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PROSPECTS FOR INTEGRATION IN THE WOODWORKING
INDUSTRY OF THE CARIBBEAN COMMUNITY

UC/CAR/86/201

Technical report: The situation in Jamaica*

Prepared for the CARICOM Secretariat
by the United Nations Industrial Development Organization

Based on the work of Pietro Borretti, woodworking consultant

Backstopping officer: A. V. Bassili
Industrial Management and Rehabilitation Branch

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1. Introduction

1.1 Title and number of the project under which this country report has been prepared:

Development of integrated industry programme for the woodworking and furniture industry sector in CARICOM - UC/CAR/86/201

1.2 Cooperating Agency:

Caribbean Community Secretariat, Georgetown, Guyana

1.3 UNIDO consultant:

Pietro Borretti, Consultant in Woodworking Industry Sector.

1.4 CARICOM counterpart:

Ivor Carryl, Industrial Economist, Economics and Industry Division.

1.5 Main institutional contact in Jamaica:

Furniture and Wooden Products Sub-Sector, Jamaica Industrial Development Corporation (JIDC)

1.6 UNIDO Backstopping officer:

Antoine V. Bassili, Senior Industrial development Officer, Industrial Management and Rehabilitation Branch, IO/IIS

1.7 Period of mission to Jamaica:

11 to 16 April 1987, 29 April to 1 May 1987

1.8 Terms of reference:

To survey selected furniture plants in order to establish their requirements for imported lumber and evaluate the efficiency of those plants in the utilization of timber inputs.

1.9 Main activities:

- (a) Visits to selected furniture plants;
- (b) Review of shipping links with Belize, Dominica and Guyana;
- (c) Review of lumber import trends;
- (d) Review of local forest resources data and lumber production trends;
- (e) Providing lumber importers and furniture manufacturers with lumber export contacts in Guyana and Belize;
- (f) Reporting to the Guyana Forestry Commission and the Belize Forestry Department on lumber requirements of Jamaica's furniture and joinery industry.

1.10 Background:

Among the primary aims of the Caribbean Community Secretariat (CARICOM), established in 1973, are the coordination of economic policies and development planning, and setting up of a special regime for its less developed members. In line with these aims, the CARICOM has developed an industrial programme for the industrial development of its 13 member states. The emphasis is on the production of goods and services for the regional market with a view to minimizing costly imports.

The development of the timber industries sector - and in particular the promotion of the supply of wood products from within the Region - has been assigned a priority role by the CARICOM secretariat, since the Caribbean Community as a whole is heavily dependent on extra regional sources of supply to meet its lumber demand.

A regional project of assistance to CARICOM - entitled 'Development of Integrated Industry Programme for the Woodworking and Furniture Industry Sector in CARICOM' - was undertaken in this connection in 1987 by the UNIDO consultant Pietro Borretti who visited nine of the twelve CARICOM countries together with his counterpart Ivor Carryl.

As a result of the missions the consultant prepared eleven reports to highlight the situation to the CARICOM Secretariat and the authorities of the member states the situation of the sector and its potential. He also recommended certain immediate measures for the development of the sector. This report concerns the mission undertaken by the consultant in Jamaica.

1.11 Related reports prepared under project UC/CAR/86/201:

The eleven reports prepared under the project include the following:

- (a) The project's terminal report (reference No. IO/R. 52) entitled 'Prospects for Integration in the Woodworking Industry of the Caribbean Community dealing with the situation in the region as a whole. The report proposes, inter alia, the implementation of three projects of regional scope:
 - (i) Study on the establishment of a timber distribution centre in Barbados or Trinidad to facilitate the supply of lumber from within CARICOM;
 - (ii) Holding a regional WOODTECH course/exhibition of woodworking machinery in Barbados in order to promote the transfer of technology for the small-scale furniture and joinery industry in the Caribbean.
 - (iii) Intra-regional tool maintenance training programme for the furniture/joinery industry;

- (b) Nine country reports covering the CARICOM member states^{1/} visited by the consultant and his counterpart in the course of the project; and
- (c) A technical report on the 'Selection of woodworking equipment for the small-scale furniture/joinery industry in the Caribbean Community' (report No. IO/R. 53).

The report covers both wood processing and tool maintenance equipment. It also includes sawdoctoring equipment for the maintenance of inserted teeth of circular saw blades, gang saw blades and band resaw blades.

2. Summary

Jamaica ranks fourth in CARICOM, following Guyana, Belize and Trinidad and Tobago, in area of commercial forests and has the largest plantation resources in the Region - followed by Trinidad and Belize - consisting of 13,480 ha of Caribbean Pine and 4,860 ha of hardwood species.

The sawmill industry consists of some 70 small-size sawmills. However, the state-owned Forest Industry Development Company (FIDCO) runs since 1982 the only industrial sized sawmill based mainly on the utilization of Pine plantations. The mill is equipped with such processing facilities as air- and kiln-drying, planing and moulding and preservation treatment. Jamaica's sawmilling output dropped from 80,000 m³ (33.9 million BM) in 1969 to 60,000 m³ (25.4 million BM) in 1977 and 31,621 m³ (13.4 million BM) in 1984. Trinidad is the second largest lumber producing country in CARICOM after Guyana, which produced 53,298 m³ (22.5 million BM) in 1985.

Local lumber production in 1984 amounted to about 35 percent of the apparent consumption and the country is expected to remain heavily dependent on imported lumber (both softwood and hardwood species) in the foreseeable future, especially with respect to lumber supply to the furniture industry.

The bulk of lumber imports consists of coniferous - mainly Pitch Pine - with nearly 50 percent of the total volume being dressed and tongue-and-grooved lumber. The bulk of coniferous lumber is imported from the United States of America, whereas most Mahogany lumber is supplied by Brazil.

Lumber supply links with CARICOM sources are limited to imports from Belize. In 1985 lumber imports from that country included 284 m³ (120,319 BM) Mahogany out of a total 431 m³ (182,657 BM)

The furniture and joinery manufacturing sector consists of hundreds of producers of which only a fraction operate on a truly industrial basis. Even many of the larger plants, some of which have immediate export interests, need to modernize in terms of wood processing methods, wood jointing machinery and tool maintenance.

^{1/} Antigua, Barbados, Belize, Dominica, Guyana, Jamaica, St. Lucia, St. Vincent, Trinidad and Tobago.

However, due to the outstanding performance of some of its furniture and joinery plants, Jamaica is the leading country within the Caribbean Community in the capability of producing wood products of export standard for extra CARICOM destinations. In particular, the Kingston Heirlooms Furniture factory is possibly the most modern and efficiently operated export-oriented plant in CARICOM, while the Caribbean Woodcraft Manufacturing Co. has attained an equal capability with respect to joinery products. Furthermore, Fairway Furniture can be considered a leading small scale plant for the production of contemporary furniture.

In the light of the severe decline in Jamaica's furniture export to Trinidad and Tobago, the furniture industry has been gearing itself towards exporting to the USA market instead. A major difficulty faced by the industry in this respect is the increasing scarcity of Brazilian Mahogany. Therefore a critical need exists in identifying supply sources of Mahogany substitutes so as to allow the scarce supplies of Brazilian Mahogany to be reserved for the furniture for export to the USA, a market which would resist the introduction of Mahogany substitutes.

Samples of such alternative timber species available from Guyana and Belize were shown by the consultant during his visit to Jamaica to furniture and joinery manufacturers and, as a result, specific requests for quotations were submitted by the potential buyers to the Guyana Forestry Commission and the Belize Forestry Department.

