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~~FURNITURE AND JOINERY INDUSTRIES IN INDIA -~~
ITS SCOPE AND PROBLEMS

by

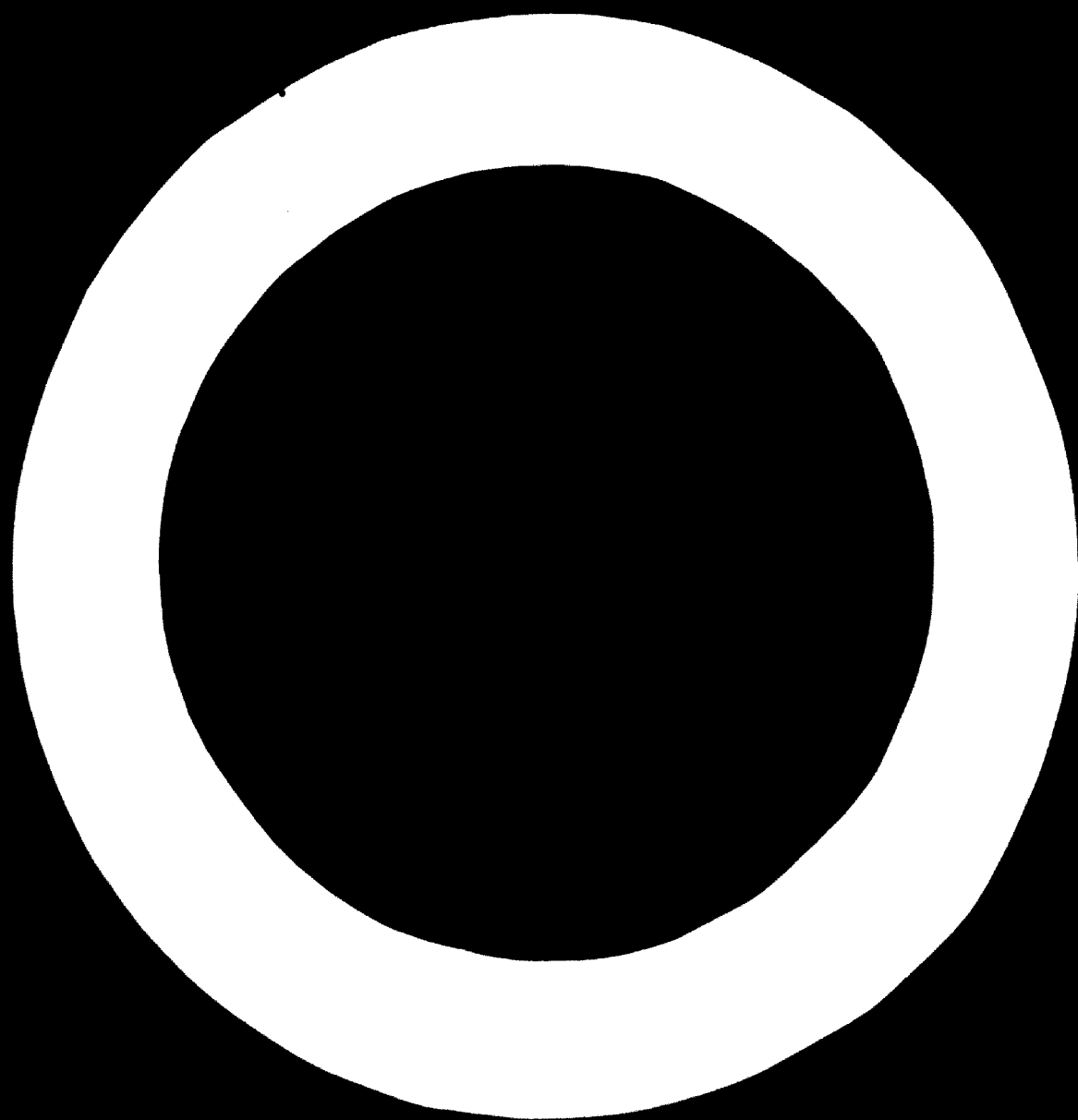
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1. CLIMATE

India is a vast country with wide variations in its climatic conditions from zone to zone. This also varies from altitude to altitude. Whereas most of its population lives on a plain within 1000 feet from the sea level, a part of the population lives even at an altitude of 15,000 feet above sea level. In most of the places three out of four seasons are very distinct. They are summer, rainy season and winter. There are places where it rains in winter but there is hardly any rain in summer. In most of the places the temperature rises to the maximum in July and falls down to the minimum in January. The temperature variation at various points in India is given in table A.

