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# HIGH-LEVEL ADVICE TO THE WOOD FURNITURE SECTOR

UC/JAM/86/033/11-01

JAMAICA

## Terminal report: Measures to be taken to develop an export-oriented furniture industry*

Prepared for the Government of Jamaica
by the United Nations Industrial Development Organization

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Vienna

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## INTRODUCTION

At the request of the Jamaican authorities, Antoine V. Bassili, Senior Industrial Development Officer of UNIDO's Division of Industrial Operations visited Jamaica from 1 to 8 May 1986 (under project UC/JAM/86/033, financed from UNIDO's Industrial Development Fund) to advise the industry and the responsible authorities on measures to be taken to develop an export-oriented furniture industry.

### Brief review of the current situation

The production of furniture from mahogany (and, for the lower income groups, from pine) is a long-established craft in Jamaica, and this is reflected in the local market's taste for "reproduction" furniture.

The industry developed, using imported materials and locally available skilled craftsmen to provide the local market and also to export to Trinidad and Tobago, a market to which Jamaica had preferential access under CARICOM. This market collapsed in 1984 with the fall in the price of oil. The local industry was never developed enough to enable it to produce the furniture for the larger resort hotels on the island. At the time of the visit all manufacturers were complaining that the local market was very inactive.

Because of this situation, fifteen leading manufacturers of furniture in the country decided to group themselves into the "Jamaica Furniture Guild" to co-ordinate their efforts on the export market. At the time of the mission some of its members had already succeeded in exporting furniture to the United States. The Guild had also received assistance from USAID insofar as it financed their participation to the Furniture Mart in High Point (North Carolina) and will be recruiting a Marketing and an Administrative Manager whose costs will be borne by USAID.

## FINDINGS

The findings enumerated hereunder are based on visits to eight furniture manufacturers and discussions with their officials. Visits were also made to Things Jamaican Ltd., the Jamaica Bureau of Standards, the Jamaica National Export Corp., the Jamaica National Investment Promotion Ltd. and USAID.

The list of persons met and their affiliation is given in Annex I.

### Jamaican Furniture Guild

The Furniture Guild which comprises some fifteen of Jamaica's leading manufacturers (some of whom are already exporting) was created to co-ordinate their efforts on the export market. It has taken the initiative to request technical assistance for its members both from USAID and UNIDO. The Furniture Guild plans to develop its activities in such fields as the co-ordination of the efforts of their members and the organization of common purchases. In order to achieve the first objective, the Furniture Guild shall appoint a Marketing and an Administrative Manager (both financed by USAID).

The Guild also has organized its members' participation at the Furniture Mart in High Point, North Carolina, U.S.A. (again financed by USAID).

In the field of furniture design it has commissioned a United States designer to design a product line in the upper range of reproduction furniture for export to that country.

Under its present set-up the Furniture Guild does not envisage to market furniture under its own name (i.e. act as a consortium).

Managerial Attitudes

Discussions with management of the eight firms visited gave the impression that whereas they are committed to enter the export market, they seem to consider it as a large financial risk which they are somewhat reluctant to take. (This could no doubt be attributed to the bad experience they had recently when their export markets in Trinidad and Tobago collapsed at a time when the local market was also very weak). They realize that goods produced for overseas cannot be sold on the local market - except for a very small volume.

All plants visited except for three (Sealey Mattress Co. (W.I.) Ltd., Caribbean Woodcraft Manufacturers Ltd., and Cariframe Ltd.) operate on a craft basis and are not geared for serial production for export.

The management of Things Jamaican Ltd., while realizing that a change from its previous operation was needed, did not seem to have decided what its goals were: employment of craftsmen, training of persons to become small entrepreneurs or industrial production.

Somehow the managers do not relize that a change in their way of thinking is needed if they are to enter export markets successfully. For example, they are aware of the need to dry the lumber but feel that somehow they will manage without a properly controlled kiln. Also, realizing that lumber is an expensive commodity which, furthermore, is imported, they do not plan their cutting operations to minimize waste, but rather accumulate the waste into piles and then rummage through them to recuperate whatever is possible for the production of a specific component.

The managers of the existing plants do not seem to wish to avail themselves of whatever local technical expertise exists (for example, at the Jamaica Bureau of Standards).

Finally, in one of the larger plants visited there was a tendency to "over control" which seemed to have exceeded the limit normally expected. It was striving to increase productivity per worker while at the same time it was producing products of limited value and reverted to the selection of waste to obtain re-useable pieces.

Physical facilities

Basically, the existing facilities of practically all the plants visited were sufficient to envisage using them for serial production.

Apart from the three firms referred to above, plant layout was by and large haphazard, the plants being laid out for craft operations in which the machine serves the craftsman and not the machine operator serves the machine.

These same plants lacked internal transport, or, when rudiments of an internal transport system existed, they were being used haphazardly.

Dust extraction systems existed in only a few of the plants. Others had dust extraction on only selected machines or none at all. The same applies to compressed air circuits which, if available at all, were not generalized. Most of the factories visited lacked the simple pneumatic aids for driving in screws, hand sanding and assembly clamps. Also, none had built into their existing older single purpose woodworking machines the simple pneumatic devices of "low cost automation" to upgrade them and increase productivity.

Only two of the plants visited had kilns, and although the other manufacturers purchased kiln-dried lumber, it was not stored in chambers with dehumidifiers and, consequently, was re-absorbing moisture. None had electric moisture meters, and they were thus not able to determine the moisture of the wood prior to its manufacture.

Apparently a 4000 fbm solar timber drying kiln has been developed (with USAID financial aid) and installed at the Ultramod factory in Kingston and is operating satisfactorily. (It is mentioned here because solar kilns could have a role to play to cover for the needs of the smaller Jamaican manufacturers.)

The location of the sanding and surface finishing facilities in many of the plants visited was poor. Sanding, spraying and drying were carried out in the same location, and the "spraying booth" consisted of a fan sucking air to the outside. The increased risk of fire in this work station was not addressed to. Only one of the smaller manufacturers (Exotic Wood Crafts) had separated fully sanding from spraying and drying.

Human Resources

Like in many developing countries aspiring to enter export markets, Jamaica has the skilled craftsmen to produce furniture on an artisanal basis. It also seems to have a sufficient number of machine woodworkers to operate the equipment. It was difficult to determine in the short mission whether skilled sawdoctors were available, but prima facie it seemed that this was the case. The skills of the carvers were adequate, but they were in short supply. The quality of their work (and that of the skilled cabinet makers) seems to have deteriorated over the past ten years. This judgement is made based on the comparison of the handmade pieces of furniture some ten years ago at Things Jamaican Ltd. and currently exhibited at Devon House and those of Things Jamaican's current production.

No marquetry work was being done at any of the factories visited. In fact, the only examples of such work seen were poor quality trays at Things Jamaican. The country lacks qualified technicians and middle managers familiar with serial production of furniture, that is to say capable of undertaking the product development work, calculate production costs, prepare cutting lists, develop the production flow, calculate machine loading and design and produce jigs and quality control gauges.

Similarly, the country lacks designers specializing in the design of furniture for industrial production. Like other countries at a similar level of development, furniture is produced based on photos. Most of the draftsmen employed do not seem to have had training in furniture construction.

Equipment

The smaller firms visited had an array of standard woodworking machines used for craft operations but, as is common with this type of operations, there was an imbalance between the various machines' capacities resulting in unutilized capactiy. This was more than what can be attributed to the firms lack of specialization, and to the fact that very few of the smaller firms produced for stock.

Only two instances of subcontracting work to firms that have the appropriate equipment were noted. Equipment at Things Jamaican Ltd., which is not being utilized, could have been rented out to the industry to undertake the more special operations.

The existing basic machines had not been enhanced with additions to simple low cost automation and use of jigs.

Tool maintenance seemed adequate, and one firm visited was subcontracting its tool maintenance to a specialized shop.

