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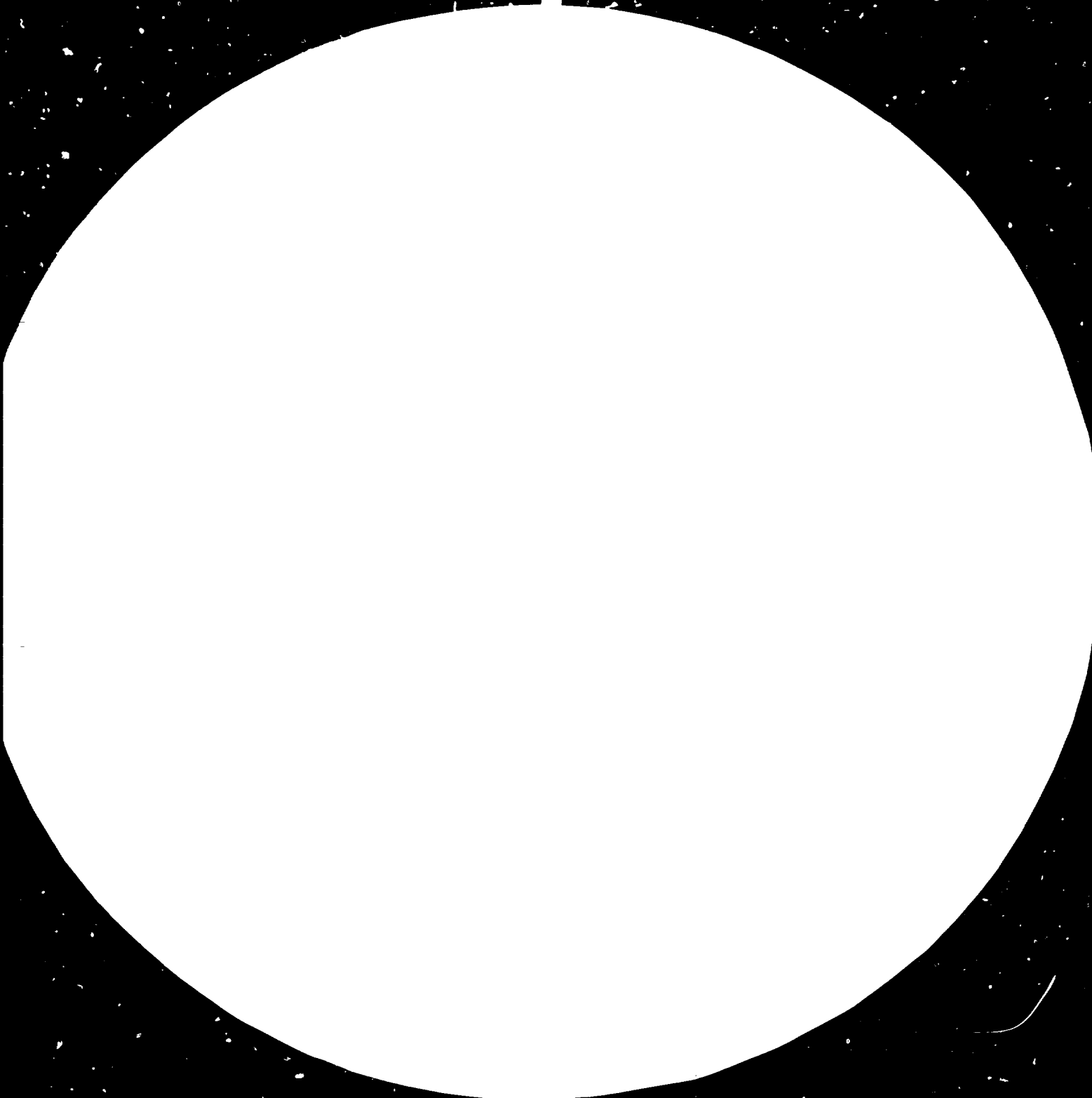
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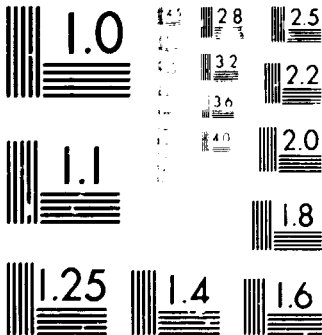
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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

REPORT ON THE SEMINAR ON ECONOMIC CRITERIA
FOR THE SELECTION OF WOODWORKING MACHINERY AND PLANT SYSTEMS,
(US/INT/80/161)
Hannover, FRG, from 19 May to 2 June 1981

and

THE CONSULTANCY SERVICE LIGNA
(TF/INT/81/001)
Hannover, FRG, from 27 May to 2 June 1981

by

002100

Heinz Eldag
Industrial Development Officer
Agro Industries Branch
Division of Industrial Operations

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1. Purpose of the Mission

A staff member of the Agro Industries Branch of the Division of Industrial Operations, Mr. Heinz Eldag, went to Hannover, Federal Republic of Germany, from 19 May to 2 June 1981 to conduct the second Seminar on Economic Criteria for the Selection of Woodworking Machinery and Plant Systems in connexion with the Consultancy Service at the LIGNA-Fair (held from 27 May to 2 June) organized to aid visitors from developing countries attending the international machinery exhibition for the forestry and wood processing industries.

2. Preliminary Preparations

This was the second such seminar that UNIDO set-up in connexion with the LIGNA-Fair and also with officials of the Woodworking Machinery Manufacturers Association of the FRG (VDMA). It was the third time that the LIGNA-Fair authorities requested UNIDO to convene a Consultancy Service within the International Service Centre at the Fairgrounds.

Both the first and second seminars were financed by voluntary contributions from the Government of the Federal Republic of Germany and Trust Funding from the LIGNA-Fair authorities as well as monies from the Machine Manufacturers Association of the FRG. Part of the Trust Fund money was donated by the INTERZUM authorities in order that participants be able to visit an exhibition of ancillary materials for the wood processing industries held in Cologne, FRG, on 23 and 24 May 1981.

The decision to repeat the seminar was informally agreed upon at the close of the 1979 LIGNA-Fair and was later formally approved by the Board of Directors of the German Machine Manufacturers Association. The agreement was put to paper on 28 May 1980 and a project document was prepared and submitted to the Programming Committee for its approval on 7 October 1980.

By request of the German authorities, the original project budget was revised and the Permanent Representative of the Federal Republic of Germany to the International Organizations in Vienna confirmed the Special Purpose Contributions to this project on 23 December 1980 which resulted in the issuance of a PAD for the total cost of US\$ 148.000 (US/INT/80/161). The contributions from the LIGNA and INTERZUM Fair authorities resulted in a PAD issued 30 March 1981 for the amount of US\$ 10,855.79 (TF/INT/81/001).

The formal letter of invitation was sent by the Training Branch on 12 January 1981 to the Resident Representatives of the countries invited (a total of 54 countries were invited to nominate candidates for the seminar after discussions with the German authorities as to which countries would most benefit from such a course). A listing of these countries is given in Annex I.

The closing date for submission of completed nomination forms by UNDP offices was 10 April 1981. Because a great number of nomination forms arrived in our offices after this date, however, we extended the deadline to 25 April. From the 91 nominations that we received from 40 different countries, 36 participants were selected from 23 countries. Initially 10 observers planned on attending the course at their own expense but only 7 actually attended.

Most of the participants arrived on time (exact arrival dates can be obtained from the daily subsistence allowance sheet) as scheduled. Again, a listing of participants, observers and consultants can be found in Annex II (UNIDO Document ID/WG.338/3C).

3. Participants

Bearing in mind that participants came from countries having varying levels of technological development, they could be considered to have been a homogenous group. All were very keen to get as much as possible information from the lecturers, company visits, exhibition visits and from the UNIDO consultants who gave them non-stop attention. They took the opportunity to discuss with each other and the consultants their specific problems during evenings at the hotel and

these conversations often lasted well into the night. Participants were especially affected by the lecture on Case Studies of Small-Scale Industries, presented by Mr. Reuter, who guided the group work for Preliminary Considerations in Planning Case Good Manufacturing Industries. This lecture sparked discussion on this and other topics of interest to participants such as the selecting of proper machinery, identifying different technologies for use in various levels of industrial development, etc.

As mentioned earlier, this was the second such seminar organized in conjunction with the LIGNA-Fair authorities and the German Machine Manufacturers Association, sponsored by the Government of the Federal Republic of Germany. It is important that specialists from developing countries be introduced firsthand to the various German manufactured woodworking machinery and plant systems since at present most of the machinery exported to these nations is from the Federal Republic of Germany. And there is no better place than such an international fair to feature the most modern and efficient woodworking machinery available on the German market. The only problem we encountered in this was that participants often found exhibitors either unable to communicate with them entirely (many of the participants were not able to understand German) or that the exhibitor oftentimes had no time to chat with the participants. In this respect the UNIDO consultants contributed a great deal of time explaining and discussing the exhibits with them.

The seven observers followed the programme closely and participated in the assignment work. They were also accommodated in the same hotel as seminar participants so that they had the opportunity to mix with and consider themselves part of the seminar group.

4. Seminar Programme

The seminar programme is listed on the following page in outline form.

OUTLINE OF SEMINAR PROGRAMME

<u>DATE</u>	<u>TIME</u>	<u>A C T I V I T Y</u>
Tuesday, 19 May	9:30 - 10:30	
	10:30 - 10:55	Mr. G.A. Voment
	11:00 - 11:20	Mr. H. Eldag
	11:30 - 14:00	L U N C H
	14:00 - 14:20	Dr. Theis
	15:00 - 15:30	Messrs. Stihl
	16:00 - 16:20	
	Wednesday, 20 May	9:30 -
	10:00 - 11:00	Mr. C.H. Vermaas
	11:30 - 12:00	Messrs. BISON
	12:00 - 14:00	L U N C H
	14:00 - 15:00	Mr. H.D. Sitzler
	15:30 -	Mr. Bory
	16:00 - 17:30	Mr. H. Eldag

Registration of participants and observers

Welcoming address by the Director of the
LIGNA-Fair

Opening address on behalf of Dr. Abdel Rahman
Khane, Executive Director of UNIDO

Welcoming address on behalf of the German Wood-
working Machinery Manufacturers Association with
an information on the present situation of the
German Machine Manufacturing Industry.

Film on Felling Operations by Chain Saws

Distribution of Lecture Documents

Distribution of the documents on the lecture,
Basic Principles in Selecting Logging Equipment
(ID/WG.296/1/Rev. 1) and Factors Influencing
Logging Costs in West Africa (ID/WG.296/9)

The Manufacture of Particle Board Based on
Unconventional Raw Materials (ID/WG.338/5)

Film on Prefabricated House Production

Wood Derived Panel Products for Developing
Countries (ID/WG.338/12)

Distribution of the document on the lecture,
The Production and use of Woodwool Light Weight
Building Boards (ID/WG.338/11)

Information on Company visits (21 and 22 May) and
general group information concerning busses, etc.

