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MANAGEMENT ASSISTANCE TO BUSH AND TOWN CO. LTD.

UC/SIL/86/317

Technical report: Improving Furniture Design in Bush & Town Co. Ltd.*

Based on the work of Niko Kralj
Consultant in furniture design and production

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* This document has not been edited.

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INTRODUCTION

The Bush and Town Co. Ltd. is a private company owned and managed by Sierra Leoneans. It was set up in 1982 as a trading company in general merchandise, especially in used tyres. Due to potential demand for good quality and better designed furniture on the local market, and encouragement and incentives by the Government to the indigenous industries using locally available materials and resources, the management took the decision to venture into wood processing industries, especially furniture manufacturing. Consequently, the company started to manufacture furniture in a multi-storey building at No. 4 Caulker Street in Wellington, Freetown, in early 1983. At the same time, the company acquired a piece of land in the Wellington industrial area, about 7 km. from the centre of Freetown, and built a new and modern furniture factory building. The new building for housing the production machinery was completed by January 1987 and it was then, on 1 January, that the company moved its furniture production operations to the new building.

To ensure regular supply of timber in required quality and quantity, it has leased a 600 acre (some 250 ha) forest in Kakayama forest region, 60 km from the town of Pujehun in the South-eastern tip of Southern Province.

In anticipation of sound techno-manegerial and product design and development skills required by the new furniture manufacturing business on an industrial basis, the management of the company approached UNDP in Freetown, through the Ministry of Industry, requesting technical assistance. This was conveyed to UNIDO by UNDP in their letter UNIDO/GP/20 dated 9 January 1986.

A two month mission was undertaken by Mr. Sinan Cinar, a UNIDO consultant in managerial problems in small manufacturing business (woodworking industry).

A one month mission to Sierra Leone was undertaken in April and May 1988 by a UNIDO consultant in furniture design, Niko Kralj, under project UC/SIL/86/317. This report deals with the consultant's findings from his one month mission.

General conditions in Sierra Leone furniture production and design were observed. Many problems in the furniture production process were identified. The quality of the products was found to be the weakest point of production.

The production in Eush & Town Co. Ltd. is analyzed in this report and its deficiencies stated. Possible improvements of the production and the products are proposed.

The difficulties in production derive from the general situation of Sierra Leonean furniture production and design methods. Some suggestions on how to improve the general conditions in the company, including education in this field, are made.

DESIGN - GENERAL CONSIDERATIONS

In the course of the past decade, the question of designers and their education has been frequently raised by professional organizations as well as by chambers of economy and educational authorities within the framework of the secondary schools and higher education institutions. Many conferences, lectures and symposia dealing with this subject have been organized. Virtually all these and similar discussions resulted in an almost unanimous answer stressing the importance of design and the role of the designer in terms of development and a country's culture and economy. It was agreed by all that a good design was extremely important, and the conclusion was drawn that developing countries were lagging behind in this particular sphere of activities. It was realized that in developing countries the hierarchy of plastic art instructions differs from their counterparts in the countries that stand in the forefront of industrial design. That is why the suggested solution ought to be conceived in such a manner as to harmonize with the peculiarities of the individual developing or developed country.

Industrialized countries have their own national educational systems in design. Usually, design faculties serve several branches of industry - schooling industrial designers of all kinds. Artistic and inventive aptitude and creativity are the main criteria in selecting the applicants who must pass certain examinations or have at least completed secondary school.

Most European industrialized countries and the USA have high levels of design education. An average of four years expensive study and residence abroad are required.

Sierra Leone is a non-aligned country with a relatively undeveloped educational system. The republic, for the time being, has no academy of arts and science and no faculty of architecture and product design. The foundation of an architectural school at the university level and an architectural association is in preparation

There is no design education in Sierra Leone and it is the proper time for the creation of a national design school.

There are two types of simple rural houses being built; in the northern parts of the country, these are predominantly circular, whereas they are square or rectangular in the southern parts. The houses are mainly constructed with lattice of polework, filled with clay and plastered. Roofs are traditionally covered with grass, palm or bamboo fronds or with bamboo tiles. There can be up to 20 rooms in a chief's house, and in most cases a verandah is built in front. This verandah has an important social function since it is the evening gathering place and serves as rest room for the elderly.