Most of the safety guards and devices existing because of legal requirements in the developed countries were no longer existing on the machines in Jamaica.

Technology used

Production was still at the mechanized craft level, i.e. using basic woodworking machines. Components leaving the machins were, by and large, not interchangeable resulting in costly and time-consuming hand finishing.

Manufacturers were aware of the importance of wood drying but were hampered by the non-availability - to the majority of them - of kilns.

Plant layout was not conducive to rational serial production.

Pneumatic hand tools were not used to their full possibilities (for sanding and assembling).

In most of the factories little or no use was made of jigs. When available they were very seldom of sufficient precision or sturdiness, thus defeating the very objective of their use.

Because orders were seldom repeated and batches were small, not enough attention was paid to optimalizing production, planning it nor to keeping records of production for improving planning and costing.

Work stations for assembly and sanding were by and large inexistant. One exception in this respect was Sealey Mattress Co. (W.I.) Ltd.

Housekeeping in many of the smaller plants was below expectations. This creates a fire risk. These smaller plants also had very poor surface finishing facilities. Some sanded, sprayed and dried their products in the same room.

Raw materials supply

Originally the industry was utilizing native mahogany (swietenia mahagoni), but as local supplies were exhausted it turned to importing this species from Honduras and Belize. Locally grown pine (pinus caribbea) is used for the lower class furniture. It was considered to be too soft, so Honduran pine was imported for better quality products.

Although a particleboard factory (using bagasse as raw material) was established quite a few years ago, it went out of production soon after coming on flow and at the time of the mission all requirements for particleboard were wet through imports from the United States.

Plywood was imported from the United States but most of it was of South East Asian origin.

Locally produced veneer (from imported logs) met most of the industry's requirements; the balance was imported.

All imports were done by individual companies and were not grouped and purchased by the Guild.

The major factor affecting the industry's raw material was not its physical supply but rather the fact that apart from one plant (and Things Jamaican Ltd.) none had timber drying kilns. The only chamber in Things Jamaican's kiln is too big (and hence too unflexible) for proper use by the furniture industry. Solar kilns were not seen during the mission but one existed. It was designed to suit a specific site so that its design cannot be reproduced for use by others.

Because of the high cost of raw materials, and the fact that the plants did not need the waste to burn in the boilers of their kilns, the offcuts were kept in heaps and whenever short components were needed, workers scavenged the piles piece by piece to retrieve what they could. This, however, is extremely labour intensive, results in poor housekeeping and a higher fire risk. There seemed to be no problem with the supply of surface finishing material and hardware fittings which were imported from the United States.

Product Range

By and large, all, except one of the Jamaican furniture manufacturers visited during the mission seemed to have found a range of products appropriate to their skills and production capacity. The production of "reproduction" type (period) furniture is well suited for both the export as well as the local market.

One manufacturer was trying to specialize in "Art Deco" furniture and kitchen furniture.

The Wicker furniture produced was also of a good quality.

The manufacturers visited mentioned that often they were unable to enter the local hotel decoration (or redecoration) projects because of the size of each contract and the quick delivery times specified.

Marketing Channels

At the time of the mission many manufacturers were just back from their participation at the Furniture Exhibition in High Point (N.C., U.S.A.). The costs of this participation were borne by USAID, and it was planned that they would repeat this activity at future such fairs.

Neither the Guild nor any of its members seemed to have appointed an agent in the United States.

With respect to local marketing, many had their own sister companies that disposed of their production for the local market. Showrooms visted were well laid out.

One manufacturer had created an assembly operation in one of the countries considered by the CARICOM to be an LDC, thus enabling him to place his products in CARICOM member states more advantageously, since they benefitted from preferential tariffs.

Things Jamaican Ltd.

The woodworking facility was not operating at the time of the mission as the whole company was being reorganized. Apart from the 22,000 fbm Moore Oregon one-chamber kiln, it was equipped with a wide range of woodworking machines, many of the "craft" type, but some (such as a copying lathe) suited for industrial production.

It produced a wide range of "reproduction" (period) styles as well as some modern furniture - the quality of the designs (and of the products) of the former was far better than those of the latter.

As to the quality of products, on visiting Devon House (most of whose furniture was produced by Things Jamaican some ten years ago) it appeared that quality has been lowered over the past ten years.

Because of underutilized installed capacity and high administrative overhead costs, Things Jamaican could no longer compete with local producers.

It had been conducting some training.

## CONCLUSIONS AND RECOMMENDATIONS

These relate to the topics enumerated under Findings. For ease of reference, they have been listed hereunder using the same headings. The order of priority of the recommendations implying international technical assistance are given by the number at the end of each subheading. They are listed, in order of priority, and costed in Annex III.

Jamaican Furniture Guild

Because of the short duration of the mission it has proven impossible to pursue an in-depth study of its aim to organize common purchases. If it embarks in this field, its activities should not be limited to purchasing lumber and wood-based panels, but it should also carefully study the possibility of grouping the requirements of auxiliary materials such as basic woodworking tools (bandsaw and circular saw blades), surface finishing material and even the more common hardware items. Economies of scale in the purchase of these materials may well justify the Guild's involvement.

The Guild also has a role to play in the provision of kiln-dried lumber to the industry. This could be done, as a temporary measure, by renting and operating the existing lumber drying kiln at Things Jamaican Ltd.'s facility, although, in the long run it is not suited for furniture production, having far too large a capacity for the industry in its current and even future needs and not providing any flexibility. (This does not call for technical assistance and could be operated by the Guild's administrative manager, once he is appointed).

Consideration should be given for the Guild to operate a subcontracting exchange whereby members with excess capacity for a given operation are willing to machine components for other members against remuneration. (This will eventually allow the firms to specialize and in the meantime improve the financial results of firms co-operating in this scheme since it would assure a fuller machine utilization).

Managerial Attitudes:

It is difficult for the owners/mangers of the members firms of the Jamaican Furniture Guild to recognize their weakest points and to determine an order of priorities for future investments and improvement in their firms.

This could be overcome by the following two activities:

1. A qualitative survey of the 15 current members of the Jamaica Furniture Guild.[1/] This survey could be based on answers given by managers to the questionnaire reproduced in Annex 2.[2/] These replies would be compiled by a technician (for example from the Jamaican Bureau of Standards) but a one-month to six-week assignment by a consultant familiar with

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1/ The authorities may, of course, wish to expand the scope of this survey by including in it also non-membes who could be in a position to enter export markets.

2/ This questionnaire was developed by a UNIDO consultant in furniture production, Desmond P. Cody, and used in another Caribbean country.

conditions in a wide range of developing countries would be needed once the data has been compiled from the questionnaires for the consultant to assess these plants quantitatively. He could thus draw to the attention of each firm surveyed those aspects which, to his eyes, are below par as far as export-oriented production is concerned. (The owners currently do not have the broad exposure to be able to do this on their own). It would enable each owner/manager to assess his strengths and weaknesses and draw up a long-range development plan, identifying priorities for future investments. It is important that this consultant be familiar with conditions in smaller plants in the developing countries. (Priority No. 1, see Annex 3).

2. Managers can be made aware of how to overcome their shortcomings, and their foremen and other technical staff can be taught important aspects of industrial production through a three-week part-time seminar on aspects of serial production of furniture. A team of, say, four or five specialists would cover the various weaknesses identified in the survey carried out under 1) (above). Over and above the lectures - which would take place in the afternoons - they would be available in the mornings to provide technical assistance to the various plants on an ad hoc basis. (Priority No. 3, see Annex 3).

Physical facilitites

Advice should be sought to optimize the existing plant layout in all but the three industrial plants.[3/] Due consideration should be given to ensure that sufficient space is allocated for work in process.