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>	<u>A C T I V I T Y</u>
Thursday, 21 May	<u>FACTORY VISITS</u>	
	<u>Group I</u>	
	(1)	Particle Board Plant Board Laminating Plant
	(2)	Decorative Veneer Plant Sightseeing Tour: Teutoburger Wald
Friday, 22 May	<u>FACTORY VISITS</u>	
	<u>Group I</u>	
	(1)	Particle Board Plant Board Laboratory Film on Chip/Cement Boards Chip Board Equipment Production
	(2)	Prefabricated Glue Lam Plant
	(3)	Prefabricated Log House Production
		Return travel to Garbsen (Hannover)
Saturday, 23 May	Day off	

Group II

- (1) Sawmill and Lumber Dealer
- (2) Parquetry Factory

Group II

- (1) Living Room Furniture Factory
 - (2) Joinery Factory
 - (3) Living Room Furniture Factory
 - (4) Kitchen Furniture Production
 - (5) Woodworking Machinery Factory
- Bus trip to Kürter (Cologne)

Group II

- 9:30 - 16:00 Visit to the INTERZUM-Fair
- 16:00 - 16:20 Welcome address by Mr. Schierhorn, Conference Services, on behalf of Mr. Lange, Director of the Cologne INTERZUM-Fair.
- 16:20 - 17:30 Demonstration of Furniture Testing Equipment and Discussion on Furniture Testing Procedures
Demonstration presented by Messrs. Hobohm and Fink with the document III/WG.338/7 as well.

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>
Sunday, 24 May	<u>Group I</u> Sightseeing in Hannover
Monday, 25 May	9:30 - 10:30
	11:00 - 11:40
	14:00 - 15:30
	16:00 - 17:00
Tuesday, 26 May	9:30 - 10:30
	11:00 - 11:20
	14:00 - 15:30

A C T I V I T Y

Group II

9:30 - 17:00 Visit to the INTERZUM-Fair

Bus trip to Garbsen (Hannover)

Mr. H. Eldag Mr. J. Priebe	Safety in Woodworking Training Manual on Safe Operation of Woodworking Machines (ID/WG.338/9)
Mr. H. Eldag	The Development of Woodworking Machinery Since 1920 and its Influence on Industrialized Woodworking.
L U N C H	
Mr. Gössel Ms. Zuber	Appropriate Technology in Pencil Production for Developing Countries (ID/WG.336/9)
Messrs. Erhardt	Films on the following: - The Manufacture of Pencils - Fully Automatic Pencil Production - The Lead Production
Mr. H. Eldag	Introduction to Assignment Work - Group Arrangement
Mr. Heilborn	Selection of Machines for Sawmill Operation in Relation to Recovery for Conditions in Developing Countries (ID/WG.338/10)
Messrs. Canali	Film on Mechanized Sawmilling (Plus the document ID/WG.296/11/Rev. 1 on Mechanized Sawmilling Appropriate for Developing Countries)
Mr. Schmid Mr. Herma	Planning and Layout of Lumber Kilns Discussion on Kiln Drying in Relation to Heat Systems and Automatic Controls (Plus the documents ID/WG.296/20 - Economic Evaluation of Heating Systems for Timber Kiln Driers in Comparison to Open Air Drying and

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>	<u>A C</u>
Tuesday, 26 May Continued	16:00 - 17:00	Mr.
Wednesday, 27 May	9:30 - 10:30	Mr.
	11:00 - 14:30	Mr.
	14:30 - 15:30	Mr.
	15:30 - 16:20	Mr.
	18:30 - 19:00	Mr.
Thursday, 28 May	9:30 - 10:20	Mr.
	11:00 - 14:00	
	14:00 - 14:20	Mr.

T I V I T Y

- ID/WG.296/21 - Economic Evaluation of Control Systems for Kiln Drying Equipment)**
- Plumridge** **State of the Art in the Development of Solar Kilns (ID/WG.338/1)**
- Grebe** **Selection of Appropriate Technologies for Plywood Panel and Veneer Production for Developing Countries (ID/WG.296/13/Rev. 1)**
- H. Eldag** **Introduction to the LIGNA-Fair and First Visit to the Fairgrounds**
- Siller** **Appropriate Machining Technologies in the Production of Log Components for Prefab Wooden Houses (ID/WG.338/8)**
- Grimmer** **Prerequisites for the Economic Evaluation of Flush Door Panel-To-Frame Production (ID/WG. 296/7/Rev. 1)**
- Honeycomb Production for Flush Doors (ID/WG. 296/7/Rev. 1/Add 1)**
- H. Eldag** **Evening Session in the Hotel on Standardization of Wooden Products**
- R. Albin** **Economic Criteria in Planning and Projecting Secondary Wood Processing Industries (ID/WG. 338/6) The document ID/WG.296/4/Rev. 1 - Evaluation of Chip and Dust Exhaust Equipment was also distributed.**
- Visit to the Fairgrounds**
- Reuter** **Preliminary Considerations in Planning Case Good Manufacturing Industries (ID/WG. 296/14/Rev. 1) The following documents were also distributed: ID/WG.296/5 - Fittings and Hardware of Furniture and Joinery Products for Mechanized Setting, ID/WG.296/30 - Modern Upholstery Materials and Equipment,**

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>	<u>A C T I V I T Y</u>
Thursday, 28 May Continued		
	14:50 - 17:30	Mr. Reuter
	17:30 - 18:00	Mr. Winter
	19:30 - 20:00	Mr. H. Eldag
Friday, 29 May	9:30 - 10:00	Mr. H. Eldag
	10:00 - 10:40	Mr. H.P. Helle
	11:00 - 12:20	Mr. Kirchgassner
		Messrs. FESTO

** With consecutive translation by Mr. H. Eldag (informal)

ID/WG.296/26 - Export Products From
Developing Countries for Industri-
alized Countries and ID/WG.296/27 -
Basic Methodologies on Calculating
the Profitability of Investments
as Final Judgement.

Group work based on drawings of a
cabinet unit

Case studies for furniture and
joinery production

Introduction to the "H" - Nail System
for Prefab House Components **

Evening Session at the Hotel on
Standardization of Woodworking
Machines

Introduction to Small and Medium-Scale
Wood Processing Industries Based on
Layout Examples of Existing Plants
Prepared by the Landesgewerbeamt Baden-
Württemberg (ID/WG.296/22 - Planning
of Integrated Wood Processing Indust.)

Service Centres for Wood Processing
Industries in Developing Countries
(ID/WG.338/2)

Pneumatic Systems for Furniture and
Joinery Industries in Developing
Countries (ID/WG.296/2)

Films on the following:

- Application of Pneumatics in
Wood Processing
- Design of a Circuit Diagram

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>	<u>A C T I V I T Y</u>
Friday, 29 May	12:30 - 15:00	Visit to the Fairgrounds
Continued	15:00 - 19:00	Utilization of Forestry and Industrial Waste for Generation of Energy. Presentation of Possibilities of Energy Generation
		(1) Economic Utilization of Wood Waste and its Value for Power Generation in Wood Processing Industries (ID/WG.296/17)
		(2) Considerations on Wood Residue Utilization Within an Integrated Timber Complex (ID/WG.296/10/Rev. 1)
		(3) Multi-Purpose Energy Plans for Small-Scale Forest Industries
		(4) Evaluation of Wood Residues as Energy Sources for Forest Industries (ID/WG.296/31)
		(5) Industrial Manufacturing of Charcoal from Forest and Agricultural Wastes (ID/WG.338/3)
		(6) Equipment for Power Generation Based on Wood Waste Appropriate for Wood Processing Industries in Developing Countries (ID/WG.338/38)
		(7) Energy Resources of Wood Generating Heat from Bio-Mass
		Films on New Technologies: - New Turning Lathe with Shaping Disc - Copy Sanding of Golf Club Heads - Oar and Paddle Copying
Saturday, 30 May	9:30 - 10:30	Visit to the Fairgrounds and Preparation of Assignment Work - Evaluation of Equipment Information for Specific Projects
	11:00 - 18:00	

Outline of Seminar Programme Continued

<u>DATE</u>	<u>TIME</u>	<u>A C T I V I T Y</u>
Sunday, 31 May	9:30 - 10:00	Mr. H. Eljag
	10:00 - 10:30	Messrs. IMBERT
	10:30 - 18:00	
Monday, 1 June	9:30 - 18:00	Messrs. Cody, Paavola Verbestal and Brion
	18:00 -	
Tuesday, 2 June	9:30 - 13:00	
	14:00 - 17:00	
	19:00 -	
Wednesday, 3 June		D E P A R T U R E

Information on New and Improved Machinery
(Country papers collected)

Demonstration on Wood-Gas-Engines and Tractors

Visit to the Fairgrounds and Preparation of
Assignment Work - Evaluation of Equipment
Information for Specific Projects

Presentation of Assignment Work

LIGNA/VDMA Reception at the Fairgrounds

Presentation of Assignment Work

Shopping and Visit to the Fairgrounds

UNIDO Reception at the Hotel Garbsener Schweiz

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5. Programme Arrangements

The final work programme under item 4 consisted of the following:

<u>Subject</u>	<u>Minutes</u>	<u>Percentage</u>	
1) Background Info			
Opening Ceremonies	195	4.0	
Administrative matters			
2) Lectures	880	18.7	} 33.0 = Theoretical Training
3) Films	250	5.3	
4) Evening sessions	60	1.3	
5) Panel discussions	210	4.5	
6) Group work	160	3.4	} 29.7 = Practical Training
7) Plant visits	540 (390) ^{1/}	11.5	
8) Exhibition visits	860 (780) ^{2/}	18.2	
9) Preparation of Assignment work	390 ^{3/}	8.3	
10) Presentation of Assignment work	660	14.0	
11) Sightseeing, enter- tainment, shopping	510 (120) ^{4/}	10.8	
T O T A L	minutes 4,715	100.0	63.0 =
	Hours 78.58 (5.6 hours		Approximate
	average per		Percentage
	day)		Basic
			Training

- 1/ According to the different companies visited, one group spent less time on plant visits.
- 2/ The group travelling to Cologne (INTERZUM-Fair) spend in addition to that time visits to INTERZUM exhibitions.
- 3/ Some participants spent more time on specific evaluation of equipment of interest to them because of their home factories.
- 4/ Those participants who went to Cologne (INTERZUM-Fair) spent less time on sightseeing in Hannover.

Due to experience gained from the 1979 seminar, we arranged the lectures in such a way that they would be interrupted by slides, films, discussions and/or group work. The selection of plant visits was arranged for persons interested in the primary and secondary wood processing industries and according to the special interests of participants and included the following:

A) Integrated Particle Board and Laminating Plant (linked to kitchen Cabinet Production)

Heidapal, Steinheim-Sandebeck: The company visit was arranged in co-ordination with Siempelkamp, manufacturer of particle board equipment. The Heidapal chip board plant was established in 1962 for a daily board capacity of 80 to 100 m³. The capacity could be increased within two years to 250 m³. At present the capacity is some 600 m³ per day. This is a good example for establishing a chip board factory in developing countries.

The chip material used in these boards is based on a 50 to 50 mix of coniferous and broad leaf species. The softwood chip part in these boards is the best condition for long wearing laminated panels. About 10 per cent of the laminated panels flow-in to their own kitchen cabinet plant, which is a highly automated factory.

B) Decorative Veneer Production

Rudolph and Studier, Minden (Westf): The company specializes in the production of sliced veneer. This company demonstrates its own development with slicing machines of the horizontal type with eccentric drive, the vertical slicer, the inclined slicer and the latest development in the contra-acting slicing operation of 80 sheets per minute. It is a good example for developing countries to follow in that it features old machines still operating efficiently along side of very modern equipment.

