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06992



United Nations Industrial Development Organization

Distr.  
LIMITED  
ID/WG.226/17  
27 April 1976  
ORIGINAL: ENGLISH

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Technical Course on Criteria for the  
Selection of Woodworking Machines  
Milan, Italy, 17 - 26 May 1976

WOODWORKING INDUSTRIES IN ECUADOR ✓

by

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id.76-1821

INTRODUCTION

The data of Woodworking Industries in Ecuador has been taken from the National Institute of Statistics and the National Forest Direction.

CLIMATE AND LOCALIZATION

Ecuador is a tropical country that is located in the Central Occident of South America. It has three very pronounced regions with different climates:

Occidental Coast:	Mean temp.	25° C	wet zone
Central Mountain ranges:	Mean temp.	16° C	dry zone
Orient Region:	Mean temp.	25° C	wet zone

1. PRESENT SITUATION OF WOODWORKING INDUSTRIES IN ECUADOR

	No.	Production (US\$)	Workers	Used Energy (M.W.H.)	Total Investm. (US\$)	New Investm. (US\$)
1972	77	13.570.000	3.380	7.300	6.400.000	1.600.000
1973	92	15.960.000	3.980	9.000	8.180.000	1.920.000

The above chart demonstrates a great development in woodworking industries in Ecuador during 1972-1973. Although we do not have the necessary information, the following years have been considered most favorable for the development of this industry.

SIZE OF WOODWORKING INDUSTRIES IN ACCORD TO THE PRODUCTION

Production		US\$ Year	No. Industries	
			1972	1973
0	to	20.000	23	24
20.000	to	40.000	16	13
40.000	to	200.000	26	39
200.000	to	400.000	3	7
400.000	to	800.000	4	3
800.000	to	1,600.000	4	3
1,600.000	to	2,000.000	1	3

This chart shows that there has been a notable increase in the number of industries with a production in the range of \$ 200,000.

#### INCENTIVES FOR INDUSTRIALIZATION

We can summarize the following:

- Tax exoneration up to 95 per cent in the constitution of the companies;
- Tax exoneration up to 95 per cent for machinery and raw material importation;
- Income tax exoneration for the first ten years of export production;
- Financing of operations for exportation;
- Financing up to 65 per cent of the investment in new industries.

#### TRADE

The actual market for wood products has increased thanks to the benefits of the "Pacto Andino".

Country members: Chile, Peru, Colombia, Venezuela, Bolivia and Ecuador.

Ecuador exports furniture to other countries of the "Pacto" with significant tax exonerations.

#### PROBLEMS

The main problem that affect Ecuador's industry are the social laws that over protect the employees and labors. Good relationship between employees and management, reduces this problem.

#### 2. TIMBERS (see appendix)

Seasoning: Generally, big industries have their own kiln drying. The drying system still in use, is drying with boilers.

#### 3. PRIMARY WOOD PROCESSING INDUSTRIES

This section represents 70 per cent of woodworking production industries in the country and 30 per cent of the people employed.

SITUATION OF THE PRIMARY INDUSTRIES OF WOOD

	No.	Production (US\$)	Workers	Used Energy (Mw.H)	Total Investm.	New Investm. (US\$)
1972	47	9.620.000	1.980	1.500	3.600.000	500.000
1973	56	11.320.000	1.280	1.700	4.300.000	1.080.000

RANGE OF PRODUCTS MANUFACTURED IN 1974

Product	Production	Exportation
Plywood	51.000 m3	5.000 m3
Sawn Wood	510.000 m3	40.000 m3
Veneer	100.000 m2	---
Fibreboard	---	---

The Plywood fabricated in Ecuador has a very good quality and production covers scarcely the necessity of the country.

Veneer is produced using tropical wood of beautiful grain.

Fibreboard panels - Soon Ecuador will begin production using sugar cane fiber.

Sawn wood is still exported but probably will be prohibited in the coming years.

4. FURNITURE, JOINERY INDUSTRIES

This represents 30 per cent of the woodworking industries production and 70 per cent of the total labor force.

All different types of furniture are produced, including: Custom made, Upholstered, Mattresses, Pantry, Kitchen, Office, Livings, Schools, Cabinets, etc.

SITUATION OF THE FURNITURE INDUSTRY AND JOINERY

	No.	Production (US\$)	Workers	Used Energy (Mw.H)	Total Investm.	New Investm. (US\$)
1972	30	3.950.000	2.300	5.800	2.800.000	1.080.000
1973	36	4.640.000	2.700	7.300	3.880.000	840.000

### DESIGN

The different designs here in Ecuador are based on European styles. The Ecuadorian models are modifications of international designs taken from magazines, although there are some original models with great acceptance especially the ones constructed of acid leathers.