The following recommendations are made towards promotion the import of furniture-type timber from CARICOM sources and promoting the efficiency of the furniture/joinery manufacturing sector as a whole:

- (a) To identify the cumulative requirements for Mahogany substitutes, such as Crabwood, Determa and Locust, by the major furniture and joinery manufacturers and make arrangements for combined lumber shipment from Guyana, possibly by charter vessels in order to overcome the problem of lack of frequent and regular shipping services between the two countries;
- (b) To investigate the possibility of making a similar arrangements for Santa Maria, a Mahogany substitute from Belize;
- (c) To provide the necessary incentives on the part of the Government departments concerned to enable the Fairway Furniture Factory to establish a Tool Maintenance Service Centre for the benefit of the furniture/joinery industry in order to (1) extend the serviceable life of expensive, imported cutting tools, such as carbide-tipped circular saw blades; (2) contribute towards reducing equipment break down; and (3) contribute towards improving the quality of finished products. A draft project document is given in Annex III.
- (e) To provide purchase specifications to the furniture and joinery industry sector, in particular to the small-scale plants, in the selection of modern and appropriate type of machinery, with emphasis on the introduction of dowel and round-end tenon wood-jointing techniques. A separate report has been prepared by the consultant in this respect, entitled: 'Guidelines in the selection of woodworking equipment for the small-scale furniture/joinery industry in the CARICOM Community' (report No. IO/R. 53).

- (f) To investigate the possibility of the Fairway Furniture Factory establishing a regional furniture distribution centre in Puerto Rico to supply that major furniture importing country, Antigua (the only CARICOM country with a current furniture import potential), the Bahamas, Guadeloupe, Martinique and other islands in the area with inexpensive and attractive furniture of contemporary type. Puerto Rico provides weekly or twice a week shipping links with most islands in the area.

3. Forest Resources

Jamaica has a total forest area of 116,750 hectares consisting of indigenous hardwoods and pine plantations, the latter providing lumber used mainly for building construction purposes. Productive forest under management include 23,340 hectares while the man-made forest cover 18,340 hectares, of which 13,480 hectares consists of Caribbean Pine and 4,860 hectares of hardwood species. The main forest clear stands include the following species: Cedar, Santa Maria, Blue Mahoe and Mahogany. The main timber species extracted from the forests are:

- Caribbean Pine (Pinus Caribea)
- Cedar (Cedrela odorata)
- Blue Mahoe (Hibiscus elatus)
- Mahogany, Jamaica (Swietenia mahogani)
- Bitterwood (Picraena excelsa)
- Guango (Samanea saman) and
- Bulletwood (Manilkara sideroxylon).

4. Sawmill Industry

Nearly 3,000 hectares of the commercial forest area are exploited by the Forestry Industry Development Co. Ltd. (FIDCO) which is a subsidiary of the Government owned Jamaica National Investment Company. FIDCO runs the only two sawmills of industrial type, which however do not operate at full capacity due to irregular and inadequate supply of logs. The lumber output of the FIDCO sawmill operation amounts to about 7 million BM (approx. 16,500 m³) per year. The total volume of lumber produced locally in 1984 amounted to 31,621 m³ (13.4 million BM)^{2/} while 57,548 m³ (24.4 million BM) of lumber was imported, resulting in an apparent lumber consumption of 89,533 m³ (37,9 million BM).

5. Lumber Imports

A considerable downturn has developed in lumber imports since 1982 when a record of 85,100 m³ (36 million BM) of lumber was imported into the country. The trend in lumber imports since 1981 is shown below.

^{2/} Source: Progress Report 1980-89, Forestry and Soil Conservation Department, Kingston.

Table 1: Trends in Lumber Imports, 1981-1985

	1981	1982	1983	1984	1985
m ³	68,139	85,100	71,670	57,548	50,158
BM	29 mil	36 mil	30 mil	24 mil	21.2 mil

Source: Jamaica Customs Records

The bulk of lumber imported in 1985 consisted of treated and untreated coniferous species which amounted to 45,072 m³ or 89.8 per cent of the total - mainly Pitch Pine. Mahogany lumber amounted to 1,482 m³ (628,071 BM) down from 3,348 m³ (1.4 million BM) in 1982. Over 50 per cent of the total lumber imported in 1985 consisted of sawn lumber, and the balance of dressed and tongue-and-grooved lumber used for panelling or flooring. The cost of lumber imports in 1985 was nearly J\$ 50 million (approx. US\$ 9 million).

In 1985 the main source of lumber imports was the USA followed by Honduras and Belize.

The following table provides details of the sources of imported lumber in 1985.

Table 2: Jamaica Lumber Imports in 1985 by Countries of Origin

Country of Origin	m ³	BM
USA	41,229	17.5 million
Honduras	3,909	1.6 million
Brazil	914	387,353
Belize	431	182,657
Guyana	135	57,213

Source: Jamaica Customs Records

The bulk of coniferous species was supplied by the USA, whereas the sources of Mahogany were as follows:

- Brazil 852 m³ (361,077 BM)
- Belize 284 m³ (120,359 BM)
- Honduras 231 m³ (97,897 BM)

Small volumes of Caribbean Cedar (*Cedrela odorata*) were imported from Belize (147 m³ or 62,298 BM) and Brazil (62 m³ or 26,275 BM).

The Table hereunder shows the trend in Jamaica's lumber imports from Belize and Guyana.

Table 3: Jamaica's Trend in Lumber Imports From Belize and Guyana, 1981 to 1985

Country of Origin	1981	1982	1983	1984	(m ³) 1985
Guyana	5,485	-	-	141	135
Belize -					
- Mahogany	1,508	1,628	2,870	1,645	284
- Pine	688				
- Cedar	--	--	--	265	147
- Other woods	--	715	--	--	--

Source: Jamaica Customs Records

Selects and No. 1 Common are the normal requirements for imported lumber to be used in furniture manufacturing. Moisture content required for furniture supplied to the local market ranges from 12-15 per cent. Manufacturers equipped with drying kilns, or having access to kiln-drying services would import timber with a moisture content of about 20 per cent.

The main lumber importer in Jamaica is the Jamaica Commodity and Trading Co. Ltd. which handles the bulk of construction lumber imports on behalf of distributors who then supply the lumber to lumber yards. The company also oversees lumber imports as a whole in that it grants licences to other importers. It is common practice in Jamaica for larger furniture plants to import lumber directly from overseas suppliers, thus saving on the cost of raw material inputs.

Table 4: Lumber Prices

	Retail Prices	
	J\$/EM	US\$/EM
a) Imported Mahogany		
- imported by manufacturers (CIF)	6.87*	1.25
- purchased from lumber importers	12-20	2.18-3.63
b) Local Mahogany	5.50	1.00
c) Spanish Elm	3-3.40	0.54-0.61
d) Cedar	3.50	0.64
e) Imported Pine (CIF)	2.75	0.50

* Price of Mahogany up from J\$4.68 in 1985

6. Import Duties and Landing Charges

The following duties are charged on imports of lumber:

- (a) 25 per cent import duty for non-CARICOM supplies;^{3/}
- (b) 27 1/2 per cent consumption tax;
- (c) 4.3 per cent stamp duty.

^{3/} This duty is waived for manufacturing firms operating in the Export Free Zone or with concession privileges.