Internal transport should be developed throughout the factories. Management should realize that an internal transport system is a must. No value is added in the production process through moving components from the floor near a machine to the floor near the next machine. The most versatile system for the type of operations existing in Jamaica are simple pallets with band-operated hydraulic pallet transporters. These pallets should have a size of 2'8" by 4', and have on each of their four edges bent metal strips in which sides, comprising a plywood sheet with two 2"x2" lateral reinforcing pieces of hardwood, are screwed. The bottom of these pieces should be longer than the plywood and correspond to the metal strips so that they can be inserted and result in a pallet with rigid sides if two are used or a bin if all four sides are fitted.

Dust extraction systems should be installed on all machines, though this cannot be done until the layout has been modified. Until such time as this has been done, portable units could be purchased and attached to the machines that generate a lot of waste. In designing the systems consideration should be given to having smaller units grouping machines which operate as a group. This would prevent the running of the entire system if only one or a few machines were to operate.

Compressed air circuits should be installed incorporating leads to all work stations and machines that might need compressed air for operating hand tools, jigs or clamps. The circuit should be in the form of a complete loop, and be dimensioned generously, i.e. have sufficiently large diameter piping to reduce surges and pressure losses, and to enable the circuit itself to store compressed air and thus become an extension of the pressure cylinder.

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3/ This could be one of the topics covered at the Seminar referred to above.

The problem of supply of kiln-dried lumber to the members of the Guild is a serious one which the Guild's Board of Management should address itself to as a matter of top priority. Some of its members have too small an enterprise to justify having their own kiln(s) and a co-operative that would operate the kilns is worth considering. This could be managed by the Guild's administrative manager (once he is appointed) with a technician to operate the kiln and a couple or three boilermen - if conventional steam-heated kilns are selected. These have as advantage that they would use waste wood and sawdust as fuel. Alternatively, dehumidifier kilns operating on electricity could be installed. Initial costs and labour costs would be lower but this would probably be more than made up by the high cost of electric power - specially to dry to the lower moisture content levels needed for goods to be exported to the United States.

Until such time as this problem is solved it is recommended that the Furniture Guild negociates with Things Jamaican Ltd. for their use of the latter's kiln. This is, however, not an ideal long-term solution since this kiln consists of only one very large chamber and not only would it be difficult to amass from the various members of the Guild lumber to fill it and then return to each his kiln-dried lumber, but also this would imply mixing thicknesses resulting in poorer and slower drying. The ideal for Jamaica would be to have a number of smaller (15 $m^3$ i.e. about 6,000 fbm) chambers so that lumber of only one thickness could be dried at one time in a chamber and a more regular supply of smaller quantities of kiln-dried lumber could be made available to manufacturers as and when needed.

The possibility of developing solar drying kilns of the greenhouse type to cater for the needs of the small manufacturers is certainly worth further investigation. A solar drying kiln of this type with a capacity of 7 $m^3$ (about 2,800 fbm) has been constructed and operated successfully for some 16 months in Guyana (under a UNIDO project). 15 charges were put through, temperatures of up to 52° C (126° F) were recorded in the kiln and the timber was dried to 8-10 per cent m.c. A 21$m^3$ (approx. 8,000 fbm) kiln is currenty being tested. Such kilns would probably also be suitable for the smaller operations in Jamaica. (Priority No. 4, see Annex 3).

<u>All</u> manufacturers envisaging exports of furniture should have an electric moisture meter, and the Jamaican Bureau of Standards should be in a position to check and, if necessary, calibrate them at regular intervals.

In redesigning the layout of the factories, care should be taken to separate sanding operations from spraying and drying. Sanding dust should be exhausted in a separate silo - or a portable dust extraction unit -because of the high fire and explosion risk it represents. A good partition between the sanding room and the spraying room should be foreseen and it should be kept closed at all times. (It should be realized that the spraying room, because of the exhaust fans create a small vacuum, tends to suck dust from adjoining rooms. This dust tends to deposit itself on the freshly painted surfaces, lowering their quality and increasing costs unnecessarily. Similarly, the drying room, even if kept only at room temperature, should be dust free as far as possible.

Because of the increased risk of fire in the spraying room, special care should be taken with all electric installation and it is recommended that fittings in this room be of the explosion-proof type.

Human Resources

There is no doubt that the "reproduction" type of furniture currently being produced by the Jamaican Furniture Guild's members is the type of furniture best suited for export. Value added can be increased by producing more intricate models, i.e. models with more hand-carving and/or marquetry work. The limiting factor is nevertheless the lack of skilled carvers, and steps should be taken to train carvers on a long-term basis. (The corresponding need for skilled cabinet makers is not as great since the serial production of furniture will greatly reduce their input in production).

This could be carried out at Things Jamaican Ltd. It would call for the provision of a skilled craftsman for at least a two-year period to train a trainer to enable Things Jamaican to continue this activity on a long-term basis. The advantage of choosing Things Jamaican Ltd. as a venue for this training are: (a) The existence of available physical facilities; (b) the existence of a copying lathe to rough out the pieces; (c) the possibility for Things Jamaican to train carvers both for the furniture industry as well as for craft operations - which is, after all, its real mandate; and (d) the relative ease with which Things Jamaican Ltd. could dispose of the trainee's work (as compared to a vocational school) through its sales network and/or through subcontracting work for industry would lower the cost of training. (Priority No. 6, see Annex 3).

(Concurrently, this would permit the industry to accept orders with carved components on an intermittent basis even when they do not have - and it would not be justified for them to have - the necessary manpower; because they would know that the work can be subcontracted to Things Jamaican Ltd.).

A similar approach should be taken in the training of craftsmen in marquetry work. This would call for another skilled craftsman to be made available to Things Jamaican Ltd. for at least a two-year period to train trainers in this field. (Priority No. 7, see Annex 3).

Short intensive training should be arranged (possibly by the Jamaican Bureau of Standards) and conducted at Things Jamaican Ltd. (or elsewhere) for middle managers and technicians from the industry. They would be more specialized and go to greater depths than the three-week seminar referred to above and would start where the seminar left off. They should cover such fields as design of jigs, estimated production times, raw material requirements and waste factors, production planning (machine loading) and control, etc. (Priority No. 5, see Annex 3).

This should go hand-in-hand with another type of short intensive courses, this time aimed at training skilled workers in such fields as kiln drying, tool and machine maintenance, surface finishing, production of jigs and quality control, etc. The object of these courses would be to introduce new technologies. They should be conducted in the plants and could be provided by the supplier of the technology (e.g. a paint manufacturer) whenever appropriate. (Priority No. 8, see Annex 3).

A special course to train draftsmen and designers from the factories in the correct construction of furniture, including reproduction furniture, should be conducted to ensure that products copied from photos are better constructed. This should be complemented by some basic information on the history of designs of furniture and the characteristics of each so that they may recognize them and design products with the correct characteristics of the period being reproduced. (Priority No. 9, see Annex 3).

The training of designers for export is not as important to Jamaica as to other countries simply because, having specialized in reproduction furniture, the need for creative design is not as large as that for correct construction, hence the lower priority accorded to it: First and foremost it is important to identify persons gifted with creativity who have the potential to become designers. This could be carried out through a competition - which could be open to all citizens of CARICOM countries - to design a range of furniture. These designs should be evaluated by an international jury who could, on that occasion, discuss with each submitter of a design the shortcomings of the product and thus help correct the mistakes made. This will permit the furniture producers in Jamaica to find out whether they have locally available design talent which could reduce their dependence on foreign designers or have to produce to their clients' design. It would also identify local talent that could best benefit from studies abroad. (Priority No. 10, see Annex 3).

Equipment

The precision of the existing woodworking machines should be checked to ensure that they meet the requirements of serial production - i.e. resulting in interchangeable parts that do not need finishing by hand prior to assembly. The way to test this precision is given in a UNIDO publication.4/

Machine operators and supervisors should be made to realize that precision of components from an accurate machine is still limited if the machine setup does not meet the same criteria of precision as that of the machine. Not being aware of this is one reason why the quality attained in plants in developing countries is not equal to that obtained in developed countries, even when identical machines are used. All safety devices incorporated into machines to cover legal safety requirements of industrialized countries should be built in again if they have been removed.