Louis XV and colonial designs also have great acceptance. It can be stated that Ecuador possesses no expert furniture designers, even though there are some good designers available.

### TECHNICAL LEVEL

The majority of furniture industries have a production level of less than \$ 200,000 per year. This limitation does not permit having technical departments in the enterprises.

Furniture of good quality and appearance is produced, thanks to the skill of the employees and craftsmen.

### PROBLEMS

- The defectively kiln dried wood, or almost total absence of it, creates a great waste of potentially good wood. Although, some big industries do have excellent kiln drying;
- Badly sharpened tools and wrong use of the accessories produce defective jobs and create danger for the workers;
- Lack of knowledge of the technical use of associated products like sandpaper, glue, oils, lacquer, etc.
- Lack of standardization.

### TYPICAL INSTALLATION OF SMALL INDUSTRIES

Consists of: thickener, planner, circular saw, band saw, turn, sander, router, hand router, mortising, air compressor with spray gun, saw machine.

In bigger installations complementary and specialized machinery is added, along with kiln drying.

DEVELOPMENT TRENDS

The advantages gained from the "Pacto Andino" open great possibilities of development of furniture's industry.

5. LABOR

There is no difficulty to find workmen for this type of industry, but with low level of knowledge and experience. They do possess a certain native skill.

Industries, however, need to incorporate specialized training programs for their employees and workers.

Ecuador does not have specialized institutions to teach specific woodworking techniques.

The average salary of the wood worker, is in the order of \$ 180 per month, including fringe benefits.

6. LOCAL MANUFACTURE OF WOODWORKING MACHINES

Ecuador only produces thickners, planners, circular saws, routers and turns. It does not produce accessories.

The quality of this machinery does not satisfy the requirements of the industries because they are not precision made and the design is not functional.



APPENDIX

DESCRIPTION OF THE MAIN WOODS IN ECUADOR

ANIME (*Dacryodes occidentalis*)

Natural specific gravity 0.83 and 0.58 when kiln dried. Low elasticity modulus; medium resistance to compressive stress in the same direction of the fiber and low resistance perpendicular to the fiber. Low hardness and volumetric contraction. Medium resistance to shear force.

Light pink wood useful to make decorative veneer, furniture, paper.

CUANGARE (*Dialythera gracilipes*)

Natural specific gravity 0.8 and 0.4 when kiln dried. Low elasticity modulus, low resistance to compressive stress parallel to fiber and very low to compressive stress perpendicular to the fiber. Low resistance to shear force. High volumetric contraction. Uniform grain and color. Light pink wood, very useful to make plywood and paper.

CHALVIANDE (*Virola sebifera*)

Natural specific gravity 0.85 and 0.41 when kiln dried. Low elasticity module, low resistance to compressive stress parallel and perpendicular to the fiber. Low hardness. Low resistance to shear force, medium volumetric contraction. Uniform color and grain. Very useful to make plywood.

QUAYACAN (*Tabebuia guayanae*)

Very hard wood, high density (0.98 when kiln dried), olive brown color, without odor and taste. Difficult to cut, easy to sand and polish. Useful to make furniture, lathe work, florins. Resistant to germs and insect attack.

MASCAREY (*Hyeronima chocoensis*)

Natural specific gravity, 1.22 and 0.74 when kiln dried. Uniform grain. Medium hardness. High resistance to compressive stress

parallel to fiber and low resistance perpendicular to fiber. (High elasticity module). Medium shear stress resistance. Very attractive red brown color. Very useful to make veneer, furniture, floor. Widely used in construction.

ROBLE (*Terminalia oblonga*)

Natural specific gravity 1.18 and 0.83 when kiln dried. High elasticity modules. High resistance to compressive stress parallel to fiber and low resistance to perpendicular stress to fiber. Medium hardness, medium shear stress resistance and volumetric contraction. Dark brown color. Useful to make veneer, furniture, floor.

SANDE (*Brosimum utile*)

Light brown color wood with black vein. Soft. Light. Easy to cut. Specific gravity 0.56. Useful to make boxes, sheathing, etc.

GEDRO (*Cedrela odorata*)

Specific gravity 0.32. Strong, easy to cut and polish. Resistant to germs and insects attack. Good for machine operations except drilling. Pink brown color. Fragrant odor and bitter taste. Soft and light.

LAUREL (*Cordia alliodora*)

Natural specific gravity 0.45 to 0.57 when kiln dried. Brown color with dark vein. Very attractive wood, medium hardness strong. Easy to dry. Good for machine operations. Easy to cut and resistant to germs attack. Widely used to make furniture and decorative veneer.

TANGARE (*Carapa guianensis*)

Specific gravity 0.55. Medium hardness, without specific odor and taste. Uniform grain. Easy to cut, sand and polish. Strong and durable. Light gray with fine vein. Useful to make windows, doors and furniture.