Flitches are mostly cut on special carriages with a turn-indexing adjustment. Very heavy logs are centre cut by a frame chainsaw, before cut into sizeable flitches. Of special interest was the veneer package line with bundling machine before veneer pack/storage.

C) Particle Board Plant, Laboratories and Board Manufacturing Equipment

BISON-Bähre and Greten: The BISON Company has its own research centre for scientific developments and evaluation of new technologies and processes. Board samples made of annual plant fibres viz: alfa grass, sugar cane bagasse, rice husks, flax slivers, cotton stalks, jute stalks and palm leaves were demonstrated and discussed. A specialised particle board production was shown in a film. Two different chip board lines were demonstrated in the works and at the end of the board mill visit an introduction to the particle board equipment production was given.

D) Glue Lam Manufacturing Plant

Heinrich Kunstin and Son, Hörden (Harz): This company employs 30 workers and is specialized in the production of glued laminated roof trusses which are prefab manufactured for carpentry industry and hall constructions. The lumber is delivered from sawmills, piled for air seasoning in the lumber yard and kiln dried down to 10 per cent moisture content before manufactured for glue lams. This production could be applied for developing countries.

E) Prefabricated Log House Plant

FOUCHS KG, Bad Lauterberg, Odertal (Harz): The production range of this company is prefab weekend houses, hunting huts, horse stables, sauna huts, childrens play houses, etc. The company employs about 90 skilled workers. The development of wooden houses from log huts to modern log houses covers a variety styles from 40 to 100 m² living room area. Wall element cross sections are 70 mm x 140 mm. The lumber comes preferably from the Scandinavian countries. Besides the log components, doors, windows, louver shutters and other interior fittings are manufactured on the prefab base and ready for assembly at the building site. The manufacture of these prefab elements could also be done in developing countries.

F) Sawmill and Lumber Dealers

August Kesemeyer Kg, Elze, FRG: Annual capacity for this company is 7,000 m³ and especially for broad leave logs, 15 per cent is used

for further manufacturing and 85 per cent is for immediate sale. The log break down is done by a gang frame saw and the mill is operated by some 40 workers.

G) Parquetry Factory

Holzwerk Osterwald, Osterwald: This company is specialized in the production of mosaic and strip flooring (preferably oak species).

H) Furniture Factories

Wilhelm Wilkening, Bad Oeynhausen: This is a medium-sized furniture factory with 15 employees specialized in living room furniture (solid wood and panel based). In addition to the standard line they accept special customers orders. This plant should prove of interest to participants from more advanced developing countries as it shows the transition from the usual multi-product system of production to more selective furniture products. The extensive use of jigs and fixtures as well as machining templates should prove of interest to production facilities in developing countries.

I) Joinery Factories

Wilhelm Sunderbrink, Bad Oeynhausen: This is a family owned company specialized in wood and metal joinery (production space some 420 m²) and produces doors, glazed doors, window frames and sashes, shelvings working to order. This plant is quite a model of present day production operations which could be imitated in developing countries. It has 7 employees (2 supervisors, 3 skilled labourers and 2 apprentices). The company is a very example of limited mechanization suitable for small and medium-sized joinery plants in developing countries. The extensive use of jigs and fixtures and frame clamps in the production line should prove worthy of application in similar plants in developing countries.

J) Kitchen Cabinet Manufacturing Plant

Gebrüder Heinz and Werner Beeck: This is a medium-scale furniture factory with 5 workers running automated linked machining lines and specialized in the manufacture of modular and built-in systems for kitchen cabinets. This visit should be good for

stimulating the ambitions of participants from developing countries in regard to future expansion and modernization of their plants.

K) Furniture Factories

Karl Storch, Kirchleugern: This family owned factory operates with 30 workers in manufacturing living room furniture to order. The use of individual specialized machines should be of great interest to participants from developing countries. Of interest was also the assembly technique applied to the different furniture models.

(These four afore-mentioned medium-scale furniture and joinery factories were especially selected because of their production techniques applied either when manufacturing in batches to order or combined batch and order. Individual machines operated with jigs and fixtures can be applied as efficient as linked automated machine lines as it could be compared. Here, UNIDO staff and consultants have to in future give more advice on the batch size to be fixed when running production with different facilities (individual, specialized and/or linked lines). It could really be found out what are the consequences in running highly automated machinery lines in view of the stock transport systems).

L) Woodworking Machine Manufacturer

Franz Torvegge, Bad Oeyenhausen: This company specializes in the production of highly automated equipment for large-scale furniture manufacturing industries. After the visits of small and medium-scale industries the participants should have a view on how to run automated equipment in furniture production. At the end of the plant visit a film demonstrated the use of high capacity machinery.

M) Ancillary Material for Secondary Wood Processing Industries

INTERZUM-Fair, Cologne: Twenty-four participants, 3 observers and two consultants attended the fair for two days. The weekend visit was formerly calculated for 17 participants and 2 consultants,

however, since an extra number were interested we accommodated them all. Mr. Schierhorn of the Cologne Fair Authorities, made rushed arrangements to secure for us 10 additional rooms (two participants from the other group changed their minds after the bus had left for Cologne and so took a train to be able to join the group in the morning of 24 May). The reactions to this exhibition by participants may be summarized as follows:

- (i) Surprise at the wide variety of materials other than wood and re-constituted wood used by the industry, such as those made from metal, plastic and combinations;
- (ii) a growing realization of the extent to which the industry depends on "brought-in" components, their variety and high quality;
- (iii) satisfaction at the discovery of so many sources of supply for hardware, fittings, surface coating materials, upholstery materials, small tools, etc.;
- (iv) surprise at the extent to which the upholstery sector of the industry has become mechanized, particularly in relation to fabric cutting and sewing, cushion preparation, upholstery assembly, procedures for springing and buttoning and materials handling and storage;
- (v) surprise at the large number of suppliers of wood components and at cabinet doors (framed, handled and louvered) cabinet drawer fronts, mouldings, mill work and joinery doors and door frames. This was a sector of export markets which many had thought, up to then, to be the special reserve of developing countries and the one with the greatest potential;
- (vi) Encouragement at finding a number of developing countries participating in the fair.

Many of the participants placed orders for materials and equipment at the fair and established very valuable contacts for future references.

N) Woodworking Machinery, Equipment and Tools for Forestry, Primary and Secondary Wood Processing Industries

LIGNA-Fair, Hannover: This fair is the largest international fair of its kind in the world with 975 exhibitors from 26 countries

and covering a net exhibition space of 83,826 m². Nearly 50 per cent of all of the exhibits are brought from foreign countries. Among the leading manufacturers in these fields are the Federal Republic of Germany (with 521), Italy (with 182), France (with 40), Switzerland (with 35), Austria (with 34), Spain (with 32), Denmark (with 20), Great Britain (with 19), Sweden (with 16), Belgium (with 15), the United States of America (with 14), and Japan (with 7). Also, two developing countries namely, Turkey and Brazil exhibited within the show. As expected, participants derived considerable information and established valuable contacts from their visits to the stands of the various exhibitors and their discussions with them. Many placed orders for machinery and equipment, while others considered offers that were made to them during the course of the fair. Some participants (according to advice given by the author) contacted companies dealing in second hand machinery. They had the opportunity to visit different storage places and to speak with the author about these. They were introduced to the second hand machine evaluation sheets issued by the German Woodworking Machine and Tool Dealers Association. Due to this current nominal value of a second hand machine is calculated by a formula approved by more than 100 tests. The five different value coefficients (multipliers) are:

- the technical obsolescence;
- the age;
- the present condition;
- the present demand;
- the safety.

As there are no comparable evaluation sheets prepared in other countries they requested the translation of the value rating system.

- 0) Group Work on Project Planning: The group work was based on case studies for furniture and joinery products. After an introduction on project planning procedures the participants could prepare their own component development sheets and operation sequence chart. The time was too short to fully explain all aspects however the subject is further perused in the document "Preliminary Considerations in Planning Case Good Manufacturing Plants" (ID/WG.296/14/Rev.1).

Also, participants had the chance to speak with the author about this (in addition to having received the afore-mentioned document) during the evening sessions).

- P) Panel Discussions: The only panel discussion which really activated the interest of participants was that on the "Utilization of Forestry and Industrial Waste for Generation of Energy". Seven speakers introduced the variety of methods of converting wood waste into energy, ranging from boiler systems through steam engines up to wood gas engines appropriate to size and special requirements of a wood processing industry.
- Q) Evening Sessions: As some lectures i.e. Standardization of Wooden Products and Machines were not of interest to all participants, these were cancelled and rather introductions to them were given in the evening sessions based on DIN standards and specifications of certain industry groups.
- R) Assignment Work: Due to the list of assignment subjects (Annex III), 14 groups were established. These were mostly related as far as practicable to the work normally carried out by each participant in his own factory. The work of the groups was carried out in the form of informal discussions among themselves, visits to various stands at the LIGNA and discussions with individual members of the UNIDO consultancy team. Each group was requested to make its presentation on the last two days of the seminar. Actually, only 9 groups were able to present their assignments for the team of consultants (evaluation given in Annex IV).

It is our opinion (because of the scarcity of time) that in future participants should be required to complete assignment work only if they do not have their own specific industry problems to work out. We think it more advantageous for the participant to concentrate on a "real problem" than a fabricated one however we do think that the approach to problem solving is properly outlined in the assignment work.

S) Information on Meetings and Conferences: The Secretary of the Association of the German Wood and Plastic Processing Industry (small and medium-scale) invited the UNIDO Seminar Group to discuss their own workshop problems with their experts. Since a one-to-one participation, however, was not possible the author collect materials from the above and discussed with participants the following:

- Windows made of wood or plastics, requirements for design, production and mounting on the building spot;
- Economic production processes for windows in joinery workshops, size of workshop and market requirements;
- Investment, an important management decision;
- Offer and order/arrangement - on the job work preparations.

The information concerning highlights of the exhibits held at the international congress for secondary wood processing was evaluated by the author and presented to the participants of the UNIDO Seminar as well.

6. Training Programme Evaluation

UNIDO's forms for the evaluation of the seminar (entitled Evaluation of In-plant Group Training Programmes) were completed by 32 participants before the end of the seminar. The replies were collected and details of this are given in Annex V. It is evident the seminar content responded only in part to the needs of the participants given their wide divergence of backgrounds and heavy concentration on furniture production. However, to this extent at least it should be instrumental in the future organization and development of their businesses.

In-plant visits and attendance at the trade fairs were particularly appreciated, the more so because of the willingness of all the personnel encountered to discuss and demonstrate in considerable detail every aspect of their activities, whether technical or managerial, and to answer fully and openly any questions put to them.

Country Papers

A listing of the country papers (now reproduced), their titles and authors is given on the following page.