Manufacturers and decision takers should be exposed to factors affecting the selection of appropriate woodworking machines. This topic should be included in the three-week seminar on furniture production technology. Otherwise it should be arranged that an impartial specialist in the topic stops over in Jamaica for two days to enable him to lecture on the topics for one day (possibly at the Jamaica Bureau of Standards) and be available to advise the industry on their specific needs.

This should be complemented by training middle management on improving productivity of the existing machines through adding pneumatic circuits to mechanize and even automate some operations and improve precision (thus reducing the percentage of rejects) while at the same time reducing oeprator fatigue and, in the case of small components, increase safety. Some 50 such applications have been described in detail and corresponding technical designs have been given in a UNIDO publication.5/ Use should be made of this, since skills exist in Jamaica to assemble locally these circuits and build them into existing machines.

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4/ Chapter 2 of document ID/247 (Technical Criteria for the Selection of Woodworking Machines) deals with checking machine precision.

5/ Manual on Low Cost Automation of the Furniture and Joinery Industry (document ID/154 Rev.1).

Technology used

Emphasis should be placed on serial production where man serves the machine and not vice versa, so as to enable Jamaica to enter the furniture export market more vigorously and for costs to be lowered. This implies interchangeable parts.

To attain this, kiln dryers must be generalized in all plants and persons trained in their operation. Before this is done an in-depth study of the relative advantage of the various types of kilns (steam, dehumidifiers. vacuum, solar) should be carried out taking also into consideration the cost of fuel - including woodwaste.

To increase productivity, increased use should be made of pneumatic hand tools.

Courses should be given on the design, production and use of jigs in furniture production. UNIDO's Manual on Jigs for the Furniture Industry 6/ referred to before, could be a starting point in this respect. Care should be taken to ensure their sturdiness and precision.

Only the Sealey Mattress Co. (W.I.) Ltd. had full production planning and control. Middle management and technicians from other firms should be trained in all these aspects. Similarly, apart from this company the design of work stations for assembly and sanding was not consistent throughout. Some were adequate while others were poor. Serial production calls for use of assembly jigs whenever possible to ensure interchangeable sub-assemblies (such as drawers). The UNIDO document referred to above should be made use of.

Cleanliness and housekeeping should be improved in most plants.

It is to the credit of the Jamaican furniture industry that they have mastered modern surface finishing techniques sufficiently to enable them to export finished furniture to the United States. Countries having not mastered these techniques and the necessary quality control techniques have to export their furniture "in the white", i.e. sanded but not further treated.

Raw materials supply

The production of furniture for export from a hot humid country (such as Jamaica) to one with a drier climate (such as in the Northern parts of the United States) calls for serious kiln drying of the lumber to a moisture content of below eight per cent and quick processing to ensure that as little uptake of moisture as possible occurs. It is not sufficient to import kiln-dried lubmer. All manfuacturers should either have their own kiln or access to one when they need it. This is really a must, and the Guild should take the necessary steps to remedy this. These kilns should be a battery of small chambers (and not a large one) not only to provide the industry with its immediate requirements on a regular and continuous basis but also to enable each species and each thickness to be kiln-dried using the appropriate drying schedule and the optimal drying rate. (If species and/or thicknesses are mixed, to obtain good quality and well-dried lumber, the load should be dried at the schedule and rate applicable to the sloweest drying species and/or thickness.)

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6/ Document ID/265

Impartial advice should be sought from UNIDO (or elsewhere) on the selection of the type of kiln and size of chambers best suited to the needs of the Jamaican furniture industry. This should imply a one-month consultancy in two phases; the first one of about 15 days to evaluate the needs and draft the technical specifications for the call for tenders, and the second, of equal duration, to evaluate the bids and to give a three-to-five-day course on wood drying technology to the future kiln operators - see next paragraph. (Priority No. 2, see Annex 3).

Kiln operators should be trained not only in the physical operation of the kilns but also be given a course on wood-drying technology so that they may fully understand what happens when wood is dried, what the defects are and how they can be avoided. This course should also include the testing of airflow in the kilns (to ensure homogeneous drying) and the calibration of electric moisture meters.

The Jamaican Furniture Guild should establish a central purchasing facility for its members. By doing so it would enable the members to avail themselves of better prices and faciltiate arranging shipping and clearance through customs thus lowering the cost of the lumber to the manufacturer. Furthermore, since the members of the Guild have, on the average, rather small requirements, the grouping of the purchases would enable each to order volumes of certain dimensions and grades not often used commensurate with his immediate needs without him having to purchase the minimum volume for any size (set by the exporter). This would also reduce the manufacturers' working capital requirements since stocks carried could be smaller.

Another topic which falls between raw material supplies and production technolgy relates to the generation and utilization of offcuts.

First and foremost, manufacturers should plan the cutting operation more carefully by cutting at the same time components of different pieces of furniture requiring the same cross sectional dimension of lumber or thickness of panels and calculating the various combinations of cutting patterns which would result in minimal waste. After this operation is completed there will be offcuts which might be long enough to serve as raw material for components of items in the production programme (currently not ordered) which are worth storing for eventual subsequent use. These should be stored, stacked according to species, grade, thickness and minimum lengths on shelves, on pallets or in bins, for immediate re-use with minimal subsequent labour costs. Before introducing this system a study should be carried out to determine the minimum sizes which are worth storing for subsequent utilization and the volume of each that it is economic to stock. The pieces having dimensions smaller than these and/or the pieces in excess of what should be kept in stock should be considered as waste and disposed of immediately either in the kiln's steam generating plant or sold as fuel to third parties. Keeping them is an unjustified fire risk. (An end must be put immediately to the current practice of keeping all offcuts, irrespective of their dimensions, in heaps, "for eventual subsequent utilization", and scrummaging through the heaps as and when a need arises).

Product range

The decision to commission the "Blue Mountain" range of designs may be justified, but on the other hand they may be better off to continue to produce copies of period furniture, as near to the originals as the skills of the workers and production facilities allow since the "Blue Mountain" range will call for investments in publicity for its launching. Production of "occasional furniture" pieces in the styles traditional to Jamaica and the United States would allow for smaller series of a wider range of products, more value added and also smaller pieces of furniture, more easy to put in a container, thus minimizing wasted space in the container and reducing the freight cost of the piece of furniture.

The manufacturer producing "Art Deco" style furniture and kitchen furniture should consider specializing in other products: the former may well be a fad which will not last and his overseas markets will dwindle with the passage of this fad, while the latter does not provide sufficient value added.

Attempts should be made at developing more innovative designs for the wicker furniture. It is such "trendy" designs which fetch higher prices.

The Jamaican Furniture Guild should study ways and means by which it can group its members and quote in the name of an ad hoc consortium (or another such legally accepted procedure) for tenders for hotel furniture which are too big for the individual companies. This would widen the range of products of the local manufacturers and eventually enable them to enter export markets with another type of product.

Marketing channels

The participation of the Guild in furniture fairs at High Point should be pursued. A common stand is preferable to individual ones.

The possibility of establishing "offshore" assembly operations in a CARICOM LDC country should be further studied by those producers whose products do not find ready acceptance on the United States market either because of their design or because of quality considerations.

Things Jamaican Ltd.

Things Jamaican should stop trying to compete with the private sector in "reproduction" (period) furniture. It should be re-orientated towards becoming a development and training centre and should collaborate more closely with the industry in carrying out operations on a subcontract basis.

To achieve this it should:

1. Lease its kiln to the Jamaica Furniture Manufacturers Guild, since it is administratively too complicated for it to kiln dry the lumber of the various clients. (Because of the large size of the chamber it is most unlikely that it could be operated for only one client). Purchasing lumber, kiln-drying and selling it to the furniture industry calls for a large working capital and is commercially risky since kiln-dried lumber re-absorbs humidity from the air upon prolonged storage (at a rate of up to one per cent per week under local climatic conditions).