TABLE A

<u>Areas around the following towns</u>	<u>Altitude from sea level</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Temp. in July</u>	<u>Temp. in Jan.</u>	<u>Annual variation</u>
Shillong	1500 to 3000'	26° North	93° East	80-85°F	75-80°F	5°F
Calcutta	0 to 600'	23° "	88½° "	80-85°F	65-70°F	15°F
Delhi	600 to 1000'	29° "	77° "	85-90°F	55-60°F	30°F
Bombay	0 to 600'	19° "	73° "	70-80°F	75-80°F	5°F
Madras	0 to 600'	13° "	81° "	85-90°F	75-80°F	10°F

In most of the areas there is rainfall in summer (maximum in July). In wide areas the annual rainfall is about 30". In few areas the annual rainfall is below 2". Throughout summer and the rainy season from May to October the atmosphere passes through various degrees of humidity. Exact figures on the relative humidity are not available to the author.

Owing to the typical monsoonic climatic conditions in most parts of India the furniture and joinery industries are facing the following problems:

- 1) Because of the humidity in most places door and window shutters undergo a seasonal change in dimension, thus getting loose in winter and very tight in the rainy season.
- 2) This causes a rapid decay of external doors and window shutters.
- 3) Sometimes during the rainy season normal shellac polishing gets impossible due to great humidity.
- 4) In the plywood industry as well as in veneer facing operations of the furniture industry the gluing process is considerably disturbed by the absorption of moisture from the dry veneer.
- 5) In the rainy season air drying process in drying stacks is prolonged by the high degree of moisture in the air.

2. PRESENT SITUATION OF THE FURNITURE AND JOINERY INDUSTRIES

Since times immemorial carpentry has been recognized a regular vocation and industry in India. It is so deeply rooted in the society that in every part of the country there is a community which, until recently, was wholly engaged in the carpentry profession. From generation to generation they attained a higher degree of skill and perfection in their work. Their activities ranged from the manufacture of horse driven wooden chariots to the construction of ocean going ships which enjoyed a worldwide reputation. In ancient scriptures two very big ship yards, one at "Tamralipta" (present name Tamruk in West Bengal, India) and the other at "Samatata" (present name Chittagong, now in Bangladesh) were mentioned.

All these facts demonstrate the important position of the carpenters' profession in the Indian society. Even at present carpentry, both as cottage and small scale industry, exists throughout the country almost in every village. Since the last century the carpentry and joinery industry have become an organized sector of the industry and by now a respectable number of small and medium sized enterprises have been established but they still fall within the small scale industry sector, i.e. within an investment limit of 7.5 Lakhs of Rupees (approximately US\$ 100,000 dollars) in plant and machinery.

With the advancement of education and a fast trend to urbanization the demand for furniture is growing at a quick pace. The steady growth of industry, trade and commerce necessitates an expansion of existing buildings and the construction of new ones creating an increasing demand in wooden building elements for houses as well as for furniture. In the hilly landscape along the northern and north eastern borders of India government buildings as well as private houses are mostly wooden constructions.

Though there exists a reasonable number of industrial carpentry and joinery units both in the large scale and small scale sector producing wooden elements for houses the general trend is more for wooden furniture.

Though reliable statistical information is not readily available it can be safely estimated that the total number of furniture and joinery enterprises in India may be in the vicinity of 30,000. Among them 95% may be very small in size employing not more than 5 workers including the owner himself. Most of these units are proprietary concerns. A great number is traditional family business. Only 1 or 2% may be employing more than 10 workers. Total employment in this sector is nearly 0.15 million. As far as carpentry and joinery industry is concerned export is negligible though in other allied lines like commercial plywood, hardboard etc. India has already come out as an exporting country. However, import in this line is almost nil.

