present Tanzania has no pulp and paper industry, only a small corrugated box plant in Dar es Salaam, but there are serious plans to build the first pulp and paper complex in the Sao Hill area in the near future.
- 1.2 Until recently the Tanzanian forest industry has been almost entirely based on the natural forests, mainly on indigenous hardwoods. Only some of the newest sawmills and panel mills use plantation timber.
- 1.3 The main forest industry is concentrated in the North Eastern part of the country where the best resources of commercially interesting species exist and where there are the best possibilities for economic operation e.g. for transport and exports. In other forest areas of the country sawn wood is produced mainly for local demand.
- 1.4 Owing to insufficient statistics and poor records the capacity and production of the wood industries currently operating in Tanzania can only be roughly estimated. It is:

	Total Production Capacity (m ³ / annum)	Actual Production in 1979 (m ³ / Annum)
About 90 sawmills	N.A.	140,000-160,000. ^{1/}
2 Plywood plants	12,500.	3,218.
1 Particle board mill	9,000.	2,833.
1 Fibreboard mill	9,000.	3,000.

^{1/} Figure refers to total sawn wood production (pitsawing included) and has been estimated on the basis of log removals (FAO- study).

- 1.5 The present forest industries in Tanzania are mainly state-owned, and since 1971 have been controlled and operated by TWICO and its subsidiaries. Only in sawmilling and secondary wood working industries do private enterprises still have a significant share.

Before the foundation of TWICO the National Development Corporation. (NDC) was responsible for the forest industries, but only the pulp and paper industry still comes under its administration. The Forest Division also had some industrial activities and various small scale wood users.

- 1.6 The present forest industries in Tanzania are estimated to employ approximately 6,000 persons.

- 1.7 Export of timber from Tanzania has been modest, some thousands of cubic meters are exported a year. But these have mainly been out of hardwoods, and, in the last few years, this export has further declined. Import of timber to Tanzania has mainly been softwood but these have stopped with the establishment of softwood mills in the 1970's.

- 1.8 The main problems facing the wood working industries in Tanzania have been the decline in production during the seventies. This was due to poor machinery, long hauling distances, poor roads and insufficient operating vehicles.

- 1.9 According to the FAO study, there were about 130 sawmills in Tanzania of which seventy were registered out of which only forty employed ten or more people. With the state dominance of the forest industry in the 1970's many private mills were closed. To date less than 50 mills are currently operating, half of which are said to be almost closed or running at very limited capacity.

TWICO has 12 subsidiary companies operating a sawmill and in total has 16 operating mills most of which have a capacity of over 5,000 m³.

- 1.10 Most of the private sawmills are very small and equipped with poor and worn out machinery. However not all the sawmills including TWICO

mills are up to standard technically and pitsawing has still an important share in the sawnwood supply.

- 1.11 TWICO is currently carrying out a renovation programme in order to improve its mills. The programme which started in 1977 is estimated to last till 1982 and to cost over 130 million Tanzanian Shillings. The Programme has won a lot of support both internationally and locally. The immediate renovation has already been implemented with the assistance of the Finnish and German Governments and the major renovation is to start soon. The programme is expected to double the current production output when complete. The main drawback so far has been the difficulty in securing the large sums of money required for the major renovation. The previous financiers are prepared to finance some of the companies but not all of them have been fortunate.

2. Timbers

- 2.1 The country's forest resources come mainly from local indigenous forests and natural Miombo woodlands comprising both softwood and hardwoods and partly from plantations.
- 2.2 The main species used are Podo, Grevillea, mixed hardwood species and typical Miombo species such as Mtundu, Muwa, Mninga, Mhuhu and typical thick forest species such as Mtambara, Mahogany, and Mvule (Iroko). Of these, Mninga, Mtambara, Podo and Mvule are of a major importance to the furniture and joinery industries.
- 2.3 Timber has not been imported in Tanzania since the late 1960's. The imports were mainly softwood (from Kenya) and with the establishment of softwood mills in the country the need to import was no longer apparent.
- 2.4 Most of the timber in Tanzania is seasoned by air-drying mainly because most of it is bought immediately after it is sawn due to the high demand. Kiln-drying facilities are also not common.
- 2.5 Major problems concerning timbers are two-fold. First is their scarcity, and second is their storage. Since the production is low,

the demand for timber is very high and the fact that the industry has very high operating costs results in very high prices on the local market, especially when compared to export prices.

TWICO's renovation programme aims at not only doubling the industry's output when complete but also reducing the operating costs to a more modest level.

The storage problem is not so apparent now with the scarcity but every year a substantial amount of lumber is destroyed by rain or sun due to too much exposure. TWICO's sole marketing company TANTIMBERS is planning to put lumber yards in all the major centres but the success of this depends heavily on the availability of funds for the purpose.