2. Things Jamaican should specialize in carved products and should offer its carving services to the industry on a subcontract basis.

3. Since wood carving is not taught as a special skill in the country's vocational training school, Things Jamaican should operate its own training centre for carvers and place its graduates with the industry. (During the factory visits it was apparent that one of the major factors hindering a rapid increase in the production of "reproduction" (period) furniture was the limited availability of skilled carvers). (Priority No. 6, see Annex 3).

4. Similarly, furniture with marquetry is currently not being produced in Jamaica. This is a product with as high a value added as the carved furniture referred to earlier in this report. While the market for this type of furniture in the United States remains to be assessed, there is a relatively large market (at least by Jamaican standards) for it in continental Europe. It cannot be touched because of the local lack of skills. Therefore, it is recommended that Things Jamaican should create a unit for training in marquetry work. The initial production could be disposed of on the local tourist market by designing and producing curio items and scuvenirs using this technique. When the necessary skills have been aquired, production of furniture could be initiated. (Priority No. 7, see Annex 3)

5. Things Jamaican should introduce new designs of furniture in its range of products by copying accurately some of the antiques in the Devon House collection. (It has easier access to this collection than companies in the private sector). These designs would probably subsequently be also produced by the private sector, but in introducing them on the market it would help familiarize potential clients (in the country and overseas) with a specific colonial style native to the country which could give an identity to furniture produced in Jamaica far more genuine than the proposed "Blue Mountain" range.

6. The Furniture Manufacturers Guild and Things Jamaican's management should study the possibility of using the latter's facilities as an in-plant training centre to upgrade the industry's skills and introduce new technologies in such fields as (but not limited to): product development, production planning and control, quality control and surface finishing.

Each of these courses would call for specialized expertise, not available in the country, and would be the object of a request for technical assistance. (For practical and administrative reasons these should be incorporated in an "umbrella project").

## ANNEX 1

### List of persons met

| Name | Function | Affiliation |
|---|---|---|
| Winston A. Ridgard | Marketing Manager | Modern Furniture Co. Ltd. |
| Geoffrey Messado | Managing Director | Gem Furniture Co. Ltd. |
| Gordon Messado | General Manager | |
| Mr. Campbell | Chief of Production | |
| Arthur L. Hendriks | Group General Manager | Sealey Mattress Co. (W.I.) Ltd. |
| Donald A.McIntosh | | |
| Allan G. Constable | Production Manager | |
| Ainsley Penriques | Managing Director | Cariframe Ltd. |
| Mr. Henriques | General Manager | |
| Paul Byles | Production Manager | |
| Hugh Nash | Director | Things Jamaican Ltd. |
| Mr. Davis | | |
| Dr. Malcolm McDonald | UNIDO CTA | |
| Ms. Angela Knight | UNV, Ceramist | |
| Winston William | Owner/Manager | Exotic Wood Crafts Ltd. |
| Kenrick Fearon | Factory Manager | Morgans Industries Ltd. |
| David Henry | Manager | Creative Wicker |
| Ms. Carol Williams | Sales Co-ordinator | Caribbean Woodcraft Manufacturing Co. Ltd. |
| Winston Gooden | Senior Director, Economic Development | Jamaica National Investment Promotion Ltd. |
| Ms. Faith Samms | Senior Economic Development Executive | |
| Ms. Denise Elliott | Ditto | |
| Lloyd Davis | Chief, Furniture Dept. | Jamaica Bureau of Standards |
| W. Smith | | |
| Ms. Claudia Marr | Marketing Advisor | Jamaica National Export Corp. |
| James J. Lowe | Industrial Development Division | USAID |
| Hugh Cholmondeley | Deputy Resident Representative | UNDP |
| Sergio Dello Strologo | Senior Industrial Development Field Adviser | UNIDO |
| Ms. Alexandra von Monbart | Junior Professional Officer | UNIDO |

Annex 2

## QUESTIONNAIRE FOR A SURVEY OF THE JAMAICAN FURNITURE INDUSTRY [1]

### 1. Company Profile

1.1. Name of company:

1.2. Office address:
Tel: Telex:
Cable:

Factory address:

1.3. Contact executive (s):

1.4. Year established:

1.5. Year of commencement of exports:

1.6. Type of business

Manufacturer .....
Manufacturer Retailer .....
Manufacturer Exporter .....
Other (specify) .....

1.7. Legal status:

Sole proprietor .....
Private Ltd Co. .....
Co-operative .....
Govt. owned Co. .....
Partnership .....
Others (specify) ....
Public Ltd Co. .....

1.8. Capital:
Authorized:
Paid up

1.9. Ownership:
Local: %
Foreign: %

1.10. Total No. of employees:
Office:
Production:
Total:

1.11. Gross sales:

| Year | Domestic | Overseas | Total |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

1/ This questionnaire was developed by a UNIDO Consultant in Furniture Production, Desmond P. Cody, and used in another Caribbean country.

## 2. Product Profile

### 2.1. Product description

Solid wood furniture .....
Panel furniture .....
Upholstered furniture .....
Bedding .....
Cane furniture .....
Furniture parts .....
Outdoor furniture .....
Domestic woodware .....
Wooden toys .....
Others (specify)

Prefabricated housing .....
Doors and windows .....
Parquet/strip flooring .....
Joinery parts .....
Moulding .....
Turned parts .....
Boat building .....
Pallets .....
Boxes crates .....
Vehicle bodies .....

### 2.2. Product specification

Own design .....
Ex catalogue .....
Customer design .....
Designer .....

Architect .....
Standard specification .....
Copy .....
Other (specify) .....

### 2.3. Quantities produced

Single items .....
Other (specify)

Batch production (specify) .....
Continuous production .....

### 2.4. Usual delivery period:

### 2.5. Other relevant information:

3. Raw Materials Profile

3.1. Timber species used

| Species | Annual imput b.ft. | Average purchase price, air dried b.ft. | Average purchase price, kiln dried b.ft. |
|---|---|---|---|
| Crabwood | | | |
| Hububalli | | | |
| Simaruba | | | |
| Determa | | | |
| Red Cedar | | | |
| Silverballi | | | |
| Locust | | | |
| Dakamaballi | | | |
| Dukali | | | |
| Durbanpine | | | |
| Kirikaua | | | |
| Itaballi | | | |
| Kabukalli | | | |
| Kurahara | | | |
| Kurokai | | | |
| Wamara | | | |
| Purpleheart | | | |
| Shibadan | | | |
| Brown Silverballi | | | |
| Tauroniro | | | |
| Tatabu | | | |
| Greenheart | | | |

3.2. Timber supply and working characteristics.

| Species | Supply | | | Machining | | | Sanding | | | Finishing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| Crabwood | | | | | | | | | | | | |
| Hububalli | | | | | | | | | | | | |
| Simarupa | | | | | | | | | | | | |
| Ceterma | | | | | | | | | | | | |
| Red Cedar | | | | | | | | | | | | |
| Silverballi | | | | | | | | | | | | |
| Locust | | | | | | | | | | | | |
| Dakamaballi | | | | | | | | | | | | |
| Dukali | | | | | | | | | | | | |
| Durbanpine | | | | | | | | | | | | |
| Kirkaua | | | | | | | | | | | | |
| Itaballi | | | | | | | | | | | | |
| Kabukalli | | | | | | | | | | | | |
| Kurahara | | | | | | | | | | | | |
| Kurokai | | | | | | | | | | | | |
| Wamara | | | | | | | | | | | | |
| Purpleheart | | | | | | | | | | | | |
| Shibadan | | | | | | | | | | | | |
| Brown Silverballi | | | | | | | | | | | | |
| Tauroniro | | | | | | | | | | | | |
| Tatabu | | | | | | | | | | | | |
| Greenheart | | | | | | | | | | | | |