The once clear-cut distinction between rural house types is now slowly disappearing since new building materials (such as cement and corrugated galvanized roofing sheets, etc.) become widely available. Electricity and water pipe systems are also more readily available in village houses. All these factors imposed their own modifications on architectural and interior design.

Sierra Leone is rich in timber, but the resources are not inexhaustible. It is therefore necessary to increase value added on products instead of exporting raw material logs or sawwood. Since the country has a high unemployment rate, labour intensive production methods are needed.

The average size of furniture and woodworking factories in Sierra Leone are suitable. A division of labour and specialization of the factories are

needed to improve furniture production. This would also improve the low productivity and the quality of wood products. The buyers of furniture are governmental institutions and private persons. The factories are trying to fulfil the needs of both. Furniture and interior design have a big role to play in Sierra Leone's architectural development. The country would need international assistance in the proper use of timber resources in order to become a competitive export partner of the developed countries.

DESIGN - SIERRA LEONE

Fundamental problems

A short enumeration of Sierra Leone's fundamental problems with respect to modern furniture design and to the products taking into account the facilities available and conditions of the country is found hereunder.

The country lacks climatological-geographical data for technological and constructional research of the principal species available in the country.

There is a shortage of dimensional, technological and quality standards as well as of research institutions in the woodworking industries.

Another major problem is the almost complete lack of marketing research in the fields of furniture design and production.

The lack of unity on whether to use imperial measure (1 foot = 0.3 m) or the metric system in the country is also a problem.

Design problems

There is a lack of design in product development and the production methods are based on handicraft. Serial production is at an early stage, except in rattan furniture design and workmanship, where, however, technology is lacking too.

There is a shortcoming of professional literature in architectural, interior and furniture design, as well as in the field of wood technology.

The survey of European furniture producers' catalogues is insufficient and the selection of models to be copied for local production is bad.

The background to Sierra Leone's ancient tribal approach and cultural patterns is insufficiently known.

Design and architectural studies do not exist at the Sierra Leone University.

Educational Problems

There is an insufficient or complete lack of short and medium term training programmes for machine woodworkers, upholsterers, joiners, woodworking technicians, just as initial thinking over academic study of woodworking engineers is insufficient.

Regular training programmes for adult education in the woodworking branch, according to the needs of productive work in Sierra Leone (special training programmes in the form of short courses with a special emphasis on work practice) have not been sufficiently studied.

There is a shortage of education possibilities in the fields of machine and tool maintenance, dust extraction, production planning and control, pneumatic hand tools, timber drying kilns, costing and pricing, design and production of jigs, etc.

The sense of cooperative and coordinated work between the enterprises and institutions in public and private enterprises is insufficiently developed.

Furniture design and production implements

Problems

There is an extraordinarily defective maintenance of old machinery and tools and a complete lack of design and product development equipment.

Sawdoctoring is one of the most neglected service sections in the wood and furniture production units.

Sorting and grading of timbers and planks, according to different dimensions and quality, is poorly done.

DESIGN - BUSH & TOWN CO. LTD.

The main objective of the designer's mission to the Bush and Town factory was to advise the company on improving furniture design.

Industrial design is composed of different partial components, such as: construction, function, form, modular coordination, adaptation to the existing machines and numerous different hand tools.

Industrial design is connected with industrial production. It is hard to speak of industrial production at the Bush and Town company. There is an individual production or manufacturing in small series. The factory building is located in a suburban flat part of the Freetown area, it is a single building, not divided into machining and assembly departments. The upholstery department, storehouse and some office rooms are separated from the main factory building. The principal production hall is equipped with different general purpose machines. These are a planer and thicknesser, a crosscut saw, hand and circular saws, a mortising machine, a contact sanding machine, etc. and some different hand tools. The factory does not possess a wood drying kiln. Skilled and unskilled workers use only air-dried solid wood. For cabinet furniture, plywood and other panel materials (except particle boards) are used.

The Bush and Town Co. Ltd manufactures chairs, armchairs, foot stools, office and dining room tables, bedroom furniture, doors, windows and many other types of furniture made to order.