Most of the carpentry and joinery units are hand operated. They purchase sawn timber either from saw mills directly or from timber traders. But since the last two decades there is a growing trend for mechanization. India's huge population and the unemployment problem among part of them bars the way to thorough mechanization of this branch of industry which normally does not involve complicated operations. Semi-mechanization of some of these units by introducing machinery for time consuming operations like sawing, planing, grooving etc. has been more or less accepted as a compromise formula under the prevailing circumstances in India. But there is also a growing trend to standardization and improvement of the quality. This aspect leads more and more units towards mechanization. In the present industrial development programme the Government has included a number of incentives in the form of hire purchase of machinery on easy repayment terms, financial loans through various state owned financial corporations at lower rates of interest, financial loans through nationalized banks for the purchase of machines on a mortgage basis, development rebate on income tax if a certain amount is spent for modernization of the factory by adding suitable machinery etc. At present most of the basic woodworking machinery is manufactured in India and hence, there is no difficulty to purchase them. Plant and equipment like seasoning kilns, hot presses, mechanical veneer dryers etc. are also being manufactured in India. The Government has posted a number of experts in the woodworking line at various places to impart technical advice to the small scale industrialist free of charge. For Government purchase seasoning of timber is growingly being made compulsory and some other clauses are also being included in the purchase schedule which may necessitate mechanization on the part of the industry in the long run.

3. PROBLEMS FACING THE INDUSTRY

The growing scarcity of good quality furniture timber is posing a great problem to this industry. This scarcity is the direct effect of drastic extraction of timber from the forests without observing the basic principle of conserving the same during the Second World War when India was under British rule. Now it may take generations to attain the normal availability of good furniture timber from Indian forests which, until the war, were rich in firstclass furniture timber like teak, walnut, padauk, sisso etc. The scarcity of solid wood necessitates the use of veneer of quality timber as facing on inferior species of timber in making furniture. This method has already become popular amongst the industrialists but the attitude of the customers in general is still apathetic towards the purchase of veneered furniture. They rather prefer solid wood furniture. There is a psychological reason behind it. If the customer cannot be sure about the durability of the core timber, its resistance to attack by insects and fungi he will be reluctant to purchase it. As long as the seller will not succeed in obtaining the customer's confidence in the solid quality of the product, this problem cannot be solved. To create such a confidence the industry should impregnate the core timber to make it resistant to insects and fungi and properly publicise the careful chemical treatment of the wood before manufacturing it into furniture.

Another cause for this apathy towards the use of furniture with a core of inferior timber species may lie in the tradition and culture of the country with a philosophy which aims at eternity. Furniture, once purchased, are expected to last for a lifetime if not for generations. Indian people have not yet found any taste in short living fashionable models. Thus the industry should consider carefully the choice of the proper core material for the furniture.

Another tendency of the customer bars the way to standardization, particularly in costly items like beds. Like the architecture of his house, design of his wife's costly "Bonares Sari" the Indian likes his bed to have an unique design. Thus the manufacturers have no other alternative but to depend on artists to permutate and combine various motifs in every piece of such furniture. It is, however, impossible to make large batches of such furniture and use one design for too long a period. At any rate the situation may change and even after standardisation of the constructional aspects of such furniture there may still remain a scope for adding artistic motifs in the finishing stage.

With the sharp rise of timber prices during the last few years costs of production of furniture have also gone up. The income of the average customer has not gone up proportionally and hence the sale of furniture, particularly the costly items, is not increasing as forecasted. To bring down production costs an improvement in technology by using core block boards, laminated and bent wood, particle boards etc. for the manufacture of furniture and, to a certain degree, the application of low cost automation is necessary.

The industry should also try to find export markets to check the sagging tendency in this branch.