The duties are calculated on the CIF value of the cargo. Landing fees and other wharfage charges including landing, storage and delivery (L.S.D.) at Kingston port are as follows:

- (a) L.S.D. per 20 ft. container: US\$ 250;
- (b) L.S.D. per metric ton of bulk cargos: US\$ 18.

7. Shipping Links

(a) Belize-Jamaica

Three times a month service (Harrison Line)

Freight rates:

- US\$ 1,340/20 ft. container (basic rate)
- US\$ 1,500/40 ft. container (basic rate)
- US\$ 250/20 ft. container (L.S.D. Kingston).

(b) Guyana-Jamaica

Twice a month service (WISCO)

Freight rates:

- US\$ 1,140/20 ft. container (basic)
- US\$ 175/20 ft. (Guyana handling)
- US\$ 250/20 ft. (Destination L.S.D)
- US\$ 2,390/40 ft. cont. (including basic rate and loading charges)

(c) Dominica-Jamaica

Monthly service by MV "MINI LINER" (WISCO)

(d) Jamaica-Antigua

(for possible shipment of furniture) Monthly service by MV "MINI LINER" (WISCO)

8. The Furniture/Joinery Industry Sector

According to 1985 statistics the formal wooden furniture manufacturing sector provides employment to 1,667 workers and represents a 4.5 per cent of the total employment in manufacturing. The employment level declined from 2,753 in 1975 on account of the mechanisation process undergone by the sector. This is also reflected in the increase of value added per employee in the furniture industry from US\$ 5,013 in 1975 to US\$ 43,724 in 1985 (at current prices).

The furniture manufacturing sector consists of hundreds of producers of which only a fraction operate on a truly industrialised basis, while the majority consist of artisanal and mechanised-artisanal shops.

Fifty of the main furniture factories are members of the Jamaica Manufacturers Association (JMA). In addition, 83 registered factories operate outside the Association. Some 36 of them are engaged in furniture export activities.

The following furniture/joinery factories were visited in the course of the mission to Jamaica:

1. Caribbean Woodcraft Mfg. Co. Ltd
2. Fairway Furniture Factory Ltd.
3. Kingston Heirlooms Ltd.
4. Kreative House Ltd.
5. Ledon Furnishing Ltd.
6. Morgan Industries Ltd.
7. M.V. Furniture Distributors.

Of the furniture/joinery plants visited, two were found to have attained a remarkable standard in terms of equipment and effective industrialized wood processing. The two companies are the Kingston Heirlooms Ltd. - furniture manufacturer - and the Caribbean Woodcraft Manufacturing Co. Ltd.- manufacturer of panel doors and flush doors as well as furniture. In addition, the consultant was very impressed with the dynamism and potential of a small-scale furniture plant, Fairway Furniture, which was producing modern, attractive furniture made of a local timber species, Spanish Elm.

8.1 Kingston Heirlooms

Jamaica's furniture export potential was greatly enhanced by the establishment in 1984 of the Kingston Heirlooms factory specifically designed to produce 18th century reproduction furniture in Mahogany for export to the USA. The factory covers 35,000 sq. ft., utilises a lumber input per year of about 500,000 BM (approx. 1,200 m³) and has attained a turnover of US\$ 3 million in a period of just one year. The plant is equipped with modern although not over-sophisticated machinery of both European and USA origin.

The company operates on the basis of a particularly effective arrangement, whereby all furniture produced is exported to a furniture manufacturer in North Carolina, USA, who then distributes it together with the furniture produced in his own plant. One of the main advantages of the arrangement is that the Kingston Heirlooms is provided free of charge by the associated North Carolina plant with all the product-and-process know-how relating to the furniture produced.

Although the items produced by the Kingston Heirlooms are very close in details to the original 18th century furniture, they have been very skillfully engineered for mechanised production, as well as for knock-down construction of selected components. The plant was set up and is operated with the assistance of a long-term production expert provided by USAID, who is now in the direct employment of the Company as its Vice-President for Manufacturing.

One of the most valuable development aspect of the Kingston Heirlooms' operation is the utilisation of Jamaica's traditional wood-carving skills. In the manufacturing process, wood-carved components are first shaped and rough-carved by machine and then finished to a very high standard of quality by hand carvers whose wages are only a fraction of those paid to American workers involved in the same type of work.

8.2 Caribbean Woodcraft Manufacturing Co.

The Caribbean Woodcraft Manufacturing Company's plant might be considered as a model operation for the production of panel doors and flush doors in the CARICOM as much as the Kingston Heirlooms is for the serial manufacturing of reproduction furniture of export standard.

The plant imports yearly, directly from Brazil nearly one million EM (approx. 2,400 m³) of Mahogany as well as 300,000 to 500,000 EM (708 to 1,179 m³) per year of Pine from Honduras and the USA.

It exports annually 6,000 panel doors in Mahogany and 3,000 panel doors in Pine, and produces some 30,000 flush doors per year made of honeycomb core and Pinewood frame. The Caribbean Woodcraft Manufacturing Co. has also pioneered the serial production of Pine Furniture.

8.3 Fairway Furniture Company

The Fairway Furniture Factory was found to have an outstanding potential to become a demonstration small-scale furniture plant. Established in 1978, the factory produces an attractive range of contemporary furniture of Scandinavian inspiration as well as wooden toys made of a local timber species, Spanish Elm. The plant is equipped with a good initial range of woodworking machines including, among others, a wide belt sander and two Hempel automatic turning lathes. However, in order to increase its efficiency, the plant would require the addition of a round-end tenoner and a clamp carrier, as well as additional tool maintenance equipment.

8.4 General conditions of the Furniture/Joinery industry

In contrast to the three furniture/joinery operations described in the foregoing paragraphs, it was found that some of the other plants visited in the course of the mission needed to modernise their working methods as well as retool their facilities because of old machinery and lack of proper wood-jointing equipment. In one particular plant it was noted that while wooden dowels were in use for the assembly of furniture components, their quality was so poor as to make it impossible to produce quality furniture for export. Perhaps the furniture industry would be better off in this respect if it imported dowels rather than attempt to produce them locally, as it is currently the case in Jamaica with the exception of Kingston Heirlooms. In fact, some European countries find it more convenient to import top-grade dowels rather than produce them locally.

Lack of proper tool maintenance equipment and easy-to-maintain moulding cutters were also found to be a major drawback towards improving operative efficiency. Although in the case of small plants maintenance of carbide-tipped circular saw blades is better handled by outside specialised workshops, the individual plants should be equipped with general-purpose maintenance equipment to carry out routine maintenance of the main types of tools such as planing knives, moulding cutters, boring bits, etc. In any case, there is certainly scope for establishing a Tool Maintenance Centre in Jamaica in view of the fact that in many instances - especially in the case of carbide-tipped circular saws - tools are shipped as far as Miami for maintenance.

8.5 Wood Seasoning

One of the main assets of Jamaica's furniture industry, as compared to the rest of CARICOM, is the availability of a number of kiln drying facilities - which provide a valuable basis for the furniture export drive of the sector^{4/}. A list of existing kiln drying facilities are listed below:

	Kiln capacity	
	BM	m ³
Cariframe Ltd	3,000	7.0
Kreative House	5,000	11.8
M.W. Distributors Ltd.	3,000	7.0
Things Jamaican Ltd	18,000	45.5
Ultramod Ltd. (solar kiln)	6,000	14.0
Wherry Wharft Ltd. (lumber importers)	30,000	70.8

8.6 Furniture Trends

In contrast to the established furniture trends in most CARICOM countries, Jamaica has not inherited a strong preference for furniture based on the use of spindles and turned parts. Rather, the emphasis is placed on reproductions of lighter looking 18th century style furniture.