CHANUL (*Humiriastrum procerum*)

Important wood with uniform brown color and fiber. Hard and heavy. (Specific gravity 0.82). Difficult to cut and easy to sand and polish. Useful to make railroad ties, floor, furniture.

MORAL FINO (*Chlorophora tinctoria*)

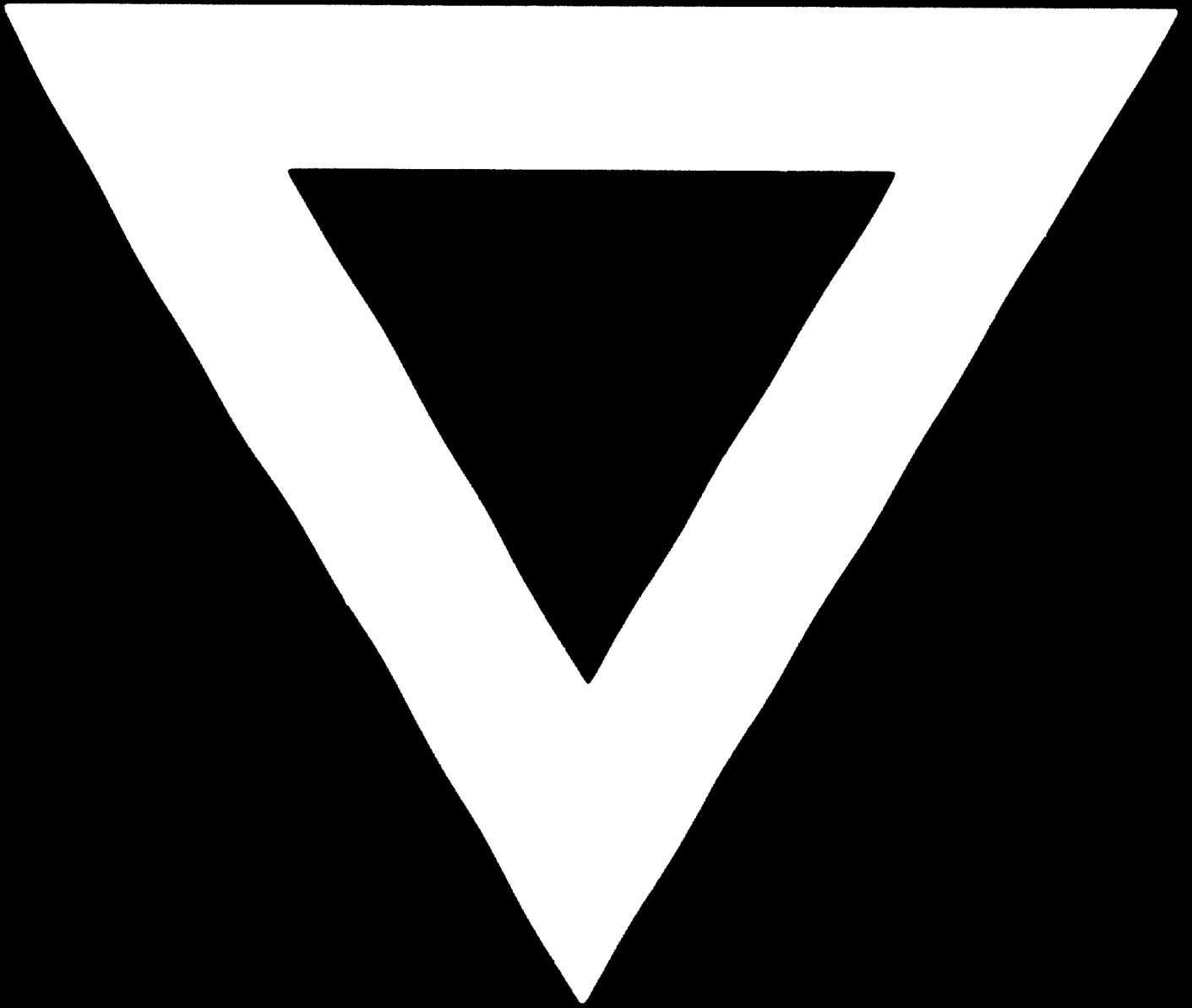
Natural specific gravity 1.15 and 0.68 when kiln dried. High resistance to compressive stress parallel to fiber and low resistance to perpendicular stress. Medium hardness. Medium resistance to shear stress and low volumetric contraction. Useful to make veneer, furniture, railroad tie.

JIQUA (*Nectandra cissiflora*)

Natural specific gravity 0.70 and 0.48 when kiln dried. Low resistance to compressive stress parallel and perpendicular to fiber. Low hardness and resistance to shear stress. Medium volumetric contraction. Yellow brown color without odor. Useful to make veneer and decorative veneer, paper.



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