COUNTRY PAPERS

<u>COUNTRY, NAME AND TITLE OF PAPER</u>	<u>DOCUMENT NUMBER</u> (ID/WG.338/)
<u>Argentina</u>	
Mr. Ricardo del Alamo "The Woodworking Industry in Argentina"	23
<u>Bangladesh</u>	
Mr. K.M.G. Mustafa "The Woodworking Industry in Bangladesh"	25
<u>Brazil</u>	
Mr. Reinaldo H. Ponce "Primary Wood Processing Industries in Brazil"	21
<u>Chile</u>	
Mr. Augustin Morreno "General Information on the Chilean Forest Industries"	20
Mr. Roberto D. Mayer Winter "The Furniture Industry in Chile"	18
<u>China</u>	
Messrs. Huang Yuyan and Wang Xuiexang "A Brief Account of the Woodworking Industry in China"	16
Mr. Tang Peiji "A General Introduction to the Chinese Furniture and Woodworking Machinery Industry"	33
<u>Egypt</u>	
Messrs. Abdallah Ahmed Atia and Younis Mohamed Younis "The Present Situation of the Woodworking Industries in Egypt"	29
<u>El Salvador</u>	
Mr. Jorge Augusto Molina "The Wooden Furniture Industry in El Salvador"	28
<u>Ethiopia</u>	
Mr. Aberra Abebe "The Woodworking Industry in Ethiopia"	26
<u>Ghana</u>	
Mr. William Kofi Ashiabor "The Woodworking Industry in Ghana"	32

Country Papers Continued

<u>COUNTRY, NAME AND TITLE OF PAPER</u>	<u>DOCUMENT NUMBER</u> (ID/WG.338/)
<u>Honduras</u>	
Mr. Ramon Alvarez Lazzaroni "A Quick Look at the Honduras Lumber Manufacturing"	31
<u>India</u>	
Mr. Vinod Chand Mathur "India's Woodworking Industry"	24
<u>Jamaica</u>	
Ms. Marguerite R.D. Orane and Mr. Lloyd Ayrton Davis "The Export Potential of Jamaica's Woodworking Industry"	22
<u>Kenya</u>	
Mr. Owen Mwangola "The Woodworking Industries in Kenya"	27
<u>Mexico</u>	
Mr. Juan Francisco Bueno Zirion "Mexico's Woodworking Industry"	19
<u>Philippines</u>	
Messrs. Eduardo D. Balyut, Manuel R. Jr. Galvez and E. Yrastorza and Ms. Zenaida D. Arce "A Combined Look at the Philippine Furniture Industry"	30
<u>Suriname</u>	
Messrs. Frans Essanjas and Herman K. Jankipersad "Timber Harvesting in the Tropical Rainforests of Suriname"	17
<u>Thailand</u>	
Mr. Pairoj Vichitrananda "Some Aspects of the Woodworking Industry in Thailand"	35
<u>Tanzania</u>	
Mr. Daniel Ndesario Mmari "Tanzania's Woodworking Industry"	34
<u>Uruguay</u>	
Mr. Mayo Cesar Mrmellini Simon "Uruguay's Forest Resources and Consumption of Them"	14

Country Papers Continued

<u>COUNTRY, NAME AND TITLE OF PAPER</u>	<u>DOCUMENT NUMBER</u> (ID/WG.338/)
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Yugoslavia

Mr. Ljubojević Branislav

"Situation of the Wood Industry in Yugoslavia" 15

Zambia

Mr. Sam Chikosola

"Zambia's Wood Processing Industry" 13

There were no country papers requested by participants from Bolivia and Cyprus since they did not receive the instructions to prepare one until just before the seminar began. The documents were informally edited and reproduced in mid-August and one copy of each was sent to each of the participants on 27 August 1981.

7. The Consultancy Service Programme

This was the third time that UNIDO was requested to provide a consultancy service for visitors from developing countries during the LIGNA-Fair. Four consultants were recruited by UNIDO and one consultant from FAO were asked to attend by the German Association in co-ordination with the UNIDO backstopping officer so that the following fields were covered:

	<u>Consultant</u>
- Forestry equipment	Mr. Letourneau**
- Machinery, equipment and toolings for primary and secondary wood processing industries	Mr. Brion and Mr. Eldag (staff member)
- Wood-based panel industries	Mr. Verbestel
- Furniture and joinery industries	Mr. Cody (Team Leader)
- Furniture industries (case goods and chairs)	Mr. Paavola

Because of unforeseen difficulties, Mr. Letourneau (of FAO, Rome) was unable to attend the seminar. **

The UNIDO team was available for visitors from developing countries to advise them on their problems in equipment selection, production technology, etc. The expertise of the team covered practically the complete field of wood processing industry, both primary and secondary.

The consultancy booth of UNIDO/FAO was located in the Service Centre of the LIGNA-Fair, but was manned by the UNIDO team only.

An information sheet of the LIGNA-Catalogue size on the consultancy service activities was prepared by the Fair Authorities and read as follows:

"For the Attention of Visitors From Development Countries

The United Nations Industrial Development Organization has recruited an international team of free-lance consultants to advise visitors from developing countries on their problems in equipment selection, production technology, etc. This four-man team has expertise in all secondary wood processing industries (wood-based panels, furniture, joinery, timber engineered products, miscellaneous wooden articles, etc.).

This advice, which is free of charge, can be obtained from the UNIDO/FAO Consultancy Booth X, Service-Centre during the official hours of the LIGNA-Fair."

In addition to this, two large posters with the same text were fixed to the walls in front of the reception desks for foreign visitors and at the UNIDO/FAO booth itself.

The inquiries dealt with at the stand include the following:

- Selection of equipment for furniture, joinery, and other secondary wood processing industries with given product ranges.
- Re-designing of products for full utilization of existing machinery.
- Information about consulting companies, represented at the LIGNA, with experience in turn-key projects.
- Statistical data related to marketing of certain products.
- Energy generation.
- Co-operation with UNIDO as consulting company or as individual expert.
- Information requests on various activities of UNIDO.
- Availability of UNIDO's assistance to projects in developing countries.
- Requests for literature and other information published by UNIDO.
- Co-operation of wood research laboratories with developing countries.

Besides these and other inquiries that could be answered directly special requests were dealt with once back in Vienna (25 in number). Some 200 man hours of consultancy service were provided for visitors from developing countries and seminar participants in this way.

Two consultants accompanied the participants on their tour of the INTERZUM in Cologne. Mr. J.B. Verbestel prepared as a consultant for wood derived panel production the following short report:

New Particleboard Processes:

During the last years, great specialization of particle board production has developed. Two or three types of wood particle board existed ten years ago, now we have more than twelve (12) types on the market. The machinery makers had to meet this evolution of the market, where the problem concerns the different stages of production. Progress is so fast that a well known machinery producer did not even exhibit a system of continuous thin particle board plant, which two years ago created a sensation. The system, (Mende system) continues nevertheless, to be a success, it is improved even, but it has to give place for new, up-to-date systems.

As the periodical W.B.P.I. comments, the MDF (medium density fibreboard) "strikes the world". All the machinery producers, especially the press manufacturers present at the LIGNA, presented press lines for MDF. The forming stations are roughly the same principle. One of the most attractive is the Pendistor (exhibited in Hall 21). This firm has experience in fibres, due to its relations with firms involved in fibre and pulp preparation, the Swedish Defibrator Company.

Siempelkamp started with the experience collected with Washington Iron Works, inventor of MDF.

BISON presented a reliable system characterized by their usual trend of simplicity.

The press lines for MDF have incorporated a pre-press system in order to reduce the thickness of the pressed mat. A pre-press for particle board was introduced thirty years ago, but was let drop later on. Now the pre-press comes back. The HF (high frequency) heating gained success in the MDF technology. The heating is applied in the form of pre-heating or principal heating. Most of the press manufacturers have introduced the system of pre-heating in their lines. It seems that MDF production will be reserved for fairly large production capacity. A calculation shows that the production costs of one square metre of 19 mm board will be between US\$ 4.40 per cubic metre for 300 tons per day capacity.

The Italian firm Pagnoni presented a press line where dry hard board can be made as well as the normal MDF board. This principle is interesting, but a careful study of the economy is necessary. The process of MDF is quite different from the particle board processes. The particles are machined very fine in chippers. The fibres are obtained from disintegrating machines. The Sunds de-fibrator for fibres is a reliable machine, based on years of experience in this field.

For the particle board production, several systems were presented. The problem for the machinery maker consists in meeting the needs of the different types of board and the different raw materials. One important producer came up with more than 15 different types, and with capacities from a few hundred kilograms to a few tons an hour.

The trend now is to make machinery with good protection against stones, sand, metal pieces, etc. Maintenance was considered, but special attention was given to the operation of changing the knife rings, to complete the operation in the shortest time.

The glueing machines for normal particle board did not display important improvements. Special glue spreading machines have been developed for the wafer board and the strand board production. The glue blending of fibres for MDF is generally executed by the

injection of a low viscosity glue in the fibres and in some places of the air conveyors.

Concerning the adhesive, firms represented at the Fair, are still dealing with the formaldehyde release in particle board production. Today a satisfactory solution to the problem has not yet become available. The molecular composition of the adhesive has been modified but the adhesive itself loses important qualities of hardening. The formaldehyde problem is being studied by several authorities in different countries.

Referring to the press lines in the above consideration of MDF, there is a general trend to the single opening press and a large size in length and width.

Two presses for continuous pressing were shown. The Conti press, invented and built by Küsters has a continuous steel band rolling very small bearings, fixed in a continuous chain. The pressure and the heat are transferred to the steel belt through the rolling chain. Such a crude description is just enough to rise the interest of the reader and to encourage him to ask for complete information. The press operated on a completely new system. The first press is already working in Belgium. Very important features include continuous operation, exact control of the pressing programme and the temperature range and the high accuracy in thickness. The production is about 300 m³ per day.

The new BISON Hydro-press is also a continuous press. An endless steel belt glides both on the upper and on the lower heated platens. This certainly is a very important new development in the press. Compared to the Conti press it is a much simpler system. It is worth further study on the basis of more elaborate information.

In the field of slicing, a new machine has been developed by the C.T.B. (Centre Technique du Bois, Paris). It is a vertical slicer,

working at constant diameter. This gives the possibility of slicing wood of very small diameter, and of producing thick veneers without splitting (10 mm). It is particularly appropriate for the production of wood tiles, sheeting crates and floors.

8. Documentation

8.1 Documentation Provided by UNIDO

In addition to the documentation prepared by the individual lecturers in connexion with their topics, the following UNIDO publications were made available to participants (through a display) and could be ordered for personal copies:

- ID/10 (EFS) Production Techniques for the Use of Wood in Housing Under Conditions Prevailing in Developing Countries
- ID/61 (EFS) Production of Prefabricated Wooden Houses
- ID/72 (EFS) Wood as a Packaging Material in Developing Countries
- ID/108/Rev. 1 + Corr. (EFS) Furniture and Joinery Industries for Developing Countries: Raw Material Input-Processing Technology and Managerial Considerations
- ID/133 (EFS) Selection of Woodworking Machinery
- ID/154 (EFS) Low Cost Automation for the Furniture and Joinery Industries
- ID/180 (EFS) Wood Processing for Developing Countries
- ID/260 (EFS) Executive Directors Report for 1980
- ID/188/4/Rev. 1 (E)
- ID/150 (E) Information Sources on the Paint and Varnish Industry
- ID/144 (E) The Construction Industry in Developing Countries
- SER.D/4 (E) Information Sources on the Furniture and Joinery Industries

8.2 Documentation Provided by Associations or Industries

INTERZUM-Fair 3-Branch Catalogue

LIGMA-Fair International Woodworking Machinery and Tool Catalogue

VDMA German Woodworking Machinery Catalogue

8.2 Continued

FWI German Tools for Wood and Plastic Processing

VDMA's "Who Makes Machinery?"