Moreover, the industry is also experimenting with contemporary designs and the use of pinewood in the production of furniture for the lower-income groups. It was also noted that lighter-shade finishes are preferred here than elsewhere in the CARICOM. In fact, some ranges of Mahogany furniture are offered with clear finishes, rather than the stained dark-red shades produced elsewhere.

9. Selected Requirements for Technical Assistance to the Furniture Industry

In view of the fact that two full-time woodworking experts attached to JFDP^{5/} are assisting in the development of the export potential of the industry, the Consultant shall limit his recommendations in terms of technical assistance to the needs of the small-scale furniture industry as follows:

- (a) selection of woodworking machinery and basic tool maintenance equipment for small-scale furniture/joinery workshops. Purchase specifications in this respect are provided in the ad hoc report listed in paragraph 1.11 (c).
- (b) supply of information on low-cost automation, jig making and modern upholstering methods (related UNIDO publications have been mailed by UNIDO to the furniture and joinery factories visited by the consultant during his mission to Jamaica. Ten extra sets of manuals will be sent to the JIDC for distribution to other leading plants).
- (c) Assistance to the Fairway Furniture Factory in setting up a tool maintenance servicing centre for the benefit of the furniture/joinery industry as a whole.

^{4/} A need exists, however, for the existing kiln drying facilities to increase their operative efficiency.

^{5/} Jamaica Furniture Development Programme

10. Wooden Furniture Export Trends and Potential

Up to 1983. CARICOM destinations had provided the major market outlets to Jamaica's furniture exports. In that year, in fact, over 90 per cent of the total furniture exports were absorbed by CARICOM countries.

Since 1983 however, Jamaica's volume of furniture exports within the Region has severely been affected, as in the case of Barbados, by the severe economic downturn experienced by Trinidad and Tobago, coupled with the emergency in the latter of a modern furniture manufacturing sector.

The following table shows the trends in Jamaica's furniture exports to CARICOM in terms of percentage of total export by the furniture industry:

Table 5: Trends in Jamaica Wooden-Furniture Exports, 1983 and 1985

Destinations	1983	1985
Trinidad and Tobago	73%	16%
Barbados	14%	3.7%
Other CARICOM countries	3.7%	1%
Total CARICOM	90.7%	20.7%
United States of America	4.5%	52%

Source: Jamaica Custom Records

Values of wooden furniture exports from 1982 to 1986 are shown below:

US\$'000				
1982	1983	1984	1985	1986
2,208	2,261	1,268	926	1,556

Source: STATIN

The situation with respect to exports to Trinidad from Jamaica and Barbados is not expected to improve because of the hard-hit and heavily under-utilised furniture manufacturing facilities in Trinidad and the consequent Government policy there to discourage imports not only of finished furniture but also of furniture parts.

In light of the severe decline in Jamaica's furniture exports to CARICOM, the industry has been gearing itself towards exporting to non-CARICOM markets and especially to the USA, where Jamaica - as other Caribbean countries - has been granted duty-free access under the Caribbean Basin Initiative (CBI). The success of this effort is reflected by the increase of the share of furniture exported to the USA from 4.5% in 1983 to 52% in 1985.

The proximity of Jamaica to the USA enables speedy delivery and saving in freight costs when shipping furniture to that country. Moreover, Jamaica has a major labour cost advantage compared with the industry in that country with respect to the industrialised production of furniture incorporating hand-carved components. In fact, Jamaica's furniture industry has the most competitive wage rates compared to Trinidad and Barbados, the other two major furniture producers in CARICOM as shown below:

Table 6: Comparative Labour Rates in the Furniture Industry

U S A	JAMAICA	BARBADOS	TRINIDAD
	(US\$ per week)		
284	34-65	91-105	133

Source: Survey of Manufacturing Costs in Barbados,
Barbados Industrial Development Corp., 1985

Jamaica seems also to have a good potential of exporting to Antigua the type of inexpensive, contemporary-type furniture produced on a serial basis by the Fairway Furniture Factory. At present, Antigua is importing cheaply made, unattractive low-cost furniture from Brazil. The potential furniture importer in Antigua is:

Mr. Aziz Hadeed, Managing Director
Plastic Foam and Furniture Co.
P.O. Box 1050, Market Street
St. John's, Antigua and Barbuda, W.I.
Tel: 462-1452

Jamaica also offers the opportunity to Belize and Guyana to supply dimension stock (dried, planed and cut-to-size parts) for the production of panel doors in quantities of 10,000 pieces per year, as per details provided under the heading on page 17.

The Jamaica Government through the Jamaica National Investment Promotion Ltd. (JNIP) has targeted the furniture sub-sector as one with great potential for both local and overseas investment in Jamaica. Some 17 furniture projects have been supported by JNIP since 1981 involving a capital investment of J\$ 12.4 million (US\$ 2.25 million).

A major role in the effort to increase exports by the furniture industry to third country markets is played by the Jamaica Industrial Development Corporation (JIDC) which is responsible for the implementation of the Jamaica Furniture Development Programme (JFDP) with the assistance of two long-term USAID advisers.

The Jamaica Furniture Guild has been established under the sponsorship of JFDP to group the dominant Jamaican exporter of furniture.

Also involved in the furniture export promotion programme is the Jamaica Bureau of Standards (JBS). With funds provided by the World Bank, the Bureau has installed a Climatic Chamber to test furniture under simulated end-use conditions. In addition, JBS is equipped with furniture testing devices and provides assistance in quality control.

11. Potential for Lumber Imports from CARICOM Countries

Unlike the other major lumber importing countries in CARICOM, such as Trinidad and Tobago and Barbados, Jamaica has so far provided only a minor market outlet for Guyana timber products. In fact, no timber exports to Jamaica were recorded in 1986 by the Guyana Forestry Commission other than 183 m³ (77,555 BM) of shingles.

However, the increasing difficulty in obtaining a steady supply of Brazilian Mahogany and the inadequate supply of lumber from local forests seems to provide an incentive for a long-term lumber supply link between the two countries. In particular, both the industry and the JIDC looked favourably into the possibility of importing Mahogany substitutes - such as Determa and Crabwood (Andiroba) from Guyana and Santa Maria from Belize - so as to allow the scarce supplies of Brazilian Mahogany to be reserved for the production of furniture for export to the USA, a market which would resist the introduction of Mahogany substitutes.

As in the other two major regional markets, Trinidad and Barbados, the interest in Guyana species in Jamaica centered on two species seen as substitutes to Mahogany, that is Determa and Crabwood and, in addition, Hububalli. However, the Fairway Furniture Company had obtained good results in testing the Guyana species Locust and expressed interest in experimenting with this species in actual production of furniture and utility wooden items, such as bowls, trays, etc.

Jamaica was also the only country of the eight visited in the course of the mission where two furniture manufacturers, the MW Furniture Ltd. and the Modern Furnishing Ltd., found the Purpleheart samples shown to them interesting and requested quotations for this particular species.

The potential of further developing lumber imports from Belize is highly enhanced by Jamaica's proximity to that country, the availability of direct shipping links and the familiarity of the market with Santa Maria - a main hardwood species exported by Belize.