4. TIMBERS

Free species

The total area of India is 1,266,892 square miles. Of this area approximately 242,104 square miles are under forest. Annual yield of timber is about 143 million cubic feet. India's population being approximately 550 million. Per capita output of timber is only 0.26 cubic feet which is quite low in comparison with the world standard.

Most of the species of Indian timber fall under the category of tropical timbers which grow in the evergreen forests. A good number of them are suitable for furniture and joinery work. A few very high quality timbers for furniture like teak, walnut, paduk are available in sizable quantity in Indian forests. Apart from a wide range of tropical species a number of conifer species have got their habitat in the high altitude of the Himalayan forests all along the northern and northeastern border of India. Well known species like birch (*Betula alnoides*), silver fir (*Abies* spp.) spruce (*Picea morinda*), chir-pine (*Pinus longifolia*), blue pine (*Pinus excelsa*) etc. are a few among them.

The following are the main species of Indian timbers which are extensively used in the furniture and joinery industries:

- Walnut (*Juglan regia*)
- Teak (*Tectona grandis*)
- Paduk (*Pterocarpus dalbergioides*)
- Rosewood (*Dalbergia latifolia*)
- Sissoo (*Dalbergia sissoo*)
- Chempu (*Michelia champaca*)
- Bonsum (*Phoebe goalparensis*)
- Gamari (*Gmelina arborea*)
- Chickrassy (*Ohukrassia tabularis*)
- Chaplash (*Artocarpus chaplasha*)
- White cedar (*Dysoxylum malabricum*)

With the exception of small imports of teak from Burma there is no need for India to import timber for the furniture and joinery industries.

Until now most of the small scale furniture and joinery units in India are not seriously considering using kiln seasoned timber. In the countryside they air-dry for their own needs. Only in urban areas and especially in larger towns the use of kiln drying is gradually gaining ground. It is, however, gratifying to state that a complete range of equipment for a seasoning kiln is now being manufactured in India. A few items of the testing equipment like moisture meter are still being imported since the Indian products of this sort have not yet attained the desirable degree of perfection. The Government starts to make kiln seasoning compulsory for any Government purchase and is including a respective clause in its tenders.

It has already been discussed earlier that solid wood is becoming more and more scarce and the price for it is rising by leaps and bounds. This has posed a great problem to the furniture industry. The furniture and joinery industries have, therefore, seriously considered the use of alternative material like various semi-manufactures and their use is gradually increasing.

The main handicaps in introducing kiln seasoning in this industry are the following:

- (i) In most cases one unit has not enough timber to dry to have the kiln run fulltime. In addition the regular payment of interests on the investment in a seasoning kiln, its maintenance and the operating personnel make it a burden to the unit and the whole process uneconomic.
- (ii) Though the steam pressure requirement of the kiln is as low as 75 lbs/sp. in. such a low pressure boiler generating the necessary quantity of steam per hour is not available in the market. Consequently, the kiln owner has to purchase a regular boiler with more than 100 lbs/sp. in. pressure. This brings the boiler under the Boiler Act with the necessary paraformalia to be observed by the industrialist including the appointment of a properly qualified boilerman. If some low pressure steam generating unit with the necessary capacity to generate the desired quantity of steam could be made available in the home market the introduction of seasoning might be easier.

(iii) As the expenditure on a seasoning kiln can only be compensated by increasing the price of timber, the price often becomes excessively high if the kiln cannot be operated the usual running period for lack of timber to be dried which often results in high prices for the end product.

However, this handicap may be overcome by the introduction of mass production and by solving the boiler problem.

4. OTHER MATERIALS - USE AND AVAILABILITY

The use of plywood, fibreboard, etc. in the furniture industry is steadily increasing. The use of particle board is still less popular. Among the wood based semi-manufactures, plywood is sufficiently available at a reasonable price to cover the requirements of the industry. Good quality particle board made by the pressing method is not yet available in a sufficient quantity. For a wider use of this material to replace solid wood, upgrading of the existing technology by introducing the dowelling system, various degrees of automation, etc. is most important. However, this may take some time and involve high investment costs.

In India the use of plastic materials as a substitute for solid wood by the furniture industry is not very common.

