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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Distr.
RESTRICTED
ODG/R.1/Rev.1
18 December 1986
ENGLISH

IN-DEPTH EVALUATION OF SEMINARS ON FURNITURE AND JOINERY INDUSTRIES
US/INT/85/156

Evaluation report*

Prepared by the United Nations Industrial Development Organization

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

The furniture and joinery industry training seminars have provided effective training to 364 people from 64 developing countries. The seminars have had a significant impact on the senior furniture/joinery industry manager level participants. This group represents approximately 79 per cent of those trained.

Questionnaire returns from 31 countries and field visits in three countries have indicated that the seminars have increased seminar participant interest and ability to recognize situations where modern production methods can improve their respective furniture/joinery operations. Apparently most management personnel have tried to apply knowledge gained towards improving their production plant efficiency and modernize production methods. Optimal application of this knowledge was however not observed in the countries visited. To improve this a more in-depth training approach in both technical and managerial subjects is recommended for future programmes. To supplement this an in-plant consultancy follow-up system is also recommended. This will maximize programme impact in the factories.

The training programme has benefitted a large number of industrial personnel over 14 years. To benefit an even larger group in a shorter timeframe more courses should be given every year. To accomplish this detailed recommendations on how to transfer the Lahti Seminar training package and know-how to the developing country regions are provided in this report.

Least developed countries with their special requirements could benefit from in-country training programmes. Recommendations on how to carry out such programmes are included in this report.

Finally it is recommended that UNIDO should produce a study on human, institutional and financial resources available worldwide to meet developing countries furniture/joinery training needs. This would help ensure that all training activity in this area is better co-ordinated.

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1. INTRODUCTION

1.1 Purpose and Brief History of the Training Programme

Among the various activities to implement UNIDO's programme of assistance to the furniture and joinery industry in developing countries, UNIDO, in co-operation with the Government of Finland, conducted three week training seminars on the furniture and joinery industries in Lahti, Finland, on a yearly basis from 1971 to 1983 (except in 1976). A similar training course was also conducted in Réduit, Mauritius, in 1984.

The objective of these seminars was to give the participants an insight into efficient industrial serial production and modern techniques of the furniture and joinery industries. The achievement of this objective was expected to serve two purposes:

- (a) to enable the participants to identify methods for modernizing and rationalizing their manufacturing operations, and
- (b) to identify the pre-requisites for the establishment and sound development of this industry in developing countries.

The very nature of the seminar's prime objective indicate that it was intended and designed for the top ranking executives or entrepreneurs of the furniture and joinery industry as the main beneficiary of the courses, since it is they who are in the best position to use and disseminate the knowledge thus gained.

The first seminar was held in Lahti in 1971 when a total of 47 countries were invited by UNIDO to nominate candidates. The participating Governments nominated 51 candidates, of whom 33 were qualified to attend. However, only 19 participants coming from 18 developing countries actually attended the first Lahti seminar.

The course content changed very little from 1971 to 1983; while the number of countries invited increased to a maximum of 75 (in 1982). the highest number of nominees, 107, was submitted by 62 countries in 1983. The first of such seminars held outside of Finland was conducted in Mauritius in 1984. 55 countries were invited to nominate candidates to the 1984 seminar. A total of 101 candidates were nominated, of whom 49, representing 16 developing countries, actually participated during the seminar.

All in all, a total of 364 participants completed the 13 courses conducted in Mauritius and Lahti. The participants came from 64 developing countries.

1.2 In-depth Evaluation Purpose and Scope

The seminars have been, for the most part, subject to mid- and end-term evaluations carried out by a UNIDO staff member of the Agro-Industries Branch, in collaboration with the Lahti Director. These evaluations were at the "process" level, i.e. they were used to assess the response of the participants to the overall conduct of the seminar, etc., technical content and method of training.

These evaluations were based on the analysis of completed opinion-rating questionnaires and/or interviews carried out during or at the end of the seminar programme. Additionally observations made during group assignments gave a certain amount of feed-back on the amount of knowledge absorbed by the group.

While findings and recommendations stemming from process evaluations have been useful, it was determined by FINNIDA and UNIDO that the time had come for a more comprehensive and independent in-depth evaluation exercise to assess the value of these seminars in terms of their objectives, design, implementation, outputs and most important the utilization and impact of the new knowledge and skills obtained by the participants at the plant level in their home country.

FINNIDA and UNIDO also wanted the evaluation to make recommendations on:

- The need for similar training programmes in the future, if any;
- The objectives of such training programmes;
- The scope and content of these programmes, selection of topics and types of activities;
- Target groups: countries, organizations, level of participants;
- The organizational arrangements of the training;

- Course venue, length of the programme, recruitment procedures and training methods;
- Follow-up and evaluation practices;
- Supplemental, alternative training activities, process, procedures and/or follow-up programmes, if appropriate.

(Detailed Terms of Reference for the in-depth evaluation of the Seminars on Furniture and Joinery Industries are in Annex I.)

1.3 Evaluation Mission Proceedings

The evaluation team consisted of Mr. Friedrich Blanz, Training Consultant from Finland and Team Leader; Mr. Horatio Brion, Furniture Industry Consultant from the Philippines; and Mr. Hans H. Heep, Evaluation Staff member, UNIDO. The team was substantively and logistically supported by FINNIDA in Helsinki, UNDP field offices in Mauritius, Tanzania and the Philippines, UNIDO field representatives in Tanzania and the Philippines and the UNIDO Programme Backstopping Officer, Mr. Antoine Bassili, in Vienna.

Structured interviews and discussions were held with personnel from the following organizations: FINNIDA, Helsinki; the host training institute, Lahti Technical Institute, Lahti, Finland; model factories in Lahti; UNDP officers in all three developing countries visited; relevant Government departments; developing country training institutes; chambers of industry, and the furniture industry itself (see Annex II for a list of persons met and organizations visited).

During the field mission the structure and content of the final report was discussed and agreed upon and the mail questionnaire field tested. The evaluation report was finalized during October after the questionnaire returns had been tabulated and analysed.

The mission was constrained by not being able to:

- visit Latin America;
- attend an on-going seminar.

The former constraint will make it difficult to assess the situation in Latin America; however, a comparison of the questionnaire responses from

other regions with those from Latin America has enabled the team to conclude that their findings and recommendations probably apply to this region as well.

The latter constraint has made it very difficult for the mission to assess the actual conduct of the seminar and the knowledge gained by the participants.

Summary of the mission activity

I. Field Mission Phase:	12.05 - 15.06 1986
Vienna	1 week
Helsinki - Lahti	1 week
Tanzania	1 week
Mauritius	1 week
Philippines	1 week
Singapore	3 hours
II. Individual analysis and report preparation	3 weeks
III. Final Analysis - Round-up in Vienna:	29.09-08.10.1986
Evaluation Report completion	8 days
Presentation of findings and recommendations	1 day

1.4 Field Study and Questionnaire Survey

The evaluation team was able to proceed as set out in the terms of reference (Annex I). Thus, the first part of the evaluation was to personally interview during the field trip as many former participants of the Lahti and Mauritius Seminars as possible. At the same time the team visited the work places of the participants to assess the extent to which they were permitted and able to use the knowledge gained from the seminars. The second major phase of the evaluation was to send a written questionnaire to all participants who have attended the seminar either in Lahti or in Mauritius and to analyse the questionnaire returns (see Annex III for the questionnaire format).

The number of participants interviewed during the field study represented 44 per cent of the seminar participant population in these countries. This figure is high enough to give a reasonably reliable picture in these countries. The short time of one week allowed in each country did not make it possible to contact people who may have been more difficult to reach. Table 1 shows the participation in the interviews in each country.

The structure of interviews although more or less the same during the whole field trip was continuously refined during the trip. The changes were made mainly in the answer alternatives provided in the questionnaire. The idea was to develop an easy to comprehend form, with answer alternatives on a simple scale and with adequate intervals between each step. There is good reason to say that the interview form finally reached the stage where the reliability and the validity are high enough for a reasonably scientific and statistically significant survey.

TABLE 1

Field Study Interview Participation

<u>Country</u> <u>Seminar location</u>	<u>Attended the</u> <u>seminar</u>	<u>Interviewed</u>	<u>%</u>
<u>Mauritius</u>			
In Lahti	16	7	44
In Mauritius	24	10	42
Total	40	17	43
<u>Tanzania</u>			
In Lahti	10	5	50
In Mauritius	1	1	100
Total	11	6	55
<u>Philippines</u>			
In Lahti	31	12	39
In Mauritius	3	2	67
Total	34	14	41
<u>Summary of three countries</u>			
In Lahti	57	24	42
In Mauritius	28	13	46
Total	85	37	44

The final version of the questionnaire was sent to all former seminar participants in 64 countries, except for those already interviewed during the field trip. The final distribution of the forms in the field was carried out by the local UNIDO/UNDP office in each country. To carry out the forgoing analyses, questionnaire returns from 64^{1/} participants, which is only 19.4 per cent of the total number, were available. There are probably two main reasons for the low response rate. Firstly, it is possible that the person never got the questionnaire and secondly, the person was not motivated enough to send his opinion and finally, the inefficient mail system in many developing countries. Table 2 shows a break-down of the survey participation from each country.

For more than half of the countries surveyed (34), no participant responded. Most of these countries have had only a few participants, and these might have been difficult to locate. However, Colombia, Ghana, Indonesia and Singapore are countries with more than 10 participants each but with very few responses. A positive example is Chile, where all 5 participants have answered the questionnaire.

1/ Thirteen more completed questionnaires were received after this analysis for a 23.6 per cent overall response rate. The response rates for individual countries improve as follows:

Additional responses received:

3	Colombia	from 6.6% to 26.6%	1	Panama	from 0% to 50%
1	Cuba	from 0% to 33.3%	1	Philippines	from 15% to 20%
2	Ghana	from 7% to 21.4%	1	Solomon	from 0% to 100%
1	India	from 37% to 50%	3	Turkey	from 0% to 100%

TABLE 2

Responses to mailed questionnaire survey by country

COUNTRY	NUMBER OF PARTICIPANTS IN QUESTIONNAIRE SURVEY	NUMBER OF ANSWERS	%	COUNTRY	NUMBER OF PARTICIPANTS IN QUESTIONNAIRE SURVEY	NUMBER OF ANSWERS	%
ANT	1	0	0	MAL	4	1	25
ARG	3	0	0	MDV	1	1	100
BGD	7	0	0	MAT	4	0	0
BAR	2	0	0	MAU*	23	3	13
BOL	1	0	0	MEX	9	2	22
BRA	11	4	36	NEP	3	0	0
BUR	3	1	33.3	NIG	6	1	8
CMR	4	0	0	PAK	3	2	66
CPR	6	4	66	PAN	2	0	0
CHI	5	5	100	PAR	2	2	100
COL	15	1	6.6	PHI*	20	3	15
COS	4	1	25	SAM	2	0	0
CUB	3	0	0	SIL	5	3	60
CYP	5	0	0	SIN	17	0	0
ECU	6	2	33.3	SOI	1	0	0
EGY	6	0	0	SOM	2	0	0
ETH	9	2	22	SRL	7	3	43
GAM	1	1	100	SUR	3	0	0
GHA	14	1	7	SWA	3	0	0
HON	4	1	25	SYR	3	1	33
HOK	2	1	50	URT*	5	0	0
IND	8	3	37	THA	7	3	43
INS	13	1	8	TON	1	0	0
JAM	6	1	17	TUN	1	0	0
IRQ	4	0	0	TRI	1	0	0
JOR	4	0	0	TUR	3	0	0
KEN	6	0	0	UGA	3	0	0
ROK	4	0	0	URU	5	1	20
KUW	1	0	0	VEN	4	0	0
LEB	2	0	0	VIE	1	0	0
LES	2	0	0	ZAM	7	4	57
LIB	1	0	0	ZIM	4	2	50
MLW	4	3	75				
				TOT	329	64	19.4

* Figures exclude those participants who were interviewed, where an overall 50% response rate was achieved

Total participation in the field study and questionnaire survey is summarized in Table 3. The countries have been grouped to cover Africa, Asia-Pacific, Latin America and Middle East. The number of answers is roughly the same in each group, except for the Middle East, where only 1 person out of the 25 participants responded. For the Middle East it will be impossible to draw any survey conclusion.

TABLE 3

Total Participation in the field study and
questionnaire survey by region

<u>Region</u>	<u>Number of participants</u>	<u>Number of answers</u>	<u>%</u>
Middle East	26	1	3.8
Africa	94	25	26.6
Latin America	86	20	23.2
Asia-Pacific	158	56	35.4
<hr/>			
Total	364	102	28.0

Table 4 shows the distribution of returns for each seminar year. Surprisingly, the difference between the number of answers for each seminar year is not big. The number of replies received from participants from the early years 1971-73 is not significantly lower than of those from the years 1981-82. Not surprisingly, the 1983 seminar in Lahti and the 1984 seminar in Mauritius have the highest figures.

TABLE 4

Total participation in the field study and
questionnaire survey by year attended

<u>YEAR</u>	<u>RESPONSES</u>	<u>SEMINAR PARTICIPATION</u>	<u>%</u>
1971	4	19	21.0
1972	7	25	28.0
1973	6	27	22.2
1974	5	25	20.0
1975	5	26	19.2
1977	8	30	26.7
1978	2	22	9.1
1979	8	31	25.8
1980	10	30	33.3
1981	6	23	26.1
1982	6	29	20.7
1983	13	28	46.4
1984	22	49	44.9
<u>TOTAL</u>	<u>102</u>	<u>364</u>	<u>28.0</u>

The position in the organization or factory of those who participated in the field study and questionnaire survey is presented in Table 5.

TABLE 5
Hierarchical position of participants in field study and
questionnaire survey by region

Region	Owner, General Manager or Director		Middle Management		Supervisor Level		Others		Total
	No.	%	No.	%	No.	%	No.	%	
	Africa	7	33.3	12	57.1	2	9.5	-	
Asia-Pacific	28	50.0	13	23.2	5	8.9	10	17.9	56
Latin America	12	63.2	4	21.0	2	10.5	1	5.3	19
Total	47	49.0	29	30.2	9	9.4	11	11.5	96
Total partic. in seminar	153	42.0	65	18.0	54	15.0	91	25.0	364

The table shows that the sample of those who answered is good, because the different levels of participants are adequately represented. The response from the owner/general manager level, the main target group, was particularly representative. Latin American respondents were of the highest management level (63 per cent from the top level). From Africa the middle management level was represented by 57 per cent while the top level represented only 33 per cent.

(The statistics also show that 83 respondents (81 per cent) still have the same employer as during the seminar.)

Evaluation levels

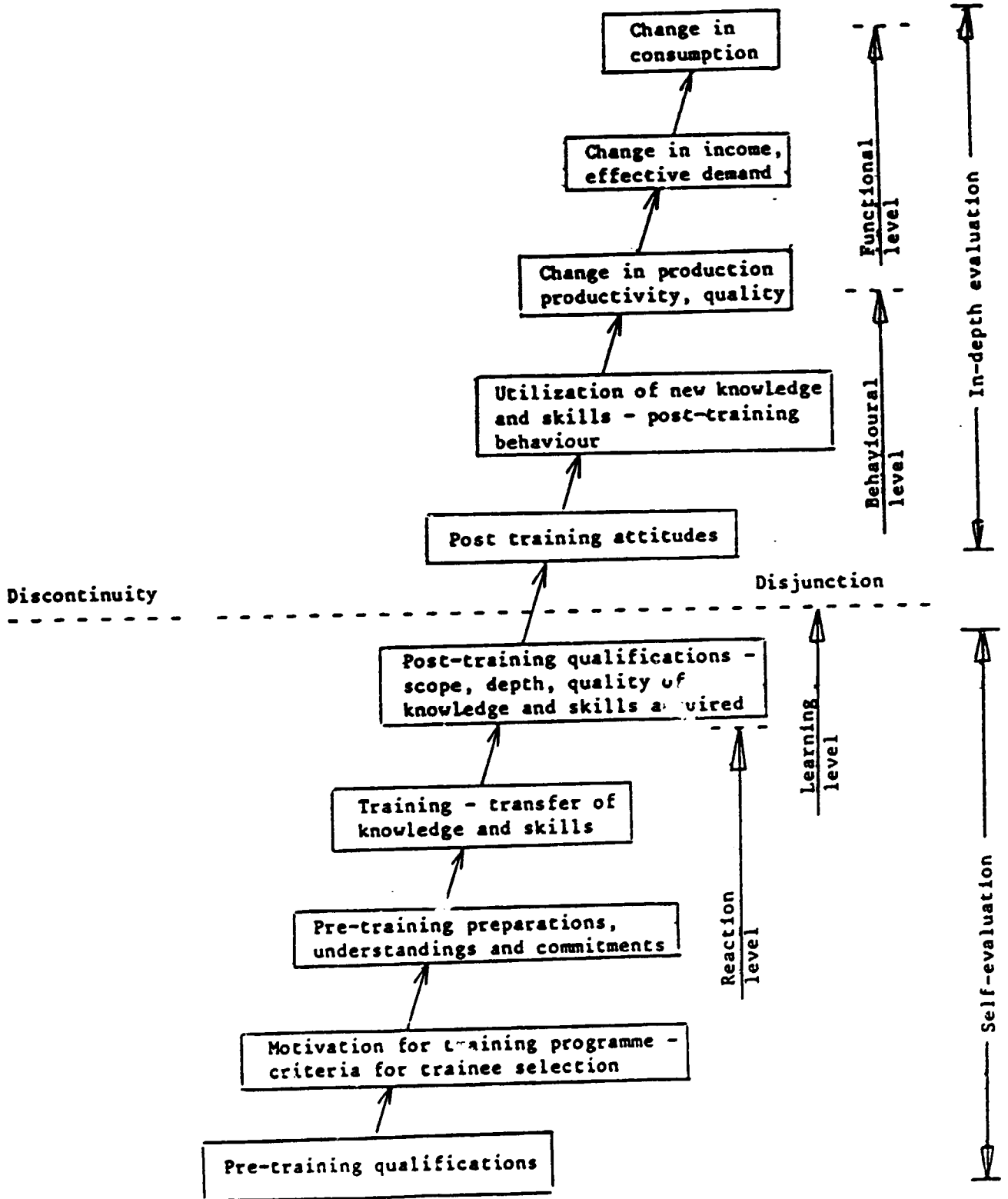
The evaluation of the Lahti Seminar, as of any training programme, can be done on four different levels, namely

- reaction level
- learning level
- behavioural level
- functional level.

These levels and their connection with training process are shown in Table 6. The source is the UNIDO "Manual on Project Design and Evaluation", UNIDO/PC.31/Rev.1.

TABLE 6

"Logic" of a UNIDO Training Project



An attempt to evaluate at the reactive and learning level was carried out during and immediately after the seminar by the organizers, and the results were well presented in the final reports prepared by UNIDO after each seminar. An evaluation of the learning and the behavioural levels has been attempted during this evaluation through oral and written interviews. An assessment of the behavioural and partly of the functional level was attempted by the evaluation team during the visits to the factories. These observations were made on the practical improvements or changes that were undertaken by the participants. These changes could involve improved production lay-outs, changed production techniques, improved product quality or any other changes in production or management practices. This is an important test of the ultimate value of the seminar. Project results could only be observed by the team in the three countries visited out of a total of 64 countries. This is important for the reader to keep in mind when interpreting the evaluation results and recommendations made later in the report.

CHAPTER I

TRAINING PROGRAMME IDENTIFICATION AND FORMULATION

A. Objectives of the Training Programme

For the 1984 Mauritius Seminar, the Development Objective of the Seminar was stated to be: "To improve the level of the furniture and joinery industries in developing countries".

The 1982 Seminar had no development objective statement in the document since such a statement is not required by UNIDO for "special purpose donor projects".

The 1984 Seminar Objective statement reads as follows: "To train 50 managers and/or owners of furniture and joinery plants in developing countries in modern technology and production methods".

The 1982 Seminar Objective stated: "The proposed seminar is intended to give the participants an insight into efficient industrial serial production and modern techniques of the furniture and joinery industries. A double purpose will be served: methods of modernization and rationalization

of the wood processing sector will be highlighted, and secondly, the prerequisites for the establishment of this industry in developing countries on a sound basis will be identified."

The above statements give the reader an idea of the purpose of these seminars. Improved statements of objectives are suggested under Chapter I, Part C below.

B. Socio-economic, Infrastructure and Institutional Setting of the Training Programme

1. State and classification of the Wooden Furniture and Joinery Industries of Developing Countries

The highly fragmented nature of the wooden furniture and joinery industries in developing countries makes it an almost impossible task to collect reliable statistics on the industry in most developing countries. Industry leaders claim that official data on the industry are incomplete and not very reliable for the following reasons:

- (i) Except in a handful of developing countries, information on the furniture industry reflects a mixture of statistics on all types of furniture products (wooden, wrought iron, tubular metal, moulded plastic, etc.);
- (ii) Except in a few small developing countries, the number of establishments reporting to pertinent government agencies represents less than 50 per cent of the industry in the country; and
- (iii) Only a few developing countries use international standards when reporting information on the industry, thus making the data available from developing countries difficult to compare.