12. Requests for Quotations (Lumber and dimension stock)

A. Requirements by Kreative House

- Mr. D.C. Orane
Managing Director
67 Waltham Park Road
Kingston 11, Jamaica
Telex: YP SEA 2211

- Quotation CIF for Mahogany, Determa, Crabwood and Santa Maria
- size: 1" and 2" thick, width 8" and up (8" minimum length)
 - Moisture content: 20 to 25 per cent
 - Trial order quantity: 1,000 BM

B. Requirements by the Caribbean Woodcraft Manufacturing Company

- Mr. J. Reynolds, Managing Director
P.O. Box 38, Kingston 10
Jamaica Telex: CARIWOOD 2207

- (i) Quotation CIF Kingston for the supply of dimension stock in Mahogany, Determa, Crabwood and Santa Maria, for the manufacture of panel doors

Each panel door consists of a set of dimension stock as follows:

		<u>Quantity per door</u>
(1) Stiles:	1 7/8"x5 3/8"x 85"	2 pieces
(2) Top rail:	1 7/8"x4 5/8"x33"	1 piece
(3) Bottom rail	1 7/8"x8 3/8"x33"	1 piece
(4) Horizontal rail	1 7/8"x3 5/8"x30"	2 pieces
(5) Horizontal rail (central):	1 7/8"x3 5/8"x33"	1 piece
(6) Vertical rails	1 7/8"x3 1/8"x18"	4 pieces
(7) Panels:	1 1/4"x12 1/2"x16"	8 pieces

The quotation should cover the supply of 10,000 sets of components to be delivered in one or two shipments.^{6/} Moisture to be 8 per cent to 10 per cent maximum.

Should the supplier not be in a position to supply kiln dried stock, a quotation could be submitted instead for rough lumber air dried to 20 to 25 per cent MC. The corresponding sizes are:

	<u>Quantity per door</u>
(1) 2"x5 1/2"x 85"	2 pieces
(2) 2"x4 3/4"x 35"	1 piece
(3) 2"x8 1/2"x35"	1 piece
(4) 2"x3 3/4"x32"	2 pieces
(5) 2"x3 3/4"x 35"	1 piece
(6) 2"x3 1/4"x 20"	4 pieces
(7) 1 3/8"x12 5/8"x 20"	8 pieces

^{6/} The component should be packed in such a way as to prevent damage and absorption of moisture in transit.

(ii) Quotation CIF Kingston for the supply of Caribbean Pine sawn lumber for furniture manufacture. Specifications are:

Sizes: current standard sizes

Grade: firsts and seconds

Moisture content: 20 to 25 per cent

Quantity: Annual requirement 300,000 to 500,000 BM

C. Requirements by Kingston Heirlooms Ltd.

(Furniture Manufacturers)

Mr. T. Smith, President

38 Red Hills Road

Kingston 10, Jamaica, W.I.

Quotation CIF Kingston for the supply of Mahogany, Determa, Crabwood and Santa Maria sawn lumber of the following specifications:

Size: 4"x4"x43" and 6"x6"x43"

Grade: clear four sides

Misture content: 20 per cent

Quantity: 30,000 pieces per year delivered in 3 shipments

ANNEX I

Persons met

Mr. S. dello Strologo	UNIDO Senior Industrial Development Field Adviser, UNDP, Kingston 5
Mr. W. G. Woodham	Managing Director, Jamaica Industrial Development Corporation (JIDC), P.O.Box 505, Kingston
Mr. W. Ridgard	Programme Director, Furniture and Wooden Products Sub-sector, JIDC, Project Officer, JIDC
Ms. Scotts	Project Officer, JIDC
Mr. A. Krufft	UNIDO Expert, c/o Things Jamaican, 68 Spanish Town Road, Kingston
Ms. V. P. Veira	Special Assistant, JIDC
Ms. C. Marr	Marketing Advisor, Jamaica National Export Corporation, Kingston 10, Telex 2124 EXPROM JA
Mr. T. Smith	President, Kingston Heirlooms Ltd. Furniture Manufacturers, 38 1/2 Red Hills Road, Kingston 10
Mr. J. Reynolds	Managing Director, Caribbean Woodcraft Manufacturing Co. Ltd. (Doors and furniture manufacturers), P.O.Box 38, Kingston
Ms. C. Williams	Production and Sales Manager, Caribbean Woodcraft Manufacturing Co. Ltd.
Mr. C. Raebel	Managing Director, Fairway Furniture Factory Ltd. Weymouth Close, JIDC-Complex, Kingston 20
Mr. C. Cunningham	Managing Director, Kreative House (furniture manufacturers), 67 Waltham Park Road, Kingston 11
Mr. D. H. Lea	Managing Director, Modern Furnishing Co. Ltd. (furniture manufacturers), 29-35 Slipe Road, Kingston
Ms. M. L. Watt	Managing Director, MW Furniture Ltd., 30 Brentford Road, Kingston 5
Mr. O. T. Williams	Managing Director, Williamsburg Ltd., Furniture Restoration and Manufacturers, 24 Shortwood Road, Kingston 8

Mr. K. Fearon	Factory Manager, Morgan's Industries Ltd. (furniture manufacturers), 68 Lady Musgrave Road, Kingston 10
Mr. P. D. Martin	Director, International Operations Division, Jamaica National Investment Promotion Ltd (JNP), 15 Oxford Road, Kingston 5
Mr. F. Dukaney	Managing Director, HL Hardware & Lumber (lumber importers), P.O.Box 332, Kingston

ANNEX II

PROPERTIES OF SELECTED GUYANESE, BELIZEAN AND DOMINICAN
TIMBER SPECIES SUITABLE FOR FURNITURE MANUFACTURING

Contents

- A. Guyana Species
 - 1. Andiroba (Crabwood)
 - 2. Courbaril (Locust)
 - 3. Determa
 - 4. Hububalli
 - 5. Purpleheart
 - 6. Silverballi
 - 7. Simarupa

- B. Belize Species
 - 8. Santa Maria

- C. Dominica Species
 - 9. Gommier

- D. Exporting contacts

1. Andiroba (Crabwood)

- Scientific name: Carapa guianensis (family: Meliaceae)
- Other names: Krapa, Guino, Figueroa, Tangare, Carapa, Crappo
- Wood appearance: Heartwood varies from pale pink to rich red-brown when freshly sawn, darkening to a fairly uniform dull reddish-brown.
- Sapwood pale brown or oatmeal coloured, not always sharply defined. Wood resembles a plain mahogany in appearance, but lacks its natural lustre. Texture medium to coarse; grain generally straight but sometimes interlocked.
- Bole 50-80 feet tall; diameter 16-20 inches.
- Physical and mechanical properties: Comparable in strength to European Beech. Weight about 610 kg/m³ (39 lb/ft³) seasoned. Small movement. Moderately hard with good mechanical properties and is fairly stable in use.
- Natural durability: Heartwood is moderately durable and fire resistant. Logs liable to attack by ambrosia (pinhole-borer) beetles.
- Timber processing: Drying: Dries fairly well but rather slowly with a tendency to split in the initial stages. Kiln schedule C.
Working: Saws without difficulty. Interlocked grain makes planing difficult. Works easily and turns well, finishing smoothly.
Assembly: Glues and holds nails well. Tendency to split on nailing.
Finishing: Takes stain and polishes satisfactorily.
- Uses: Suitable for general carpentry, furniture, cabinet work, turnery and interior joinery.
- Supplies: Occurs in reasonable quantities in Guyana. Regular supplies possible.