The main materials used in production are solid furniture constructions assembled with mortise and tenon joints or plywood over solid wood frames. Dowel joints are generally not used because particle board is not available in the Freetown region.

The consultant, after some days of observation, analyzed the furniture pieces of the current production.

In the presence of the chief of production, each piece of furniture was observed and analyzed from the constructional, functional, ergonomic,

economic, modular and shape points of view. Attention was mainly paid to the quality of workmanship, since the quality of the products of this factory was the weakest point in the production process.

The causes of the poor quality of products were: the incorrect choice of machines, their deficient maintenance, bad maintenance of cutting blades, bad working jigs (jigs that were not well designed?), bad fittings, bad quality abrasive paper and bad equipment for surface finishing. It must be said that one of the greatest barriers to the improvement of quality is a complete lack of kiln drying equipment and the extremely low professional education of the production workers.

The analysis of the different furniture pieces showed that they were poorly copied from foreign catalogues, since the factory had, at its disposal, only the perspective or axonometric catalogue pictures from which it was impossible to take more accurate sizes, for example of chair backbone slopes and wood thicknesses. In his analysis, the consultant did not try to state how much the products deviated from the catalogue presentations, but he observed the manufactured goods as the factory solutions which were accommodated to the factory's machines and tools. It is, in general, possible to state that nearly all constructions of chairs and tables, as well as other furniture pieces was oversized. The factory management agreed with the consultant's advice regarding the size of the furniture produced and to slimming down most of the structures. The consultant was unable to advise on a really proper thinning of legs, frames, chair backs, etc. (this would have been possible in nearly every European factory equipped with well maintained machines). Owing to the extremely poor maintenance of the machines, it was necessary to provide greater thicknesses and constructional reserves. The thickness reserves are also necessary due to the fact that solid wood is only air dried. The percentage of moisture content in the wood could not be determined in the factory due to the lack of a moisture meter.

The consultant's analyses, critiques and proposals for improvements were generally aimed at informing the management about the principles of

design, construction and function which would be generally applied in all furniture produced. The consultant tried to determine, experimentally, the best chair height, the best chair back slope, the right depth of cabinet, the good height of a table, the most functional turned handle for drawers, etc.

In studying the furniture produced, it was pointed out to the counterparts that good form should not contradict with material, manufacturing process and economy, otherwise it could lead to trumpery. Wrong and in correct forms of the whole and also of the details were determined on all the manufactured pieces studied. The necessary corrections for the majority of the pieces produced which can be taken into account in future productions have thus been examined, analyzed and noted.

There was great willingness in the factory to implement the proposed improvements, but modelling possibilities were not as readily available.

The necessity of organizing the elaboration of plans for all their furniture production in the factory was discussed. Advice was given on the purchase of necessary drawing implements or the start of such developing work in the factory, since no documentation plans are available for their furniture.

Besides correcting shapes and constructions, the consultant showed new models he had designed for other enterprises and explained their characteristics ('performance features') in slides and with plans and drawings. The consultant allowed Messrs. Bush and Town to use all the models of his furniture. The plans or photographs were given to the factory for use with no compensation. Plans of some proposals for new models of seating furniture and tables were designed on graph paper and handed over. It would be necessary to test these as prototypes. This could not be done during the one month assignment.

Beside the advice for the improvements of the existing products given together with the furniture production expert, advice for improvement in maintenance of machine tools, wood storage, surface finishing, packaging and standardization was also given. None of the advice could be put to practice due to the short duration of the assignment.

DESIGN - SUGGESTIONS

Future development of furniture design at a global level leads towards stressing national cultures and away from uniform civilization. The design of furniture forms should follow antropometrical (whatever that means) standards, climatic conditions, existing equipment and domestic materials but it should also always follow customer taste. On a long term basis, it should be possible to buy Sierra Leone furniture that takes into account its cultural patterns, but in the near future nothing except perhaps well copied European modern furniture will be available.

At a discussion on furniture design during a workshop on production management in public sector mechanical wood processing industries in Ljubljana, a basic idea about a collection or bank of furniture designs for developing countries was aired by the workshop discussion leader. This fundamental idea may be implemented by UNIDO through an international assistance project in furniture design to developing countries.