HILDEBRAND's "Die Schnittholztrocknung" (Lumber Seasoning)

FESTO's "Pneumatics in Woodworking"

IMBERT's "Energiegewinnung durch Vergasung von Biomassen"

SPILLING Consult's "Energy Problems of the Developing Regions"

L G A's^{1/} "Support for Layout of Small and Medium-Sized Firms",
"Wood and Plastic Processing Industries" and
"Planungshilfen, Zimmer und Holzbaubetriebe"

DIN Standards for Wood Products
Standards for Woodworking Machines and Tools

EUMABOIS List of Technical Recommendations for Woodworking Machines
(Annex VI)

R A L's^{2/} "Quality Specifications" on (in German only):

- mouldings
- upholstery materials
- windows
- silos
- particle boards
- case good furniture
- glue lam constructions
- upholstered furniture
- modular built-in kitchen cabinets
- tables

9. Library for Wood Processing Industries

Since some 14 publishing companies exhibited their magazines and journals during the Fair, the German Association provided a list of all companies so that it was easy for the participants to inform themselves of the literature available.

10. Assessment of the Project

The project included the Seminar on Economic Criteria for the Selection of Woodworking Machinery and Plant Systems and the Consultancy Service Programme.

^{1/} Landesgewerbeamt Baden-Württemberg

^{2/} Ausschuss für Lieferbedingungen und Gütesicherung

Certainly the tentative working programme having been modified for actual seminar use was completed despite the fact that some of the participants felt that too much time was devoted to lectures. All lecture documents were distributed to participants well before the beginning of each lecture so that time was given for preparation. As we expected, however, few persons read the lectures ahead of time as it is far easier to become acquainted with the material offered by just listening. Of course, much also depended upon the lecturer himself as to how interesting or uninteresting his topic was to participants.

As mentioned earlier, the lecturer representing FAO, Rome, did not attend the seminar however his document from the 1979 seminar was passed out. Two lectures did, in fact, have to be dropped because of lack of time and for these either the document referring to the subject material was passed out or the information was presented during an evening session (i.e. as in the case of the discussion on standards). Taken as a whole, 33.2 hours were spent on theoretical training (lectures) and some 29.7 hours were spent on practical training (plant and exhibition visits) making the all over average of training time 3.4 hours a day.

Certain of the participants were requested by their industries at home to bring along machinery lists, layout drawings and tooling lists and to ask specific questions about them. These questions were put to exhibitors and also to representatives from a variety of Consulting Firms. Those who had in mind to set up a new plant could be advised to base the selection of machines, equipment and tools on a limited products range, for example. Here we have a justification for having visited the LIGNA and INTERZUM Fairs since one features woodworking machinery and tools and the other features ancillary materials for the wood processing industries. A good understanding of both is necessary in order to select machines for manufacture of lumber and panels and also for choosing of hardware and the appropriate tools for fixing and assembly. Many of the participants were keen to develop KD-furniture, for instance, but first they needed to learn the different technologies applied in the relation of machining appropriate for hardware chosen and the assembly technique.

One could observe in the day-by-day evening discussions with participants that most of them unflinchingly collected material, studied it and formulated new questions from what they had learned from it.

On 2 June 1981, the last day of the Fair and the last seminar day, the author was invited by Dr. Theis, representing the VDMA, and Mr. Rosenbaum, representing the LIGNA-Fair Authorities to discuss the results of the seminar and whether or not it would be feasible to have such seminars in future. Dr. Theis began the meeting by again thanking UNIDO for having organized the seminar and consultancy service (with Mr. D.P. Cody acting as Team Leader). It was mentioned that Mr. Cody's long-term contacts with both the LIGNA and INTERZUM-Fairs rendered it possible for visitors from the developing countries to observe development trends in these specialized fields of wood processing and to apply them through question and answer sessions to the industries in their home countries.

The meeting with the above mentioned gentlemen concluded that both the seminar and consultancy service were conducted in the prescribed manner and that UNIDO will hopefully convene another such seminar during the LIGNA 1983. It was suggested that any proposals to improve the seminar of 1981 should be submitted to the representatives of the Woodworking Machinery Manufacturers Association (VDMA) and to the LIGNA-Fair Authorities as well as the INTERZUM-Fair Authorities at the earliest possible date.

11. Conclusion and Recommendation

Based on the participants own evaluations of the course and the discussions held with the LIGNA organizers, the author is convinced that the course is an extremely useful one and should be repeated in 1983 again in connexion with the international fairs.

Financing of the 1983 project could be handled somewhat differently, according to Dr. Haniel of the German Ministry of Economic Co-operation, who names other sources of financing viz: the CDG (Carl Duisberg Gesellschaft), the BSE (German Foundation for

International Development) under Tit 68502. For further information on financing for the 1983 seminar it was suggested that the Ministry be contacted.

Discussions the author held earlier in the year with the related German Authorities and the CDG revealed the possibility of co-ordinating a seminar with the German Foundation for International Development (at the International Seminar Centre) in Berlin-Tegel. One week would be proposed for examining wood processing machine technologies in Berlin, one week for a visit to the LIGNA and INTERZUM-Fairs and various wood processing industries in the Cologne/Hannover areas and finally one week on projecting product planning and production calculations again in Berlin. Because of budgeting reasons, however, a project of this scale should be formally discussed by the proper authorities no later than end-October 1981.

12. Other Matters

It should be noted that three of the participants required medical assistance because of the drastic change in diet during the beginning of the seminar. Also, one participant contracted Malaria and had to be hospitalized for 2 days in Hannover. The participants kindly paid (through a collection) for the hospital bill of this particular person since there was no money allocated in the budget for such an event.

13. Acknowledgements

The author hereby wishes to express his gratitude to Mr. Weinig, President of the German Woodworking Machinery Association (VDMA) who sponsored the seminar in co-ordination with Mr. Voment, Director of the Hannover Fair and for their aid with the Consultancy Service Programme. Special thanks should go to Dr. H. Theis, Secretary of the German Association and who co-ordinated the preliminary work with UNIDO and Mr. Rosenbaum and his assistant, Ms. Stockhammer, who worked long hours prior to, during and after the end of the seminar to ensure its success.

The author also wishes to thank the officers within the Fairgrounds who directly or indirectly helped with the seminar activities including

the world-wide press coverage we received months before the seminar and for our contact with local press and radio announcers during the course of the seminar.

Thanks too go to Mr. Schierhorn, Conference Services of the ENTERZUM-Fair in Cologne, who co-ordinated our visit to that international exhibit of ancillary materials for the secondary wood processing industries.

Finally, to the lecturers, managers of plants (most especially to Mr. Greume, Director of TORWEGGE Machine Manufacturers who organized the tour guidance for the furniture and joinery industries with visits in and around Bad Oeyenhausen) and all other persons who in some way aided in the success of the seminar, we express our sincere thanks.

The author also wishes to take this opportunity to commend the ever-sound professionalism of the Team Leader, Mr. Desmond P. Cody, in his dealings with the other seminar consultants, the exhibitors at both international fairs and the UNIDO administration.

14. Final Budgeting

After having calculated the seminar budget (under project numbers US/INF/80/161/Rev. II and TF/INT/81/001/Rev. II), the required monies were transferred to the backstopping officer through the Deutsche Bank, Hannover., in the sum of DM 97,903 (approximately US dollars 44,500.13) and were used up locally in Hannover and in Cologne.

The following cash contributions were paid by the German Association (GZF) directly in Hannover:

	<u>US\$</u>
3 bus trips (study tours on 21 and 22 May 1981)	664.00
Seminar secretary - bilingual (travel + per diem + fees)	2,243.50
<u>TOTAL</u>	<u>2,908.10</u>

KEY: ** indicates
having been selected
as observer

SEMINAR ON ECONOMIC CRITERIA FOR THE SELECTION OF WOODWORKING
MACHINERY AND PLANT SYSTEMS, HANNOVER, FRG,

WORKSHEET FOR NOMINATION EVALUATION

ANNEX I

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
ARGENTINA	Mr. Ricardo del Alamo	30.3.81 10.4.81	23.4.81	X		
BANGLADESH	Mr. K.M.G. Mustafa Mr. Abdus A.K.M. Samad Mr. M.D. Idris Mr. Jala Luddin Ahmed	5.3.81	X X X No nom form	X	X	X
BOLIVIA	Mr. Ernesto Guzman Cardenas Mr. Marcello Gutierrez Rojas Ms. Cristobal Roda Vaca Mr. Osvaldo Juan Encinas Blanco Mr. Guillermo Roig**		20.3.81 17.3.81 20.3.81 5 5.81	X X X Late Submission		
BRAZIL	Mr. Reinaldo Herrero Ponce Mr. Joaquim Alves A.V. Neto	21.4.81 16.2.81	30.4.81 No nom form	X		
CHILE	Mr. Augustin Moreno Solar Mr. Roberto Daniel Mayer Winter Mr. Christian Jose Motero Mufios Mr. Sergio Delano Abbot		15.4.81 15.4.81 15.4.81 No nom form	X X	X	

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
CHINA	Mr. Tang Peiji Mr. Huang Yuang Mr. Wang Xuexiang		26.3.81 26.3.81 26.3.81	X X X		
COLOMBIA	No nominations					
COSTA RICA	No nominations					
CUBA	No nominations					
CYPRUS	Mr. George Pasialis		9.3.81	X		

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
ECUADOR	Mr. Diego Carrion	18.3.81	23.3.81			X
EGYPT	Mr. Abdallah Ahmed Atia Mr. Younis Mohamed Younis Mr. Ashraf Lzz El Din Ibrahim	9.3.81		X X		X
	Mr. Mahmoud Awad ** (Did not participate)	6.4.81				
EL SALVADOR	Mr. Jorge Augusto Molina	20.3.81		X		
ETHIOPIA	Mr. Aberra Abebe	3.4.81		X		
FIJI		31.3.81	(Promised but not sent)			

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
GHANA	Mr. Xorlali Kwabla Adipke Mr. William Kofi Ashiabor Mr. Kweku Prah Ghartey Mr. Gariba Awudu		24.3.81	X X	X X	
	Mr. Joseph M. Agbedor**					
GUYANA	Mr. Carlton Collins	12.1.81	8.5.81 (Late submission)			
	Mr. David H. Persram ** Mr. John Agard **					
HONDURAS	Mr. Ramon Alvarez Lazzaroni	28.2.81	27.2.81	X		
	Mr. Angel Murrillo Selva Reina	4.3.81	18.3.81		X	
INDIA	Mr. Vinod Chand Mathur Mr. B.V. Talmar	31.1.81		X	X	
	Mr. Pradeep Jain ** (Did not participate)	23.3.81				
INDONESIA	Mr. Umar Diajaprawira Mr. Is Kandar Masution Mr. M.A. Sanusi	25.3.81	25.2.81 (Late submission)			
	Mr. J. Groenëndiji ** (Did not participate)	30.3.81				

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
JAMAICA	Mr. Lloyd Ayrton Davis Ms. Marquerite Rose Doreen Orane Mr. Guy Anthony Symes Mr. Howard William Cargill Mr. Christian Raebel	1.4.81 14.3.81		X X	 X X X	
JORDAN	Mr. Mohamed Salim Othman	1.4.81	Late Submission			
KENYA	Mr. Owen Mwangola	26.3.81	1.5.81	X		
LIBERIA	No nomination					
LIBYAN ARAB JAMAHIRIYA	Mr. Abubakr Al-Snakshuki Mr. Mahmoud Al-Sheriff	19.5.81	No nom forms			