Source: Guyana Forestry Commission.

2. Courbaril (Locust)

- Scientific name: Hymenaea courbaril (family: Caesalpiniaceae)
- Other names: Copalier, Algarrob, Gaupinal, Jatoba.
- Wood appearance: Heartwood light brown to brown often with dark streaks and with a subdued golden glow. Sapwood of whitish grey colour is sharply defined. Texture medium coarse.
- Grain straight, lustre medium, uniform vessel lines distinct.
- Bole 60-80 feet long, diameter 24-36 inches.
- Physical and mechanical properties: Very hard and strong. Weight varies from 910 to 1000 kg/m³ (57-62 lb/ft³) seasoned. Moderate shrinkage, relatively stable once dry. Good mechanical properties, especially elasticity.
- Natural durability: Very resistant to decay.
- Timber processing: Drying: dries readily without distortion or splitting.
Working: moderately difficult to work but finishes smoothly. Planes and turns without difficulty. Good bending to steaming process.
Assembly: glues well, but difficult to nail. Fastenings are held well.
Finishing: Finishes smoothly. Polishes and varnishes without difficulty
- Uses: A wood of decorative appearance suitable for use in the manufacture of high grade furniture, cabinet work, decorative joinery and veneer. Also used for ship-building, general construction, and the making of tool handles and croquet mallets.
- Supplies: Occurs widely but not abundantly in the Guyana forests. Regular supplies in modest quantities are available.

Source: Guyana Forestry Commission.

3. Determa

- Scientific name: *Ocotea rubra* (family: Daumecae)
- A.T.I.B.T. standard name: Louro Vermelho
- Other names: Wana, Grignon Franc, Red Louro
- Wood appearance: Pale reddish-brown with subdued golden lustre. Grain straight to irregular, texture rather coarse. Bears some similarity to a dense grade of African Mahogany. Bole 60-80 feet long, cylindrical; diameter 24-36 inches.
- Physical and mechanical properties: Average weight about 620 kg/m³ (39 lb/ft³). Hardness - soft to medium. Strength class 5/4, generally below the average for its density. Movement low to moderate. Determa responds extremely slowly to atmospheric changes and is, thus very stable in use.
- Natural durability: Determa heartwood is rated durable in graveyard and pure culture tests. The wood equals Honduras Mahogany in its resistance to termites, and is also fairly resistant to marine borers.
- Determa is highly resistant to moisture absorption and has excellent weathering characteristics.
- Timber processing
- Drying: kiln schedule E. Because of the slow diffusion rate of the moisture in the wood Determa is difficult to season.
- Working: saws well, works easily with all tools; turns and carves well.
- Finishing: stains and polishes well after filling.
- Uses: A general utility timber, widely used for all kinds of indoor and outdoor work. Uses include boat and ship building (keelframe, planking and decking); carriage and wagon building; building construction both interior and exterior (framing, stairs, windows, sash frames, flooring strips, interior trim); cooperage, furniture and cabinet work. The wood is suitable for bending to a moderate radius of curvature.

Supplies:

Available in considerable quantities. Supplies adequate to meet all likely requirements, both in quality and quantity. The timber is available in large sizes.

4. Hububalli

Scientific name: Loxopterygium sagotii (family: Anacardiaceae)

A.T.I.B.T. Standard name: Slangenhout

Other names: Koika, Onotillo

Wood appearance: The wood is brown to reddish-brown, attractively figures; contains numerous narrow to rather wide darker stripes and streaks. Lustre medium. Texture medium, uniform. Grain straight, sometimes interlocked or wavy.

Physical and mechanical properties: Weight about 50 lb/ft³. Strength class 4, moderately hard; toughness medium to rather brittle. Movement rather low. Air dry Hububalli compares closely with Burma Teak in all strength properties except compression and tension perpendicular to grain.

Natural durability: Resistant to decay; moderately resistant to termites. The wood is highly resistant to moisture absorption.

Uses: Because of its attractive figuring and relative scarcity the wood is best suited for panelling, high-grade furniture and cabinet work.

Supplies: The wood is frequently found in the far interior. Moderate quantities are available for export.

5. Purpleheart

- Scientific name: Peltogyne pubescens (family: Caesalpiniaceae)
- A.T.I.B.T. standard name: Amarante
- Other names: Amaranth, Nazareno, Pau Roxo, Bois Violet, Barabu
- Wood appearance: Dull brown when freshly cut, rapidly oxidizes to violet-purple on exposure to light and gradually toning down in course of time to dark purplish-brown. Sapwood whitish or cream coloured. Grain generally straight, sometimes wavy or interlocked. Texture moderate to fine. Bole 50-90 feet long, cylindrical; diameter 20-44 inches.
- Physical and mechanical properties: Wood is very tough, strong and resilient. Weight about 860 kg/m^3 (54 lb/ft^3) seasoned. Movement small bending strength 147 N/mm^2 (21399 lbf/in^2) modulus of elasticity 1600 N/mm^2 ($2420,00 \text{ lbf/in}^2$) compression parallel to grain 78.5 N/mm^2 (11380 lbf/in^2). Shock resistance medium.
- Natural: Highly resistant to decay, termites and fire. Heartwood very durable and extremely resistant to preservative treatment, but sapwood is permeable.
- Timber processing:
- Drying: dries well and fairly rapidly with little degrade. Kiln schedule E.
- Working: not difficult to work. Saws, planes and turns well, finishing smoothly; takes a high polish.
- Assembly: it takes glue well and holds nails and screws satisfactorily.
- Finishing: gives good results when lacquered or polished.
- Uses: Possesses high strength and very good durability and is an excellent structural timber suitable for heavy outdoor constructional work such as bridges, dock work and park benches. As flooring it has high wearing

qualities and is suitable for most conditions of traffic. Has been used successfully in chemical plants for vats, filter press plates and frames. Suitable for high-grade furniture and turnings. Also used for making billiard cue butts, tool handles, interior and exterior joinery. A valuable wood for its attractive appearance and its strength.

Supplies:

Regular supplies are available.

6. Silverballi (Group)

<u>Family:</u>	<u>Lauraceae</u>
<u>Scientific names:</u>	Brown: <u>Licaria canella</u> Kereti: <u>Ocotea puberula</u> , <u>Ocotea wachenheimii</u> , <u>Ocotea oblonga</u> Kurahara: <u>Ocotea glomerata</u> Swizzlestick: <u>Octotea schomburgkiana</u> White: <u>Octoea canaliculata</u> Yellow: <u>Aniba ovalifolia</u>
<u>A.T.I.B.T. standard name:</u>	Canela
<u>Other names:</u>	Pisie, Caralou, Canelo, Louro Branco, Inamui, Preto
<u>Wood appearance:</u>	<p>In Guyana the Silverballi group is divided into 'hard' and 'soft', with the dividing line being put at an air dry specific gravity of 37 lb/ft³.</p> <p>The heartwood ranges from greyish through yellowish buff to light brown and darkens on exposure. Lustre medium to high. Texture rather fine to moderately coarse. Grain straight. The wood usually has a pleasant aromatic odor.</p> <p>Bole 60-70 feet long; diameter 16-24 inches.</p>
<u>Physical and mechanical properties:</u>	<p>The 'hard' Silverballi is rather light to heavy with densities from 37 lb per cubic foot. The group is generally in strength class 2.</p> <p>Movement rather low; the lighter species shrink less than the heavier types.</p>
<u>Natural durability:</u>	Moderately resistant to insects and decay, but susceptible to termites. Highly resistant marine borers. Difficult to impregnate.
<u>Timber processing:</u>	<p><u>Drying:</u> kiln schedule G. Silverballi air dries well with little degrade.</p> <p><u>Working:</u> saws well and works easily.</p> <p><u>Assembly:</u> holds nails, screws and glue well.</p>

Finishing: Finishes smoothly unless grain is severely interlocked. Paints well.