An estimate of the training needs of the industry in the developing countries of the world, therefore, can only be made through an approximation of the actual needs.

Figures 1, 2 and 3 (see pp. 20-22) place the furniture and joinery industry of developing countries in three categories.

The group that composes up to 60 per cent to 70 per cent of the industry in a developing country (in terms of number of establishments) is the "family-type" which operates on an artisan level of production (see Figure 1). It is generally characterized as follows:

- (i) Each establishment usually has 10 or fewer workers, but may expand to 20 or more workers at peak sales periods through the temporary hiring of carpenters on a sub-contract basis;
- (ii) The establishment usually has only a few basic woodworking machines (jointer, thickness planer, table saw, etc.);
- (iii) Materials are purchased as needed, so that there is almost no inventory;
- (iv) The workshop is usually located under or adjacent to the residence of the owner/manager;
- (v) Goods are produced only on an "as ordered" basis and the selling staff is composed of the wife (or a near relative) of the owner/manager, who usually also handles the design aspects of the sale; and
- (vi) "Poor housekeeping" practices predominate in the workshop, which with the absence of serial production, leads to very low productivity.

On the other end of the industry profile there is the very small group of establishments which have graduated from the workshop to the factory level of operations (see Figure 3). These firms comprise about 10 per cent to 15 per cent of the known establishments in the industry in countries such as Indonesia and Malaysia, and as many as 20 per cent to 25 per cent of the registered firms in countries such as the Philippines and Thailand and some countries in Africa. Many developing countries in Africa and the Pacific Area, however, may only have one or two factories developed to this level, or none at all. Most usually, the firms in this group have been exposed to modern production techniques as a result of direct participation by, or technical advice received from, foreign entities and/or consultants. These firms, in general, have the following characteristics:

- (i) Serial production is practiced to a major degree;
- (ii) The influence of family-type operations is totally erased as a result of more extensive delegation of authority by the owner/manager to professionals hired to do the job;

- (iii) There is a remarkable degree of specialized machine utilization;
- (iv) Good "housekeeping practices" facilitate smooth and orderly flow of goods-in-process;
- (v) The importance of adequate and timely supply of production materials and supplies is recognized and put into practice through the maintenance of an adequate inventory of the items;
- (vi) Products are mostly sold from inventory, although there are still a few types of goods produced on an "as ordered" basis;
- (vii) Marketing is given as much importance as the manufacturing aspects of the firm's operations; and
- (viii) Production operations have reached the "rigid mass production"^{2/} stage. Rigid mass production is the stage of development where in some cases these firms are able to export their furniture or joinery products.

The middle group (see Figure 2) is composed of very small factories which make up 15 per cent to 20 per cent of the industry in a developing country. The factories in this category have started to move away from the artisan level of operations, and have typical characteristics which fall in between the extremes which describe the "family-type" and most advanced groups of furniture/joinery products manufacturing establishments. This is the group which has a good potential for further development and has the most need for training and external technical assistance. Approximately 12,000 firms are operating at this level throughout the developing world.

^{2/} Canela, E. "Production Management for the Furniture and Joinery Industries in Developing Countries", UNIDO, ID/300, Vienna, 1983.

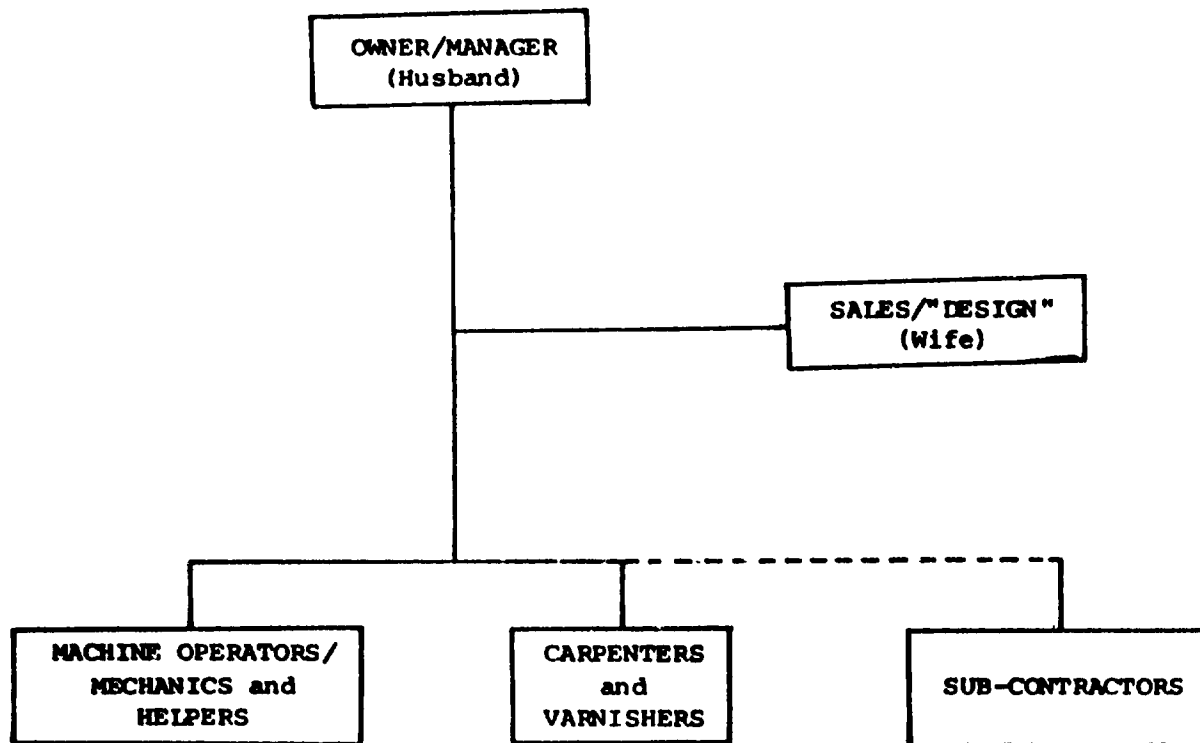


Figure 1
BASIC ORGANIZATIONAL SCHEME OF
"FAMILY-TYPE" FURNITURE/JOINERY PRODUCTION SHOP IN DEVELOPING COUNTRIES
ARTISAN LEVEL

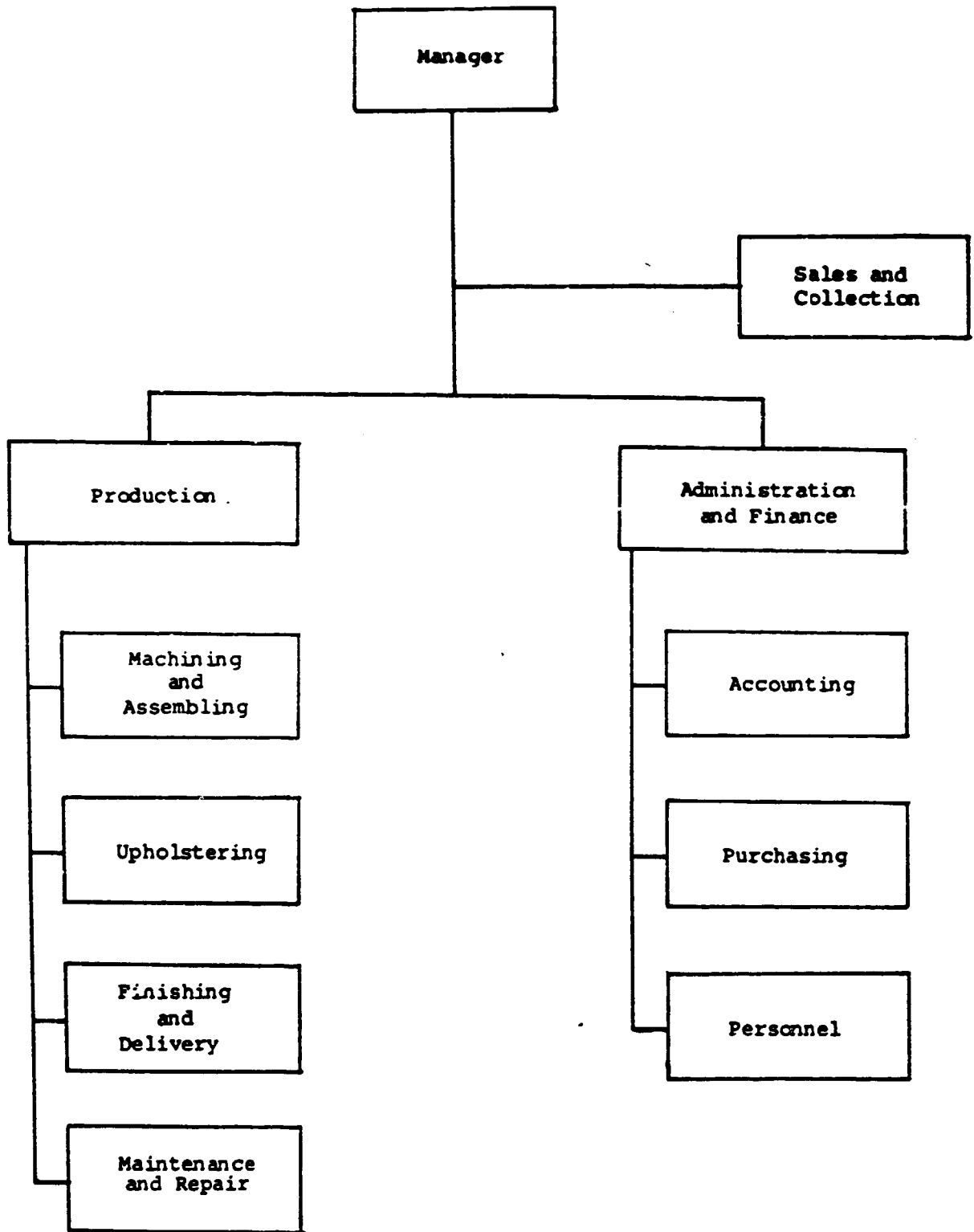


Figure 2

TYPICAL ORGANIZATIONAL SCHEME OF
MODERATELY DEVELOPED FURNITURE/JOINERY MANUFACTURING FIRMS
IN DEVELOPING COUNTRIES

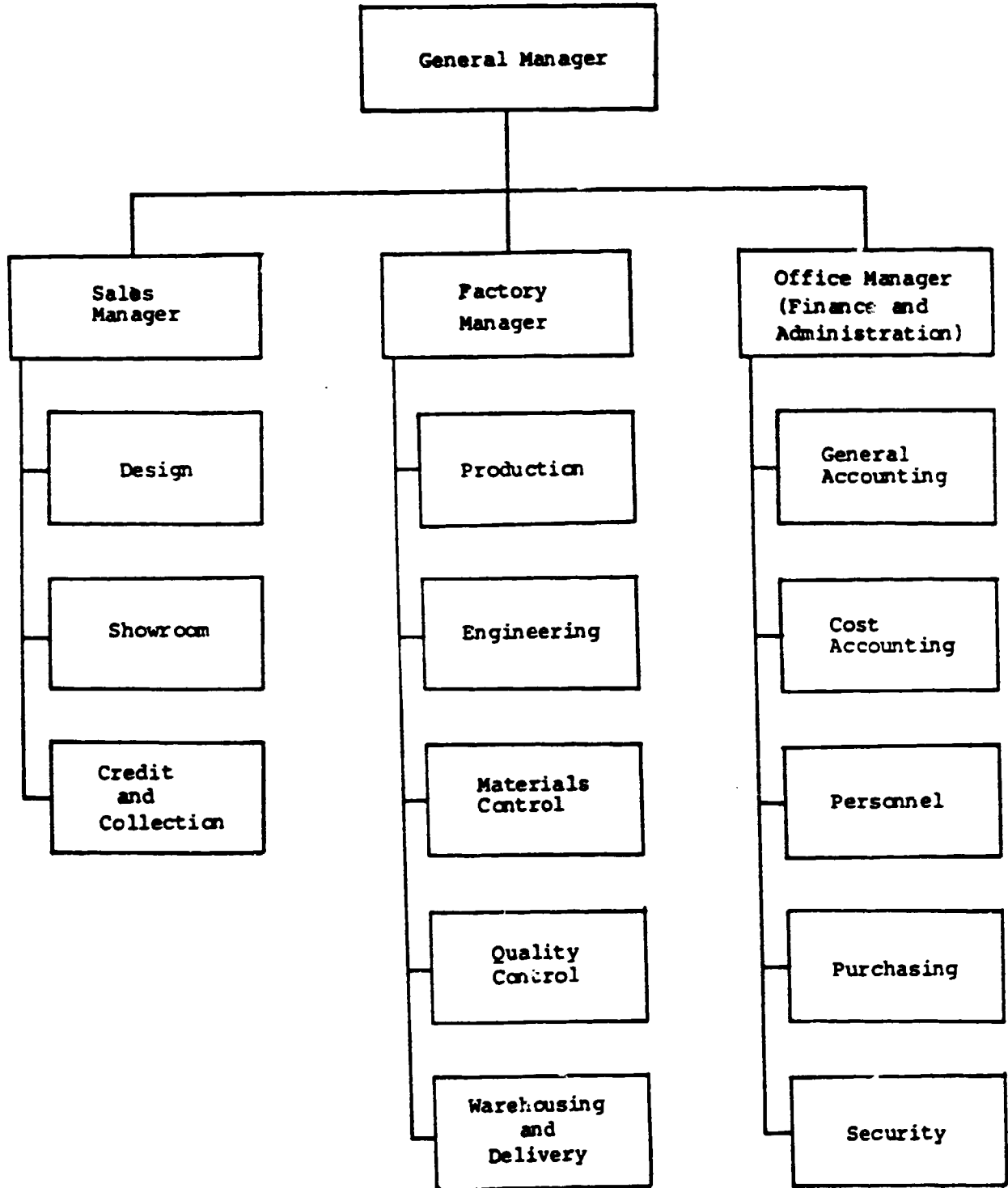


Figure 3

TYPICAL ORGANIZATIONAL SCHEME OF
THE MOST ADVANCED FURNITURE/JOINERY MANUFACTURING FIRMS
(WITH PREVIOUS FOREIGN ASSISTANCE/PARTICIPATION)
IN DEVELOPING COUNTRIES

2. Industry problems and specific training needs

During the evaluation, the participants were asked about the problems of the furniture and joinery industry in their respective countries. The return analysis covers 98 participants responding to this question. The problems related to production management (inventory control, production scheduling, manning, etc.) were cited as the predominant problems in the participants' countries. This is followed to an almost equal degree by problems arising from unsatisfactory choice, inappropriate use and poor maintenance of machinery and equipment; and those brought about by ill-trained labour, compounded by the absence of or, if it exists, a poorly-trained middle management. Problems related to the supply of materials, such as poor quality, high prices and unreliable availability were cited as the next most pressing group of problems of the industry in the participants' countries.

The inability of the entrepreneur to cope with the above-listed problems has been aggravated or compounded to an alarming degree by problems that are related to unsatisfactory and inefficient product design and quality and lack of financial resources, which result in high production costs and consequently high prices. In the face of these adverse conditions it is therefore understandable that a good number of the respondent participants (17) have recognized that they have marketing problems.

Of the 98 participants who responded to the question on what topics they think UNIDO should organize for further training, 64 gave two or more topics while 31 gave only one topic each. The general distribution of the topics is listed below.

TABLE 7

Topics for which UNIDO should organize further training

<u>Topics related to</u>	<u>No. of positive responses</u>	<u>% of total respondents</u>
(a) Production operations	61	62.0
(b) Product type and marketing	41	41.8
(c) Management	35	35.7
(d) Industrial plant engineering	26	26.5
(e) Other fields	13	13.2

The participants wished to have more UNIDO training assistance in their manufacturing operations including industrial plant engineering. Management-, product-, and marketing-related topics also received a significant number of requests for UNIDO assistance in future training activities.

Another aspect which increases the training need is the growing interest of the furniture industry to enter into the international markets. This will require better product design, quality control, marketing management and other similar improvements.

The training needs can be classified according to the size of the factory, to the organization level, to the production technology or to the ratio between domestic and international selling of the products. Thus the owner of a small-scale private factory needs training in all aspects, including management skills, technology, design, quality control, etc. The production manager in big factory with serial production can concentrate in production problems. His training needs are narrower but deeper than those of the owners of small-scale enterprises.

3. Fullfillment of Training Needs through the Training Seminars and by other Organizations

Referring to the description of the state and problems of the furniture industry, it is easy to draw the conclusion that there are great training needs in each developing country in the furniture industry. This was true in the beginning of 1970's, when the training project started, and it is even more true now after 15 years. Even if this project as well as several other training activities, have covered a considerable number of factory owners and other staff, it still is a small number compared with the key personnel requiring training in the whole industry.

The intended role played by the project in meeting all those training needs has obviously been mainly to teach the owners, general managers and production managers about new technology opportunities, so that their factories can better compete both on the domestic and international markets. This may involve transferring new ideas in improved production line processes, more economical manufacturing and an overall better understanding of serial production requirements.

When selecting the participants for the Lahti Seminar, the organizers made almost no difference between different countries or between private and government factories. The main selection criteria included that the participant hold a senior management position in the middle group of moderately developed firms in the furniture and joinery industry (see page 19, paragraph 2).

It is difficult to find out what the role of the Lahti seminar has been in comparison with the other training given for furniture industry, internationally or inside the countries. There is no information source or survey report, as far as the evaluation team could find out, which could give a full picture of the range of training programmes for the furniture industry available.

UNIDO has organized several high-level seminars that were more or less complementary to the Lahti Seminar. Several of the participants in the Lahti Seminar had also attended some of these UNIDO seminars. The mission's small statistic shows that 18 of the 101 participants in our surveys had attended at least two UNIDO seminars (see Annex IV for a more complete description of UNIDO activities).

TECHNONET Asia, based in Singapore, and composed of subscribing members from developing countries in Asia and the Pacific and a few industrially advanced nations like Canada and the USA, has organized training seminars for the furniture and joinery industry in ASEAN countries since 1978. Two to three-week technical workshops, closely similar to the Lahti and Mauritius seminars in general objectives, have been conducted twice each in Malaysia, Thailand, Indonesia and the Philippines. These workshop training courses however laid emphasis on the concept of "Technical Co-operation between Developing Countries (TCDC)".

Japan, through the Japanese International Co-operation Agency (JICA) has provided assistance to the training needs of developing countries in Asia. The assistance has been given in the form of laboratory testing and woodworker demonstration machinery. The Japanese Government has also provided financial support for training seminars (or courses) on furniture and joinery conducted in Bangkok, Manila, Jakarta and Singapore.

In the Philippines the UP-ISSI (University of the Philippines - Institute for Small-Scale Industry) has organized both research and training for furniture industry.

Research work of the UP-ISSI included:

- Studies on export potentials for furniture and joinery products;
- Comparative studies between local and foreign furniture and joinery industries;
- Case studies on management; model schemes; and industry profile for the furniture and joinery industry;
- Evaluation of the impact of low-cost automation applications in the industry;
- Feasibility studies on industry potentials;
- Industry surveys.

Training activities covered:

- In-house/in-plant seminars on selected aspects of the industry;
- Application of low-cost automation to the furniture and joinery industry;
- Export marketing for small entrepreneurs.

There are also training programmes which cover several industries and which therefore have also covered various aspects of the furniture industry. A good example is PRODEC (Programme for Development Co-operation) from the Helsinki School of Economics. They have organized, among other courses, a Training Programme on Export Marketing for the Small Entrepreneur in the Philippines, with 10 furniture exporters among the participants.

Other professional training received by participants

72 participants (70 per cent of total respondents) gave definite answers to the question on what other professional training they had received. The rest of the participants (30 per cent) did not answer the question at all. Of the 61 participants (60 per cent) who said they had had other professional training, 35 had had training in more than one instance, while the rest, 26 participants had training only in one aspect. The majority (97 per cent) of this additional training was in fields related to furniture and joinery industry and covered only specific aspects of the topics presented at the Lahti course. Most of the training was intended for floor level supervision or to provide technical skills in particular aspects of manufacturing (or wood processing) operations. The Lahti Seminar, however, provides an overview and management perspective of all furniture and joinery manufacturing aspects required to modernize production operations (see Annex V for an indicative list of furniture and joinery related training received by those participants who responded to this question).

Availability of training

There were 50 institutions and Government agencies which were listed by participants as providing training services to the furniture and joinery industry in their respective countries. Except for the institutions listed below, all the other institutions mentioned provide training services only at vocational or trades and crafts levels.