3. Primary Wood Processing Industries (Sawnwood and Wood based panels)

3.0 As already stated above, the primary wood industry in Tanzania is dominated by TWICO, but private enterprise still has a remarkable share of sawmilling and secondary wood working i.e. joinery and furniture industries. But, as the majority of the private mills are small and poorly equipped, and the development of the private sector has almost stopped, the following evaluation of the existing wood industries will concentrate on TWICO industries.

3.1 General

TWICO has 13 wood industry subsidiaries and in addition it directly owns some sawmills. Total production capacity and achievable actual production of TWICO's existing and new primary wood industries under construction can be roughly summarised as follows:

			Normal Capacity m ³ per annum	Actual Production ^{1/} m ³ per annum
Sawmills	1975	approx.	40,000	22,000
	1976	"	60,000	25,000
	1977	"	95,000	30,000
	1978	"	110,000	40,000
	1979	"	110,000	51,000

^{1/} Including Sleepers

	Nominal Capacity m ³ per annum	Year	Actual Production m ³ per annum
Plywood and blockboard	12,000	1975	4,200
		1976	4,000
		1977	3,600
		1978	4,000
		1979	3,200
Particle Board	9,000	1975	4,790
		1976	5,200
		1977	4,600
		1978	4,000
		1979	2,800
Fibreboard	9,000	1975	2,600
		1976	5,000
		1977	2,700
		1978	3,000
		1979	3,000

Sawnwood is normally sold unseasoned and only a few sawmills have facilities for air seasoning or kiln drying. Little attention is paid to the quality of the sawing or to the grading of timber as the market can absorb almost any quality produced. With the renovation programme however, the increased output expected has to be matched with increased efforts to improve the quality.

The main species sawn are Podo ^{1/} and several indigenous hardwood species such as Camphor, Mahogany, Mninga, Mtambara, Muhuhu, Mvule and Brachystegia Species.

In addition, TWICO produces flush doors, joinery products, impregnated poles and other secondary wood products.

The TWICO subsidiaries and mills and their capacity, production and sales date are listed in the table on the following page.

1/

For the botanical names of these species see booklet - Timbers of Tanzania.

PRODUCT	NAME OF COMPANY	ACTUAL 1977	ACTUAL 1978	PLANNED 1979	ACTUAL 1979	PLANNED 1980
Sawnwood (m ³)	Sao Hill Sawmill Ltd.	12,258	17,600	19,550	25,756	24,000
	Tembo Chipboards Ltd.	806	3,000	6,000	3,130	6,400
	Fibreboards Africa Ltd.	-	700	4,325	1,440	3,350
	Mbeya Sawmill	550	500	1,200	500	?
	Mang'ula Sawmill Ltd.	184	1,100	2,250	1,814	2,500
	Kiltimbers	-	NIL	7,100	5,580	7,300
	Tabora Msitu Products	378	5,300	6,100	3,373	2,768
	Mkata Sawmill Ltd.	-	NIL	2,100	1,073	2,683
	Mingoyo Sawmill	416	1,000	2,160	1,087	?
	Kilwa Sawmill	-	NIL	1,350	555	1,000
Sikh Sawmills	7,588	6,400	6,900	3,350	6,190	
TOTAL		28,180	35,600	59,035	47,546	56,191

PRODUCT	NAME OF COMPANY	ACTUAL 1977	ACTUAL 1978	PLANNED 1979	ACTUAL 1979	PLANNED 1980
Particle Board (tons)	Tembo Chipboards Ltd.	2,539	2,100	3,600	1,777	3,376
	Fibreboards Africa Ltd.	2,380	2,600	3,800	2,900	3,634
Hardboard (tons)	1. Sikh Sawmill Ltd.	3,040	4,000	3,077	2,791	3,488
	2. Kiltimbers	-	-	774	426	557
Plywood			4,000	3,851	3,217	4,045
Flush Doors (pieces)	1. Sikh Sawmill Ltd.	7,676	30,100	27,000	28,046	27,000
	2. Fibreboards Africa	-	2,600	29,850	16,990	20,500
	3. Kiltimbers	-	-	3,000	980	?
		7,676	32,700	59,850	46,016	47,500
Blockboards (m ³)	1. Sikh Sawmill Ltd.	-	?	10,000	6,745	10,000
	2. Kiltimbers	-	?	5,000	10,217	1,500
				15,000	16,962	11,500
Impregnated Poles						15,500
	1. Sao Hill Sawmill	-	?			
	2. Kiltimbers	-	?	7,667	2,150	9,000
	3. Fibreboard Africa Ltd.	-	-	-		4,600
Tobacco Cases (pieces)						
	1. Sao Hill Sawmill	-		18,400	22,435	20,000
	2. Kiltimbers	-		13,200	4,157	12,000
Wattle Extract (tons)						
	Giraffe Extr. Co. Ltd.	1,588	1,400	1,700	994	2,000