Uses:

'Hard' Silverballi: General carpentry, boat building (planking), suitable for both interior and exterior work in house building; furniture and cabinet work; suitable for veneer and plywood.

'Soft' Silverballi: general carpentry, interior work, light furniture; suitable for utility plywood.

Supplies:

Occurs frequently in the Guyana forests. Regular supplies are available for orders placed in the Silverballi group.

7. Simarupa

- Scientific name: Simaruba amara (family: Simarubaceae)
- A.T.I.B.T. Standard name: Marupa
- Other names: Aceituno, Acajou blanc, Scemardepa, Bitterwood.
- Wood appearance: Heartwood whitish, not differentiated from the whitish or straw coloured sapwood. Wood has a slightly bitter taste, but is odourless. Grain straight. Texture is medium, uniform and lustrous. Bole 70-90 feet long; diameter 20-24 inches.
- Physical and mechanical properties: A very light, soft timber. Weights about 430 kg/m³ (27 lb/ft³) seasoned. In several respects very similar to Obeche (Triplochiton scleroxylon). Movement small. Low in bending strength stiffness, crushing strength and shock resistance.
- Natural durability: Timber of low durability, blue stains easily. Green converted timber can easily be treated by short dipping and diffusion.
- Timber processing:
Drying: dries very rapidly and very well. Kiln schedule L
Working qualities: Easy to work with both manual and machine tools.
Assembly: glues well. Can be easily nailed with good holding qualities.
Finishing: easy to paint, stain or varnish.
- Uses Suitable for use where a light, easily worked hardwood is required and where its lack of durability and low strength are not important. Examples are in furniture for interior use, drawer slides, and some types of cabinet framing; interior joinery and shoe heels. Excellent qualities for model making, utility wood ware and toy manufacture. Simarupa peels well and makes attractive plywood.

Supplies:

Adequate supplies available in
commercial quantities.

Source: Guyana Forestry Commission

8. Properties of a Belizean Timber Species suitable as a substitute to Mahogany in furniture production

<u>Names</u>	Trade: Santa Maria Botanical: <u>Calophyllum brasiliense</u> <u>Camb.var. reko Standl Guttiferae.</u> Local: Santa Maria, Leche Maria, Jacareuba (Brazil).
<u>Range</u>	Mexico to Brazil and through the West Indies.
<u>Description of Wood:</u>	Sapwood - pale pink, 1-2 inches wide. Heart - light pinkish to reddish brown. Odour and taste - not distinctive. Grain - generally interlocked. Texture - medium. Growth rings - indistinct, usually limited by a fine line of parenchyma. Pores - medium, visible, in diagonal to radial chains and in irregular groups, rather numerous. Vessel lines - distinct, darker than background. Rays - very fine, invisible to naked eye on cross section; fine but distinct on radial surface, darker than background; faintly visible on tangential. Gum Veins - often associated with calcium carbonate deposits, rather frequent. Parenchyma - in concentric or broken tangential lines, indistinct on cross section; distinct because of darker colour than background on longitudinal surfaces, where an irregular pattern is produced.
<u>Physical properties</u>	Weight: 34-45 lb. per cubic foot at 15 per cent moisture content. Hardness: moderate, about equal to that of English Oak. Shrinkage - above average. From green state to about 11 per cent moisture content: tangentially 5/8 inch per foot radially 3/8 inch per foot. Distortion: There is some tendency towards distortion in seasoning unless the logs are suitably converted, preferably by the semi-quartered method. But given this, and careful seasoning, the wood has been observed to give satisfactory results in good class joinery trials over a period of eight years.
<u>Durability:</u>	Resistance to fungal and insect attack moderately high. Heartwood moderately

durable in contact with the ground. Constructional material in exposed situations very durable. Not readily attacked by termite. Not resistant to marine borers. Resistance to impregnation with preservatives: Sapwood readily amenable to impregnation, but heartwood extremely resistant.

Mechanical properties

In resistance to static bending, shock load and splitting, the timber is slightly superior to English Oak. It has poor bending qualities and cannot be compressed without buckling.

Working qualities

Works with moderate ease in most operations with both hand and power tools and is comparable with medium quality English Oak in resistance to cutting. Saws: Flat-sawn green wood may cast off the saw. Planing: For the dressing of seasoned stock cutter knives require to be kept in good condition while the rate feed should be relatively low in order to obtain the best results. Unless this care is taken pronounced pick-up may occur in the stripe figure of fully quartered stock, thus causing extra sanding prior to finishing and polishing. If obtainable, a cutting angle of less than 20 degrees materially improves the finished surface. Drilling: The wood tends to tear at the exit hole and the wood must be carefully supported to minimize damage. Turns: readily to a reasonably good finish. Stains and finishes: well but quarter-sawn stock requires much sanding to remove 'picked-up' grain. Nailing: The wood is rather hard to nail and, in dimension stock, nails once driven are very difficult to pull. Where the darker coloured gum streaks are present the associated calcium carbonate tends to dull the cutter edges.

Laboratory tests:

(a)

One small log of Santa Maria was tested at Imperial Institute, London in 1922.

- (b) A preliminary test on 5 logs was made at the U.K. Forest Products Research Laboratory in 1932 and a major test on some 1400 cubic feet in 1933.
- (c) Four bolts from different parts of the same tree were tested at Yale School of Forestry in 1932.

Trade trials:

Material from the major test was tried by woodworking firms.

- (a) Veneer and plywood: The interlocked grain persisting throughout the wood caused tearing of rotary cut-stock. Gum streaks were present. Veneers showed a tendency to buckle and in drying the interlocked grain caused splitting both at the ends and middle of the sheets. Plywood showed open end-split, torn grain and gum streaks while distortion was pronounced.
- (b) Plywood
A short log taken from the parcel described in laboratory test (b) above was examined by a firm of decorative veneer manufacturers, who stated that interlocked grain was present and caused tearing of rotary cut veneer, and that gum streaks were present, thus causing a tendency towards splitting and buckling in the veneer when drying. Nevertheless plywood made up from these veneers and kept under observation for some years has remained flat and shows a fairly decorative appearance. For future plywood manufacture care should be taken to select at source logs which are the most suitable in size and shape, and as far as possible free of the defects mentioned.
- (c) Trials as general purpose furniture
A favourable report was made on a parcel of about 500 cubic feet by a furniture manufacturer. The wood was used for turnings, light articles of furniture, small tables, chairs, mattress sides,

couches. It was noted that the condition was very fair and comparable with other commercial Empire timbers. Defects and distortion after resawing were not more than 5 percent, which is reasonable. The timber had good 'standing' qualities during manufacture and final assembly.

Source: Notes on Forty Two Secondary Hardwood Timbers of British Honduras, 1946, Forest Department of British Honduras.