<u>Furniture/Joinery industry-oriented training institutions in developing countries</u>	<u>Location</u>	<u>Courses taken by responding participants</u>
1. Instituto Tecnológico de Costa Rica	Cartago, Costa Rica	Tool maintenance, lumber grading, wood drying, structural design
2. Lilongwe Technical College	Lilongwe, Malawi	Machine woodworking
3. National Institute of Design	Ahmedabad, India	Furniture design
4. F.E.T.E.P.	Sao Bento do Sul Sta. Catarina, Brazil	Course for foremen and supervisors
5. Industrial Training Centre	Beau-Bassin, Mauritius	Advance course in woodworking
6. Design Centre of the Philippines	Manila, Philippines	Furniture design
7. Technological Training Centre, National Cottage Industry Development Authority (NACIDA)	Marikina, Metro Manila	Furniture production course (basic, advance)

In addition to the above list, the following are industry-oriented institutions visited by team members during the mission, or during the exercise of their respective professions, and which provide training services for personnel of the furniture/joinery industry:

<u>Name of institution</u>	<u>Location</u>	<u>Courses/services offered</u>
Institute of Small-Scale Industries, University of the Philippines	Quezon City, Philippines	Management; Productivity; Low-cost automation; Costing techniques
Forest Products Research and Industry Development Institute	Los Baricos, Laguna, Philippines	Kiln-drying; Sawn filing and knife grinding; woodwork machinery

<u>Name of institution</u>	<u>Location</u>	<u>Courses/services offered</u>
Furniture Development Division, Industrial Services Institute	Bangkok, Thailand	Kiln-drying; woodworks machinery; furniture testing; furniture design
Forest Research Institute of Malaysia	Kepong, Kuala Lumpur, Malaysia	Kiln-drying; basic courses in woodworks machinery; joinery
P.I.K.A.	Semarang, Java Indonesia	Complete courses in wood- working and furniture production: sawmilling for furniture components; kiln-drying; wood machi- ning operations; furniture manufacturing; painting and finishing techniques; furniture design

The training courses listed above are either for middle management and shop-floor-level supervision or deal with very specialized aspects of the furniture and joinery industry. The Lahti course, however, provides managers with a broad perspective, together with an intensive introduction to the systems and techniques involved in modern furniture and joinery manufacturing operations. Thus, the Lahti training course is both supplementary and complementary to the courses listed above.

It will be noted that there are only nine (9) developing countries in the above list of institutions which offer training services to the furniture and joinery industry. It is highly likely that similar institutions exist in other developing countries. There is therefore a need to compile develop a complete inventory of institutions and organizations which provide training services to the furniture and joinery industry.

The preceding paragraphs show that a number of training seminars are conducted for the furniture and joinery industry in developing countries by various agencies. However, there has been no attempt so far to co-ordinate these activities in order to avoid overlapping of objectives and repetition of activities, and to obtain a realistic evaluation of the impact or beneficial effects of such activities to the industry.

C. Project Design

The project documents formulated and designed each year to describe the training activities covering the furniture and joinery industry to be undertaken in Lahti, and once in Mauritius, were inadequate in their design (refer to Chapter I, A, page 16).

Inadequate project document design does not necessarily mean that the project, its implementation and the actual project results are inadequate. The best project document formulation does not guarantee that the persons entrusted with its implementation are up to the job and are able to produce results as planned; however, a well designed project document certainly helps to ensure that a particular project will succeed as expected. Moreover, a well designed project provides decision-makers with enough information to more easily take an approval decision and helps other decision-makers to subsequently implement, monitor and evaluate it.

The inadequate specification of project, outputs and objectives made it difficult for the evaluation team to measure or report on project results in relation to the contents of the project document. The mission, therefore, had to resort to reporting project results based on observations, discussions and questionnaire returns without being in a position to assess whether the results were more or less than originally planned.

Despite this handicap the mission was able to determine that project training activity was successfully completed and that the training results and impact were substantial enough to satisfy most expectations, even if they were for the most part assumed by the parties involved in the design, implementation and monitoring of the projects. Evidence of this conclusion is presented in the remaining sections of this report.

The following Development and Project Objectives were formulated in order to bring about greater clarity and specificity as to what the UNIDO/FINNIDA training project was intended to accomplish. These were then used to evaluate the project results.

Development Objective

To contribute towards an accelerated growth and competitiveness of the developing countries' furniture/joinery industry in national, regional and global markets, by improving productivity, product quality and design, thus increasing the profitability potential of the emerging furniture and/or joinery industries of developing countries.

Immediate Objective

Improved product quality and design along with increased productivity in "X number" small- and medium-scale furniture and joinery factories in participating developing countries.

Outputs

"X number" of key production personnel of furniture and/or joinery products trained to recognize the value of and begin applying modern concepts and techniques of serial production and the corresponding management techniques and practices.

Increased awareness and interest levels of participants, enabling them upon return to their respective factories or workshops, to:

- (i) Recognize situations in their manufacturing facilities and operations where knowledge of modern concepts and techniques of serial production should be applied;
- (ii) Install a production management system that will assure a continued and effective use of new production techniques;
- (iii) Be aware and make better use of the characteristic properties of basic raw material inputs of the industry for purposes of serial production;
- (iv) Be aware of the benefits and advantages of and, as the opportunity arises within their own operations, initiate policies and programmes on the use of the following knowledge gained in the training course:
 - Proper wood preservation and seasoning;
 - Value analysis;
 - Proper selection of woodworking machinery and equipment;
 - Adequate and timely care and maintenance of machinery, equipment and cutting tools;

- Appropriate plant and machinery lay-out;
- Adaptation and use of low cost automation systems in production operations;
- Extensive use of jigs and fixtures in machining and allied production operations;
- Development, installation and effective implementation of appropriate quality and cost control systems; and
- Recognizing the value and making use of modern concepts and practices of motivating workers to produce more with less effort and at lower cost.

The above training programme objective together with the output statement now specifies the intended utilization by the participants of newly acquired skills and knowledge after the training has been completed, i.e. in his/her job on return to his/her country.

The outputs of a group training programme are the additional skills, knowledge and attitudes the trainees will acquire through participating in the programme. These are directly related to the training objective.

Since the evaluation team was not able to carry out an "end of programme" evaluation, a full assessment of training results at this level could not be carried out.

CHAPTER II

TRAINING PROGRAMME IMPLEMENTATION

A. Delivery of Inputs/Costs

Since the costs of the Lahti Seminar have not substantially changed over the last four years, the 1982 Seminar was selected to show the costs involved in conducting the seminar at Lahti.

Costs are broken down into payments in kind, which cover expenses reimbursed to the Lahti Training Institute directly by the Finnish Government. The other cost breakdown covers payments made by UNIDO from project funds which were paid by the Finnish Government to UNIDO as a special purpose donation. The project funds are used to pay participant travel, costs of UNIDO produced materials and UNIDO staff member participation.

During 1982, FINNIDA paid in kind approximately \$ 58,500.00 to the Lahti Institute to cover participant internal travel, lecturer travel, participant housing/meals, seminar lecturers, demonstrations and administrative costs.

Lecturer costs were approximately \$12,500. Local costs for participants, room and board, etc. amounted to approximately \$30,000, while participant travel to Finland totalled approximately \$100,000, resulting in a total participant variable cost of \$130,000 paid from project funds, or approximately \$4,300 per participant.

The total cost of the seminar was about \$160,000 which, after subtracting \$130,000 participant variable costs, leaves approximately \$30,000 in fixed costs. The cost per participant, if all costs are considered, was \$5,333.

It is interesting to note that, if the course were to train 40 instead of 30 persons, the cost per participant would only be reduced to approximately \$5,050. This is because 80 per cent of the seminar costs are variable costs.

The cost structure for the 1984 Mauritius Seminar was different in several ways. In this instance the lecturers also had to travel long distances to Mauritius to conduct the seminar, which cost approximately \$27,000. Their fees were \$7,700, for a total lecturer cost of \$34,500 versus \$12,500 in Lahti.

The travel for the 25 international participants cost \$75,000 versus \$80,000 for the 30 participants at Lahti. The Mauritius location, therefore, resulted in a more expensive travel budget. However, with lower hotel and food expenses the participant cost for the 25 international participants totalled \$4,700, versus \$4,300 in Lahti.

If international participants had come from the region, the travel costs (over 50 per cent of past budgets) could have been lowered dramatically.

The transport of all the training materials, which was budgetted at \$8,600 was an additional extra cost which did not apply to Lahti. On the other hand, local administrative costs totalled only \$2,000.

The total per participant cost (\$200,000 divided by 49) amounted to \$4,080, versus \$5,300 for the 1982 Lahti Seminar. If the more desirable number of 30 had participated in Mauritius the cost would have risen to \$6,666.

Although this was not possible in Mauritius, significant travel cost advantages could be realized if regional and country level programmes were to be developed and implemented. The level of participation, nature and quality of the courses would be different however. Detailed suggestions are made on how to establish more permanent training capacities in developing countries.

B. Implementation of Training Activities

1. Seminar Implementation Overview

The organization of the furniture and joinery industries seminars is a joint undertaking between the Lahti Institute of Technology and UNIDO. The former provides the co-ordinator/seminar director, seminar assistants, facilities, teaching aids and equipment, and organizes transport and catering and provides administrative support with UNIDO assistance.

UNIDO is responsible for the nomination process, international administrative and logistical co-ordination, including travel arrangements, and the recruitment of consultants. UNIDO also contributes the time spent by its own staff members as lecturers and provides support during the seminars.

UNIDO has also organized and arranged to print useful handbooks and supplementary technical publications which are distributed to the participants.

UNIDO, through their own field representatives and UNDP offices, announces the upcoming courses and requests nominees from selected developing countries.

Nomination forms used by UNIDO are a combination of the standard UNIDO form and a form developed by the Agro-Industry Branch especially for the seminar. The purpose of the supplementary form is to get better information about the nominee's level, sophistication and participation in the furniture and joinery industry.

Requested supplementary information includes:

- Field of activity
- Size of company
- Actual consumption of raw materials
- Range and size of actual production
- Number of employees
- Turnover
- Export market and percentage of turnover
- Range of products manufactured
- Responsibility for what aspects of production
- Field of professional interest
- Specific training interests

This supplementary information has allowed UNIDO and FINNIDA to get a very good picture of nominee suitability. Screening of nominees is done by the UNIDO backstopping officer and the Director of the Lahti Institute on the basis of guidelines developed from experience with previous courses.

For Mauritius, the Lahti Institute and UNIDO were assisted by local counterpart staff from the Ministry of Industry, local training institutions and prominent industrialists who worked together in a steering committee. This worked very effectively in no small measure due to the enthusiasm and devotion of the steering committee participants.

FINNIDA, beyond its funding and monitoring activities, provided guidance and continuing assistance in arranging assistance from the Finnish organizations. FINNIDA has also influenced decisions with respect to the selection of participant countries, in accordance with the established Finnish Government policy on development assistance focal points. The final selection of participants from a larger list of recommended nominees was made by FINNIDA.

Copies of the 1982 Lahti Seminar and the 1984 Mauritius Seminar programme schedule are included as Annex VI. As these schedules show, the seminar involves an intensive programme of lectures, demonstrations, plant visits, handout materials, panel discussions, group assignments and presentation of group assignments.

The preparation for and conduct of the seminars were for the most part very well organized. However, in the past misunderstandings arose between FINNIDA and the seminar organizers at UNIDO and Lahti concerning the assignment of responsibility for the selection of seminar participants and for the organization and administration of travel arrangements. It would serve no purpose to go into this subject in detail. The conclusion, however, is that the responsibility for carrying out each activity in the programme should be clearly specified and assigned fully to a particular party and or organization. Any such agreement should be strictly adhered to throughout the agreed period of co-operation, which should last at least three years.

2. Participation

A total of 13 courses (12 in Lahti and 1 in Mauritius) were successfully conducted during the period 1971-1984. No course was conducted in 1976. A total of 315 participants completed the course in Lahti and 49 in Mauritius. The participants came from 64 developing countries (a total of 77 countries were invited to participate). They are regionally distributed as follows:

TABLE 8

Regional Distribution of
Country Representation in the Course

<u>Region</u>	<u>Number of countries represented in course</u>
Africa	16
Latin America	16
Asia - Pacific Region	10
Asia (Continental)	9
Middle East	8
Caribbean Region	3
Mediterranean Region	<u>2</u>
Total	64

There were nine (9) countries which sent more than ten (10) participants during the period under study:

TABLE 9

Countries with more than 10 participants

<u>Country</u>	<u>Number of Participants</u>
Mauritius	40
Philippines	34
Singapore	16
Colombia	14
Ghana	14
Indonesia	13
Brazil	11
Tanzania	11

All the other countries sent fewer than ten (10) participants to attend the seminars in Lahti and Mauritius. It should be noted here that Mauritius had 33 participants in the course held in that country during 1984.

The 364 participants, including 32 who attended the course at no cost to the seminar, came from both Government and private sectors, as shown in Table 10.

Table 10

BREAKDOWN OF PARTICIPANTS, ACCORDING TO
EMPLOYERS AND LEVEL OF RESPONSIBILITY

Year	Position in Firm Producing Furniture/Joinery Products			Government Agency Involved with the Industry		Other Private Firms Serving the Industry	Total
	Top Executive	2nd Ranking Executive	Supervisory Level	Monitoring/ Control	Support		
1971	7	2	1	4	5	NIL	19
1972	10	6	3	NIL	5	1	25
1973	11	5	2	4	5	NIL	27
1974	11	3	4	6	1	NIL	25
1975	10	4	4	5	2	1	26
1977*	13	3	4	3	6	1	30
1978	10	4	4	2	2	NIL	22
1979	12	8	5	NIL	5	1	31
1980	15	5	4	3	2	1	30
1981	11	3	1	3	5	NIL	23
1982	7	9	6	NIL	5	2	29
1983	17	4	2	1	4	NIL	28
1984	16	10	15	2	4	2	49
GRAND TOTAL	150	66	55	33	51	9	364
Percent of GRAND TOTAL	42%	18%	15%	9%	14%	2%	100%

* No seminar was conducted in 1976.

At the time of their acceptance to attend the seminar, 75 per cent of all the participants held top management and supervisory positions in firms engaged in the manufacture of furniture and joinery products. 153 participants (42 per cent) in this group held the top executive position, 65 participants (18 per cent) were the second ranking executives, while 54 participants (15 per cent) held supervisory positions. 33 participants (9 per cent) belonged to Government agencies which have monitoring and/or control responsibilities over the furniture and joinery industries, while 51 participants (14 per cent) were key officers in Government agencies which have supportive (personnel training, research and development, etc.) roles in the development of the industry. Nine participants (2 per cent) were top officials of private (supply of machinery and spare parts) and parastatal (supply of sawn-timber, plywood or particle board) firms which serve the furniture and joinery products manufacturing industry.

Nineteen furniture manufacturing firms in 13 countries sent their key officers to two or more of the seminars in different years during the period under study. The Egyptian Woodworking Company led this group by sending six top officers to five seminars, starting with the Chairman and Managing Director in 1971, and including the next lower levels of management in the firm during succeeding years.

Similarly, furniture/joinery manufacturing firms in the following countries sent their key officers (at different levels of management) to succeeding courses in Lahti and Mauritius: Argentina, Brazil, Burma, Cameroon, Colombia, Cuba, Ethiopia, Ghana, Indonesia, Mauritius, Sierra Leone and Singapore. It is of particular interest to note in this connection that although the Philippines had the second largest total participation in the seminars in Lahti and Mauritius, all the participants came from different furniture/joinery products manufacturing firms in the country, indicating the highest potential for extensive dissemination of the knowledge made available in Lahti and Mauritius.

The preceding paragraphs and tabulations indicate that the selection of Seminar participants from those nominated by their respective Governments, although diverse in functional coverage, were primarily from the top management of manufacturing firms and, in most cases, key officers of Government agencies concerned with the development and growth of the furniture and joinery manufacturing industry.

These participants thus belong to the policy-making and programme-initiating ranks of their respective firms and offices.

The analysis of seminar participants' responses concerning the size and composition of the groups of trainees resulted in the following findings:

- Overall 86 per cent of the respondents felt that the number of participants was adequate. Only 12 per cent said that the groups were too large. Only one respondent said that the group was too small. No significant regional differences were noted.
- Participants from Asia and Africa, respectively 70 per cent and 62 per cent, felt that the educational and professional background of the participants was just right, whereas 61 per cent of the Latin Americans felt that the groups were too diverse.
- Asia and Africa, respectively 80 per cent and 87 per cent, stated that variety of the participant countries was just right. Only 55 per cent of the Latin Americans felt the same way.

Although the majority responded positively, from discussions with the participants during the field mission and with the somewhat mixed survey results above, the mission concluded that a more homogeneous grouping of seminar participants is desirable, particularly vis-à-vis Latin America.

3. Services and facilities

The survey results concerning local arrangements (board, lodging, transport, free-time) were considered by 51 per cent of the participants to have been excellent and 41 per cent to have been good. 92 per cent therefore felt that the arrangements were good or better. This is a very positive response. During the field mission the overwhelming response was appreciation for the local arrangements with minor comments concerning diet, free-time and in some cases home sickness. With participants from all over the world this is unavoidable. Overall the seminar organizers did very well in accomodating the needs of the participants.

The facilities and materials used in Lahti have been excellent and can stand even the most critical evaluation. The organizers and especially Mr. Pekka Paavola, the main teacher and principal of the Lahti Institute for Technology, have succeeded very well in preparing these.

A special seminar class room has been designed and equipped only for this purpose at the Institute. It has a comprehensive complement of the modern teaching aids. This includes an extensive slide and overhead transparency collection, as well as computer aided videos for seminar use. English versions of lectures, slides and overheads are filed in a systematic manner in the class room. Illustrative samples of jigs and other techniques used in the production are readily available.

The laboratories in the institute include many practical examples of how the course content can be made clearer with demonstrations of how to implement improved machinery and production line procedures. Annex VI includes photographs of some demonstrations. They were taken during the 1983 seminar in Lahti. Most of the teaching and demonstration aids can also be adapted for use in other seminar locations as was the case during the Mauritius Seminar.

The Lahti mill visits included several factories of different sizes. They were representative of different levels of production technique sophistication. The selection of factories was good and some of them were relevant to all types of participants. A good example is Varjonen's factory, where many low-cost automation ideas have been put into practice in ways that could be possible in a developing country factory. The most modern and biggest factories, such as ASKO or ISKU, however, are targets in the distant future for the most of the trainees. The purpose of visiting them is only to show the range of possibilities to the furniture industry in developing countries.

The majority of the responding participants (71 per cent) said that Finland was the right place to hold the seminar for the following reasons:

- (a) The level of development of the furniture and joinery industry in the Lahti area was relevant to the needs of the industry in their own country;

- (b) Lahti Institute of Technology has the best teaching facilities in the furniture/joinery industry and consultants are available in the area; and
- (c) Finland is a hospitable country.

Other countries were suggested for reasons specific to a few of the participants' needs. However, 18 per cent of the responding participants did not have any place of preference, provided the place or venue of the seminar offers the required logistics, training facilities and teaching staff.

The majority of participants were also very pleased with the seminar in Mauritius; however, Lahti was their overwhelming choice for future seminars.

4. Training Programme

A wide range of topics was presented in the seminars; 21 topics were presented in the seminar series at Lahti, while 22 topics were presented in the Mauritius Seminar. The topics presented cover almost all the basic aspects of furniture manufacturing: the properties and use of the principal raw materials in the manufacture of furniture; design and product development; production techniques; quality control; packaging and marketing, etc. Some advanced knowledge was also presented with a view to acquainting the participants with the possibilities of using the following in their future operations: low-cost automation, value analysis, production economics and production planning.

70 per cent of the participants felt that the seminar was correct in its content; 25 per cent felt it was too broad and general, while 45 per cent of the Latin American participants felt it was too broad and general, only 21 per cent of the Asian and 13 per cent of the African participants expressed this opinion. This marked regional difference again reflects the problems involved in selecting a heterogeneous grouping of countries and designing the course at a level suitable to the needs of the Asian and African participants. This response result also indicates that too many subjects are covered in too short period of time and that a split into two specialized seminars may be of benefit.

A total of 121 hours was required to deliver the technical know-how under the Lahti Seminar. It appears that a very good variety of techniques for imparting knowledge were used, such as: lectures, demonstrations, plant visits, panel discussions, and preparation and presentation of seminar assignments. Table 11 gives the distribution of seminar hours among the various modes of delivery of technical know-how.

TABLE 11

Distribution of Seminar Hours According to Mode of Delivery

Activity	<u>Lahti Seminar</u>		<u>Mauritius Seminar</u>	
	Hours	% of total	Hours	% of total
Lectures	67	55.5	61	54.95
Plant visits	23	19.0	15	13.51
Presentation of Seminar Assignments	11	9.0	11	9.9
Demonstrations	9	7.4	9	8.0
Panel Discussions	7	5.8	4	3.64
Background Information	4	3.3	11	9.9
TOTAL	121	100.0	111	100.0

Lectures were used during about 55 per cent of the time, followed by plant visits.

57 per cent of the respondents felt that the course was just right in duration, whereas 40 per cent felt it was too short. During the field interviews the participants expressed the view that more time would have been desirable to gain an in-depth knowledge of the subjects covered by the seminar. On the other hand a period of perhaps four weeks would be the absolute maximum that most plant management personnel could be away from their companies. Given the trade-offs required to stay within the three week time constraint, interviewees agreed then that the duration of the course was a reasonable compromise.