3.3 End use of various species.

| Species | Furniture | Joinery | Pre-fab Houses | Moulding | Flooring | Other (specify) |
|---|---|---|---|---|---|---|
| Crabwood | | | | | | |
| Hububalli | | | | | | |
| Simarupa | | | | | | |
| Determa | | | | | | |
| Red Cedar | | | | | | |
| Silverballi | | | | | | |
| Locust | | | | | | |
| Dakamaballi | | | | | | |
| Dukali | | | | | | |
| Durbanpine | | | | | | |
| Kirikaua | | | | | | |
| Itaballi | | | | | | |
| Kabukalli | | | | | | |
| Kurahara | | | | | | |
| Kurokai | | | | | | |
| Wamara | | | | | | |
| Purpleheart | | | | | | |
| Shibadan | | | | | | |
| Brown Silverballi | | | | | | |
| Tauroniro | | | | | | |
| Tatabu | | | | | | |
| Greenheart | | | | | | |

3.4. Other materials

| Materials | Supply | | | Local | Imported | Quality | | | Average price per unit. |
|---|---|---|---|---|---|---|---|---|---|
| | Good | Fair | Poor | | | Good | Fair | Poor | |
| Plywood | | | | | | | | | |
| Plastic Laminates | | | | | | | | | |
| Locks | | | | | | | | | |
| Handles | | | | | | | | | |
| Hinges | | | | | | | | | |
| Castors | | | | | | | | | |
| Mirrors | | | | | | | | | |
| Adhesives | | | | | | | | | |
| Sandpaper | | | | | | | | | |
| Oils | | | | | | | | | |
| Stains | | | | | | | | | |
| Fillers | | | | | | | | | |
| Lacquers | | | | | | | | | |
| Nails | | | | | | | | | |
| Pins | | | | | | | | | |
| Screws | | | | | | | | | |
| Staples | | | | | | | | | |
| Upholstery covers. | | | | | | | | | |
| Foams | | | | | | | | | |
| Other fillings | | | | | | | | | |
| Springs | | | | | | | | | |
| Webbing | | | | | | | | | |

3.5. Is supply of raw materials satisfactory? If not, please indicate the major problems. (Rank five problems in order of importance).

Local materials

Irregular availability .....  Fluctuating price .....

High cost .....  Unsuitable dimensions .....

Quality not conform to specifications .....

Quality of local materials do not compare favourably with imported materials .....

Government regulations and procedures cumbersome .....

Imported materials

Restriction on imports .....  High import tariff and taxes .....

Fluctuating prices .....  Long delivery time .....

High prices .....  Import procedure and regulations cumbersome .....

Other (specify) .....

Any other relevant information or comments.

## 4. Manufacturing Profile

### 4.1. Site and Building

Site area:_____ Length:_____ Width:_____

Timber storage, covered:_____ Uncovered:_____

| Production | Length | Width |
|---|---|---|
| Machining | _____ | _____ |
| Assembly | _____ | _____ |
| Finishing | _____ | _____ |
| Upholstery | _____ | _____ |
| Dispatch | _____ | _____ |
| Product development | _____ | _____ |
| Machine maintenance | _____ | _____ |
| Other materials storage | _____ | _____ |
| Storage for work in progress. | _____ | _____ |
| Height to eaves | _____ | |

Single storey: .....  Multiple storey: .....

Floors: Concrete: .....  Wood: .....  Other (specify) .....

Space: Open: .....  Subdivided: .....

Lighting: Natural .....  Artificial .....  Other (specify) .....

Power: Three phase .....  Single phase .....

Room for expansion: .....

Have you expansion plans (specify): .....

4.2. Machinery and Equipment.

| Process | Model/Type | H.P | Age Yrs. | Condition | | | Purchase Price |
|---|---|---|---|---|---|---|---|
| | | | | Good | Fair | Poor | |
| 1. Cross-cutting | | | | | | | |
| 2. Band sawing | | | | | | | |
| 3. Ripping | | | | | | | |
| 4. Planing and Thicknessing. | | | | | | | |
| 5. Planing and Moulding. | | | | | | | |
| 6. Moulding. | | | | | | | |
| 7. Turning | | | | | | | |
| 8. Morticing | | | | | | | |
| 9. Tenoning | | | | | | | |
| 10. Dovetailing | | | | | | | |
| 11. Boring | | | | | | | |
| 12. Drilling | | | | | | | |
| 13. Sanding | | | | | | | |
| 14. Other (specify) | | | | | | | |
| | | | | | | | |

4.3. Ancillary production equipment. (1)

| Equipment | Model/Type | Age Yrs | Condition | | | Purchase Price |
|---|---|---|---|---|---|---|
| | | | Good | Fair | Poor | |
| 1. Dust exhaust system. | | | | | | |
| 2. Compressor | | | | | | |
| 3. Compressed air system. | | | | | | |
| 4. Spray Booths | | | | | | |
| 5. Spray Guns | | | | | | |
| 6. Pneumatic tools (specify) | | | | | | |
| 7. Power tools (specify) | | | | | | |
| 8. Internal transport (specify) | | | | | | |
| 9. Spares and accessories. | | | | | | |
| 10. Tool maintenance (specify) | | | | | | |
| 11. Other (specify) | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 4.4. Ancillary production equipment. (2)

Type of cutting tools generally used

High speed steel .....

Tungsten carbide tipped .....

Other (specify) .....

If equipped with pressure impregnation plant state:

Number of units: _____

Capacity : _____

Type of treatment : _____

If equipped with kiln drying facility state:

Number of units: _____

Capacity : _____

Type/Model : _____

Supply of fuels and lubricants. Good ..... Fair ..... Poor .....

Source of power: G.E.C ..... Diesel generator .....

Other (specify) ..... Gasoline generator .....

Cost of power. _____

Any other relevant information.

4.5. Is supply of production machinery and ancillary equipment satisfactory?

If not, please indicate the major problems (Rank problems in order of importance:

Shortage of foreign exchange: .....  High prices: .....

Restriction on imports: .....  Long delivery time: .....

Import procedure and Regulations cumbersome: .....

High import tariff and taxes: .....

Others (specify): .....

4.6. If production capacity is under utilized, what are the major reasons? (Rank reasons in order of improtance)

Insufficient domestic demand: .....  Insufficient overseas demand: .....

Shortage of raw materials: .....  Shortage of spares and accessories: .....

Lack of working capital .....  Lack of adequate power .....

Non availability of skilled labour: .....  Non availability of unskilled labour: .....

Other (specify)

5. Personnel Profile

5.1. Management and Supervision

| Functions | General education | Relevant technical/managerial training |
|---|---|---|
| 1. Owner/manager: ..... | | |
| 2. General manager: ..... | | |
| 3. Production manager: ..... | | |
| 4. Marketing sales manager: ... | | |
| 5. Financial and admin. manager: ..... | | |
| 6. Production supervisor ..... | | |
| 7. Machine setting-up and maintenance: ..... | | |
| 8. Other (specify): ..... | | |

State which, if any, of above functions are exercised by the same person.

No(s) _____

What in your opinion, are the major constraints in employing suitable management personnel.

Shortage of trained managers: ..... Emigration .....

High salaries sought: ..... Other industry competition: .....

Unattractiveness of wood industry ..... Other (specify) .....

Lack of job security: .....

5.2. Supervisors/Charge hands/Foremen for:

Timber yard:.....

Drying kiln (s):.....

Pressure impregnation plant: .....

Break-down mill: .....

General machining: .....

Assembly/Joinery: .....

Finishing (lacquering): .....

Sanding: .....

Upholstery: .....

Other (specify): .....