In villages animal glue is still commonly used for jointing purposes. However, ready mixed synthetic glue in various sizes of containers is now available in the market under various brand names and they are gradually becoming popular.

In India, until now painted furniture was not popular. Customers prefer polished furniture with distinct visibility of the grain structure of the wood. Shellac dissolved in methylated spirit is mostly used as polishing material. French chalk and similar material is used for filling the pores. Nitrocellulose lacquers are only used in urban areas by reputedly good manufacturers of quality furniture. Plastic coating and similar processes are rarely in practice.

Until conventional types of hardware are used in the furniture industry. The industry mostly depends on the established hardware market for their supply. Designers of furniture have not yet extended their activity to design hardware items like hinges, knobs, etc. to any remarkable extent.

Among other kinds of raw materials, Formica sheets are being extensively used especially for kitchen and hotel furniture.

The main obstacle for a wider use of particle board as substitute for solid wood are the difficulties in introducing automation to a reasonable extent. Its introduction will require high investments necessitating the provision of foreign exchange for the import of such plants. Moreover, automation will reduce employment opportunities which is considered undesirable in a country where the growing unemployment ranges among her main problems. Efforts are, however, being made to solve this problem.

5. LABOUR

As far as personal skill is concerned, Indian carpenters possess a superb standard of skill since, for most of them, this is their hereditary profession. In the use of traditional instruments they are real masters. This has also been acclaimed by many experts from European countries who came in connection with various development programmes for this particular industry. It has often been noticed that workers who possess skill in hand carpentry work adjust quickly to the operation of woodworking machines without a long organized training programme. The industry is exclusively depending on the traditionally skilled technical personnel for any degree of mechanization which is has so far attained. Their strength has been increased by the graduates of various artisan training courses run by the state governments.

In all parts of India vocational training centres are run by both the industry and the labour departments to impart the necessary knowledge and skill to the trainees in the furniture and joinery trades. Most of these training centres are equipped with basic wood working machinery. Some of them have also training facilities in kiln seasoning. The most specialized training is imparted by the "foremanship courses" of the Ministry of Labour which has five to six training institutes in all parts of the country. There are no specialized courses for carpentry and joinery at Indian universities. However, in all engineering courses on an undergraduate level a systematic training in carpentry is included.

In most of the small scale units a skilled senior worker is assigned by the proprietor as supervisor. In organized sectors posts as supervisors, foremen, etc. are usually filled by trainees of the above mentioned courses.

6. FURNITURE AND JOINERY FACTORIES

In rural areas the size of an average furniture and joinery factory is very small. It only produces those products which a carpenter is capable of manufacturing and sells its products in its immediate vicinity. They are mostly hand-operated units. Their production ranges from the manufacture and repair of wooden ploughs, doors and windows, to the performance of carpentry work in the construction of rural houses, and the manufacture of simple types of furniture like little stools, benches, beds, chairs, solid wood top tables and desks for schools etc.

In urban areas the products of such industries comprise doors and window frames and shutters, polished furniture like tables, chairs, beds, cupboards, dining tables, office furniture, school and college furniture, internal decoration work, the manufacture of shop showcases, counters etc. In some cases work is carried out on order basis. In all such cases specifications, drawings, etc. are provided by the customers. For normal retail show-room sale a set of designs is kept ready in an album being mostly artistic isometrical designs prepared by commercial artists. It frequently happens that the same artist prepares sets of designs for different units. The items for which designs are kept ready cover the entire range

of household and office furniture. The manufacturing process to be followed is completely in charge of the leaders of the groups of workers who, in most cases, work on piece rate basis. The proprietor of the unit provides the material, tools and shopfloor facilities.

There exists also a good number of organized units in every large city. They have their products designed by free lance artists on payment. Some of them have even one or two artists on their staff. Sometimes changes are made in the standard designs by the designer on the spot if this is desired by a good customer. Units with a good reputation for a sizeable counter sale have a number of designers for each individual item of furniture, maintain a stock of them and have a regular production programme.