3.2 Equipment Installed in a Typical TWICO Mill

3.2.1 Sawmill

A typical TWICO sawmill would be a sawmill of about 2,600 m³ per annum (achievable capacity) working in two shifts and cutting hardwoods like Mninga, Mvule and Brachstedia and employing about 80 persons and a recovery rate of 40 to 50 per cent. The main machines consisting of a 4-foot Brenta bandsaw, a reciprocating horizontal saw, two roller feed push bench saws and one pendulum cross-cut saw. There would be no log turning device in the log carriage and log turning would be carried out by means of a chain block and by hand. Facilities for internal transport of sawnwood would be missing and timber would be air seasoned in the yard after being graded into three grades, prime, selected and standard.

3.2.2 Wood Based Panels (Particle Board)

A typical particleboard mill will be that of a normal capacity 9,000 m³ per annum of board (9mm thick, with two shift operation, employing about 90 persons and utilizing about 50 per cent of the rated capacity). The wood raw material would consist of 33 per cent residue and 67 per cent thinnings and small size logs from plantations. Wood consumption would be 1.56 m³/n³ of particle board produced. The basic machinery would be mainly of German origin and the process would be simplified because of the low capacity. Wood would be cut into flakes by a Hombak U-28 flaker and reduced in a Condux hammer mill. Particles would be dried in a tube-bundle drier, screened by a vibrating screen and conveyed to the dry particle silo.

For gluing there would be a Verkor blender. Only Ureaformaldehyde resin would be used, the average resin consumption being 56 Kg. resin solids per m³ of particle board. Surface layer and core layer particles would be separated by a pneumatic classifier after gluing, sheet forming would take place in two stationary Würtex

forming machines during a back-and-forth movement of the caul plate.

The press would be hot and designed for 1,200 mm by 2,440 mm panels and would have three openings and a space for two more press plates. The press would be heated by hot water from wood waste boiler constructed for a pressure of 1.0 Atm.

Pressed panels would be separated manually from the cauls which are cooled by a water spray and transported to the forming line by hand. The finishing line would be equipped with a two-edge trimming saw and a three-drum sanding machine.

3.3 Development Trends

Wood industries in Tanzania are still a new technology. Most of the industries use simple equipment with the exception of a few new TWICO mills which have automatic and hydraulic equipment.

The present development trends are thus not geared at modernizing the industry but mainly rehabilitating it.

As mentioned earlier, the technical standards are still very low, most of the machinery are old and there are very few qualified people to run the industry efficiently.

The current TWICO renovation programme is aiming at improving the existing mills by replacing the worn out machinery and introducing more efficient machinery to the extent that the mills are matched with their rated capacities.

The renovation not only include overhauling machinery but also training mainly through job instructors.

3.4 Problems

The problems facing the primary wood processing industries in Tanzania are as follows:

- (a) High Operating Costs - Long distance log hauling, shortage of vehicles, poor roads, inexperienced labour force, low

financial capabilities, expensive imported raw material, high fuel costs all contribute to this.

- (b) Low Productivity - In many cases the mills do not get the required log input or raw material. The basic problem being long distance hauling on poor roads and with only handful of vehicles, the result of this is low productivity in the mills.
- (c) Shortage of Manpower - The industry lacks sufficient personnel in particular high level manpower and technical personnel. The industry has to compete with other industries in the country like textiles, food etc. which are more attractive to employees (This section will however be dealt with in more detail when we discuss the labour situation).

4. Secondary Wood Processing Industries (Furniture, Joinery, etc.)

4.1 Range of products Manufactured:

- (a) Furniture: This includes household, hotel, office, school and, to a smaller extent, hospital furniture. The range of products are thus tables, chairs, cupboards, sofa sets, arm chairs, side boards, chest of drawers, wardrobes, stools, etc.
- (b) Joinery: These are mainly doors, (flush and panel) windows, door frames and window frames. Prefabricated housing is a common practice.

4.2 Product design in furniture industry: The furniture industry in Tanzania is still not well organized. Product design mainly starts with the customer as most of the production is done on order specifications.

4.3 Technical level of furniture and joinery factories in general:

The level of technology in this field is still very low. With the exception of a few industries most of the work done in

furniture factories is manual. Simple equipment with very little automation is used.