5.3. Have you or any of your management/supervisory personnel attended training courses conducted by:

| Organisation | If yes, specify |
|---|---|
| Guyana Management Institute ..... | |
| Government Technical Institute ..... | |
| Guyana Manufacturers Association ..... | |
| Extramural Department of University of Guyana. ..... | |
| United Nations Industrial Development Organisation (UNIDO). ..... | |
| International Trade Centre UNCTAD/GATT. ..... | |
| Other (specify) ..... | |
| | |

| 5.4. Management systems and procedures | |
|---|---|
| Activity | If yes, specify |
| 1. Production planning: ..... | |
| 2. Series production: ..... | |
| 3. Product costing: ..... | |
| 4. Quality control: ..... | |
| 5. Piece work: ..... | |
| 6. Incentive bonus schemes: ..... | |
| 7. Work study: ..... | |
| 8. Marketing: ..... | |
| | |
| | |

5.5. Labour

State the number of employees, male and female engaged in each of the following:

| Department/Section | Male | Female | Total |
|---|---|---|---|
| 1. Timber yard | | | |
| 2. Pressure impregnation | | | |
| 3. Kiln drying | | | |
| 4. Break down mill | | | |
| 5. General machining | | | |
| 6. Sanding | | | |
| 7. Furniture assembly | | | |
| 8. Joinery | | | |
| 9. House element assembly | | | |
| 10. Surface finishing | | | |
| 11. Cutting and sewing | | | |
| 12. Upholstery | | | |
| 13. Others (specify) | | | |

5.6 Usual standard of education attained by employees:

General education: _____

_____

Technical education: _____

_____

5.7. How do you train your workers?

On the job training: .....  Technical Institute: .....

5.8. Hourly/daily wage rate:  Male: $ _____ Female $ _____

Hourly/daily overtime rate:  Male $ _____ Female $ _____

5.9. Normal working week:  Hours:.....

Average weekly overtime:  Hours: .....

5.10 Contract workers.

Number employed:  Male:..... Female:.....

Average weekly earnings:  Male:..... Female:.....

Method of payment (specify)

5.11 Any other relevant information.

6. Marketing Profile

| | |
|---|---|
| 6.1. Quantity available for export<br><br>Per order: $<br><br>Per year: $ | 6.2. Delivery period<br><br>6.3. Quotations F.O.B .....<br>CIF ..... C.F .....<br><br>6.4. Terms of payment:<br><br>6.5. Port(s) of shipment: |

6.6. Previous exports

| Year | No. of Units. | Value | Main markets. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

6.7. Availability of sales aids.

Samples: ..... Catalogues: ..... Other (specify) .....

Photos: ..... Price list: .....

6.8. Packaging and quality control

List important packaging materials

Are there any problems related to their availability?

yes:..... no: .....

If 'yes', please specify

Do problems exist regarding quality control?

yes: ..... no: .....

If 'yes', please specify.

6.9. What in your opinion are the major constraints which affect your exports? (Rank constraints in order of importance)

Lack of market information: .....

Lack of market demand: .....

Lack of trade contact: .....

Low prices: .....

Inadequate shipping services: .....

High shipping costs: .....

Other specify: .....

Discrimination tariffs: .....

High import tariff: .....

Non tariff barriers: .....

Payment problems: .....

Quality requirements too demanding: .....

Restrictive import regulations: .....

6.10 Please specify areas of assistance needed to achieve increased exports. (Rank in order of importance)

Market information: .....

Export incentives: .....

Market survey: .....

Export finance: .....

Raw materials: .....

Packaging: .....

Trade contact: .....

Selling mission: .....

Reduction in taxes/duties: .....

Export management training: .....

Product adaptation: .....

Product design: .....

Improvements in production techniques: .....

Improvements in quality: .....

Others (specify): .....

6.11. Are you interested in joint venture agreements? yes:..... no:.....

If 'yes', please indicate your interest:

Management: ..... Finance: ..... Marketing:..... Technology:.....

6.12. Are you planning to diversify your export markets yes:..... no:.....

If 'yes', which countries

1) 4)

2) 5)

3) 6)

6.13. Are you in need of financing yes: ..... no: .....

If 'yes', please check (List in order of importance)

Raw materials financing:..... Export credit financing:.....

Machinery financing: ..... Additional working capital financing:.....

Joint venture financing: ..... Expansion financing:.....

Other (specify):.....

6.14. Would you like to make suggestions concerning export development of your products?

7. Financial Profile

| 7.1. Costs. | $ | % |
|---|---|---|
| Timber | | |
| Plywood | | |
| Plastic laminates | | |
| Ironmongery | | |
| Fittings | | |
| Adhesives | | |
| Finishes | | |
| Upholstery covers | | |
| Upholstery frames | | |
| Fillings and foams | | |
| Springs and webbing | | |
| Bought in parts | | |
| Bought in finished goods | | |
| Other materials (specify) | | |
| Outwork (payment for work done on materials supplied by you) | | |
| Production wages* | | |
| | | 100 |

*All wages concerned with production whether direct or indirect.

| 7.2. Manufacturing overhead | $ | % |
|---|---|---|
| Holiday pay | | |
| Light and power | | |
| Rent and Rates | | |
| Building depreciation | | |
| Building, maintenance and repairs. | | |
| Plant and machinery, maintenance & repair | | |
| Consumable stores | | |
| Design development | | |
| Rectification and Inspection | | |
| Any other manufacturing expense | | |
| a. | | |
| b. | | |
| c. | | |
| d. | | |
| Total | | 100 |

| 7/3. Distribution overhead | $ | % |
|---|---|---|
| Wages and salaries | | |
| Packing and storing expenses | | |
| Truck drivers wages | | |
| Vehicle depreciation | | |
| Vehicle operating expense | | |
| Other distribution costs | | |
| a. | | |
| b. | | |
| Outside contractors charges | | |
| Total | | 100 |

| 7.4 Selling overhead | $ | % |
|---|---|---|
| Sales representation and office | | |
| Travelling and entertainment | | |
| Advertising and exhibition cost | | |
| Trade discounts allowed | | |
| Bad debts | | |
| Other selling expenses | | |
| a. | | |
| b. | | |
| Total | | 100 |

| 7.5 Administration overhead | $ | % |
|---|---|---|
| Salaries (other than above) | | |
| Telephone, Telegrams, Postage | | |
| Printing & stationery | | |
| Office equipment depreciation | | |
| Audit, accounting fees | | |
| Bank charges | | |
| Trade subscriptions | | |
| Other administration expenses | | |
| Total | | 100 |

| 7.6. Insurance overhead | $ | % |
|---|---|---|
| Manufacturing | | |
| Distribution | | |
| Selling | | |
| General | | |
| Total | | 100 |

| 7.7 Summary | | $ | % |
|---|---|---|---|
| Total production (sales) | | | 100 |
| Prime costs | Direct materials | | |
| | Outwork | | |
| | Direct wages | | |
| | Total prime costs. | | |
| Gross margin | | | |
| Overheads | Manufacturing | | |
| | Distribution | | |
| | Selling | | |
| | Administration | | |
| | Insurance | | |
| | Total overhead | | |
| | | | |
| Net profit for comparison with total assets. | | | |

## 8. Pricing

Please indicate your average ex-factory prices for the following:

Dining-room chair $..... Dining-room table $.....

Show-wood armchair $..... Sideboard $.....

Wardrobe (solid wood) $..... Wardrobe (plywood)$.....

Chest of drawers $..... Dressing table $.....

Executive desk $..... Other (specify) $.....

Name:..... Signature:.....

Designation:..... Date:.....

## ANNEX 3

### Proposed Programme of Technical Assistance 1/

1) Survey of the Jamaican Furniture Industry

A consultant should be recruited for six weeks (split mission) to survey the Jamaican Furniture Industry. In the first phase (two weeks) he will finalize the questionnaire and train the local counterpart (national expert) in the enumeration. In the second phase (one month) he shall assess the results of the survey, recommend measures to be taken, select priorities for the third topic of technical assistance (see below) and make the necessary arrangements for implementing it.

| Estimated cost | m/m | $US |
|---|---|---|
| 11-51 Consultant in furniture production (split mission) | 1.5 | 12,000 |
| 17-01 National expert | 2.0 | 2,000 |
| 51-00 Reporting costs | --- | 500 |
| 99-00 Total | 3.5 | 14,500 |

2) Advice on the selection of timber drying kilns

The services of a consultant should be secured for one month (split mission) to advise the members of the Guild on the timber drying kilns most appropriate to their needs.