It should be noted, however, that the 70 per cent of the Latin American participants felt that the duration was just right compared to the Africa participants, 70 per cent of whom felt that it was too short. This reflects the more advanced level of Latin American participants and the frustration felt by the African participants.

This survey result is another argument for more homogeneous grouping of participants, so that the organizers can tailor the depth of their instruction to the level of participants' experience in the industry.

The majority (70 per cent) of the responding participants considered the time given to the lectures "just right"; 47 per cent wished to have more laboratory demonstrations; 28 per cent said that there was "too little" of the factory visits; 23 per cent said that there was "too little" group work. Except for laboratory demonstrations, the time allocated for the various groups of activities during the seminars was considered "just right" by 66 to 70 per cent of the responding participants.

77 per cent of the respondents felt that the general level of the training courses was adequate and 17 per cent felt it was a little too low. Again we have a bias since 45 per cent of the Latin Americans felt it was a little too low. No one indicated that it was much too low. 5 per cent of all respondents claimed that the courses were a little too high, no one said it was much too high. Given the heterogeneity of the group a good balance has been struck by the organizers. The Latin American participants' responses indicate a need for a programme geared to their level.

72 per cent of the total responding participants suggested changes to the seminar if it were to be organized for their colleagues. The types of changes suggested by 5 or more participants were:

<u>Topic</u>	<u>Suggested by</u>
(i) More emphasis on laboratory demonstrations	12
(ii) General course improvement	10
(iii) More relevant plant visits	9
(iv) Lengthen the seminar by 1 to 6 weeks	8
(v) More practical activities	5

Overall, it is believed that the range of topics was wide enough to give the participants a good idea of the fine points of furniture manufacturing and to apprise them of the possible future developments in the industry. The seminar also opened the eyes and minds of the participants to the problems existing in their own individual manufacturing operations and, furthermore, presented possible approaches to the solution of such problems.

5. Comparison of the Lahti Seminars with the 1984 Mauritius Seminar

This section discusses differences between the seminars which were not discussed in the preceding sections.

From the technical point of view, changes in topics discussed during the two seminars followed the differences in the composition of the participants. The following topics were given more coverage during the Mauritius seminar: kiln-drying, upholstery material, upholstered furniture manufacturing technology and tool maintenance. The following topics were given less time in the Mauritius seminar than in the Lahti seminar: adhesives technology, design, furniture technology, value analysis, plant lay-out, low-cost automation and quality control.

These changes were apparently introduced in the Mauritius Seminar to bring the level of instruction and degree of sophistication of the technical "know-how" within reach of the lower average industry position of the participants and also as a result of the shorter total number of hours available during the Mauritius Seminar. Other points of difference between the two seminars were as follows:

- (i) the following topics were presented in Lahti but not in Mauritius: product development, and production jigs in machining; and
- (ii) the following topics were presented in Mauritius but not in Lahti: production planning, knock-down furniture fitting and costing.

A total of nine factories were visited during the Lahti Seminars whereas only six factories were visited during the Mauritius Seminar. In view of the less developed nature of the industry in Mauritius, there were no visits made to wood-based panel furniture factories as there was none on the island. The Lahti plant visits were more or less evenly distributed among factories which were engaged in various types of furniture manufacturing, such as solid wood type, wood-based panels type and upholstered furniture. A particleboard plant was visited in Lahti. It was not possible to do so in Mauritius as there was no plywood, particleboard, blockboard, nor MDF board factory in the country.

The survey did not show appreciable differences between the response of participants in the Lahti and Mauritius Seminars. This fact speaks for the tremendous efforts and support provided by the Mauritius Government officials, institutions and the industry.

The only significant difference was that the laboratory demonstrations were not as well and as extensively executed as in Lahti. Fully established regional training programmes could easily rectify this shortcoming.

Another difference was that of necessity the plant visits were different in that the local industry in Mauritius cannot be considered to be models in all aspects as was the industry represented in Lahti. The plants visited in Lahti did make a tremendous effort to set up displays to explain production processes and methods.

Many of the participants at a lower level in their firms' hierarchies residing in Mauritius would like future seminars in their country to be given in French, although participants attending were adequately conversant with the English language. Although the survey results do not reflect this view, the very wide differences in the backgrounds of participants, which ranged from a storekeeper to owner/managers of large operations, must have presented a problem for both the lecturers and the participants themselves.

6. Tanzanian participants

During the field trip to Tanzania, the evaluation team interviewed some of the former participants and visited several furniture factories. In terms of number of establishments most of the factories are private, small and artisanal. There is also some government-owned industry, mostly in connection with TWICO (Tanzania Wood Industry Corporation).

Most of the trainees had been from TWICO and they did not have a strong connection with or responsibility in furniture or joinery production. Only two participants were from private factories, although these factories have a great need for training.

The private industry is located around Arusha-Moshi area in the northern part of the country. Basic training infrastructure is available at two institutes. The Technical College Arusha (TCA), a modern and well organized institute, is well equipped and provides vocational training in different areas. For the moment there is no furniture industry training, except for basic courses and workshops in wood working. The Forest Industries Training Institute (F.I.T.I.) is situated in Moshi and trains mostly workers and foremen for TWICO and other forest industries. One of their instructors has attended to the Lahti Seminar. There are approximately 30-40 artisanal units in this area which could benefit very much from a suitably modified in-country seminar.

CHAPTER III

TRAINING PROGRAMME RESULTS AND ACHIEVEMENT OF OBJECTIVES

A. Trainee output

The quantitative output of the training programme has been the training of 364 persons from 64 countries. The majority was and continues to be closely connected with or involved in the furniture and joinery industry. Some countries have benefitted extensively (Mauritius, Philippines), but for others it has either only reached a few participants or, in one case, the wrong people have participated (Tanzania). Even if it is impossible to estimate the training needs in the countries where the field study has not been done, it is certain that only a small part of the training needs have been met.

On the other hand, the target was to run only one course per year. This target has been met completely and there has been the maximum number of trainees every time.

The quality of trainees has also been good. Most of them have been the owners or managers in small-scale industry, who really need knowledge and who have the power to put in action the development ideas they are exposed to. Also Government representatives have been important participants because of the influence they can have on supporting the furniture industry.

The application of training results has not been achieved in cases where the participants have later left the furniture industry and thus could not put their newly acquired knowledge into practice. However, only an insignificant number of the past participants contacted are no longer active in the furniture industry. It is probably safe to say that most of those whom the mission could not contact are still active in the furniture/joinery industry.

The relatively large training groups, the short duration of the training course and the broad course content in the Lahti Seminars have meant that the participants could not receive enough in-depth practical advice and support on translating their newly acquired knowledge into practice in their own factories. The reasons for this were:

- too many different countries, mills and people
- too many participants
- too little time for practical exercises during the seminar.

The intensive group exercises and morning-to-evening presence of the lecturers did apparently partially make up for these shortcomings. Suggested ways to alleviate this problem are included in the seminar follow-up recommendations made in this report.

B. Changes in knowledge, skills and attitudes and their application

Specific changes in knowledge, skills and attitudes of the participants represent the intended output of the seminar programme. The project objective is the application of these new skills and knowledge in the production processes of the factories to which the participants return. The different subjects of training have already been discussed earlier in this report. The evaluation team had no direct opportunity to assess project outputs at the end of a seminar. However, the following findings are based on the team's observations, interviews, questionnaires and earlier experience on training and industry matters in developing countries:

- Positive changes in attitudes of the trainees have occurred. The training has shown them different possibilities for changing and developing their production, products, etc. Also, a very positive attitude has been created towards UNIDO, FINNIDA and the Finnish furniture industry.

- The theoretical knowledge of the trainees has increased. The majority (more than 85 per cent) of the participants who responded to the question about the usefulness of seminar indicated that they often or sometimes use the knowledge they gained in the Seminar. Only two topics elicited a significant number of negative responses (21 per cent of respondents): Value Analysis and Low Cost Automation (LCA). The predominantly negative answers ("never used") were principally (about 60 per cent) due to the response of participants from Mauritius regarding these topics. This is readily understood when the level of industrial (and economic) development of the countries from which the negative replies came is considered. Simply stated, the Mauritius furniture industry does not present enough opportunities to make use of value analysis of LCA components available in the country. The same conditions prevail in the other countries (such as Burma, Pakistan, Indonesia, etc.) whose participants gave similar negative

responses to the question. A significant number of negative responses (about 10 per cent) were also received in the use of knowledge on (a) selection of woodworking equipment and (b) tool and machinery maintenance. These negative replies came from developing countries with very tight foreign currency restrictions which discourage the importation of machinery and spare parts. Under these conditions seminar participants have very few opportunities to apply the knowledge they have gained on the selection of woodworking machinery and the proper maintenance and repair of machines and tools.

- The majority of respondents has been able to apply at least part of the knowledge they have gained in practice.

85 per cent of the responding participants indicated specific topics from the seminar which they had applied in practice and described specific examples of these applications. These topics cover a wide range of industrial activities and are summarized below in order to give a comparative picture of their importance.

TABLE 12

Seminar topics applied in the operations of participants' firms

<u>Topic</u>	<u>No. of participants reporting use of topic</u>	<u>% of total response</u>
Product design and development	20	23.3
Production management	16	18.6
Furniture manufacturing technology	15	17.4
Plant and machinery and equipment lay-out	15	17.4
Jigs and fixtures	14	16.3
Low Cost Automation	13	15.1
Selection of woodworking machinery and equipment	13	15.1
Seasoning and wood preservation	10	11.6

All other topics received less than 10 per cent mention from the participants. Another 12 participants gave indications of their application of the knowledge gained in the seminar in a very general way, not mentioning any specific topics.

(Note: In this part of the survey exercise, 57 participants gave two or more topics as having been applied in their respective operations, 31 participants gave only one topic, while 3 participants did not give any answer.)

During the evaluation team field visits it became very clear that the former participants in all factories visited had tried as much as they were able to apply the knowledge gained at Lahti. Yet it was found that follow-up consulting assistance would have made these efforts far more successful. Participants at all factories visited felt that such assistance is required in order to maximize the impact of the seminars.

Nevertheless, while visiting factories in Mauritius, Philippines and to a lesser extent Tanzania, the team was able to observe the following applications:

- Introduction or more sophisticated use of jigs and fixtures;
- Improved maintenance practices;
- More efficient production floor layouts;
- New machinery purchased on the advice received during the seminar;
- New product lines using serial production techniques particularly shelving, doors, and desks;
- Introduction or increased use of knock-down furniture design;
- Greater use of ergonomic principles in the product designs;
- Introduction or improvement of wood-drying techniques;
- Introduction of standardization principles particularly in product design;
- Introduction of low cost automation techniques;
- Greater use of value analysis techniques.

C. Transfer of know-how to others

Many of the trainees have transferred their knowledge, both by means of lecturing and by providing copies of material to their fellow managers and other key personnel in their factories. Table 13 shows to what extent the participants had possibilities to transfer their knowledge to their colleagues, students or other relevant persons.

TABLE 13

Responses to the question :

"To what extent have you had possibilities to transfer your knowledge to your colleagues, students or other relevant persons?"

<u>Region</u>	<u>Lecturing in classrooms</u>					
	<u>Often</u>		<u>Sometimes</u>		<u>Never</u>	
	No.	%	No.	%	No.	%
Asia-Pacific	15	31	11	23	22	46
Africa	2	12	6	35	9	53
Latin America	3	18	11	64	3	18
Total	20	24	28	34	34	41

<u>Region</u>	<u>Practical advising on-the-job</u>					
	<u>Often</u>		<u>Sometimes</u>		<u>Never</u>	
	No.	%	No.	%	No.	%
Asia-Pacific	47	87	7	13	-	-
Africa	17	77	3	14	2	9
Latin America	11	69	5	31	-	-
Total	75	82	15	16	2	2

<u>Region</u>	<u>Distributing the written material and hand-outs</u>					
	<u>Often</u>		<u>Sometimes</u>		<u>Never</u>	
	No.	%	No.	%	No.	%
Asia-Pacific	19	40	23	48	6	12
Africa	5	28	8	44	5	28
Latin America	8	42	9	47	2	11
Total	32	38	40	47	13	15

Almost everyone (98 per cent) has been advising on-the-job either often or sometimes. More than half (58 per cent) have been lecturing in the class room at least sometimes. Material distribution has taken place in 72 cases, which is 85 per cent of all answers. This result is very encouraging and will be referred to later, when recommending means for the transfer of training know-how.

D. Improvement of personal and company performance

Another encouraging result is the improvement of the participants' own performance after the seminar (Table 14).

TABLE 14

Responses to the question:
"To what extent has your own performance improved after the Seminar?"

<u>Region</u>	<u>Managerial skills</u>					
	<u>Very much</u>		<u>To some extent</u>		<u>Not at all</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Asia-Pacific	21	41	27	53	3	6
Africa	14	70	5	25	1	5
Latin America	9	50	9	50	-	-
Total	44	49	41	46	4	5

<u>Region</u>	<u>Technical knowledge</u>					
	<u>Very much</u>		<u>To some extent</u>		<u>Not at all</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Asia-Pacific	31	56	23	42	1	2
Africa	11	52	8	38	2	10
Latin America	11	55	7	35	2	10
Total	53	55	38	40	5	5

<u>Region</u>	<u>Responsibility and power</u>					
	<u>Very much</u>		<u>To some extent</u>		<u>Not at all</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Asia-Pacific	17	33	30	59	4	8
Africa	14	74	1	5	4	21
Latin America	3	15	14	70	3	15
Total	34	38	45	50	11	12

<u>Region</u>	<u>Salary and annual increase</u>					
	<u>Very much</u>		<u>To some extent</u>		<u>Not at all</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Asia-Pacific	12	24	25	52	12	24
Africa	3	16	11	58	5	26
Latin America	-	-	13	68	6	32
Total	15	18	49	56	23	26

The management skills have been improved very much in 50 per cent of all answers and in 70 per cent of African answers. Technical knowledge has increased very much in over 50 per cent of all regions. Responsibility and power has been increased in 74 per cent of the African participants but much less in Latin American cases. The changes in the level of salary only play a minor role.

94 participants (93 per cent of total respondents) stated that the seminar had effected positive change(s) in their awareness and professional approach in their business operations. The changes effected a more professional approach for 48 participants (51 per cent), while 39 participants (41.5 per cent) cited specific changes in certain aspects of their production operations which had been directly discussed during the seminar.

The majority (62) of those participants who responded to the question (83) on the effect of knowledge they had gained in the seminars on their respective firm's competitive performance indicated positive changes in various manufacturing aspects of their firm's activities. The positive effects ranged from more and better products manufactured at desirable cost levels to a new capability to engage in export operations.

Some performance improvements observed in Tanzania, Mauritius and Philippines include:

- Change from artisanal workshop to semi-industrialized factory;
- Overall increased productivity, efficiency and quality through introduction of serial production and low-cost automation techniques;
- Uniform end-products;
- Better finishes;
- Less wastage of raw materials;
- Dramatic decreases in rejects;
- Higher output of ready made furniture;
- The possibility of a few companies to enter into new markets, for example, army, Ministry of Education, etc.;
- Introduction of cost control system.

Although it is difficult to verify, a few of the people interviewed confidently claimed that their company's rapid growth or the fact that they were able to export or stay in business was directly attributable to their seminar participation.

CHAPTER IV CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

Training needs (reference page 23)

The predominant training need amongst furniture manufacturers, according to their responses to the questionnaire and field study, are: first,

production management subjects, such as inventory control, production scheduling, planning, etc.; second, training in the use and maintenance of machinery and equipment and other production techniques; third, management and industrial engineering; and fourth, marketing design and quality control.

Existing coverage of training needs (reference pages 24-28)

The evaluators were not able to identify a comprehensive survey or study on the training requirements of the furniture and joinery industry, nor could they find adequate information on organizations providing training to the industry. Moreover, there seems to be no systematic co-ordination of training activities to avoid potential overlapping of objectives and training activities.

The Lahti programme is apparently singularly important as a major initiative to train owners, general managers and production managers in new technology opportunities that can be used to bring about improved production methodologies in order to improve competitiveness on domestic and international markets.

Project design (reference pages 29-31)

Overall project design did not contain an adequate specification of expected training results at the project objective and output level. This did not, however, affect the quality of the training programme implementation nor the adequacy of project results. After so many years of repeating basically the same programme with the same management a lack of such detail was probably neither noticed nor considered important. Future project documents should, however, be more carefully formulated to facilitate expanded training programme management, monitoring and evaluation.

Seminar implementation (reference pages 33-35)

The preparation for and implementation of the seminar were meticulously carried out. Misunderstandings due to differing perceptions of who was responsible for what during the preparatory activities of the seminars have arisen. A more precise and detailed assignment of responsibilities is required and should be adhered to by all parties concerned.

Seminar participation (reference pages 35-39)

The distribution of countries sending participants to the seminars literally covers the globe, with 64 countries represented. The number of participants from each country is on the whole small. Only 9 countries have been able to send more than 10 participants. Countries with high participant rates reflect partly the size and suitable level of the industry and partly UNIDO's response to FINNIDA's wish to focus on English-speaking Africa.

With 75 per cent of all participants holding top management and supervisory positions in firms engaged in the manufacture of furniture and joinery industry products almost all were directly involved in industry. The selection process was very well carried out, so that the right people were reached.

On the basis of interviews with participants in the field and mixed questionnaire results, it can be said that the seminar participant composition was too mixed in terms of educational and professional background and regions represented.

Services and facilities (reference pages 39-41)

As over 92 per cent of the respondents finding the local arrangements good or better no further comment is necessary.

The city of Lahti is an excellent venue for the seminar owing to the varying size and technical levels of industry operating in and around the city. The industry was also most co-operative in spending time to show participants how they manufacture their products.

The facilities and training materials developed at Lahti are comprehensive and excellent in quality. The entire training capacity in Lahti including the Lahti training capability should be replicated, so as to benefit a larger number of furniture and joinery industry personnel world-wide.

Training Programme (reference pages 41-43)

The wide differences in the levels of participants' qualifications, experience and manufacturing activity, despite the careful selection process,

make it very difficult to fully respond to the training needs of all participants. However, over 70 per cent felt that the seminar was correct in its concept and at the right level for them. The duration of the course and the mix between theoretical and practical training activity received a mixed response; more emphasis on practical demonstrations and other "how-to" exercises seems to be called for. Nevertheless, almost 100 per cent were satisfied with the course relevance and 50 per cent found the course to be very relevant. The overriding view was that the topics did provide the participants with a good insight into the fine points of furniture and joinery products manufacturing and provided them with a good overview of present and future developments in the industry.

The overall conclusion was that the more advanced participants were more satisfied than those from less advanced backgrounds, which argues for more homogeneous groupings.

Mauritius Seminar (reference page 44-45)

Both the Lahti and Mauritius programmes were very successfully organized and implemented to the satisfaction of the majority of participants. Although no appreciable differences in survey results were noted, the information gathered during the mission visits to Mauritius lead to the conclusion that future programmes in the regions should be carried out in such a way that a lasting training capability and capacity be established in the process. Detailed suggestions towards this end are included in the recommendations section of this report.

Future seminars in developing countries should be conducted for participants from surrounding countries, where affinities, language and the nature of industry are more homogeneous. Another major benefit of regional seminars would be in-depth coverage at less cost, since travel costs are a important cost item.

Suitable or appropriate locations where permanent Lahti seminar type capabilities could be established would require a separate study. This subject is further discussed in the recommendations section.

It is interesting to note that the majority of the Mauritius Seminar participants preferred Lahti as the location for future seminars, although they appreciated Mauritius very much as host country, as well as the quality of the programme.

Tanzania (reference pages 45-46)

For countries with a nascent furniture and joinery industry, country-level seminars need to be developed and conducted. In Tanzania such a workshop would be most appropriate for the furniture industry in the Moshi-Arusha area. How to proceed with this suggestion is discussed under "Recommendations".

Training Programme result and achievement of objectives
(reference pages 46-52)

Beyond question, the seminars had a significant impact on the participants in increasing their awareness and interest to recognize situations that needed improvement in their respective manufacturing facilities and operations. The knowledge gained of modern concepts and techniques of serial production was applied in one way or another after the seminar. Comprehensive, extensive and optimal application of these techniques was not observed. Follow-up consultancy assistance in the production units would be required to achieve a more extensive and thorough application of the knowledge gained.

Further, it is necessary that more training time be spent in the course on the practical technical aspects of furniture and joinery product manufacture, and that the management and marketing aspects be covered under a separate course.

Participants interviewed were enthusiastic about the seminar programme and displayed an in-depth awareness of the problems of their industry vis-à-vis other industries and the problems of their own plant level operations as compared to other countries both developed and developing. This awareness and resultant openness to improvements can in most cases be attributed to their participation in this international seminar. Follow-up consultancy assistance to past participants would therefore fall on properly prepared fertile ground.

Although a large number of industrialists have benefitted from the seminar, the excellent training programme developed at Lahti should benefit far more people, including second level management. Detailed suggestions on how to accomplish this are provided in the recommendations section.