9. Properties of a Dominican Timber Species suitable
for Furniture/Joinery Making

Gommier

Scientific name: Dacryodes excelsa Vahl. D. hexandra
(Hamilt. Griseb) (family: Burseraceae)

Other names: Gommier blanc, gommier montagne
(Guadeloupe and Martinique); tabonuco
(Puerto Rico)

Distribution Gommier occurs in Puerto Rico and the
Lesser Antilles, generally in small groups
along ridge-tops and upper slopes of the
rain forests in Dominica, Saint Lucia, St.
Vincent, Grenada, Guadeloupe and St. Kitts.

The tree: Gommier is a large to very large evergreen
tree reaching a height of 36.0 m and a
diameter of 1.0 m to 1.5 m although mature
trees are more commonly 18.0 to 24.0 m
tall and 0.5 to 0.75 m in diameter. They
are deep rooted, without buttresses, and
able to stand up well to the numerous
hurricanes of the Caribbean. The boles
are straight and well formed.

The timber: Gommier is variously reported to resemble
birch (Betula, mahogany, and sometimes
yellow poplar (Liriodendron). It is
perhaps closer in appearance to the
botanically associated gaboon or okoume
(Aucoumea), but harder, heavier and much
finer textured.

The sapwood is narrow, greyish in colour
and not clearly demarcated from the
heartwood which is uniform pale brown with
a purplish cast when freshly cut, turning
a pinkish brown when dried, and a lustrous
brown on exposure. The grain is sometimes
interlocked, producing an attractive
ribbon stripe. The lustre is high and
often satiny in appearance. The texture
is fine to medium and uniform, and in
general is somewhat finer textured than
mahogany.

The wood weighs about 640 kg/m³ when dried.

Drying: It dries easily with no appreciable distortion or other defects. Its volumetric shrinkage from green to oven dry is 10.5 percent; tangentially it is 6.4 percent and radially 4.1 percent, which is superior in terms of drying to those values for African and Honduran mahogany.

Durability: moderate.

Working qualities:

The timber is easy to work but with a tendency to dull cutting edges due to the high silica content of the wood. When sharp cutting edges are maintained, the wood finishes smoothly and takes glue and all finishes effectively. It is good wood for turning and for holding nails.

Uses:

Gommier is used extensively in the Caribbean area for furniture and cabinet making, and in Puerto Rico is often stained and sold as 'mahogany'. It is also used for boat-building, shingles and crates. In the Caribbean, it is considered very susceptible to termite attack, and for exacting purposes not as good as mahogany with its known resistance to termites. Gommier also produces very good veneer. Tests made at the Centre Technique du Bois indicate that gommier is suitable for plywood, with selected stock suitable for decorative veneer. This was substantiated by other tests carried out in Canada with the recommendation that eccentric peeling produced better quality veneer.

Exporting Contacts

Guyana Mr. H. E. Cort, Marketing Manager, Guyana Forestry Commission,
1 Water Street, Kingston, Georgetown, Guyana, Telex: 2262
WALABA GY, Tel.: 02-54191

Belize Mr. H. Flower, Chief Forest Officer, Forestry Department,
Ministry of Natural Resources, P. O. Box 148, Belmopan,
Belize, Telex: 102 FOREIGN BZE, Telephone: (08) 2415

Dominica Mr. E. W. B. Jerome, Manager, North Eastern Timbers Sawmill
Palm Tree-Woodford Hill, Dominica Tel.: 809-449-7042

Mr. D. Southwell, Managing Director, Dominica Timbers Ltd.
Sawmill (Portsmouth), P. O. Box 198, Roseau, Dominica

ANNEX III

Draft Project document

Country: Jamaica

Title of project	Assistance to the Fairway Furniture Factory Ltd. in setting up a tool maintenance servicing centre
Company address and contact	Fairway Furniture Factory Ltd. Nanse Pen, Small Industries Complex, Kingston 20, Jamaica, West Indies, Tel.: 92-34075, Telex 3506 (Mr. Christian Raebel, Managing Director)
Government Implementing Agency	Jamaica Industrial Development Corporation, P. O. Box 505, Kingston, Jamaica
Executing Agency	United Nations Industrial Development Organization (UNIDO)
Duration	Three months
Estimated starting date:	
External inputs	US\$ 25,000
Government inputs	In kind.

PART I - LEGAL CONTEXT

To be indicated in final project document.

PART II - THE PROJECT

Part II A - Development Objective

To improve the operative efficiency of the furniture and joinery industry in Jamaica.

PART II B - Immediate Objective

To enable the Fairway Furniture Factory to acquire the necessary know how for providing tool maintenance services to Jamaica's furniture and joinery industry.

PART II C - Background and Justification

The formal wooden furniture manufacturing sector provides employment to over 1,600 workers which represents a 4.5 percent of the total employment in manufacturing. Fifty of the main furniture factories are members of the Jamaica Manufacturers Association (JMA), while 83 registered factories operate outside the Association. Some 36 of these are engaged in furniture export activities. The dominant Jamaican exporters of furniture are grouped under the Jamaica Furniture Guild established under the sponsorship of the Jamaica Furniture Development Programme.

The Jamaican Government, through the Jamaica National Investment Promotion has targeted the furniture industry sector as one with great potential for both local and overseas investment in Jamaica.

With the exception of few of the larger plants the furniture industry as a whole is ill equipped with respect to tool maintenance. As a result, the serviceable life of expensive cutting tools such as carbide-tipped circular saws is drastically reduced, while also contributing to inferior surface quality of processed parts, wastage of material and maintenance problems of woodworking machines. In order to offset tool maintenance problems some plants have cutting tools such as carbide-tipped saws serviced in the United States of America.

In recognition of this major constraint the management of the small-scale furniture plant Fairway Furniture Factory has expressed a keen interest in setting up a tool maintenance servicing centre to serve its own needs as well as those of other furniture/joinery plants in Jamaica.

The Fairway Furniture Factory was identified during the UNIDO/CARICOM mission undertaken in Jamaica under project UC/CAR/86/201 as the leading small-scale manufacturer of contemporary furniture in CARICOM.

This project proposes to provide the necessary know-how for the establishment and initial operation of the tool maintenance centre by the Fairway Furniture Plant.

PART II D - Outputs

1. The tool maintenance equipment purchased for the Tool Maintenance Servicing Centre commissioned and operational; and
2. Three technicians trained in the operation of the equipment.

PART II E - Activities

1. Preparation of plant layout of the maintenance centre.
2. Supervision of the installation and trial operation of the equipment;
3. Calculation of appropriate servicing charges for standard maintenance work;
4. Setting up a simplified costing system to monitor the Centre's expenditure and income; and
5. Training in the operation of the equipment in the process of providing maintenance services.

PART II F - Inputs

1.	<u>External inputs</u>	man/months	US\$
11-01	Tool maintenance expert (split mission)	3	24,000
51-00	Miscellaneous expenses		1,000
99-00	Total external inputs		25,000
2.	<u>Government inputs</u>		
2.1	Local transport		In kind
2.2	Secretarial services		
3.	<u>Inputs by Furniture Wood Working Ltd.</u>		
3.1	Cost of the tool maintenance equipment.		In kind
3.2	Cost of auxilliary equipment consumed.		
3.3	Counterparts		

PART II G - Related activities

The selection of the equipment is provided in the ad hoc report prepared under the UNIDO project UC/CAR/86/201 and entitled: Guidelines on the selection of woodworking equipment for the small scale furniture/joinery industry in the Caribbean Community (report No. IO/R.53).

Prior Obligations

The equipment must be purchased before the final approval of this technical assistance project.