The lack of professional design, architectural and interior design publications could be overcome by sending circular letters from Freetown University to American and European publishing houses requesting them to send to the Sierra Leone University Library a single back issue, free of charge.

Production under licence

Production under licence makes it possible to produce without uncertainty good and well-known models of furniture. This could be a suitable solution for Sierra Leone at this stage of its development. But for the long run, production under licence would undermine future design independence and originality.

Importing designs (drawings and models)

When drawings (if possible full size) and corresponding models are imported, a sellable collection of furniture prototypes can be made in a short

time. This is a suitable way to improve Sierra Leone's furniture design in the shortest possible time. About two to five prototypes in succession for each product, even in order to adapt a product to Sierra Leone needs and conditions, are required.

Importing designers

Import or international exchange makes possible the creation of an extended collection of new designs in a moderately short time. The lack of draughting equipment and current restrictions on payment from Sierra Leone make these solutions almost impossible.

Long term solutions

Ancient models of Sierra Leone rattan seats and table are traditionally well designed and executed. The present insufficient use of this knowledge has to be corrected, supervision of craftsmen using it and its diffusion to other craftsmen should be organized.

Sierra Leone tribal furniture designs, as an ancient cultural pattern, if they exist, might be used for the creation of a future national Sierra Leone design.

It is necessary to study the properties of the species commonly used in Sierra Leone. New innovative furniture constructions, suitable for solid wood constructions should be developed - if possible. Such furniture, designed for knock-down, long distance transport could be interesting for export to developed countries.

EDUCATIONAL PROBLEMS IN FURNITURE AND WOODWORKING FIELDS SUGGESTIONS

A small and efficiently operating woodworking centre in Freetown, with medium-term and short-term programmes for training machine woodworkers,

upholsterers, joiners, woodworkers and technicians, is urgently needed. The development and production in Sierra Leone of furniture and wood articles needs a permanent and enlarged international technical assistance programme. People are skilled but lack the most basic necessary machines, tools, basic wood technology, knowledge of equipment and blade maintenance. Sierra Leone will remain, without substantial support in the woodworking branch, a least developed country.

This international assistance could not be achieved by sending short term consultants but through organizing a woodworking educational centre in Freetown. The most necessary decision would be the foundation of a new woodworking centre, with international assistance in the Freetown Industrial area. The woodworking school in Rosenheim (FRG) or the Yugoslav one in Skofja Loka are examples of such a centre.

The new woodworking centre cannot be only a school. This centre has to be a combination of production and lecturing hall and has to be supervised by the Ministry of Education (like in Germany or Yugoslavia) and have full industry support. Its workshops have to be equipped with modern, not too specialized machines, and those workshops could serve as showrooms of different European machine producers for Sierra Leone industrial buyers. The teachers in such a centre should not be university professors, but woodworking machine master craftsmen and highly qualified model joiners with experience in industrial and handicraft production. In the frame of such a centre, the pioneer work in design, drawing, documentation and production: planning and control has to be included in the syllabus.

National design problems, among them furniture design problems, have to be studied at the state universities or academies of art and science. Sierra Leone is reaching a point when a University course on design and architecture is needed for a faster industrial development of the country's wood processing sector.

Such a centre could serve also as an additional training place for programmes for adult education in the woodworking and machine branches (special training programmes in the form of short courses with a special

emphasis on work practice). A well organized woodworking centre could include - courses on production planning, product development, timber drying, production of jigs, costing, pricing, design modification and work preparation.

It is necessary to organize immediately a tool and machine maintenance service for maintaining tools and blades in the Freetown industrial area.

CONCLUSIONS

Rattan furniture production should be promoted, and constructive, functional and formal solutions should be improved along the lines of advice given to the Bush and Town company.

Prospects exist for copying Scandinavian furniture models adapted to Sierra Leone conditions for a short term solution, and developing new construction methods specific to Sierra Leone's solid wood for a long term solution. This could also be the first step towards achieving Sierra Leone furniture design identity.

ANNEX

A list of the consultant's furniture designs, drawings, prospects and catalogues submitted to Bush and Town Co. Ltd. contains 120 pages including 766 drawings and photos.

A list of European furniture design catalogues and prospects submitted to the Bush and Town Co. Ltd. contain 332 pages.