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
MALAYSIA	No nominations					
MALTA	No nominations					
MEXICO	Mr. Juan Francisco Bueno Zirion	16.4.81	12.5.81	X (Despite late submission)		
MOROCCO	No nominations					
MOZAMBIQUE	Mr. Monteiro Dias Joo Nhampute	3.4.81	No nom form			

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
NIGERIA	Mr. Ehigiamosae Uzamere	16.4.81	Received too late			
PAKISTAN	Mr. Ashig Hussain Sheik Mr. Ba Shir Ahmed Mr. Raza Mehdi **	23.1.81	No nom forms		Both candidates recommended by The World Bank but nominations <u>not</u> submitted by Pakistan Government	
PAPUA NEW GUINEA	Mr. Mark Stephan Mr. E.F. Fitzgerald **	3.2.81	No nom form		X	
PARAGUAY	Mr. Raul Gauto Vielma	1.4.81	No nom form			
PERU	Mr. Charles van Ginhoven Mr. Luis Guillermo Ostolaza	17.3.81	Received too late			

OF

Worksheet For Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
PHILIPPINES	Mr. Alberto L. Morales			X		
	Mr. Eriberto Yraitorza	14.4.81	All nominations received late	X	X	
	Mr. Ruben Eblacas	15.4.81				
	Ms. Zeneida Arce			X		
	Mr. Manuel R. Galvez			X		
	Mr. Raphael Ralph Lapuos				X	
	Mr. Rodolfo N. Navarro			X		
	Mr. Celestino Salvador Santiago	24.3.81				X
	Mr. Benjamin Bacamante			X		
	Mr. Eduardo Baluyut			X		
Mr. Samie Lim **						
SIERRA LEONE	Mr. Lew Alley	27.3.81	Nomination forms received too late			
	Mr. Musa Tambawy					
	Mr. Gbondo	18.3.81				
	Mr. Saidu					
SINGAPORE	Mr. Jmaes Kon Jyh Gang	12.3.81				X X
	Mr. Koj Tee Ooi					
SOMALIA	Mr. Jama Gani Ahmed	1.4.81	Nomination forms received too late			
	Mr. Scerif Aves Nur					
	Mrs. Mohamed Mohamid Addow					

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
SRI LANKA	Mr. Hope O'Neil Todd Mr. Ponnukone Genesis Joseph	1.4.81	No nom forms			
SURINAME	Mr. Frans Essanjas Mr. Herman Koenwarbahadoersing Jankipersad Mr. Gourt Cornetiz Peet ** Mr. H.E. Lenne Vreden ** (Did not participate)	3.3.81 19.3.81	15.4.81	X X		
SYRIAN ARAB REPUBLIC	Mr. Said Nomer	6.4.81	No nom forms			
THAILAND	Mr. Pairoj Vichitrananda	26.3.81		X		
TOGO	Mr. Abgoss Ou Kouanvi	12.4.81	No nom forms			
TRINIDAD AND TOBAGO	No candidates submitted					

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
TURKEY	Cables sent but nominees not named	16.1.81 22.4.81				
UGANDA	No nominations					
UNITED REPUBLIC OF CAMEROON	Cable requesting information but no subsequent nominations	22.1.81				
UNITED REPUBLIC OF TANZANIA	Mr. Daniel Ndesario Mmari	25.3.81		X		
URUGUAY	Mr. Mayo Cesar Armellini Simon Mr. Aurelio del Hebron Gallichio Marzicco	23.4.81		X		X

Worksheet for Nomination Evaluation Continued

COUNTRY	NAME OF PARTICIPANT	NOMINATION		RECOMMENDED	REC./RESERV.	NOT RECOMMENDED
		CABLE ONLY	NOM FORM			
VENEZUELA	Mr. Osvaldo Encinas Blanco	1.4.81	No nom form			
YUGOSLAVIA	Mr. Pero Sulic Mr. Branislav Ljubojevic Mr. Boris Ljuljka		20.3.81	X X	X	
ZAMBIA	Mr. Sam Chikosola		6.3.81	X		

COUNTRIES TOTALED: 5*

NOMINATIONS TOTALED: 91

ANNEX II

Seminar on Economic Criteria for the Selection of
Woodworking Machinery and Plant Systems
Lannover, FRG, from 19 May to 2 June 1981

LIST OF PARTICIPANTS, OBSERVERS AND CONSULTANTS

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Argentina</u>		
Ricardo Del Alamo	Owner/Manager	COMINDEX S.R.L. Chiclana 1085 2000 Rosario (S.F.)
<u>Bangladesh</u>		
K.M.G. Mustafa	Development Officer and Officer-in- Charge	Bangladesh Small and Cottage Industry Corporation DIC, Kustia
<u>Bolivia</u>		
Ernesto Guzman Cardenas	Owner/Manager	Maderera Liner P.O. Box 763 Cochambaba
Cristobal Roda Vaca	Owner/Manager	Cimal Ltda. P.O. Box 700 Santa Cruz
Marcelo Gutierrez Rojas	Purchasing Manager for Latin America	Pittsburgh Bolivia Casilla 4112 Santa Cruz

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Brazil</u>		
Reinaldo Ferrero Ponce	Manager of Wood Processing Plant	IPM Sao Paulo P.O. Box 7141 01000 Sao Paulo S.P.
<u>Chile</u>		
Robert Daniel Mayer Winter	Production Manager	Industria Maderera Fernando Mayer S.A. Avda. General Velasquez 1280 Santiago
Agustin Moreno Solar	Manager	Industria Maderera Moreno Vial Ltda. Lourdes 1681 Santiago
<u>People's Republic of China</u>		
Tang Peiji	Engineer, Chief of Technical Department	Shanghai Municipal Furniture Corporation Jiznxi Jonglu Shanghai
Huang Yuyan	Chief Engineer	Beijing Woodworking Industries Corporation 12 Bei Chizi Street Beijing
Wang Xuexiang	Research Worker for wood drying	Institute of Wood Industries Chinese Academy of Forestry Wan Shou Shan Beijing
<u>Cyprus</u>		
George Pasialis	Assistant Production Manager	Cyprus Forest Industry P.O. Box 4043 Nicosia
<u>Arab Republic of Egypt</u>		
Abdallah Ahmad Atia	Chief of Production and Planning Dept.	Kafr El Gemal Toukh Kalubia

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Egypt Cont.</u>		
Younis Mohamed Younis	Woodworking Mach. Maintenance Specialist	5 Talaat Hart St. Cairo
<u>El Salvador</u>		
Jorge Augusto Molina	Presidente y Gerente Gral.	Muebles Molina Hermonos 4a. Calle Ota. No. 7-4 Santa Tecla
<u>Ethiopia</u>		
Aberra Abebe	Manager, Produc- tion and Technical Services	Warka Furniture Plant P.O. Box 3086 Adis Ababa
<u>Ghana</u>		
Xorlali Kwabla Adikpe	AG. Manager, Carpentry and Joinery	State Construction Corporation P.O. Box 2582 Accra
William Kofi Ashiabor	Director	Kumasi Furniture and Joinery Company Ltd. P.O. Box 300 Kumasi
<u>Honduras</u>		
Ramon Alvarez Lazzaroni	Operations Manager	Maderas Preciosas de Honduras, S.A. P.O. Box 765 Tegucigalpa, D.C.
<u>India</u>		
Vinod Chand Mathur	Development Officer (Engineering)	Directorate General of Technical Development Udyog Bhaven Ministry of Industry New Delhi
<u>Jamaica</u>		
Lloyd Ayrton Davis	Head Furniture Lab	Jamaican Bureau of Standards 6 Winchester Road Kingston 10

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Jamaica Cont.</u>		
Mauguerite R.D. Orane	Managing Director	Douglas C. Orane Ltd. 4 Hanse Pen Drive Kingston 11
<u>Kenya</u>		
Owen Mwangola	Assistant Conservator of Forests (UNIDO Timber Project)	Forest Department Headquarters P.O. Box 30513 Nairobi
<u>Mexico</u>		
Juan Francisco Bueno Zirion	General Manager	IRGSA DM Nacional Calz. San Juan de Aragon 439 Mexico 14, D.F.
<u>Philippines</u>		
Eduardo D. Balyut	Vice President and General Manager	S. Balyut MFG. Ltd. 3801 Cor. Liling Rocas Street Fina Avenue Sta. Mesa Metro Manila
Manuel Jr. R. Galvez	President	Woodflex Philippines Incorporated 2555 Taft Avenue Extension Pasay Metro Manila
Alberto L. Morales	President	Philippine Wood Manufacturers Export Development Association Pasay, Metro Manila Suite 8H Strata 100 Bld. Emerald Avenue
E. Yrastorza	Production Manager	Mehitabel Furniture Incorporated Cebu City Manila
Zenaida D. Arce	President	UNIK International Selecta Drive Quezon City

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Suriname</u>		
Frans Essajas	Production Manager	Suriname Timber State Forest Industries P.O. Box 2980 Paramaribo
Herman K. Jankipersad	Production Manager	Bruynzeel Suriname Hourmaatschappiji B.V. P.O. Box 1831 Paramaribo
<u>Thailand</u>		
Pairoj Vichitrananda	Manager of Dept. of Administration	Thai Plywood Company Ltd. Ministry of Agriculture and Co-operatives Mansion 6 Rajdamern Avenue Bangkok 2,
<u>Tanzania</u>		
Daniel Ndesario Mwari	Woodworking Instructor	Ministry of Natural Resources Forest Division Forest Industries Training Institute P.O. Box 1925 Moshi
<u>Uruguay</u>		
Mayo Cesar Armellini Simon	Technical Manager	Darten S.A. Avenue Rondeau 1908 Esc. 17 Montevideo
<u>Yugoslavia</u>		
Ljubojević Branislav	Head Engineer, Bureau for Preparation of Engineering Institute	COAL SIPAD Sarajevo WO SIPAD-IRC, Centre for Research and Development BOAL "Sumaprojekt" Titova Street 64 Sarajevo
<u>Zambia</u>		
Sam Chikosola	Woodworking Manager	ITT Supersonic (Z) Ltd. P.O. Box 50497 Listone, Zambia

OBSERVERS

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Bolivia</u>		
Guillermo Roig Fachaco	President	Assorado Marabelo Avenue Bauzar 407
<u>Ghana</u>		
Joseph M. Agbedor	Project Consulting Engineer	c/o Spilling Consult-AG 5610 Wohlen Switzerland
<u>Guyana</u>		
John Agard	Engineer (Project and Planning)	c/o Robert Hildebrand GmbH Nürtigen Federal Republic of Germany
David H. Persram	Conservator of Forests	Guyana Forestry Commission P.O. Box 1017 Georgetown
<u>Papua New Guinea</u>		
E.F. Fitzgerald	Chairman	Forest Industries Council of Papua New Guinea P.O. Box 3498 Port Moresby
<u>Pakistan</u>		
Raza Mehdi	Research Assistant	Forest Product Research Division Pakistan Forest Institute Peshawar
<u>Philippines</u>		
Samie Lim	Vice President/ General Manager	Automatic Centre Ayala Avenue Makati Metro Manila

CONSULTANTS

<u>COUNTRY</u>	<u>FUNCTION</u>	<u>MAILING ADDRESS</u>
<u>Belgium</u>		
Jean B. Verbestel	Owner	Scientific and Technical Consultant for Wood Industries J. Van Maerlant Street 8500 B-Kortrijk
<u>Finland</u>		
Pekka J. Paavola	Head, Department of Wood Technology	Lahti Institute of Technology (Training College Stahlberginkatu 10 15110 Lahti 11
<u>Ireland</u>		
Desmond P. Cody	Senior Partner	Desmond Cody and Associates Industrial Consultants Leopardstown Road "Bunneyconnellan" Co. Dublin
<u>Philippines</u>		
Horatio P. Brion	Chairman	Expertise Industrial Corporation 29 Linaw Street San Francisco del Monte Quezon City Metro Manila

ANNEX III

TOPICS FOR ASSIGNMENT WORK

1. Objectives

The organizers of the seminar draw great importance to this part of the programme. The participants activity in preparing and presenting assignment work in small groups contributes in solving the problems according to conditions prevailing in the country of each participant. Such work will also facilitate the exchange of views and experiences between participants.