B. Recommendations

Recommendations are divided into three major parts.

Part I recommends a more differentiated training concept and approach. Suggestions here cover the need to focus training attention to different categories of participants in different geographic regions. This would involve precise target group specification and criteria for the different types of seminars suggested. An attempt has been made to outline a work programme for the next three years to realize the above. Mechanisms to further develop programmes in the long term are incorporated in this plan.

Part II recommends Lahti seminar programme changes based on the feed-back received during the field mission and from the questionnaire returns.

Part III covers miscellaneous recommendations addressed to UNIDO and FINNIDA which do not fall directly under Parts I and II above, and summarizes the actions and costs of the whole programme.

Part I

1. Overall it is recommended that a more comprehensive training programme for the furniture/joinery industry be developed through an improved Lahti programme and through the transfer of training know-how from Lahti to the regions. This would require:

- More in-depth training of key personnel in the furniture/joinery industry in developing countries.

- A programme of in-plant consultancy follow-up after participation in the training programme so as to maximize impact.
- The development and modification of the training and demonstration material so that the transfer of training know-how and adaptation of development ideas would be possible in various groups of countries with similar industry conditions.
- Trained local instructors who would also ensure a more systematic knowledge, adaptation and follow-up.
- Two kinds of further training of former participants in order to improve their skills both as managers and instructors.

2. Therefore, three types of training should be undertaken to meet the needs of the furniture and joinery industry in the developing countries: (a) continuation of a modified Lahti seminar programme in Finland, (b) a regional training programme and (c) a country training programme.

The level of participants, content of training and approach have been outlined in the following training model:

Lahti Seminar Programme

Level: Category I (refer to "Recommendations", page 59)

Content:	Advanced Technical Seminar	4 weeks
	Management and Marketing Seminar	3 weeks
	Instructor Seminar	1 week

Approach: Lahti will continue training senior management. The technical course has been lengthened. Management and marketing have been emphasized in a separate course. An instructor seminar will be conducted to support the regional and country programmes.

Regional Programme

Level: Category II

Content:	Technical Course	4 weeks
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Approach: Full transfer of Lahti Seminar model to one or several regions with some modifications to suit local conditions.

Country Programme

- Level: Category III
- Content: Introductory technical and plant level programme 3 months
- Approach: As required, tailored to country needs, with extensive in-plant follow-up by members of international team.

3. The classification of participants for different programmes is as follows:

Minimum level of development/conditions of nominee's industrial operations and personal characteristics

<u>Criteria</u>	<u>Category I</u> (for Lahti)	<u>Category II</u> (for the regional course)	<u>Category III</u> (for the national course)
1. Rank/position in his/her company	Owner or General Manager	Production Manager, Plant Manager or Technical Head of Workshop or Factory	Supervisory position below Plant Manager
2. Nature and level of industrial operations	Limited serial production	Limited serial production	Artisanal stage
3. Number of production workers	more than 40	more than 20	more than 10
4. Home country	Participants from all regions in the world, but not simultaneously in one seminar	Participants from same region	Participants from one country
5. Language requirement	Demonstrated proficiency in English	To be determined	To be determined

Regional Programme

4. To increase participant coverage globally, and facilitate a more cost-effective and homogeneous group composition it is recommended that a regional programme be developed. Further justification involves the need to transfer the excellent training programme developed in Lahti to the regions in order to create local capabilities able to meet the particular regional needs which cannot be covered in Lahti.

To transfer the Lahti training capability to the regional levels, a systematic effort will be required to effect such a transfer. This would involve:

- (i) Survey of needs, training resources including institutions, opportunities and constraints in selected countries;
- (ii) Selection of international team of furniture and joinery industry specialists to organize, conduct and backstop initial regional training seminars and full installation of regional capabilities;
- (iii) Modification of Lahti programme to meet the regional specific training needs;
- (iv) Production of training modules or packages which would include programmed teacher and student workbooks, demonstration materials and exhibits, and other audio-visual aids such as slides, and video tapes;
- (v) Final organization, preparation and conducting of the regional seminar by international team;
- (vi) Evaluation of the experience. Decision taken to proceed with the development and permanent installation of training capability and capacity;
- (vii) If affirmative, selection and training of full-time instructors from training institutions and part-time instructors from the industry for a comprehensive training programmes for trainers in Lahti;
- (viii) With assistance of international team transfer and installation of permanent training capability and conduct of second seminar;
- (ix) Repeating the process for another region.

The evaluation team recommends that South-East Asia and English-speaking Africa should be selected as the first regions. A programme for South-East Asia would require the following actions during next 3 years:

- A study of the furniture/joinery industry, with the objectives of identifying the specific training needs, resources, future instructors and potential training places - February-April 1987.
- Training the first instructors in Lahti - August 1987.
- Training package developed and translated.

- Training programme formulated for the next two years in the region.
- First seminar and follow-up conducted in 1988.
- Permanent training systems installed in a regional centre by 1989.

Country Programme

5. In many developing country there will be requests to hold a country level course programme for a large group of local furniture and joinery product manufacturers. Tanzania is one country where a specially conducted course in Moshi/Arusha area for approximately 30 participants could have a major impact on the local furniture industry. Travel to Lahti or to some regional centre would neither be appropriate nor cost-effective.

Holding such a course would not entail a full transfer of the Lahti training capability, such as suggested for the regional programme.

A team of experts similar to the one discussed under Recommendations 4 (ii) above would be assembled to conduct such a programme. Based on requirements determined during the training course, the team of experts would stay on to provide course follow-up through in-plant consulting assistance.

One or two production facilities would be used for a group training case study exercise.

The development, organization and conduct of country seminars would involve:

- (i) Identification and agreement of recipient country;
- (ii) Survey of needs, resources, opportunities and constraints;
- (iii) Selection of a team of furniture and joinery industry specialists to organize and conduct the country training programme;
- (iv) Modification and translation of Lahti package;
- (v) Conduct of training programme;
- (vi) In-plant consultancy and follow-up activity;
- (vii) Evaluation of the experience.

6. It is recommended that such a country level programme be initially conducted in Tanzania. See Annex VIII for a more complete description of this programme.

7. Two countries will be selected for a repeat of a similar programme as in Tanzania for the years 1988-89.

8. There is a need for an in-country follow-up of the Mauritius Seminar. The need became apparent not only during the mill visits, but also during discussions held with Government representatives and with the UNDP Resident Representative. The purpose here is to consolidate the knowledge obtained in the class-room training into practice at the plant level. See Annex IX for a more complete description of this programme.

Instructor Skills Development

9. The regional and country approach outlined above will require the transfer of training know-how to the place of training. This will require the development and transfer of training packages as recommended in recommendation 4 (iv) above and the training of trainers programme which is introduced below:

During the regional training programme development study, instructors will be selected from training institutions and the industry in the region for special training. Also, assistant instructors for country programmes must undergo instructor training. All instructor trainees are required to have attended the Lahti Seminars beforehand.

There should be two types of instructor and teacher training in Lahti. Namely a one-week instructor seminar and a more comprehensive 2 to 3 month teacher programme. The first one is intended for:

- (a) those who assist the international team in the country courses;
- (b) those who assist the international team in the first regional course, and
- (c) those who can use parts or modules of the training package in class-room training in industry.

The 2 to 3 month teacher programme is meant for those who will later be acting as full time teachers for the furniture and joinery industry.

Part II

10. Lahti Programme

Part II addresses the changes required in the Lahti Programme to accommodate the regional and country approach outlined under Part I above and those changes required to make the Lahti programme even more effective.

Two specialized seminars at Lahti are proposed instead of the single seminar approach previously followed. There is a need to lengthen and intensify both technical and managerial training given at Lahti. To allow adequate time for the technical aspects, an expanded specialized technical seminar is proposed. On the other hand, a separate course on furniture industry management and marketing should be developed. The existing management and marketing topics would then be taken out of the existing Lahti training seminar programme so that these topics can be more thoroughly covered under this separate seminar on management and marketing.

On the instructor training side, two different types of programmes are recommended. One short-term (1 week) to cater to the country programme training needs. The other is a longer term (2 to 3 month) programme to train full-time instructors for the regional programme activities.

11. Advanced Technical Seminar

The existing seminar should be converted to a four-week advanced technical seminar. Development of the improved course should take into consideration the responses of participants in previous seminars which is summarized as follows:

- Emphasis should be given to laboratory demonstrations and plant visits;
- Selection of topics more relevant to the immediate needs of the participants;
- etc.

These innovations have been worked into a draft syllabus for an advanced technical seminar which is detailed in Annex X.

12. Follow-up

To ensure maximum training impact, a post-training follow-up system needs to be established. During the last week of the course, the participants will be required to submit a Programme of Action they will undertake to solve the more urgent problems in their respective factories. These programmes will apply the concepts and know-how acquired during the seminar. During the same week the participants will be given the opportunity (after the lecture sessions) to discuss their respective programmes of action with an expert who has been designated leader of the in-plant consultancy follow-up team. The team leader-designate will then consolidate and analyse the nature and degree of the problems covered in the programmes of action and draw up specifications for the other experts who will compose the follow-up team.

It is expected that the follow-up team will normally be composed of three experts:

- (a) A team leader who is a furniture and joinery industry generalist and will cover furniture/joinery products manufacturing technology;
- (b) A specialist in maintenance and repair of machinery, equipment and cutting tools; and
- (c) A specialist in the aspect of the industry as determined by the team leader as a result of his analysis of the participants' "Programmes of Action".

The follow-up activity in the field is done through consultations, for an average of 3 days in each factory or workshop. The concept is to compare the actual progress attained with the Programme of Action submitted by the participant at the Lahti Seminar. Technical advice on matters which delayed or prevented the full implementation of the "Programme of Action" will be given by the respective expert in the follow-up team.

13. Management and Marketing Seminar

A three-week management and marketing seminar should be developed. It should meet the special management and marketing training needs of the earlier Lahti/Mauritius participants, and future advanced technical seminar graduates.

The seminar will train participants to understand and apply management functions, specifically how to plan and implement them at the plant level. The seminar programme will include:

- Strategic planning
- Management concepts
- Marketing
- Product development
- Financial management
- Personnel management
- Production planning
- Production management
- Industrial engineering
- Investment planning.

More complete details of the management and marketing programme are in Annex X.

14. Follow-up

A follow-up of the marketing and management seminar will be proposed and agreed upon by the end of the seminar. Each participant will be required to draw up a development programme which will be discussed with the seminar before the end of the seminar. The follow-up will be carried out after 6-9 months. Participants will be invited to a follow-up seminar cum evaluation to report progress in the implementation of their factory development programme and to discuss problems. The seminar place will be chosen from the area where most of the factories are located. This will reduce follow-up time and costs. Two teachers or management experts will carry out the follow-up.

15. Training Package

To implement regional and country training programmes will require the transfer of training know-how. Therefore a training package, including teacher handbook, student workbook, audio-visual material and demonstration equipment, will be prepared in Lahti.

The handbook will include summaries of lectures, overhead transparencies, slides and video programmes with the instructions. The demonstration equipment will include e.g. wooden jigs and examples of typical joinery techniques.

The training package will be copied and modified to suit each region or country. This means translation of texts and adaptation of demonstration equipment to meet the local needs.

16. Instructor Seminar

The use of the training package will be introduced in the instructor seminar. The programme will include lecturing techniques, use of audio-visual material, job instruction techniques, programming the mill visits, etc. Each participant has also to demonstrate his teaching skills. More complete details are presented in Annex X. The participants will also programme their later use of the package and define their role as independent instructors, as assistant instructors for expatriate teachers or as managers running the classes for their own staff.

A follow-up of the instructor seminars will be done in connection with regional and country programmes.

Part III - Miscellaneous and summary recommendations

17. Details of the conduct, particularly the assignment of responsibilities, of future technical co-operation activities where UNIDO and FINNIDA are partners should be negotiated and precisely spelled out in an agreement annexed to any project agreement between the two parties.

18. If UNIDO and FINNIDA mutually agree to go into partnership in the conduct of training seminars in the future, the mission feels that for any joint project full administration responsibility for project implementation should rest with UNIDO as implementing agency and that FINNIDA as a financing agency should concentrate on the monitoring and evaluation of UNIDO's work. Division of responsibility has created confusion in the past and does not lead to the efficient use of established administrative capacities and capabilities.

19. UNIDO, FINNIDA and many other organizations are supporting various furniture industry programmes. Co-ordination and synchronization of the different offerings are left to organizational initiatives and chance. Therefore, UNIDO should conduct a survey of furniture and joinery training needs and of human, institutional and financial resources that are available and that need to be developed or created to meet training needs. The end product should be published as a guide and source of information for developing recipient and developed donor countries alike.

20. On the basis of the above work, UNIDO should formulate a global development and training policy and plan for the wood and furniture/joinery industries in developing countries, in co-operation with and on behalf of its member states. This would promote mutually supportive development co-operation in this sub-sector.

Summary recommendation

21. Recommendations for the Lahti Country and Regional Programmes have been synthesized into an action plan to give an overview of the actions required during the next three years for each programme element. The action workplan is as follows:

Furniture/Joinery Industry Training Programmes

<u>Activities</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
<u>1. Development and conduct of Lahti Seminar Programme</u>			
1.1 Modification of Programme	—		
1.2 Production of Training Materials	—		
1.3 Running of Seminars			
- technical	—	—	—
- managerial	—	—	—
- instructor	—	—	—
1.4 Follow-up and Evaluation	—	—	—
<u>2. Development of Regional Programme</u>			
2.1 Survey and Programme	—		
2.2 Preparation, Conduct and Evaluation of Course		—	
2.3 Transfer of Training Know-how in Lahti		—	
2.4 Development of Permanent Training Systems, Plant Follow-up and Evaluation			—
<u>3. Development and Conduct of Country Programmes</u>			
3.1 Study of Needs and Resources	—	—	—
3.2 Transfer of Training Know-how in Lahti	—	—	—
3.3 Preparation, Conduct and Follow-up of Course	—	—	—

22. To carry out the action plan a indicative cost estimate for each programme element has been prepared and is given below:

Furniture Industry Training Project

Cost Estimati (1.000 USD)

Cost Item	1987	1988	1989
2.1 Seminars			
- Advanced technical	160	160	160
- Management and marketing	120	105	105
- Instructor skills	30	50	70
- Follow-up	180	180	180
	<u>490</u>	<u>495</u>	<u>515</u>
2.2 Training packages			
- Experts	50	-	-
- Technical production	100	50	25
	<u>150</u>	<u>50</u>	<u>25</u>
2.3 Regional courses			
- Studies	60	-	60
- Courses with follow-up	-	250	250
- Teacher training	-	100	100
- Permanent systems	-	-	100
	<u>60</u>	<u>350</u>	<u>510</u>
2.4 Country programmes			
- Tanzania	120	-	-
- Mauritius	15	100	-
- Other countries	-	120	120
	<u>135</u>	<u>220</u>	<u>120</u>
2.5 Miscellaneous	65	85	130
TOTAL	900	1,200	1,300
Grand total 1987-) is roughly 3,5 mil USD.			

23. The whole furniture industry training programme is recommended to continue in 3-year cycles. The different parts of the programme, the Lahti seminar programme, the regional programme and the country programmes should be evaluated in good time before the end of each cycle, so that an objective decision can be made to either continue or to terminate anyone of programme elements. For instance, the seminar programme in Lahti can after 1989 (a) continue, (b) be moved to another place, or (c) be totally stopped.

ANNEX I

Terms of Reference

for the in-depth evaluation of

Seminars on Furniture and Joinery Industries
from 1980 to 1983 in Lahti, Finland and
during 1984 in Réduit, Mauritius

I. Background

UNIDO has so far convened 12 training seminars on Furniture and Joinery Industries in Lahti, Finland, on a yearly basis, from 1971 to 1983 (except in 1975), and a similar one in Réduit, Mauritius in 1984.

The objective of these seminars was to give the participants an insight into efficient industrial serial production and modern techniques of the Furniture and Joinery Industries. The achievement of the objective serves two purposes: to allow the participants to identify methods for modernizing and rationalizing their industries, and to identify the prerequisites for the establishment and sound development of this industry in developing countries.

A total of 364 participants, of the 968 nominated, have attended these training seminars, as outlined in Attachment A.

The seminars have been, for the most part, subject to mid- and end-term evaluations carried out by a UNIDO staff member of the relevant technical branch who attended the Seminar, in collaboration with its Director. These evaluations were at the "process" level, i.e., they were used to assess the response of the trainees to the technical content of the training programme and the method of training. Evaluations were based on analysis of completed opinion-rating questionnaires and/or interviews taken during or at the completion of the training. While findings and recommendations of process evaluations have been useful, it has been found that the time has come for a more critical and objective in-depth exercise to assess the value of these seminars in terms of their design, implementation, results and utilization of the new knowledge and skills obtained by the participants for the industrial development of their countries.

II. Purpose and Scope of Evaluation

A) Purpose

The primary purpose of the evaluation is:

1. To assess the overall role of the seminar on furniture and joinery in light of sectoral policies, development programmes, priorities and requirements of developing countries and in view of various training services available to the developing countries in this and related fields.
2. To assess the appropriateness of the objective set for the seminars.

3. To evaluate the impact and relevance of the training for the participants, their organizations, the industry being served and the countries concerned.
4. To evaluate the attainment of the objective and to assess the effectiveness of the training objectives.
5. To evaluate the appropriateness of the structure of the course programme and the teaching methods.
6. To evaluate the relevance of the structure of the costs and use of resources.
7. To suggest actions needed in order to sustain or increase the intended effects on target beneficiaries and to draw conclusions which may be of relevance to other seminars.
8. UNIDO objective
9. FINNIDA objective

B. Scope of Work

In order to accomplish the above purpose the evaluation team will:

Analyze and assess:

1. the overall role of the seminars in light of sectoral policies, development programmes, priorities and requirements and in view of various training services available to the developing countries in this and related fields.
2. relevance of the training with respect to the training needs and the training opportunities provided by the countries themselves, other aid agencies, international organizations and training institutions.
3. suitability of the organizational arrangements of the training and available alternative solutions
4. effectiveness and efficiency of the programme: attainment of set objectives and cost efficiency of the training programme
5. relevance of the objectives set for the training programme, the contents of the programme and its development
6. impact of the training for the individual participant, (his work and work performance, position in the organization), for the employer organization, (its product development) and for the country
7. implementation procedure: venue, recruitment, training methods, trainers, lecturers, organization.

Make recommendations on:

- the needs for similar training in the future
- the future objectives of the training programme
- the scope and contents of the programme, selection of topics and type of activities considering seminars against other alternatives
- target groups: countries, organizations, level of participants

- the organizational arrangements of the training
- course venue, length of the seminar, recruitment procedures, training methods
- follow-up and evaluation practices
- supplemental, alternative training activities, processes, procedures, and/or follow-up programmes, if appropriate.

III. Plan of Approach

A) Composition of the evaluation team

The team will be composed of:

- An independent furniture expert with extensive knowledge of furniture and joinery industries, including production planning, plant lay-out, quality control, engineering, equipment selection, maintenance and marketing. Experience in developing countries and in one or more types of training activities is essential (to be selected by UNIDO, with the agreement of the Ministry of Foreign Affairs of Finland).
- A training expert with extensive knowledge of industrial training programmes, with knowledge of conditions in developing countries and familiarity with technical co-operation activities (to be selected by the Ministry of Foreign Affairs of Finland, with the agreement of UNIDO).
- An officer from the UNIDO Evaluation Unit.

B) Consultation during evaluation exercise

The team will maintain close liaison with UNIDO, the concerned agencies of the Finnish and Mauritian Governments, and the staff of the host institutes in both countries.

Although the team should feel free to discuss with the authorities concerned all matters relevant to its assignment, it is not authorized to make any commitments on behalf of either UNIDO or the Finnish Government.

C) Activities and report of the team

The work required in this evaluation will consist of:

1. Desk review, including development of questionnaires at UNIDO Headquarters, and visit to Lahti, Finland
(See Attachment B, steps 1 to 9)
2. Missions in at least three countries
(See Attachment B, steps 10 to 12)
3. Analysis of completed questionnaires and preparation of final report approximately two months after field mission
(See Attachment B, steps 13 and 14)
4. Final meeting at UNIDO to present report and determine follow-up actions, approximately six weeks after submission of final report
(see Attachment B, step 15)

The questionnaires to be used by the evaluation team should be approved in advance by all parties concerned.

In writing the evaluation report, the team should have the opportunity for discussing its preliminary findings, conclusions and recommendations with the representatives of the Government of Finland and UNIDO before the final version of the report is made. Responsibility for the final content of the report, however, remains with the evaluation team.

Man/Months Table

Reference to activities above	Technical Consultant B/L 11-01	Training Consultant B/L 11-02	UNIDO Evaluation Unit	Total
C)1	0.5 m/m	0.75 m/m	0.75 m/m	2.0m/m
C)2	1.0	1.0	1.0	3.0
C)3	0.5	0.5	0.5	1.5
C)4	1 day	1 day	1 day	
Total	2.0 m/m	2.25 m/m	2.25 m/m	6.5 m/m

* See Attachment C, time-table bar chart.