In the first phase (3 weeks) he shall survey the members' needs and draw up technical specifications of their kilns, and, if appropriate, on a battery of kilns to be established by the Guild for its members as a common service facility. If need be he shall hold a one-day seminar for the Guild members on how wood dries (a.m.) and the types of kilns available (p.m.).

In the second phase (one week) he shall make his services available to advise the members of the Guild on the evaluation of bids for kilns they have received.

| Estimated cost | m/m | $US |
|---|---|---|
| 11-51 Consultant in wood drying (split mission) | 1.0 | 10,000 |
| 51-00 Reporting costs | --- | 500 |
| 99-00 Total | 1.0 | 10,500 |

3) Seminar on Furniture Production

A three-week seminar for the Jamaican furniture manufacturers will be conducted in the afternoons covering the major problems identified in the survey proposed under 1), above. (In the mornings the team of consultants will be available to provide ad hoc assistance to the participants' factories).

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1/ The items listed are in order of priority.

A team leader - consultant in furniture production - will be recruited for one month, and a team of 4 to 6 specialists, in fields to be determined in the survey, will assist him each in his field of specialization. Local lectures will be used to the extent possible. Existing UNIDO documentation will be used as far as possible, complemented by some textbooks.

| Estimated costs | | m/m | $US |
|---|---|---|---|
| 11-51 | Consultant in furniture production | 1.0 | 8,000 |
| 11-52 | Consultants (fields to be determined later) | 2.0 | 20,000 |
| 17-00 | National experts | | 5,000 |
| 41-00 | Documentation | | 5,000 |
| 51-00 | Miscellaneous | | 2,000 |
| 99-00 | Total | 3.0 | 40,000 |

4) Development of solar-drying kilns

Solar drying of timber is the solution for the small manufacturer producing for the local and CARICOM markets. Such dryers could also be used for production for export to countries outside the Caribbean, since moisture contents of as low as 8 per cent can be obtained.

It is proposed to recruit a specialist for one month to assess the typical needs of the smaller furniture manufacturers and design a kiln that would use, as much as possible, locally available materials. This prototype kiln should be erected using a national expert, and the consultant would come again for two one-week missions to supervise the start-up, training operators and then to evaluate the results of its operation.

| Estimated cost | | m/m | $US |
|---|---|---|---|
| 11-51 | Timber drying expert (split mission) | 1.5 | 15,000 |
| 17-00 | National expert (erection of kiln) | 2.0 | 3,000 |
| 42-00 | Prototype solar drying kiln | | 20,000 |
| 51-00 | Miscellaneous | | 2,000 |
| 99-00 | Total | 3.5 | 40,000 |

5) Training of middle managers in production management, cost estimation, low cost automation, design of jigs, plant layout, etc.

The object of this training is to introduce modern production management methods and other topics in the factories of the participants of the Seminar proposed under 1), above. The exact topics and their order of priorities are to be determined by the Furniture Guild.

A specialist will be recruited for one month to cover each topic. Training material should also be provided.

| Estimated cost | (FOR EACH TOPIC) | m/m | $US |
|---|---|---|---|
| 11-50 | Consultant | 1.0 | 9,000 |
| 41-00 | Training material | | 5,000 |
| 51-00 | Miscellaneous | | 1,000 |
| 99-00 | Total (FOR EACH TOPIC) | 1,0 | 15,000 |

6) Training of skilled wood carvers

This assistance is to be provided to Things Jamaican Ltd. to enable them to establish a hand-carving facility that would operate for the Jamaican Furniture Guild members on a subcontract basis and to train a trainer (from among the initial batch of trainees) who would then continue the training programme.

Because a skilled craftsman in wood carving cannot be trained in less than 18 months, a two-year assignment by an expatriate specialist is needed. Using experts would make the cost of this assistance prohibitive, so it is recommended to implement this project using the services of a UN Volunteer (if a competent one could be located).

| Estimated cost | m/m | $US |
|---|---|---|
| 14-00 UN Volunteer - wood carving trainer | 24.0 | 30,000 |
| 41-00 Tools and benches and training material for ten trainees | | 20,000 |
| 51-00 Miscellaneous | | 5,000 |
| 99-00 Total | 24.0 | 55,000 |

7) Training of skilled craftmen specialized in marquetry

Same as 6), above, except that the field of training is marquetry (wood intarsio work). This would open a new field of high value added products for the Jamaican furniture industry, and the market for such products in Europe is good - provided a high quality can be attained.

| Estimated cost | m/m | $US |
|---|---|---|
| 14-00 UN Volunteer - wood marquetry trianer | 24.0 | 30,000 |
| 41-00 Tools and benches, training materials for ten trainees | | 15,000 |
| 51-00 Miscellaneous | | 5,000 |
| 99-00 Total | 24.0 | 50,000 |

8) Training of skilled workers in new technologies (such as new surface finishing methods, upholstery, quality control, etc.)

The introduction of new technologies calls for the corresponding training of skilled workers. Equipment manufacturers are always willing to sell their products but are seldom willing to mention the real duration of training needed lest its cost would affect adversely the decision to introduce the technology.

The Jamaican Furniture Guild should determine their priorities for such courses and then request that short (one to two weeks) intensive courses be conducted by specialists.

| Estimated cost | (PER COURSE) | m/m | $US |
|---|---|---|---|
| 11-50 Consultant | | 0.7 | 5,000 |
| 99-00 Total | (PER COURSE) | 0.7 | 5,000 |

9) Training of draftsmen

The serial production of "reproduction" furniture does not call for furniture designers in the conventional sense, since the designs are well-established and the manufacturers are merely trying to copy these as faithfully as their available skills and equipment permits.

This nevertheless calls for them having competent draftsmen, familiar with the intricacies of furniture production using both craft and serial methods on basic woodworking machines. It is therefore recommended that a one-month course for draftsmen be run by a two-man team. The first will be a specialist in antique furniture - who will lecture on the design and construction characteristics of each style, showing also examples of typical pieces, their dimensions, original materials used, characteristics of the original hardware, etc. The second will be a teacher of furniture construction and drafting (mechanical drawing) who will lecture on correct construction (for serial - machine - production) and drafting procedures.

| Estimated cost | | m/m | $US |
|---|---|---|---|
| 11-51 | Expert in antique British and Early American furniture | 1.0 | 15,000 |
| 11-52 | Draftsman | 1.0 | 8,000 |
| 51-00 | Miscellaneous | | 2,000 |
| 99-00 | Total | 2.0 | 25,000 |

10) Design competition

Currently there are no designers in Jamaica specializing in the design of furniture for industrial production. This does not mean that there is no creative talent in the country but these gifted people have not been induced to devoting their talents to the furniture sector.

For the furniture industry to develop it would eventually have to have its own, native, designers. Producing to a buyer's design always results in a lower price being obtained than for a similar product having the company's own design.

It is difficult for the industry to identify good potential talent and to induce them to design furniture for serial production.

One way by which this could be overcome would be to organize a "National Furniture Design Competition", with prizes and an international jury. The prizes would tempt the designers to devote time to come up with a project while the international jury - composed of well-known furniture designers from a country to which Jamaica wishes to export - would, through their assessing and rating of the projects submitted, create a de facto roster of recognized Jamaican furniture designers from which the industry could commission designs.

If the opportunity is given for each designer having submitted a project to spend half a day with the jury to discuss professional matters of common interest, he would benefit even more. Alternatively the jury could conduct a two-to-three-day Seminar to advise the Jamaican designers on their shortcomings.

Estimated Cost

It is difficult to estimate the cost of such a project, because prize money and fees for the jury can vary considerably. Advice could be obtained from ICSID, the International Council of Societies of Industrial Design.1/

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1/ ICSID's address is: Kluvikatu 1D, 00100 Helsinki, Finland, Tel. (00358) 0626661, Telex 124724 MDAUL SF.