2. Methodology

Early in the course participants have to indicate their interest in at least two and no more than four of the following topics: The economic criteria in selecting machines and equipment for the manufacture of:

- (a) Lumber and sawn goods
- (b) Plywood and veneer
- (c) Flush doors
- (d) Louvered shutters and doors
- (e) Prefab house components
- (f) Kitchen cabinets
- (g) Solid wooden school furniture
- (h) Plywood or upholstered chairs
- (i) Parquetry
- (j) Furniture and joinery products

Evaluation of equipment for:

- (k) Dust and chip exhaust
- (l) Lumber kilns
- (m) Forestry
- (n) Selection of ancillary material
- (o) Energy generation

Details of the technical specifications of each product have to be drafted by participants.

Groups will be formed and group leaders chosen. On the last two days of the seminar each group will be given two hours to present its work. They will be requested to determine and evaluate the type of equipment they recommend for the production process, draft a layout of machines selected, and prepare a machine and equipment list to explain in detail the evaluation criteria.

Participants will have to visit the LIGNA Exhibition and a specialized group will visit the INTERZUM Exhibition to obtain technical and economic data on the various types of machines available on the market.

The UNIDO staff and the experts of the Consultancy Service Centre will be available throughout the duration of the Fair to guide the groups in their work. They will also have the possibility of discussion technical problems with the various lecturers.

In presenting their group's work, the group leaders are encouraged to make full use of the audio-visual material.

3. Specifications for the assignment work

3.1 Selection of machinery and equipment for sawmills

Draft a lay out, select machinery and equipment for log break-down.
Log input: 10,000 m³ per year of tropical species

Log dimension: Maximum diameter 120 cm
Average " 80 cm
Maximum length 6 m
Minimum " 2 m

Tentative cost: US\$ 80,000

Output: Sawn lumber according to European standards - 25 per cent of lumber will be kiln dried. Select a lumber kiln for the following conditions: Red wood species (Sapeli, etc.) 25 mm thick, length 6m, initial moisture content 20 per cent (air seasoned) and final moisture content 12 per cent (kiln dried).

3.2 Selection of machinery for plywood and veneer production

Draft a lay out, select machinery for a plywood plant and a sliced veneer plant.

Log input: 10,000 m³ per year of tropical species

Log dimension: Maximum diameter 120 cm
Average " 80 cm
Maximum length 6 m
Minimum " 2.5 m

Manufacture of plywood: 2,000 m³

Panel size: 4' x 8'

Thickness: 3, 5, 8, 12, 16 mm (average 5 mm)

Manufacture of sliced veneer: 1,000,000. m²

Length: up to 3 m and Thickness: 0.8 mm

4. Selection of machinery for flush door production

Draft a lay out, select machinery for a flush door manufacturing plant.

4.1 Production capacity

50 flush doors per day application of appropriate technology for small scale industries - Tentative costs US\$ 50,000.

4.2 Production capacity

150 flush doors per day application of intermediate technology for medium sized industries with the view of doubling the production within 2 or 3 years.

Choose the appropriate raw material based on low grade lumber and/or using off-cuts (waste material) - Tentative costs US\$ 150,000.

5. Selection of machinery for the production of Louvre shutters and doors

Select and evaluate machines available on the market and calculate the production capacity based on the average size for:

Louvre shutters: height 142 cm
width 70 cm
Louvre doors height 210 cm
width 100 cm

The production area is 60 m x 25 m. Machines are laid out in a way that the hall can be extended to install further facilities for a production increase according to market requirements. The first stage includes labour intensive facilities.

6. Selection of machinery for the production of kitchen cabinets

Draft a lay out, select machinery for the production of KD kitchen cabinets based on a modular system.

The case good material should be plastic laminated.

The doors should be of solid wood (paneled doors, slatted doors or louvered doors).

The production is based on 45,000 cabinet units per year - Tentative costs at US\$ 25,000.

7. Selection of machinery for the production of school furniture (pupils chairs, desks and college desks)

Draft a lay out, select machinery for the production of solid wooden school furniture.

Production capacity: chairs 20,000 per year
desks 40,000 per year

The plant is to use air seasoned tropical species.

Machinery and equipment has to be chosen appropriately for labour intensive manufacturing processes.

Tentative costs of machines at US\$ 50,000.

8. Selection of machinery for the production of solid wooden chairs with and without upholstered seats and backs

Draft a lay out, select equipment for the manufacture of 10,000 chairs per year.

The production is based on solid wooden frames made of tropical species.

4,000 chairs are of upholstered type
5,000 chairs are of solid wood only (seats and backs are glued-up stock)
500 of these chairs have carved components

Tentative costs of machinery at US\$ 50,000.

9. Selection of an appropriate lumber kiln for a furniture and joinery plant

List wood species.

Capacity per month in m³.

Lumber dimensions: length in metre
thickness in mm (minimum-maximum-average)

9. Cont.
Kiln loading facilities (lorry, forklift, etc.)
Heating system to be provided or available?
Choice of manual or automatic control?
Will prefab or brick built chamber be installed?
Compare different kiln operation systems.
10. Small scale wood processing industries
- 10.1 Selection of machinery for prefab house components (wall units, parti-
tions, roof trusses, etc.) - (17 Employees)
Production range: Wall units and partitions: 40 per cent
Joinery products: 40 per cent
(wall cladding, stair treads)
Roof trusses: 20 per cent
(with possibility of using nail plates)
Extend the building and facility so that wooden bridges and jetty
production could be included.
- 10.2 Selection of machinery, tooling and equipment for a plant manufacturing
furniture and joinery products
Manufacturing range:
Individual furniture, small batches of furniture and flush doors and
paneled doors.
Number of employees: 1 manager
1 foreman
4 skilled labourers
8 unskilled "
Prepare according to the lay out the machinery, tooling and equipment
list.
Calculate FOB prices for: machinery
toolings
additional equipment
dust exhaust equipment
compressor and equipment
11. Selection of machinery and equipment for the manufacture of strip
flooring (parquetry: tongued, grooved and matched)
Production capacity: 500 m² per day tropical species.
Grade packaged per square metre.
Parquetry strips to be machined according to standardized sizes.
Tentative cost of machines at US\$ 100,000,- (185,000,000,-)
12. Selection of equipment for forestry
Describe your logging site and select appropriate felling, logging,
and skidding equipment.
Compare individual and/or combined equipment for logging, skidding and
road building.
13. Selectioa of small-scale equipment for the cottage industry
Describe the present work on wood in the cottage industry and suggest
the use of power driven tools to facilitate cottage work.

ANNEX IV

EVALUATION OF ASSIGNMENT WORK

Key: 3 satisfactory
2 requires improvement
1 unsatisfactory

ASPECTS	I	II	III	IV	V	VI	VII	VIII	IX
	Kin Dyer (found Furniture plant	Swami K.D.	Kitchen Cabinet Plant	Flush Doors 50 units per day	Veneer and plywood plant	Furni- ture and joinery plant	Forest- ry e- quip- ment selection	Parquet Floor Plant	Hand- crafts
Group leaders:	J. Davis	Lazaromni	Bueno/ Galvez	Ashabor	Vichi- tramma- da	Baluyot	Ponce	H. Orane	Hustafa
Research and Preparation	3	3	3	3	2	3	2	3	2
Technical Content	2	3	3	2	2	2	2	3	3
Cost benefits Ratio	3	2	2	2	2	1	1	3	1
Management Content	1	1	1	1	1.	1	1	3	1
Appropriateness to Developing Countries	3	3	3	3	2	3	2	3	2
Presentation (oral, visual aids, etc.)	1	3	3	3	1	3	2	3	1
Employment context	1	3	2	3	1	2	1	2	2
Marketing context	1	2	2	1	1	1	1	2	2
Provision for training and maintenance	1	2	1	2	1	1	1	2	2

ANNEX V

SUMMARY OF RESULTS
GROUP TRAINING PROGRAMME EVALUATION

I. PRE-COURSE INFORMATION:

1. How was the introductory information you received in your home country presented: (please mark an x in the suitable column)

	<u>Sufficient</u>	<u>Not sufficient</u>	<u>Missing</u>
Aim of the training	<u>26</u>	<u>3</u>	<u>0</u>
Content of the programme	<u>28</u>	<u>2</u>	<u>1</u>
Level of the programme	<u>20</u>	<u>7</u>	<u>3</u>
What, if any, other information do you feel should have been included:			
None	<u>29</u>		
Hotel information	<u>2</u>		
Routes to host country	<u>1</u>		

2. How many weeks before the beginning of the training programme did you receive the following information:

Information about the programme:	No answer	<u>1</u>
	Two weeks or less	<u>6</u>
	Three to five weeks	<u>5</u>
	Six to ten weeks	<u>16</u>
	More than ten weeks	<u>2</u>
Being accepted to the programme:	No answer	<u>2</u>
	Less than two weeks	<u>14</u>
	Two to five weeks	<u>15</u>
	More than five weeks	<u>1</u>

Comments:

No comments	<u>17</u>
Need earlier notice of acceptance	<u>12</u>
No formal reply	<u>1</u>
No answer	<u>2</u>

II. PROGRAMME CONTENT AND ORGANIZATION:

3. What is your opinion of the total duration of the course?

Too long 0 Just right 25 Too short 6

If not "Just right", what, in your opinion, would be the most suitable duration for the course?

No answer 25
Four weeks 6
Four and a half weeks 1

Comments:

No comments 24
Time too short 6
Time for personal needs too short 2

4. State your opinion about the daily schedule:

Too heavy 8 Just right 21 Too light 0

Comments:

None 18
• No free periods 3
Too many topics 2
More factory visits instead of lectures 5
No time to read papers before lectures 2
Identify lectures for mandatory or optional attendance 1
Heavy schedule 1
Better choice of hotel room would help 1

5. Would you suggest any changes in the general nature of the training programme?

No answer 7
No change 3
More and/or better plant visits 5
Better planning and organization of Seminar 12
Better accomodations 1
More social activities 2
More free time for participants 2
Technology in printing 1

6. Do you feel that the training corresponded to your professional needs?

To a very large extent	<u>3</u>
To a large extent	<u>12</u>
To a sufficient extent	<u>16</u>
To a small extent	<u>1</u>
To a very small extent	<u>0</u>

Please comment:

None	<u>14</u>
Improvement on programme	<u>7</u>
Satisfactory	<u>1</u>

7. Please give your opinion about the study visits (if any):

None	<u>6</u>
Very good	<u>8</u>
Good	<u>4</u>
Language barrier problems	<u>1</u>
Choice of plants visited poor	<u>3</u>

Please suggest other study visits that might have been valuable:

None	<u>11</u>
Improve plant visit programme	<u>7</u>
Include upholstery and polishing machines	<u>2</u>
Visits to furniture show-rooms	<u>1</u>
Visits more relevant to needs of participants	<u>2</u>

8. What do you think of the general level of the training?

Much too high	<u>0</u>	Too high	<u>2</u>	Adequate	<u>25</u>
Too low	<u>3</u>	Much too low	<u>0</u>		

Comments:

None	<u>15</u>
Satisfactory	<u>8</u>
For improvement of programme	<u>6</u>
Others	<u>3</u>

9. Which subjects of the programme did you find most valuable?
(please state reason; for example new subject, my speciality, relevant to my work, new information, etc.)