D) Review and follow-up

Within six weeks of receipt, representatives of the Government of Finland and UNIDO will meet in Vienna to review the findings and recommendations included in the evaluation report, agree on actions to be taken by the parties concerned, and establish a mechanism for monitoring the implementation of approved actions.

SUMMARY OF RESPONSES FROM MEMBER STATES TO INVITATIONS TO THIRTEEN SEMINARS

	1971	1972	1973	1974	1975	1977 ^{1/}	1978	1979	1980	1981	1982	1983	1984	TOTAL
Number of countries invited by UNIDO to nominate candidates	47	42	40	47	53	57	54	58	60	63	75	62	55	75 ^{2/}
Number of candidates nominated by the Governments	51 ^{3/}	56	66	61	59	102	65	82	80	46	92	107	101	968
Number of candidates who would qualify to attend	33	43	44	45	36	38	30	39	38	24	44	54	59	527
Number of participants who actually attended	19	25	27 ^{4/}	25	26 ^{5/}	30	22	31 ^{6/}	30 ^{7/}	23 ^{7/}	29	28	49 ^{8/}	334 ^{9/}
Number of countries from which participants originated	18	19	19	14	17	22	13	20	22	18	20	22	16	62

^{1/} In 1976 a seminar was not held.

^{2/} Most countries were invited to nominate participants for all seminars.

^{3/} Excluding 13 candidates from European countries not acceptable to Finland.

^{4/} Including 2 participants attending at their own cost.

^{5/} Including 3 participants attending at their own cost.

^{6/} Including 2 participants attending under a fellowship project of DP/CHR/77/006.

^{7/} Including one participant attending at his own cost.

^{8/} Including 24 participants attending at their own cost.

^{9/} Including 32 participants attending at no cost to the Seminar.

Proposed Workplan

Evaluation activities will include the following:

1. Jointly establish criteria of evaluation (i.e., indicators of success and failure) and develop evaluation approach;
2. Conduct background s on a sample of countries representing different groups of developing countries (to establish role of seminars in light of sectoral policies, development programmes etc.)
3. Collect and analyze data available in Vienna and Lahti to assess the following factors:
 - annual aide-mémoires and other documentation;
 - level, type and qualifications of participants;
 - quality and relevance of substantive content;
 - location of training;
 - delivery methods;
 - evaluation methods, feedback and course improvement efforts;
 - role of UNIDO and Finnish authorities in planning, administration, evaluation and follow-up activities;
4. Based on the above work, develop and distribute questionnaires and cover letters to the total participant population over the last five years, to the host training institutions, and lecturers;
5. Establish a sample of participants to be interviewed and select countries to be visited (the preliminary selection includes Tanzania, Malawi, Philippines and Mauritius).
6. During the course of the exercise described under 3. above, based on the established sample of participants, collect and analyze data on sample participant background, record of seminar participation (including individual expectations), status of furniture and joinery industries in home countries, situation in home factory and expressed training needs, etc. The purpose here is to attempt to establish some baseline for measurement of change;
7. Prepare and distribute Aide Memoire to Resident Representatives, SIDFAs and Government and industry officials explaining the purpose of the field exercise, and soliciting co-operation, including pre-mission preparatory work which may be necessary, e.g., developing interview schedules, collecting latest industry statistics, etc.;

8. Check availability and current employment of selected participants and willingness to co-operate in exercise, possibly with the help of SIDFAs;
9. Develop a standard interview approach to be used with selected participants, superiors and/or original sponsors of their training, industry and Government officials, employees, etc.
10. Undertake missions in at least three countries having provided numerous participants (the preliminary choice is: Philippines, Tanzania and Malawi) in addition to visits to Lahti, Finland and Réduit, Mauritius, to conduct field interviews and collect data;
11. Based on these missions, analyze data and findings and assess quality and relevance of changes in job behaviour traceable to the seminars, with particular reference to realization of training objective;
12. Based on above mission analyses, prepare findings and preliminary recommendations for increasing the quality, effectiveness and significance of the seminars in the future;
13. Analyze questionnaire returns from participants, lecturers, host training institutions and, based on findings obtained from these returns, analysis carried under 3. above and field missions, prepare recommendations for improving relevance of substantive content, selection of participants, methods of delivery and priority seminar topics;
14. Prepare a final report which will describe the major findings, conclusions, recommendations and proposals developed in terms which are responsive to the purpose and expected results of the exercise outlined above;
15. After study and review by both sponsoring parties, a meeting of senior officers of UNIDO and the Government of Finland will be convened to consider the evaluation results pertaining to the furniture and joinery seminars and agree upon follow-up actions by either or both parties.

Time-table bar chart

	Month	1	2	3	4	5	6	7
	Week	1234	1234	1234	1234	1234	1234	1234
Furniture Expert		-DDM	MMM-	----	----	AA--	----	F---
Training Expert		DDDM	MMM-	----	----	AA--	----	F---
Evaluation Unit		DDDM	MMM-	----	----	AA--	----	F---

Activity Reference

- C)1 Desk review, development of questionnaires, and field mission preparation work in Lahti, Finland and at UNIDO (See D on above chart.).
- C)2 Missions in at least three countries (See M on above chart.).
- C)3 Analysis of completed questionnaires and preparation of final report (See A on above chart.).
- C)4 Final meeting to present report and determine follow-up actions (See F on above chart.).

ANNEX II

LIST OF PERSONS MET AND ORGANIZATIONS CONSULTED
BY COUNTRIES VISITED

UNIDO

Antoine BASSILI Senior Industrial Development Officer, Agro-based Industries, Backstopping Officer of Seminars

Bernado JAMILLA Chief, Evaluation Staff

Nikola CATIPOVIC Evaluation Officer, Evaluation Staff

FINLAND

Industry

Harri HAANNJOKI Training Expert, F. BLANZ & CO. OY, Training Consultants, Höyläämötie 5, SF-00380 Helsinki

Aarre HORKO Mananging Director, LAHDEN PUUTYÖ OY (Furniture Factory)

Arto JUVA Mananging Director, A.J. CONSULTANTS OY LTD., P.O. Box 23, SF-17301 Vääksy

MUSTALAHTI Production Manager, VARJOSEN PUUNJALOSTUS OY, Lahti

Veli-Pekka NIITAMO Consultant, F. BLANZ & CO. OY, Training Consultants, Höyläämötie 5, SF-00380 Helsinki

Pekka PAAVOLA Principal of Lahti Institute of Technology, Lahti, and Director of the Seminars

Markku SIMULA Mananging Director, INDUFOR KY CONSULTANTS, P.O. Box 173, SF-00161 Helsinki

Nuanwan K. SIPILÄ Furniture Design and Production Consultant, Former Chief Furniture Industry Development Division, Industrial Services Institute, MINISTRY OF INDUSTRY, Bangkok

Seppo SIPILÄ Consultant

Juhani VARJONEN Mananging Director, VARJOSEN PUUNJALOSTUS OY (Furniture Factory), Lahti

Pekka VARJONEN Administrative Director, VARJOSEN PUUNJALOSTUS OY, Lahti

FINLAND (cont'd)

Government

Kari KARANKO Assistant Director, FINNIDA, MINISTRY FOR FOREIGN AFFAIRS OF FINLAND, Department for International Development Co-operation

Ilari RANTAKARI Assistant Director, FINNIDA, MINISTRY FOR FOREIGN AFFAIRS OF FINLAND, Department for International Development Co-operation

TANZANIA

Industry

M.J. AMANI Principal, FOREST INDUSTRIES TRAINING INSTITUTE (FITI), Moshi

Gilbert BGOYA General Manager, KILIMANJARO TIMBER UTILISATION CO. LTD. (KILTIMBERS), Moshi

Y.B.H. FURUTUNI Personnel and Training Officer, KILIMANJARO TIMBER UTILISATION CO. LTD. (KILTIMBERS), Moshi

Sheriff Jamil HABIB General Manager, MERU WOOD PRODUCTS LTD., P.O. Box 175, Arusha

John HOLMES Operations Adviser (former Training Manager), TANZANIA WOOD INDUSTRIES CORPORATION (TWICO), P.O. Box 9160, Dar-es-Salaam

I.T. KURINGE Manager, Planning and Development, TANZANIA WOOD INDUSTRY CORPORATION (TWICO), P.O. Box 9160, Dar-es-Salaam

F.M. MASSINDA Manager, TANZANIA CONCRETE ARTICLES LTD., Subsidiary Housing Corporation, Ministry of Housing and Urban Development, Dar-es-Salaam

Gladness MTANGO (Ms.) Industrial Economist, TANZANIA WOOD INDUSTRY CORPORATION (TWICO), P.O. Box 9160, Dar-es-Salaam

LT. Colonel Jacob Paul MURO Owner/Managing Director, NJORO FURNITURE MART LTD., Moshi

Captain J.N. MUSHI General Manager, FIBREBOARDS AFRICA LTD.

TANZANIA (cont'd)

Industry (cont'd)

Phillip Adam NDAGA General Manager, DOMUS WOODWORKS LTD., Subsidiary Coastal Steel Construction Corp., Dar-es-Salaam

Daniel NDESARIO MMARY Woodworking Instructor, FOREST INDUSTRIES TRAINING INSTITUTE (FITI), Moshi

Charles Morris NGAHYOMA Production Manager, TWICO (Fibreboards (A) Ltd. Arusha), P.O. Box 1024, Moshi

Charles NGUNDA Production Manager, KILIMANJARO TIMBER UTILISATION CO. LTD. (KILTIMBERS), Moshi

N.G. SEM General Manager, TEMBO CHIPBOARDS LTD., Ministry of Natural Resources, Private Bag, Mombasa

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SUMAI Maintenance Engineer, FIBREBOARDS AFRICA LTD.

Government

Emmanuel I.M. HANTI Senior Industrial Economist I, MINISTRY OF INDUSTRIES AND TRADE, Dar-es-Salaam

HIZA Head, Civil Engineering Department, TECHNICAL COLLEGE OF ARUSHA, MINISTRY OF EDUCATION

D.M. MBOSOLI Deputy Director, TECHNICAL COLLEGE OF ARUSHA, MINISTRY OF EDUCATION

Stephen MWAKENGILI Manager, Technical Training, SMALL INDUSTRIES DEVELOPMENT ORGANIZATION (SIDO), MINISTRY OF INDUSTRY, Dar-es-Salaam

Heidi PIHLATIE First Secretary (Development Corporation), EMBASSY OF FINLAND, Dar-es-Salaam

Ambassador Ilkka RISTIMAKI MINISTRY FOR FOREIGN AFFAIRS of Finland

UNDP/UNIDO

M. CHINNERY-HESSE Resident Representative, UNDP, Dar-es-Salaam

Morten FALCH Junior Professional Officer, UNIDO Office, c/o UNDP, Dar-es-Salaam

MAURITIUS

Industry

E. Yee CHONG (and sons)	E. YEE CHONG + SONS LTD., 30 Sir William Newton St., Port Louis
José HITIE	General Manager, GREWALS LTD., P.O. Box 697, Bell-Village
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Philippe Hervé LEBON-GEORGES	Production Supervisor, GREWALS LTD., P.O. Box 697, Bell-Village
Mohammed Moustapha MAHARAULLEE	Managing Director, MAHARAULLEE & CIE., Eau Coullée, Curepipe
M.M. MAHARAULLEE (Mrs.)	Financial Director, MAHARAULLEE & CIE., Eau Coullée, Curepipe
Bijay MOHUNGOO	Leading Store Keeper, Rose-Belle, Royal-Road
Abdul Reshad NEETOO	Owner/Managing Director, NEETOO INDUSTRIES & CO. LTD., 12-36 Royal Road, Coromandel
Jagarnath NUNDLAV	Foreman Machinist, PANACHE, Helvetta, St. Pierre
Dawood E. PATEL	Managing Director, DAWOOD FURNITURE LTD., Steering Committee Mauritius Seminar
Luc S. Hedley PERRINE	Owner, L.S.H. PERRINE & CO., 63 Sainte Croix Rd., Sainte Croix, Port Louis
Jean PILOT	Managing Director, PANACHE LTD., St. Pierre
Teywa RAWATEE	Assistant Inspector, DEVELOPMENT WORKS CORPORATION, Camp Benoit, Petite-Rivière
M.Y. Dey RAMANA	Production Manager, PANACHE, Tamil Church St., St. Pierre
Bolowan RUGHOPUTH	Supervisor of Production/Training Officer, DEVELOPMENT WORKS CORPORATION, 8 Labourdonnais Avenue, Quatre Bourne
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MAURITIUS (cont'd)

Industry (cont'd)

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Amurdalingum VEERAPEN Supervisor, VEERAPEN MEUBLES, 42 Souillard St.,
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Government

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-ITTC/Beau Bassin, 6 Engrais Martial Street, Eau
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Division, Camp Fouquereaux, Castel

Maurice CHI KAM CHUN Extension Officer, Small Industries Development
Organization, MINISTRY OF INDUSTRY

Y. GOPAUL Senior Principal Assistant Secretary, MINISTRY OF
INDUSTRY

Smith LAI CHEONG Manager, INDUSTRIAL TRADE TRAINING CENTRE -
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during Seminar)

P. MOHITH Ag. Permanent Secretary, MINISTRY OF INDUSTRY

Mohamud Rafik OOMAR Technical Instructor, INDUSTRIAL TRADE TRAINING
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UNDP

Louis K. DARBOUX Resident Representative, UNDP, Port Louis

Thérèse YANG KAM WING Senior Programme Assistant, UNDP, Port Louis

PHILIPPINES

Industry

Alejo A. AQUINO Jr. Part-Owner/President, WOOD PATTERN'S INC., Manila

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Rodolfo N. NAVARRO President/Owner, POLYMART INC., 97 Wawa St., Alabank Muntinlupa, Metro Manila

Romualdo L. STA. ANA President and Managing Director, WORX MACHINERY PHILIPPINES CORP., MCC P.O. Box 1811, Makati, Metro Manila

PHILIPPINES (cont'd)

Industry (cont'd)

Gregorio STA. MARIA GREGORIO STA. MARIA AND ASSOCIATES, Architectural Firm, 31 Pitimini St., Quezon City

James SO FURNITURE WAREHOUSE AND EXPONENT WOODART INDUSTRIES, Km. 23.5 West Service Road, South Express Way, Alabang, Metro Manila

F. VILLA SENOR Owner, INTER-ART METALWOOD PRODUCTS INC., 143 Kamias Road, Quezon City

Government

Sonia T. AQUINO Deputy Director, UNIVERSITY OF THE PHILIPPINES - INSTITUTE FOR SMALL-SCALE INDUSTRIES, UP Campus, Quezon City

Aquiles S. CRISPINO Assistant Director - Industrial Extension, LOW-COST AUTOMATION LABORATORY, INSTITUTE FOR SMALL-SCALE INDUSTRIES, UP Campus, Quezon City

Leoncio T. CUBILLAS JR. Research Assistant, LOW-COST AUTOMATION LABORATORY, INSTITUTE FOR SMALL-SCALE INDUSTRIES, UP Campus, Quezon City

Bernadette V. DE LA RESMA Extension Officer, Project Development Division, BUREAU OF SMALL AND MEDIUM INDUSTRIES, MINISTRY OF TRADE AND INDUSTRY, Metro Manila

Safrullah G. MASAHUD Assistant Director, MINISTRY OF TRADE AND INDUSTRY, Bureau of Small and Medium Industries, Trade and Industry Building, Makati, Metro Manila,

UNDP/UNIDO

FONG Elizabeth Deputy Resident Representative, UNITED NATIONS DEVELOPMENT PROGRAMME, Manila

Erich BOS Junior Professional Officer, UNIDO Office, c/o UNDP, Manila

SINGAPORE

Industry

Leon V. CHICO Executive Director, TECHNONET ASIA (Asia Network of Industrial Technology, Information and Extension), 1 Goldhill Plaza, Podium Block # 03-35/37, Singapore

ANNEX III

UNIDO/FINNIDA EVALUATION OF SEMINAR ON
FURNITURE AND JOINERY INDUSTRIES

Participant Questionnaire

Date _____ 1986

1.0 PERSONAL AND COMPANY DATA

1.1 Name: _____

1.2 Country: _____

1.3 Tel. No.: _____ 1.4 Telex: _____

1.5 Address: _____

1.6 Attended the Seminar on Furniture and Joinery Industries in Lahti or
Mauritius in 19__.

1.7 Name of present employer: _____

1.8 This employer represents:

_____ Furniture and/or Joinery Industry in:

_____ Public

_____ Private

_____ Mixed Public/Private

_____ Other Industry, please specify

_____ Government Department

_____ Training Institute

1.9 If Furniture or Joinery Industry, what is the volume of wood material
input during your last fiscal year?

<u>Raw material</u>	<u>Quantity (units)</u>
Sawn Timber/Lumber	_____
Plywood	_____
Particle or Fibreboard	_____

1.10 Number of workers, including foremen: _____

1.11 Position in Organization:

- _____ Owner
- _____ Owner and General Manager
- _____ General Manager or Director
- _____ Manager or Assistant Director Level
- _____ Middle Management Level
- _____ Supervisor Level
- _____ Other, please specify: _____

2.0 PERSONAL CAREER

2.1 Do you have the same employer now as at the time of the Seminar?

YES _____ NO _____

2.2 If NO, give the name of your employer and nature of business during the Seminar: _____

2.3 How many different employers have you had after the Seminar? _____

2.4 To what extent did the Seminar help you in attaining your present job position?

_____ Very much _____ To some extent _____ Not at all

2.5 Please describe other professional training you have received.

Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored

2.6 Has the Seminar changed or influenced your awareness and professional approach in your business operations?

_____ YES _____ NO

If YES, in what way have they changed?

2.7 Has the Seminar changed or influenced your company's competitive performance?

_____ YES _____ NO

If YES, what has changed?

3.0 AVAILABILITY OF TRAINING

3.1 Please name and describe any institutions abroad which provide training in furniture and joinery industry suitable to your needs.

3.2 Describe existing training opportunities for the furniture or related industries in your country. Underline any course which you feel may be of personal benefit to you.

Institution	Location	Type and level of training	Duration

3.3 On what topics should UNIDO organize further training for you?

3.4 Briefly describe the training needs of your own employees which you feel are not being adequately met in your country. (Other than those listed under 3.3 above.)

4.0 USEFULNESS OF SEMINAR

4.1 To what extent do you in your present work use the knowledge gained in the Seminar? I am using the knowledge on:

Topic	Often	Sometimes	Never
Wood Preservation and Seasoning			
Materials for Furniture Joinery Products Manufacturing			
Furniture Design and Product Engineering			
Furniture Manufacturing Technology			
Value Analysis			
Selection of Woodworking Machinery and Equipment			
Tool and Machinery Maintenance			
Low-Cost Automation			
Plant and Machinery Lay-out			
Production Management			
Costing Techniques			
Quality Control Techniques			

If applicable, please explain why you are never using it for any of the topics above: _____

4.2 To what extent have you had possibilities to transfer your above knowledge to your colleagues, students or other relevant persons?

Form of Transfer	Often	Sometimes	Never
Lecturing in classroom			
Practical advising on-the-job			
Distributing the written material handed out at the Seminar			

4.3 To what extent has your own job performance improved after the Seminar?

	Very much	To some extent	Not at all
Managerial skills			
Technical knowledge			
Responsibility and power			
Salary and annual income			

4.4 Were you able to put in practice the techniques you learned during the Seminar in your furniture/joinery factory or related organization?

_____ YES, to a large extent

_____ YES, to some extent

_____ NO, not at all

4.5 If you answered NO, please explain why not:

4.6 If you answered YES, please describe practical examples of techniques used:

5.0 EVALUATION OF YOUR UNIDO/FINNIDA SEMINAR

5.1 The preliminary arrangements (initiation, issuance of tickets, travel arrangements, etc.) were

- _____ Good
- _____ Average
- _____ Poor

5.2 The local arrangements (board, lodging, transport, free-time activities, etc.) were

- _____ Excellent
- _____ Good
- _____ Fair
- _____ Below expectations

5.3 The duration of the course was

- _____ Too long
- _____ Too short
- _____ Just right

5.4 The content of the programme was

- _____ Too detailed for some subjects
- _____ Too broad and general
- _____ Correct in its concept

5.5 What do you think of the general level of the training?

- _____ Much too high
- _____ Little too high
- _____ Adequate
- _____ Little too low
- _____ Much too low

5.6 The total group of participants was

- _____ Too large
- _____ Adequate
- _____ Too small

5.7 The educational and professional background of the participants was

- _____ Too diversified
- _____ Just right

5.8 The variety of the participant countries was

- _____ Too diversified
- _____ Just right

5.9 The relevance of the training programme for my job was

- _____ Very good
- _____ Satisfactory
- _____ Poor

5.10 This Seminar should be held

- _____ in Finland
- _____ in my country
- _____ elsewhere, please specify: _____

Please explain why: _____

5.11 During the three (3) weeks of the Seminar was the time allocated for

	Too much	Just right	Too little
Lectures			
Laboratory demonstrations			
Factory visits			
Group work			

5.12 The same Seminar should be organized for my colleagues

_____ Not at all

_____ In the form it had at the time I attended

_____ With changes

The following changes would be needed: _____

6.0 THE ROLE OF INDUSTRY

6.1 The support given by the authorities to furniture and joinery industry in my country is

_____ better than for other industries

_____ same level as for other industries

_____ less than for other industries

6.2 The furniture industry in my country is _____% private-owned and _____% government-owned or controlled.

6.3 What are the problems of the furniture and joinery industry in your country?

ANNEX IV

Summary of recent UNIDO training activities for furniture industry

In addition to the Lahti programme UNIDO has provided training to about 40 trainees during two in-plant training courses on management of maintenance in woodworking industries, also held in Finland and financed from voluntary contributions of the Finnish Government to UNIDO.