Since final assembly and finishing is done in most of the case on a piece rate basis only machining of components is done by the factory with a set of machines and a set of skilled workers and an adequate management. In these factories only basic single purpose machines are kept. The workers are conversant with the operation of the machinery. The factories are capable of attaining the maximum extent of perfection in manufacturing furniture according to a design which, in most cases, is an artistically drawn coloured picture of one item of furniture not to scale. The perfection thus obtained is the nearest approach possible to the apparent look of the piece of furniture to the design of the same with all its aesthetics for which Indian craftsmen have got a keen sense. There are also a few design centres at least one in each state engaged in evolving new designs, including designs for wooden furniture.

Until now automation has not been tried out on a larger scale in this sector of industry.

According to the production scale of this industry not many technological problems arise. But with the adoption of a certain degree of automation sets of machinery will have to be imported. It may be advisable to have our workers trained by an expert from the plant of the manufacturer of the machinery after having commissioned such an automated unit. For the Indian set up only low cost automation at various stages can be visualised and for this purpose less elaborate training may be sufficient. In spite of the existing lack of skill our workers may be quick in acquiring the additional skill.

But in the case the possibility arises to export our furniture abroad we may have to go to a higher degree of automation and in that case the import of costly plants along with the technical know-how by way of a systematic training of our personnel may become necessary.

7. MARKETING

At present the industry is catering to the need of the home market to the fullest extent.

It has been observed that all over the Western world there is a growing trend to have antique motives, particularly with an oriental touch in the furniture design. Thus we shall take this opportunity and, as a developing country of the orient, try to step in the export market.

At present the direct sale from the factory-cum-showroom in case of rural and very small urban units and from the show room of the bigger units in big cities is the main channel of marketing for this industry. As far as export purchases are concerned almost all purchases are effected through tenders and the units' quotations against the tender.

There is no serious marketing problem for the industry at their present production scale. However, if office and school furniture as well as doors and windows for government buildings were standardized, more scope for batch and line production will be opened for the industry. If the purchase of doors and windows etc. were planned well in advance proper programming of the production for large series may be made by the industry. Even in lean seasons components may be manufactured and stocked to keep the plant engaged to a reasonable extent.

8. TRENDS

With the standardisation in office and school furniture as well as doors and windows for government buildings organized industries in this sector may have a better home market. At present such work is being handled by a contractor community who have got no workshop but carry a strength of labour force with them to fabricate the doors and windows mostly by the manual process at the building site. In case the design will be standardized, mass production may be introduced. In that case prices will come down and there will be less expenditure for building construction. If, in addition some export markets were found, the furniture and joinery industry can be developed to a great extent.