Subject:	Planning integrated wood processing industry	7
	Pneumatics	5
	Product components process development	3
	Machinery selection and plant lay-out	3
	Fibreboards	
	All other topics received one or two votes each	
	No answer	3
Reasons:	New information	9
	Relevant to current activities/work	17
	Other reasons	8
	No answer	3

10. Which subjects of the programme did you find least valuable?
State why (for example too elementary, inadequate instruction, irrelevant to my work, etc.)

Subject:	Pre-fabricated houses	3
	Primary wood processing	5
	None, all subjects valuable	1
	All other topics received one vote each, eg.:	
	Production and process flow	
	Quality control	
	Sawmilling and particle board manufacturing	
	Energy	
	Woodworking tools	
	No answer	7
Reasons:	Not relevant to present work	8
	Lecturer could not be understood	3
	Others	14
	No answer	7

11. Were there in your opinion any relevant subjects that were not adequately covered in the programme?

Yes 12 No 13 No answer 1

If yes, what did you miss?

Economics of selecting machinery	<u>5</u>
Financing methods of import of machinery	<u>2</u>
Upholstery and polishing	<u>2</u>
Hardware use techniques	<u>1</u>
Energy Development and re-cycling	<u>1</u>
Others	
No answer	<u>7</u>

12. Which changes would you have preferred in the methods of instructions?

	<u>No changes</u>	<u>more</u>	<u>less</u>
a) lectures	<u>14</u>	<u>3</u>	<u>10</u>
b) group work	<u>15</u>	<u>12</u>	<u>2</u>
c) demonstrations	<u>7</u>	<u>19</u>	<u>0</u>

Comments:

None	<u>11</u>
More group discussions	<u>6</u>
More audio-visuals	<u>2</u>
More reas case studies	<u>3</u>

13. How did you find the general standard of the instructor with respect to:

	<u>i)Command of English</u>	<u>ii)method of instruction</u>
Very good	<u>19</u>	<u>16</u>
Rather good	<u>5</u>	<u>11</u>
Fair	<u>5</u>	<u>2</u>
Poor	<u>1</u>	<u>1</u>
Very poor	<u>0</u>	<u>0</u>

Please comment:

None	<u>26</u>
They tried to explain in simple English	<u>2</u>
Visual aids useful	<u>1</u>
Less reading of lectures needed	<u>1</u>

14. Did you have sufficient time for professional exchange of views with:

	<u>i) the programme staff</u>	<u>ii) fellow participants</u>
Yes	<u>19</u>	<u>24</u>
No	<u>9</u>	<u>9</u>

Comments:

None	<u>23</u>
No time	<u>4</u>
More discussions with speakers	<u>1</u>
More lectures read	<u>2</u>
Good exchange	<u>3</u>

15. How much did you benefit from these exchanges of views with:

	<u>i) the programme staff</u>	<u>ii) fellow participants</u>
A great deal	<u>9</u>	<u>9</u>
Much	<u>13</u>	<u>13</u>
Somewhat	<u>6</u>	<u>6</u>
Little		
Not at all	<u>1</u>	<u>1</u>

Please comment:

None	<u>25</u>
No time	<u>1</u>
Views exchanged with other participants mostly during mealtime	<u>3</u>
Seminar staff tried hard to explain matters to be understood	<u>2</u>

III. RELEVANCE AND APPLICABILITY:

16. Did you find the contents of the programme relevant to conditions in your company (institute)?

To a very great extent	<u>3</u>
To a great extent	<u>16</u>
To a sufficient extent	<u>12</u>
To a small extent	<u>2</u>

Please state why:

No answer 17
Lectures were mostly on large
scale operations and primary
wood industry, not relevant or
hardly applicable to developing
countries 4
Relevant to present work 9

17. Do you feel that by participating in this training programme you have benefitted professionally?

To a very great extent 8
To a great extent 8
To a sufficient extent 19
To a small extent 1
To a very small extent 0

Please state why:

No answer 22
Will help in present job 10

18. Do you think that you will have an opportunity to apply your newly acquired knowledge and experience in your present job?

To a very great extent 8
To a great extent 6
To a sufficient extent 17
To a small extent 2
To a very small extent 0

Please state the difficulties that you expect to meet if any:

No answer 24
Information received not relevant
to present job 1
Inputs needed not available in
developing countries 3
Reluctance of some manufacturers
in developing countries to change
their ways 11
Needs adjustment period 11

19. Will you be in a position to transfer your acquired knowledge to others in your home country?

- To a very great extent
- To a great extent
- To a sufficient extent
- To a small extent
- To a very small extent

20. How will this transfer be done?

- a) In day-to-day work with colleagues and subordinates
- b) In specific training activities inside present employment
- c) In specific training activities outside present employment

What difficulties, if any, would you expect to meet?

- No answer
- No difficulty
- Demonstration aids needed
- Problem of adaptation to local conditions

IV. SOCIAL ASPECTS OF THE PROGRAMME:

21. Please state your opinion about the leisure time activities organized by the programme staff:

- No answer
- Very good
- Good
- Not efficient
- Very poor
- No leisure time, at all

What additional activities would you have appreciated?

- No answer
- More sports and fellowship activities
- Introduction of participants to one another on first day
- More plant visits
- Learn host country's language
- More discussions with lecturer
- Brief city/country tour in between session days
- No additional activities

22. Please give any comments you choose on aspects not adequately covered by this questionnaire:

No comments	<u>19</u>
More organization needed	<u>6</u>
Need for more practical work	<u>2</u>
More consideration for health and welfare of participants	<u>2</u>
Generally useful	<u>2</u>

TECHNICAL RECOMMENDATIONS

A./ STANDARDIZATION OF CLASSIFICATIONS

- A.1. Technical classification of woodworking machines and auxiliary machines for woodworking (six languages).

B./ STANDARDIZATION OF ACCEPTANCE CONDITIONS

1. General conditions.
2. Single blade circular saw benches. 12.131.36.
3. Surface planing machines with cutterblocks. 12.211.11.
4. Thickness planing machines with rotary cutterblocks 12.212.
5. Spindle moulding machines. 12.311.
6. Planing machines for 2, 3, 4 side dressing. 12.22, 23, 24.
7. Combined surface planing and thicknessing machines. 12.31.
8. Table band sawing machines. 12.121.51.
9. Slot mortising machines. 12.531.1.
10. Chain mortising machines. 12.521.1.
11. Single spindle boring machines. 12.41.
12. Routing machines. 12.315.12.
13. Turning lathes. 12.61.
14. Two, 3, 4 side moulding machines 12.32., 33, 34.
15. Double end tenonning machines 31.13.
16. Veneer pack edge shears 11.52.
17. Single blade stroke circular sawing machines for ripping 12.131.31.
18. Circular sawing machines with travelling table (dimension saw) 12.131.372
19. Double edging precision circular sawing machines 12.132.34.

C./ STANDARDIZATION OF COMPONENTS

- C.2. Spindle diameters for woodworking machines with rotating bored tools.
 3. Diameters of wheels for table band sawing machines
 4. Integral circular cutterblocks with detachable blades, retained by wedges for woodworking machines.
 5. Circular saw spindles : collars & sleeves.

D./ STANDARDIZATION OF CHARACTERISTICS OF MACHINES

- D.2. Working level heights for woodworking machines.
3. Minimum working widths and depths capacities.

E./ STANDARDIZATION RELATIVE TO THE TOOLS

- E.2. Relation of dimensions of thin blades for integral cutterblinks.

F./ SAFETY

- Recommendations for safety on 24 woodworking machines. (1971)

G./ TERMINOLOGIES

- G.1. Single spindle moulders 12.311.
2. 2, 3, 4 side moulding machines 12.32,33, 34.
3. Combined surface planing and thickmessing machines 12.31.
4. Surface planing machines 12.111
5. Thickmessing machines, one side - 12.212.
6. Table band saws 11.5
7. Band resaws 12.121.11
8. Single blade circular saw benches 12.131.36
9. Chain mortising machines 12.521.1
10. Slot mortising machines 12.531
11. Routing machines 12.315.12.
12. Log band saws vertical 12.121.121.
13. Frame clamps 31.21.
14. Overhead belt sanding machines 12.722.1.
15. Overhead radial saws 12.131.122
16. Multi spindle boring machines 12.42.
19. Multi blade circular sawing machines 12.132.34
20. Veneer pack edge shears 11.52
21. Universal tool and cutter grinding machines 55.7
22. Grinding machines for band saw blades 55.11.
23. Curtain coating machines 34.22.
25. Veneering presses, hand loading 31.331.1.
26. Single blade stroke circular sawing machines for ripping 12.131.21.
27. Crosswise veneer splicing machines 31.119.2.
28. Veneer slicing machines 11.421.

- 29. Mortising machines with oscillating tool action 12.5.
- 30. Multipurpose machines for assembling with adhesive and machines for production of cone stock from laths 83.12.
- 32. Turning lathes 12.6.
- 33. Simple end edge bonding machines 83.15.
- 36. Circular sawing machines with travelling table (dimensions saws) 12.131.072.

I./ NOISE

Recommendation for measurement of airborne noise emitted by woodworking machines (1980) Draft.

NOTE - Copies are available on request

Most of these documents are published in the review :

BOIS ET MACHINES - WOOD & MACHINES - MAQUINAS Y MADERA - HOLZ UND MASCHINEN
7, rue des Alpes -
CH-1201 GENEVE

ANNEX VI

PROJECT-SEMINAR BUDGET ^{1/}
(HS/INT/80/161 and TF/INT/81/001)

For 36 Participants:	Calculated Budget (US \$)	Actual Expenditures (US \$)
Travel	72000	64979.33
Excess Baggage	6120	5200.95
Per Diem	48600	37232.50
For 4 Consultants:		
Travel and Per Diem	8500 (8500)	5648.50 (8834.31)
Lectures	2000	1967.27
Solar Kiln Bibliography	1800	2400.00
Safety Regulation Manual	1800	1400.00
Local Bus Travel	1000	2777.50
Travel to INTERZUM (Hotel Accommodation plus terminal expenses)	(2448)	(1569.28)
Sundry (Stationary)	300	
UNIDO Reception	600	611.63
Transport of Seminar Documentation	1000	604.06
Travel of UNIDO Staff	1070 2220	1582.87 1645.78
Miscellaneous	990	804.75
TOTALS	148000 (10948)	126855.14 (10403.59)
GRAND TOTALS	<u>158948</u>	<u>137258.73</u>

NOTES:

Numbers in brackets refer to Trust Fund monies.

The DM expenses were calculated at an exchange rate of 2.2 per 1 US\$. (Based on the status of receipts and computer print-out of August 1981).

^{1/} This is not the final budget calculation as the project has not yet been financially completed (i.e. operationally completed) by the Budget Section.