In 1981, UNIDO convened in Beijing, People's Republic of China, a seminar on wood-based panels and furniture industries that was attended by 18 participants from 12 countries and 25 Chinese observers. It was financed by a special contribution of the Government of China to UNIDO.

In 1976, 1987, 1980 and 1982, and again in 1984, UNIDO sponsored courses on criteria for the selection of woodworking machinery. These courses attended by 183 technicians from 56 countries, were entirely financed by special contributions to UNIDO from the Government of Italy and were held in collaboration with ACIMALL (Italian Association of Woodworking Machinery Manufacturers) during the INTERBIMALL (International Biennial Exhibition of Woodworking Machinery) in Milan.

In connection with the International Fair for Woodworking Machines and Plant Systems (LIGNA), UNIDO in May 1977 provided a consultancy service for visitors from developing countries. This service was also provided at the next two LIGNA Fairs in 1979 and 1981. These activities were financed by the fair authorities and the German Woodworking Manufacturers Association (VDMA) consultants. A similar service was provided at the INTERBIMALL exhibitions in Milan in 1980, 1982 and 1984, financed by a special contribution from the Government of Italy.

In 1979, UNIDO convened two courses at the INTERZUM Fair in Cologne and at the LIGNA Fair in Hannover respectively, on selection of ancillary material for secondary wood processing industries and economic criteria for the selection of woodworking machinery and plant systems. These courses were financed by a special contribution to UNIDO from the Federal Republic of Germany. This course was repeated again in conjunction with the 1981 LIGNA Fair in Hannover. 79 persons attended these courses.

Two workshops on technical appraisal of and production management in public sector mechanical wood processing industries were organized by UNIDO in collaboration with the International Centre for Public Enterprises in Developing Countries (ICPE) and SOZD UNILES, Woodworking Industry and Trade Association, and held in Ljubljana, Yugoslavia, in 1983 and 1985, respectively. They grouped 46 participants from 24 countries.

UNIDO and the Commonwealth Scientific and Industrial Research Organization (CSIRO) organized a three week training workshop in timber engineering in 1983. This was held in Melbourne, and financed by a special contribution from the Government of Australia. It introduced 18 qualified civil engineers and architects coming from 14 countries to wood technology, engineering design and the potential for using wood in construction.

A technical course on timber structures (in Spanish) was held in Costa Rica and Honduras in 1984 for 16 engineers and architects from ten countries in Central and South America. The aim was to introduce participants to wood technology and design procedures and to familiarize them with the UNIDO prefabricated modular wooden bridges built in Honduras.

In Auckland, New Zealand, a specialized training course on timber engineering in 1984 combined an introductory one-week programme of lectures, discussions and site/factory visits with participation in the Pacific Timber Engineering Conference for 20 engineers and wood scientists from ten countries.

In 1985 a two-week study tour on coconut wood use in building was organized in the Philippines for 16 participants from the Asian and Pacific region. It comprised attendance at a national seminar and a programme of visits, discussions, and demonstrations.

ANNEX V

Furniture-related professional training received by respondents

Most respondents did not list any training received. A few were able to list a multitude of courses.

Country	Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored
BRA	Administration Various courses in Brazil related to furniture manuf. and business administration	3	Italy	1974	OGGI/ILO
BUR	Group Training Course in Wood Working Machinery	13	Japan	1978	Japanese Government
	Furniture and Joinery Management	13	Finland Denmark Sweden	1983	Finnish Government
CHI	Computing in medium enterpr.	1	Chile	1978	Univers. Católica
	Export and marketing	3	Chile	1981	"
	Technical criteria for select. of woodworking machines	3	Italy	1984	UNIDO/ACIMAL
ECU	Technical training	2	USA	1981	ARTECTUM
	" "	2	Italy	1983	"
	Industrial design	1	Ecuador	1982	DECOSA
	" "	1	Ecuador	1984	"
	Ergonomy	1	Ecuador	1983	"
ETH	Courses in woodworking machining	32	Japan	1981	Japan
HON	Machinery Show	1	USA	1984	CONTESSA
IND	Timber Engineering and Timber Technology	4	India	1966	Central Building Research Inst. (CSIR)
	Advanced Management Course	3	India	1981	Govt. of Kashmir
	Seminar on Workshop Joinery/Plywood	2	Jugosl.	1984	UNIDO + Govt. of India
INS	Management	4	USA	1980	Amer. Govt.

Country	Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored
JAM	Furniture Testing, Q/C, Management	6	Canada	1977	CIDA
	Industrial Q/C	5	Jamaica	1979	UNIDO/SIDA SAF
	Selection of woodworking mach.	3	Italy	1980	UNIDO
	" " " "	3	Germany	1981	"
MLW	Industrial Attachment with A.H.McIntoch	32	Scotland	1979	Press Holdings Ltd.
	London College of Furniture - Diploma in Furniture Production	36	England	1979-80	"
	Stock Control and Physical Distribution Seminar (Inst. of Production Control U.K.)	2	Malawi	1985	self
MDV	Multi-Country Study Mission on Furniture Design	2	China + Japan	1985	Asian Product. Organization
MAU	To take management of small scale board making plant that company proposes to set up	24	Finland	1982-83	Govt. of Finland
	Visits to factories and fairs (INTERZUM and LIGNA)	2	Germany	1975	UNIDO
	Seminar on wood based panels	3	China	1982	UNIDO
PAK	Management of Maintenance of Wood-Working Machines	7	Finland	1975	UNIDO
	Industrial Fair (on the job training with selected factories in W.Germany)	6	Germany England Sweden	1979	Company
	Wood machinery	4	Italy	1980	ACIMAL
PHI	Seminar on wood-working mach.	2	Italy	1974	UNIDO
	Seasoning and Preservation of Timber	24	India	1963-64	Colombo Plan
	Lumber Grading and Composer Products	6	Phil.	1968	PICOP (Paper Industry Corp.)
	Veneer + Plywood Manufacture (Inplant training)	8	Phil.	1967	"
	Technical aspects of veneer + plywood manufacture	120 hrs.	Phil.	1970	"
	Selection and maintenance of wood-working machinery	2	Italy		ACIMAL/UNIDO (Ital.Mach.Ass.)
	Criteria for selection of wood-working machinery	4	Germany		UNOP

Country	Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored
PHI	Sales of wood-based products of joinery industry (visit)		Netherl.	1983	Govt. of Netherlands
	Maintenance of wood-working machinery	4	Finland	1978	UNIDO
	Marketing of furniture in Europe	1	Indonesia	1981	UNIDO
	Marketing of furniture in Middle East	1	Dubai	1982	UNIDO
	Marketing of Furniture in U.S.	4	USA	1979	UNIDO
	Wood furniture development pneumatics	3	Phil.	1984/85	JETRO Company
	Painting + Finishing	18	USA + Canada	1962	Singer Sewing Machines
	Machinery Operation + Mainten.	24	Germany Italy Finland	1974	SARMIENTO
	Pneumatics	6	Germany Australia	1979	FESTO PNEUMATICS
	Furniture Finishing	3	USA	1985	Guardsman Chemicals Inc.
	Furniture Joinery	4	Japan Phil.	1984	JETRO
	Quality Improvement	2	Phil.	1985	"
	Jig making	2	Phil.	1986	"
	Sawmilling	1/2	Germany	1974	SARMIENTO
	Kiln Drying	2	Phil.	1973	FORPRIDECUM
	Buying machinery training	3	Germany		UNIDO
	Asean/Eur. Marketing	1	Thailand		EEC
	Japan Marketing	1	Japan		Japanese Government
	Furniture Marketing Seminar	2	Japan		JETRO
	Export promotion marketing seminar	6	Germany	1975	Carl Duisberg Gesellschaft
	Export marketing of furniture to EEC	1	Thailand	1982	EEC
	Seminar on selection and maintenance of wood-working machinery	4	Italy	1981	UNIDO/ACIMAL
	Seminar on standardization	2	Phil.	1984	Bureau of Standards (ISO)
	Product Adaptation + Developm. for Export Industries	15 days	Japan	1974	JETRO + UNIDO
	Production Control + Export Marketing	6 days	Indonesia	1981	Govt. of Germany

Country	Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored
PHI	Study of Australian Market for Wood Products	8 days	Australia	1985	Richwood Mfg. Ind.
	Surface Finishes	2 days	Phil.	1976	CFIP
	Kiln Drying	1 day	Phil.	1976	Los Banos
	Modern Trend in Furniture Technologies	90 days	Phil.	1976	U.P. Small Scale Ind.
	Export Crating + Packaging	2	Phil.	1976	CFIP
	Selection of wood-working mach.	2	Italy	1984	UNIDO/ACIMAL
SIL	Logging operations in tropical countries	6	Nigeria	1964	UN/FAO
	Kiln seasoning, wood preservat., wood structure,...	18 mos.	UK	1964/65	UK Govt.
	Furniture production + managem., adv. wood technology	36 mos.	UK	1968/71	UK Govt.
	Woodworking machinery	108	Sierra Leone	1965-68	Sierra Leone Forest Ind. Corp.
	Furniture production + managem.	16	England	1974	"
	Seminar on Furniture Industry	3	Finland	1980	UNIDO
	Upholsters	24	Nigeria	1962	Forest Ind. Corp. (FIC)
URT	Furniture Construction + Design	24	England	1974	"
	Method of instruction	3	Tanzania		
	"	4	"		
THA	Wood based panel production	3	Finland		
	General management in wood ind.	16			
	Study tour in utilization of wood and wood industries	4	UK Denmark Sweden	1978	Forest Ind. Organiz. (FIO)
	Seminar on machinery adding value and marketing	1	Singapore	1979	"
	Southeast Asia Wood Industry Conference and Equipm. Exhibit.	1	Malaysia	1980	"
UGA	Training in technical managem. for furniture industry	12	Japan	1979	AOTS (Assoc. for Overseas Techn. Scholarship), Japan
	Furniture design	20	Japan	1982	JICA
	Criteria for selection of woodworking machinery	3	Italy	1982	UNIDO

Country	Purpose of course	Duration in weeks	In which country	Year	Explain who sponsored
ZAM	Production control to acquaint managers with principle for planning and controlling	3	Zambia	1981	Employer
	Management developm. to develop managers by expanding their knowledge to key issues of management function	4	Zambia	1981	"
	Production planning	4	Zambia	1985	"
	Foam and PVC technology	4	UK	1974	Employer
	Furniture technology	6	UK	1978	"
	General management	4	UK	1981	"
	Senior management	4	UK	1986	Employer
	Production planning and product design	4	Zambia	1976	PRODEC Finl.
	Production planning and product design	1	Zambia	1978	"
ZIM	Management training	1	Zimbabwe	1977	Employer

ANNEX VI

A. PROGRAMME OF THE SEMINAR AT LAHTI, FINLAND

3-28 August 1982

Monday, 9 August 1982

- 09:00 - 09:30 Opening Addresses, Hotel Seurahuone
Mrs. Taina Teräväinen, Finland; Ministry of
Foreign Affairs of Finland
Mr. Juhani Vaulo, Vice Chairman, Board of
the City of Lahti
Mr. Antoine V. Bassili, Delegate of UNIDO,
Vienna, Austria
Mr. Pekka Paavola, Director of the Seminar,
Lahti Institute of Technology
- 09:30 - 10:30 Introduction of participants
- 10:30 - 11:30 Information on Finnish Furniture and Joinery
Industries, Mr. Christer Antell
- 12:00 - 13:15 Lunch at Hotel Seurahuone
- 13:30 - 15:30 Visit to Murame Oy, Furniture Factory, Salpakangas
- 15:30 - 17:30 Medical Check-up
- 19:00 - 21:00 Ministry for Foreign Affairs Reception,
Hotel Seurahuone

Tuesday, 10 August 1982

- 08:30 - 11:00 Properties and use of glues in furniture and
joinery industries, Professor Jaakko Meriluoto
- 13:00 - 14:00 Properties and use of glues . . . (continued)
- 14:00 - 16:00 Wood based panels used by the furniture and
joinery industry, Mr. Pekka Paavola,
Lahti Institute of Technology and
Professor Jaakko Meriluoto

16:00 - 17:00 Information on Seminar Assignments,
Mr. Antoine V. Bassili, UNIDO

Wednesday, 11 August 1982

08:30 - 11:30 Solid Wood as raw material for furniture and
joinery industries, Mr. P. Paavola, LIT

13:00 - 16:00 Visit to Sotka Oy, furniture factory, Lahti

16:00 - 18:00 Kila drying
Introduction
Demonstration
Mr. Osmo Moilanen, LIT

Thursday, 12 August 1982

08:30 - 11:30 Technical Product design, Mr. P. Paavola, LIT

13:00 - 15:00 Visit to Lahden Purityö Oy, furniture factory, Lahti

15:30 - 16:30 Technical product design . . . (continued)

18:00 - Sauna and high tea, Mikkula Summer Hotel
(Presentation by RAUTE, Manufacturers of
woodworking machinery)

Friday, 13 August 1982

08:30 - 10:30 Selection of woodworking machinery,
Mr. Antoine V. Bassili, UNIDO

10:30 - 12:00 Polyurethane in furniture industry,
Mr. Raimo Väkevää, Espe Oy

13:00 - 17:00 Product Development, Mr. Ahti Keronen,
Oy Polardesign Inc.

Saturday, 14 August 1982

11:30 - 13:00 Lunch by City of Lahti, Restaurant Fellmanni
(Hosted by Mr. Jukka Elomäe, Chief-
Tourism Department)

Sunday, 15 August 1982

10:00 - 14:30 Tour of Hollola

Monday, 16 August 1982

08:30 - 11:30 Furniture Technology, Mr. P. Paavola, LIT

13:00 - 15:00 Visit to Sopenkorpi furniture factory, Lahti

15:00 - 18:00 Demonstration of production jigs in machining
laboratory, Mr. P. Paavola, LIT and
Mr. Kaarlo Ilonen, Vocational School
and Mr. Eino Martinen, LIT

18:00 - Sauna and high tea, Mukkula Summer Hotel
(Presentation by TEKMA Oy, manufacturers
of wood drying equipment)

Tuesday, 17 August 1982

08:30 - 11:30 Furniture technology, Mr. P. Paavola, LIT
(Including demonstration of high
frequency glueing).

11:30 - 13:00 Visit to Asko-Upo Oy, furniture showrooms,
Lahti (Including lunch).

13:00 - 18:00 Value analysis (including case study),
Mr. Arto Juva, AJ Consultants Oy

20:00 - 21:30 Informal discussions on the use of wood in
housing in developing countries, by
Mr. Antoine V. Bassili, UNIDO

Wednesday, 18 August 1982

08:30 - 11:30 Production economics, Mr. A. V. Bassili, UNIDO

13:00 - 15:30 Upholstered furniture technology,
Mr. Arto Juva, AJ Consultants Oy

15:30 - 17:30 Tool maintenance, Mr. Peter Wagner

Thursday, 19 August 1982

- 08:30 - 11:30 Plant layout, Mr. P. Paavola, LIT
- 13:00 - 15:30 Visit to Varjonen Puunjalostus Oy, furniture
factory, Uusikylä
- 15:30 - 17:00 Activities of UNIDO, Mr. Antoine V. Bassili, UNIDO
- 17:00 - 18:00 Plant layout . . . (continued)

Friday, 20 August 1982

- 08:30 - 10:00 Methodology for establishing a new furniture
factory, Mr. Arto Juva, AJ-Consultants Oy
- 10:00 - 11:30 Low-cost automation, Mr. Osmo Moilanen, LIT
- 13:00 - 15:15 Visit to Isku Oy, particle board factory, Lahti
- 15:30 - 18:30 Low-cost automation (including demonstration . . . (continued)

Saturday, 21 August 1982

- 08:30 - Preparation of seminar assignments

Sunday, 22 August 1982

F R E E

Monday, 23 August 1982

- 08:30 - 10:30 Visit to Metsäliiton Teollisuus Oy,
joinery factory, Vääksy
- 13:00 - 16:30 Marketing of furniture and problems
of export trade, panel discussions
of experts
- 18:00 - 20:00
18:00 - 20:00 Sauna and high tea, Mukkula Summer Hotel
- 20:00 - 22:30 From Folkloric to Modern Finnish Design,
slide show, Mr. Ilmari Tapiovaara

Tuesday, 24 August 1982

- 08:30 - 10:30 Quality control of inputs and finished products, Mr. P. Paavola, LIT
- 10:30 - 11:30 Furniture design - relations between design and industry, Mr. Ahti Taskinen
- 13:00 - 16:30 Furniture design and dimensioning for serial production, Mr. Mauri Laatikainen
- 16:30 - 18:00 Films on Quality Control in furniture (Technologisk Institute, Denmark) and selection of textile materials for upholstery (FIRA, UK) and slide show on quality control equipment in furniture industry, Mr. P. Paavola, LIT.

Wednesday, 25 August 1982

- 08:30 - 11:00 Visit to Peem Oy, upholstered furniture factory, Lahti
- 13:00 - 17:00 Furniture production, panel discussion of experts

Thursday, 26 August 1982

- 08:00 - 13:00 Factory visits for small groups according to individual wishes
- 08:30 - 12:00 Demonstration of simple surface finishing methods by Mr. Kaarlo Ilonen, Vocational Training School
- 13:00 - 15:00 Packaging for export, Mr. Johan Sulin, Senior Packaging Adviser, VTC
- 15:00 - 18:00 Presentation of Seminar assignments

Friday, 27 August 1982

- 08:30 - 11:30 Presentation of Seminar Assignments
- 13:00 - 15:00 Presentation of Seminar Assignments . . . (continued)

15:00 - 15:45 Demonstration of edge banding and finger jointing

15:45 - 18:05 Presentation of Seminar Assignments

Saturday, 28 August 1982

10:00 Departure for Helsinki

14:00 - 16:00 Tour of Helsinki

B. SEMINAR ON FURNITURE AND JOINERY INDUSTRIES
FOR DEVELOPING COUNTRIES, MAURITIUS, 11 TO 30 JUNE 1984

ANNOTATED PROGRAMME OF WORK AND OUTLINE ON LECTURES

6 August 1984, 8:30 a.m.: Registration (1 hour)

Participants will find their way in the lecture hall, and browse through the documentation that they will find on their tables.

6 August 1984, 9:30 a.m.: Opening ceremony (30 minutes)

Short addresses will be made by:

- a representative of the Mauritius Government;
- a representative of the Finnish Government;
- a representative of UNDP;
- a representative of UNIDO.

6 August 1984, 10:00 a.m.: Introduction of the participants (2 hours)

Each participant will be required to introduce himself (his background, education, current duties, responsibilities, etc.) to give a short (5 minutes) outline of the conditions of the furniture and joinery industries in his country, its status, importance, problems, etc. This would actually be the contents of their country papers. Such a presentation is useful (a) to break the ice among the participants, and, (b) for the lecturers - who hopefully will be able to attend the opening ceremony - to have an idea of the overall level of the participants and who among them can lead discussions, etc.

6 August 1984, 1:30 p.m.: Raw material supply in Mauritius (all afternoon)

The lecturer(s) - a specialist from Messrs. Grewals, possibly assisted by the Utilization Officer of the Forest Department - will be expected to enumerate the range of wood species available in Mauritius for production of furniture and joinery, their sizes, properties (strength, density, durability, workability, paintability, glueability, etc.) and end uses. They would also cover the range of qualities available and the respective prices. (In view of transport problems, FOB prices would be a better basis for a comparison.) A similar coverage should be done for the wood based panels.

This lecture should be complemented by an exhibition of the various species, and, if possible by circulating samples on which the names have been inscribed.

N.B. The lecture should be closely planned with the visit to Messrs. Grewals on the next day, so that the lecturer can explain in a classroom the points he will show the next day during the visit.

6 August 1984: Reception

This is the "welcome" reception hosted by the Mauritian authorities.

7 August 1984, 8:30 a.m.: Wood preservation (approximately 100 minutes)

The lecturer - a specialist from Messrs. Grewals, possibly assisted by the utilization officer of the Forest Department - will be expected to cover:

- factors affecting decay in wood;
- types of fungi and insects and their identification, occurrence, conditions affecting their reproduction, etc.;
- types of preservatives available, their effectiveness, cost and methods of application;
- methods for preserving logs and sawnwood (both those currently used by Grewals - with appropriate references to the visit the same afternoon - and those not currently used in Mauritius). Information on various parameters - cost of chemicals, order of magnitude of investment, improvement of the durability of the treated wood, etc. should be covered.