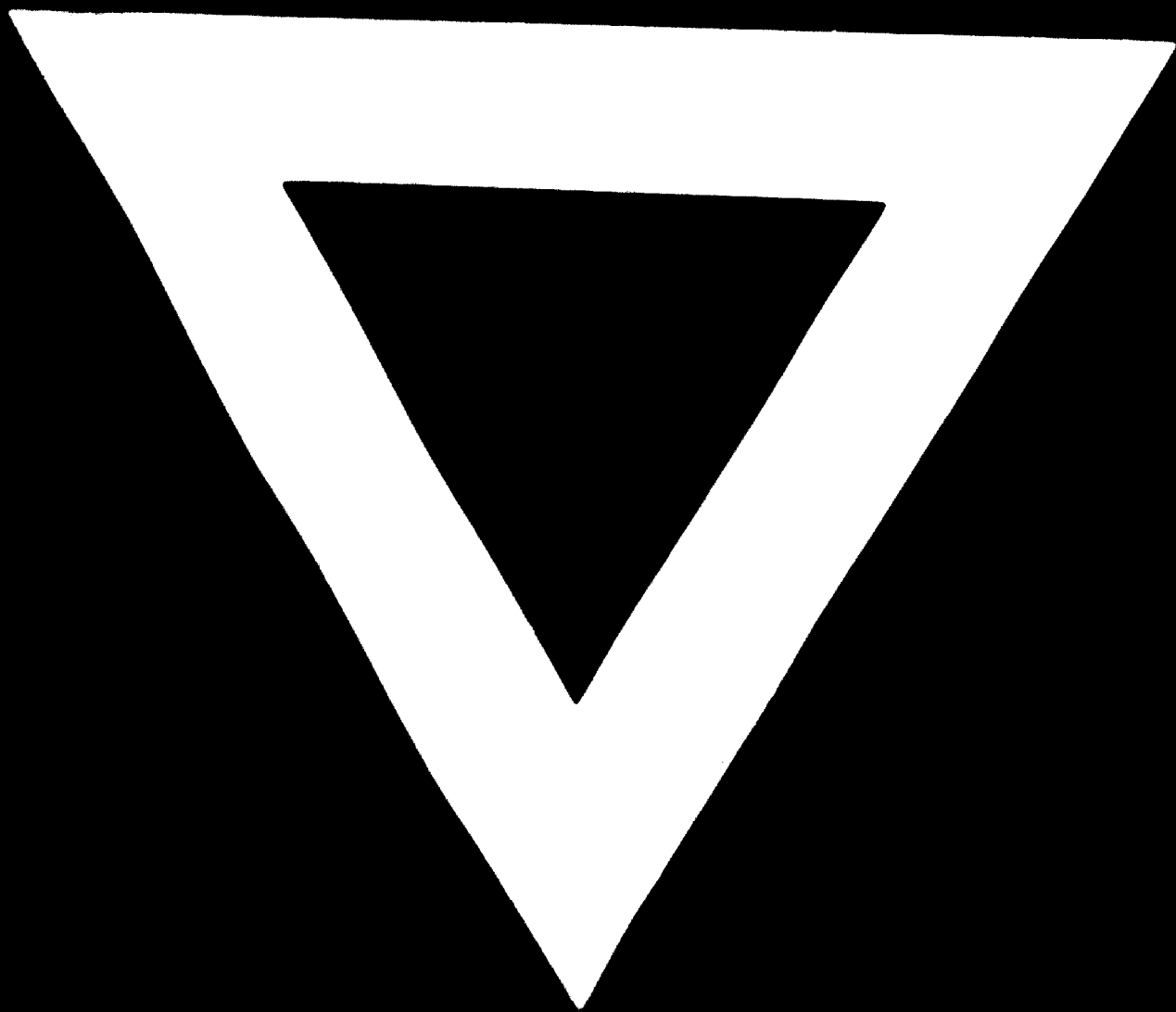
With a better co-ordination among various purchasing government departments such as Public Works, Housing, Education, Health, Forest, Industry etc. the common aim of standardizing doors and windows in government buildings, furniture for different government agencies could be attained and a schedule of purchases at government level through one single purchasing agency could be visualized. Then the entire purchase of the Government could be made in a phased manner making thus possible that various units of this industry will be supplied with sufficient purchase orders. The Government is already aware of this problem and it is a matter of time to arrive at this ideal situation.

For export also, a relevant Government Department may be active to get sufficient orders from the Western market. For that purpose it may be

advisable to have some common marketing organisation sponsored by the industry itself with specialized units. Such organisations are already existing in other countries like Japan, Sweden, Finland, etc. It may compile brochures of designs, if necessary, with designers engaged for this purpose, make market surveys in various countries, participate in trade fairs in different countries and ultimately obtain export orders for the country and distribute them to the competent units. Other formalities for the export may also be done by this organization. A joint action programme of such an organization with our Government will lead to an increase in the export of Indian furniture.

UNIDO can assist at this stage by a series of technical assistance programmes some of which are listed below:

- 1) Holding mobile exhibitions on the use of various special hardware items for the furniture and joinery industry as is the practice in developed countries to which India may export furniture.
- 2) Holding mobile exhibitions on machinery and equipment on low cost automation for furniture and joinery industry.
- 3) Holding exhibitions of designs in vogue in countries where potential export markets may be developed for our furniture along with detailed illustrations on their possible manufacturing techniques with suggestions for low cost automation.



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