4.4 Specific technological problems of furniture and joinery industries:

There is no product specialization particularly with furniture. Each customer may dictate the shape of furniture he requires therefore, it is difficult to create a smooth production flow and even to gain enough experience in producing a particular type of furniture. In joinery, however, some specialization has been achieved, particularly with flush doors.

4.5 Equipment installed in a typical mill: A typical furniture and joinery mill in Tanzania will be a rather small unit equipped with saw tables, planing machines suitable for small scale manual operation, and a few moulding machines. Most of the work will be done manually and even doors could be moulded in an ordinary jointer. Flush doors would however be pressed in the plywood mill.

4.6 Development Trends: As mentioned earlier, the furniture and joinery industry in Tanzania is still disorganized and inefficient. It lags behind the primary processing industries in that, there is no proper organization, the units are mostly very small and manually operated and there is no specialization. The industry uses mainly solid wood and very little panel products are used.

The present development trends are thus aimed at improving the industry by starting a new factory specializing on knock-down furniture which could be multipurpose and which will produce quality furniture not only for the local market but also for export and which will use less high quality timber. The joinery industry is a bit more advanced than the furniture particularly the production of flush doors but there is also a lot to be done in this section.

4.7 Problems

The main problems facing the secondary wood processing industries are:

- (a) Shortage of raw materials - Local materials available are mainly solid woods. Panel products are scarce and to some extent of poor quality.
- (b) The industry has been to a large extent left to small apprentices who not only lack financial support but also the technical knowledge required.
- (c) High Operating Costs: Lack of specialization leads the units to produce too many designs and use too many types and sizes of raw materials. This not only increases material cost but also labour costs.

5. Labour

5.1 Quality and Availability

- (a) Unskilled: These can be found easily from ex-primary and secondary school leavers.
- (b) Semi-skilled: These are also available but in a smaller scale than the unskilled labour. These have to be trained mainly by the industry itself either by sending them to vocational schools, technical schools or training abroad.
- (c) Skilled: These are very few compared to their demand. There is a heavy competition with other industries for less specialized areas. For the more specialized areas, the problem is getting the people with the required basic education for further training. Furthermore wood technology is not yet taught at college level. The consequence of this is a heavy reliance on foreign experts. The experts are normally attached with counterpart personnel but where

the counterpart does not have the required basic education the training results are minimal.

5.2 Vocational Training

There are two main vocational training centres. One is in Dar es Salaam for general apprenticeship and the other one is in Moshi for forest industry training. The one in Dar es Salaam provides mechanics, electricians, carpenters, etc. and the other one in Moshi is specialized in all areas related to forest industry such as logging, machine operation, saw doctoring etc. The courses mainly take two years and various trade tests are given up to artisan grade I. Only in areas like heavy forest machine operation and specialized fields like panel board production do students train abroad.

5.3 Higher Technical Education

Higher technical education is limited. There are a handful of technical secondary schools, two technical colleges issuing diplomas and advanced diplomas in engineering and one University issuing degrees in engineering. Wood technology as a speciality is not included in these institutes but there are serious plans to include the programme in one of the technical colleges (Arusha Technical School).

6. Local Manufacture and/or import of woodworking machines

6.1 Range of machines, tools and spare parts. A few tools and spares are manufactured but their contribution is minimal.

TWICO is planning to start a spare parts fabrication centre this will be after the machine standardization programme carried out together with the current rehabilitation programme is completed.

6.2 Imports of woodworking machines and restrictions existing

Most of the woodworkng machines are imported as mentioned above.

Import occurs only after securing an import licence due to foreign exchange scarcity.

6.3 Value and Origin of Imports

Annual imports are in the range of about 100 million Tanzanian Shillings and most of the machines originate in the Federal Republic of Germany.

6.4 Marketing Channels

Spares and tools are normally imported by a number of agents but for more specialized spares and industrial tools there are government agencies charged with the import and selling responsibility. End users are normally advised to import through consignees.

TWICO also operates a service centre for tools and spares for its subsidiary companies and to a smaller extent it assists other public institutions.

6.5 Availability and quality of after sales service

After sale service is almost non-existent except for a few machines bought through local agents.

6.6 Problems

- (a) Financial - As explained above, most of the machines, spares and tools are imported. This puts a heavy burden on the country as it has to use scarce foreign exchange. Furthermore financial problems sometimes restrict the amount purchased thus reducing the total investments.
- (b) Administrative - Delays occur in importing due to long distance communication. Furthermore after-sale service is almost non-existent

(c) Technical - The end users do not have enough opportunity to know what they intend to purchase. In most cases they end up in purchaisng complicated machines or outdated technologies which in future lead to problems of getting spares.