Slides of decay, insects, wrong and correct application of timber in construction (eg. termite barriers, etc.) would be useful. Samples of decayed timber could also be circulated.

7 August 1984, 10:00 a.m.: Wood drying (approximately 100 minutes)

The lecturer - Mr. Pekka Paavola - will cover the importance of drying, the relation between moisture content in air and wood, deformation of wood on drying, correct air drying procedures, etc. He will also describe briefly the various existing methods of artificial drying and how to operate drying kilns - both "conventional" and of the "dehumidifier" type.

7 August 1984, 1:30 p.m.: Visit to Messrs. Grewals Ltd. (all afternoon)

The object of the visit is to show the participants all the points raised in the first three lectures as well as how to store, preserve and dry timber, as well as how to administer a sawnwood yard.

The visit will also comprise visits to Grewal's joinery plant, where participants will see the equipment, the layout, tool maintenance and discuss how orders are processed. At the end of the visits a "question and answer" session, with the lecturers of all three first lectures should be organized to answer any remaining queries.

8 August 1984, 8:30 a.m.: Solid wood as a raw material in furniture
(all morning)

The lecturer - Mr. Pekka Paavola - will cover the topic using material from UNIDO publication ID/108 Rev.1.

8 August 1984, 1:30 p.m.: Glues used in furniture and joinery (90 minutes)

Ditto.

8 August 1984, 3:00 p.m.: Wood based panels used in furniture and joinery
(two hours)

Ditto

9 August 1984, 8:30 a.m.: Foams used in upholstery (approximately 100 minutes)

The lecturer - Mr. Ismael Sayed - should aim at:

- (a) describing to the participants what the technical specifications of foams should be;
- (b) how these are checked; and
- (c) explaining to the participants how to use these foams correctly.

The lecturer should also cover the properties of these foams with respect to resilience, fire, etc. and also describe how to specify the various ancillary material needed - eg. glues used.

..... Samples of both "good" and "poor" quality foams in various densities should be circulated. UNIDO document ID/WG.378/3, copy attached, could be made available if requested. Visual material would be useful.

9 August 1984, 10:00 am.: Ergonomics (approximately 100 minutes)

The lecturer - Mr. Mauri Laatikainen - will probably use the existing UNIDO document ID/WG.302/3. He will be expected to expand it by giving modular sizes for other products which affect furniture design - eg. size of files for office furniture, size of clothing for wardrobes, etc.

9 August 1984, 1:30 p.m.: Technical product design (approximately 100 minutes)

The lecturer - Mr. Pekka Paavola - will use material in ID/108 Rev.1

9 August 1984, 3:00 p.m.: Knock-down fittings used in the furniture industry
(approximately 100 minutes)

The lecturer - Mr. Pekka Paavola - is expected to bring with him a set of knock-down fittings of an appropriate level - bearing in mind the level of development of the participants' countries - and explain how they are utilized. These will be circulated to the participants. The various considerations in designing knock-down furniture and the various methods of jointing this type of furniture will be explained.

10 August 1984; 8:30 am.: Furniture design for small scale production and low cost furniture (all morning)

The lecturers - Messrs. Mauri Laatikainen and Pietro Borretti - will cover this topic and will have to emphasize how to design simple construction - i.e. constructions where all angles are right angles, where only a limited range of mouldings, dowel holes, etc. are used, and where functional use, rigidity and ease of maintenance is given priority over aesthetic value. (Ergonomics would have been covered in the lecture on 14 June 1984.)

10 August 1984, 1:30 p.m.: Visit to Panache (all afternoon)

The visit should stress the way designs are developed, how master templates (or full size drawings) are made, and records kept as well as the actual production and quality control of the furniture. emphasis should be placed on the steps needed to ensure high quality, and information provided on packaging of goods for export.

11 August 1984: 8:30 a.m.: The use of timber in construction

It is planned that this lecture be an optional one.

The lecturer - Mr. Antoine Bassili - will identify the problems related with the use of timber in construction in developing countries.

He will show a set of slides showing the use of timber in construction both in developed and developing countries, and also circulate a set of documents used at a Workshop on Timber Engineering convened by UNIDO in Australia in 1983.

The object will not be to explain how to design using wood, but rather to identify the problems that the manufacturers of wooden houses and their components in developing countries usually have to overcome before having their products accepted by the specifiers and the general public.

13 August 1984, 8:30 a.m.: Furniture production technology (all morning)

The lecturer - Mr. Pekka Paavola - will use material in UNIDO publication ID/108 Rev.1 and existing visual aids.

13 August 1984, 1:30 p.m.: Demonstration at KTC Beau Bassin (all afternoon)

Mr. Paavola will communicate directly his exact requirements for the demonstration.

14 August 1984, 8:30 a.m.: Furniture production technology (all morning)

(Continuation of lecture from previous morning)

14 August 1984, 1:30 p.m.: Furniture production technology (approximately 100 minutes)

(Ditto)

14 August 1984, 3:00 p.m.: Quality control in furniture (approximately 100 minutes)

The lecturer - Mr. Pekka Paavola - will use material from the UNIDO publication ID/108 Rev.1. He will also use his visual aids and bring with him a set of appropriate quality control gauges and measuring instruments from the Institute in Lahti.

15 August 1984, 3:30 a.m.: Upholstery technology (all morning)

The lecturer - Mr. P. Mäkela - will be expected to cover the production of upholstered furniture using modern (e.g. no-sag springs, foams, fibre-fill, rigid foam shells, etc.) products and production methods adapted to the small series common to the developing countries.

He should cover: selection of product range, selection of equipment, plant layout, upgrading of skills and training needs, description of the various raw materials - stressing minimization of wastes, quality control, etc.

The lecturer will have to bring with him - or have shipped with the material that will be sent from the Lahti Institute of Technology - samples of the products he will be referring to in his lecture as well as the necessary visual aids to document his presentation.

15 August 1984, 1:30 p.m.: Visit to Meubles Laval (all afternoon)

The object of the visit is along the same lines as that of Panache. More stress should be placed on operation of the machines - using jigs whenever appropriate, flow of production, intermediate storage of components, layout, etc.

16 August 1984, 8:30 a.m.: Criteria for the selection of equipment (all morning)

The lecturer - Antoine Bassili - will use material published in UNIDO document ID/108 Rev.1.

16 August 1984, 1:30 p.m.: Visit to Techno Meubles (all afternoon)

The object of this visit is not so much to see the operation of a furniture factory, but to demonstrate to the participants the operation of, advantages and limitations of the wide range of specialized woodworking machines not available in the other furniture factories that will be visited. Emphasis should be placed on ease and requirements of maintenance, versatility of the machines (showing the various operations that could be carried out on them) as well as of their setting up procedures. (It must be remembered that participants are unlikely to be familiar with such machines, and that it is also unlikely that most of them will have the opportunity to see such machines in operation prior to purchasing them - if ever they decide to do so.)

17 August 1984, 8:30 am.: Marketing panel (all morning)

The members of the panel - Messrs. J. L. Albaladejo, Laval Koo Sin Lin, J. Pilot, D. Patel and P. Mäkela - should start by explaining the difference between "marketing" and mere "selling". They should then cover the various options concerning distribution channels, sales policies, pricing, promotion, publicity, export marketing problems, fairs, and exhibitions, etc.

It would be useful if the chairman of the panel would introduce each topic and then ask each of the panel members to make a short oral presentation on his own experience and views on the matter.

(There exists no written material for this panel discussion.)

17 August 1984, 1:30 p.m.: Plant layout (all afternoon)

The lecturer - Mr. Pekka Paavola - will use material included in document ID/108 Rev.1

18 August 1984, 8:30 a.m.: Packaging of furniture (all morning)

This optional lecture - of interest to exporters and potential exporters of furniture - will consist of a set of some 80 slides prepared by the International Trade Centre and commented upon by either Mr. Bassili or Mr. Albaladejo. Document ID/WG. 378/3 will be handed out.

20 August 1984, 8:30 am: Tool and machine maintenance (all morning)

The lecturer - Mr. Pietro Borretti - will cover the maintenance of circular and hand saw blades, cutter blocks, planer knives, boring drills, routing heads, etc. both in HSS and tungsten carbide. He will base his lecture on material from ID/108 Rev.1. plus some slides available at UNIDO.

Maintenance of machines will be explained by him with no document to cover it. He will explain what to maintain, how to maintain and how to keep records for the basic machines found in small furniture plants of developing countries (band and circular saws, planers, thicknessers, spindle moulders, routers, mortising machines, boring machines, presses, pneumatic devices and compressors, spray guns, etc.)

20 August 1984, 1:30 p.m.: Demonstration of tool maintenance and safety of woodworking machines (all afternoon)

The demonstration, at the ITTC in Beau Bassin, will cover the topics of the lecture of the mornings of 25 and 26 June. Exact requirements will be communicated by the lecturer. ITTC will need to have some blunt tools to demonstrate the effects of using them and to show for example how they are repaired and maintained. Blunt tools will also be needed to demonstrate safety.

21 August 1984, 8:30 a.m.: Safety in woodworking machines (approximately 100 minutes)

The lecturer - Mr. Pietro Borretti - will cover the points that he could not cover in the previous afternoon's demonstration. He will use as material the text of the UNIDO document ID/WG.338/9.

21 August 1984, 10:00 a.m.: Low cost automation (approximately 100 minutes)

The lecturer - Mr. Antoine Bassili - will use as material ID/154 Rev.1. He will nevertheless stress the aspects "when to automate" and "what to automate" and not "how to automate" since the demonstration material and laboratory facilities are lacking.

21 August 1984, 1:30 p.m.: Surface finishing of furniture (all afternoon)

The lecturer - Mr. Jo Rouillard - will be expected to cover the properties and correct application of various types of surface finishing material used by the furniture industry in Mauritius. Some material on this topic exists in ID/108 Rev.1, but the lecturer will probably want to prepare his own.

The visual aids that would be useful would be to circulate small specimens of wood, raw, sanded, unfinished, semi-finished, finished, etc. so that participants may see what is meant by the various stages and what they should look like. Examples of correct and incorrect procedures in various operations (such as finishing wet wood, wrong spray configuration, wrong viscosity, wrong spraying distance, etc.) should also be prepared. The lecturer might even want to bring an assistant and demonstrate the actual application, correct and incorrect. In that case he would still have to prepare samples for circulation, since the ones prepared during the course would be wet. All samples for circulation must be labeled appropriately.

22 August 1984, 8:30 a.m.: General considerations on costing (approximately 100 minutes)

The lecturer - Mr. J. Pochun - will cover general aspects of costing and financial management as relating to small-scale enterprises. In covering this he will have to liaise closely with Mr. Maharaullee.

22 August 1984, 10:00 a.m.: Cost in furniture production (approximately 100 minutes in the morning and again the same time from 1:30 p.m.)

The lecturer - Mr. Mohamed Maharaullee - will be expected to cover all the points not covered by Mr. Pochun, namely - but not limited to - estimating raw material, labour and overhead expenses, determining waste factors, costing maintenance of machines, allocation of overheads to various operations, planning cash flow, etc. Examples of actual cases and group work (making the participants take decisions - are useful. Examples of the various forms used to keep these records should be handed out or included in the text. Examples should be given of common errors in this field and of ways to avert them.

22 August 1984, 3:00 p.m.: Production planning for furniture plants
(approximately 100 minutes)

The lecturer - Mr. Mahuraullee- is to explain the reasons for planning and controlling, etc. He will use as example the system he has developed to plan and control production in his own factory. The whole methodology should be explained, preferably by using an order as an example (case study) and then showing how the forms are filled out on a step by step basis, explaining the possible alternatives, sources of error, etc.

(The duration of this lecture may have to be extended at the detriment of the previous one.)

23 August 1984, 8:30 a.m.: Visit to Messrs. Mahuraullee (90 minutes)

The object of the visit is to show participants the application of the system referred to in the previous day's lecture. Other objectives are to show the plant's very good system of waste retrieval and the self-built machines.

23 August 1984, 10:30 a.m.: Visit to Messrs. Nettoo (90 minutes)

The object of the visit is to familiarize participants with the various operations common to producing metal furniture or metal components for other types of furniture.

23 August 1984, 1:30 p.m.: Rattan furniture production (all afternoon)

(The lecturer has not yet been identified)

The object of this lecture is to familiarize the participants with the types of rattan available, their qualities, properties and end uses, the correct storage and pre-processing and the processing of the rattan.

Considerations in the design of rattan furniture should also be given (eg. binding and joining systems, minimum radii of curvature to which it can be bent, etc.)

Methods of working the rattan should - if at all possible - be demonstrated and samples of the various points raised in the lecture be circulated to the participants. A set of slides or better still an exhibition of rattan furniture could be arranged at the lecture theater site.

UNIDO would be willing to make available to the participants copies of its manual on production of rattan furniture (ID/299), but a new text would be recommended since the UNIDO publication is for larger scale production using more machines, etc.

24 August 1984, 8:30 a.m.: Presentation of seminar assignments (all day)

No activities by the lecturers, but it would be hoped that they would be attending to help clarify the various points, expand them, and also realize the impact that their lecture made on the participants.

ANNEX VII

Pictures of demonstrations used in
Lahti Seminar 1983

- Fig. 1 Wooden jig (feed slide) for band-sawing a straight edge to an unedged board.
- Fig. 2 Spindle-moulding curved chair legs (Louis XVI-style). A set of two double-sided jigs are needed to machine all four sides.
- Fig. 3 Pneumatic router for carving. Workpiece clamping, rotation, and tool feed by compressed air. Function controlled by microprocessors.
- Fig. 4 Spindle-moulding of coat hanger parts by using a double-sided jig.
- Fig. 5 Pneumatic boring unit. Rotation, feed and workpiece clamping by compressed air.
- Fig. 6 Same as figure 3.
- Fig. 7 Penumo-electric boring unit with multiple spindle head. Workpiece clamping by compressed air.
- Fig. 8 Robot designed and constructed at the Lahti Institute of Technology for training purposes.
- Fig. 9 Control panels of robot.
- Fig. 10 Suction cup of robot approaching the topmost panel of stack.
- Fig. 11 Same as figure 3.
- Fig. 12 Testing the electromagnetic field of a test press for radio-frequency heating (press self-constructed). Fluorescent lamp is used for the purpose.
- Fig. 13 Simple belt conveyor assorting panels by size.

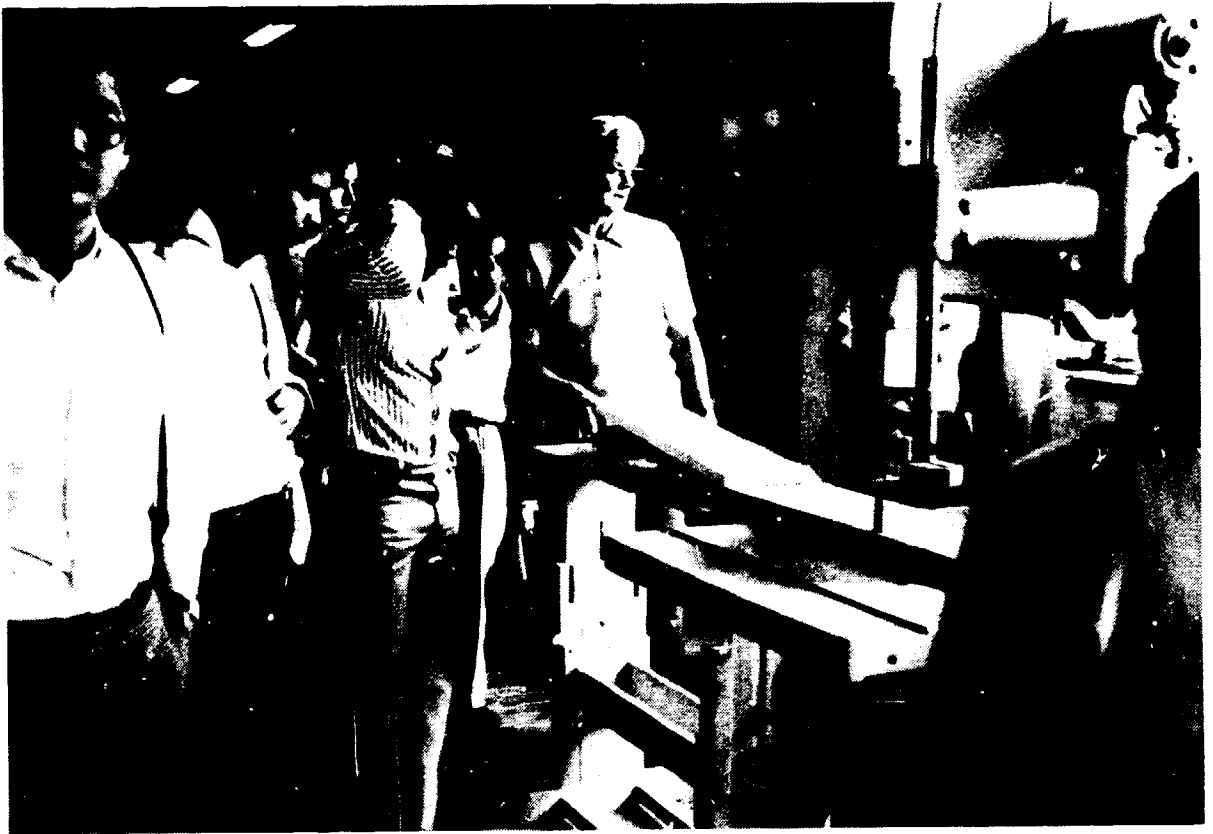


Fig. 1



Fig. 2



Fig. 3



Fig. 4

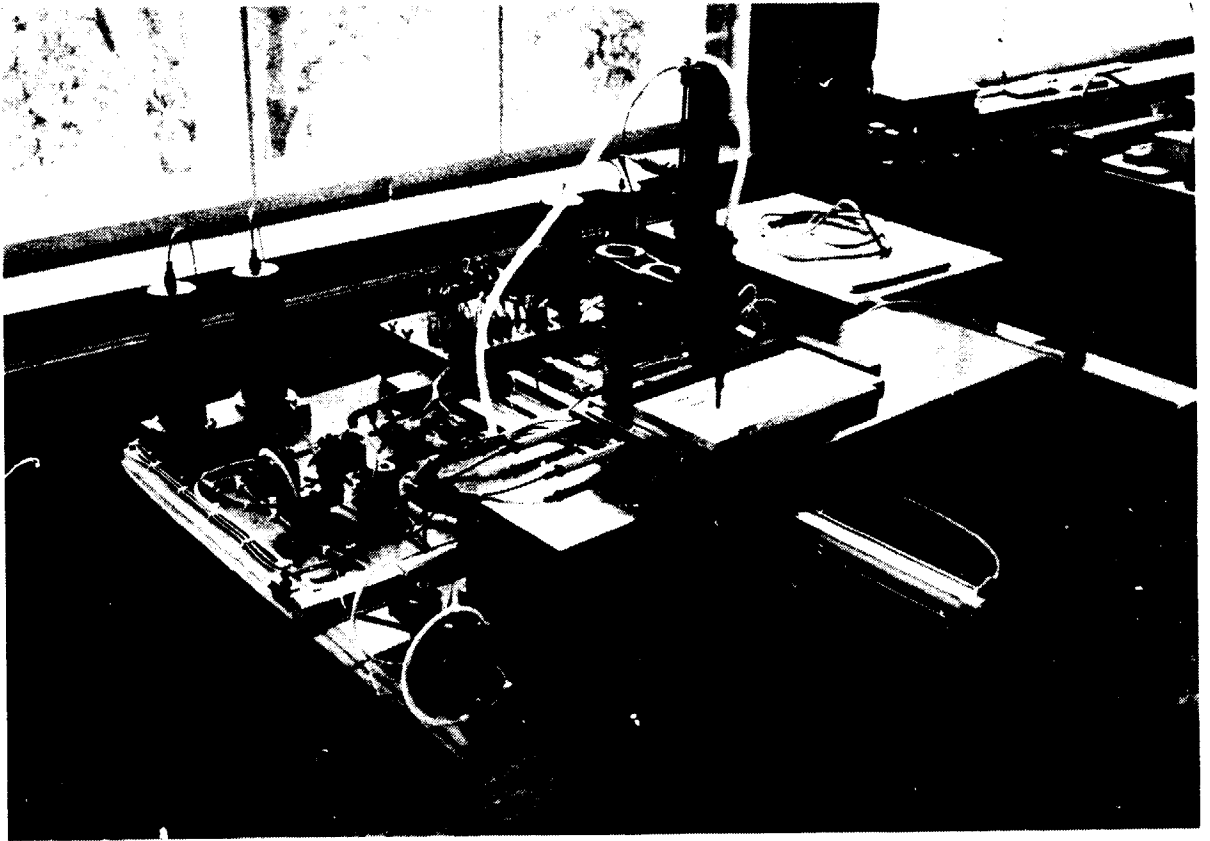


Fig. 5

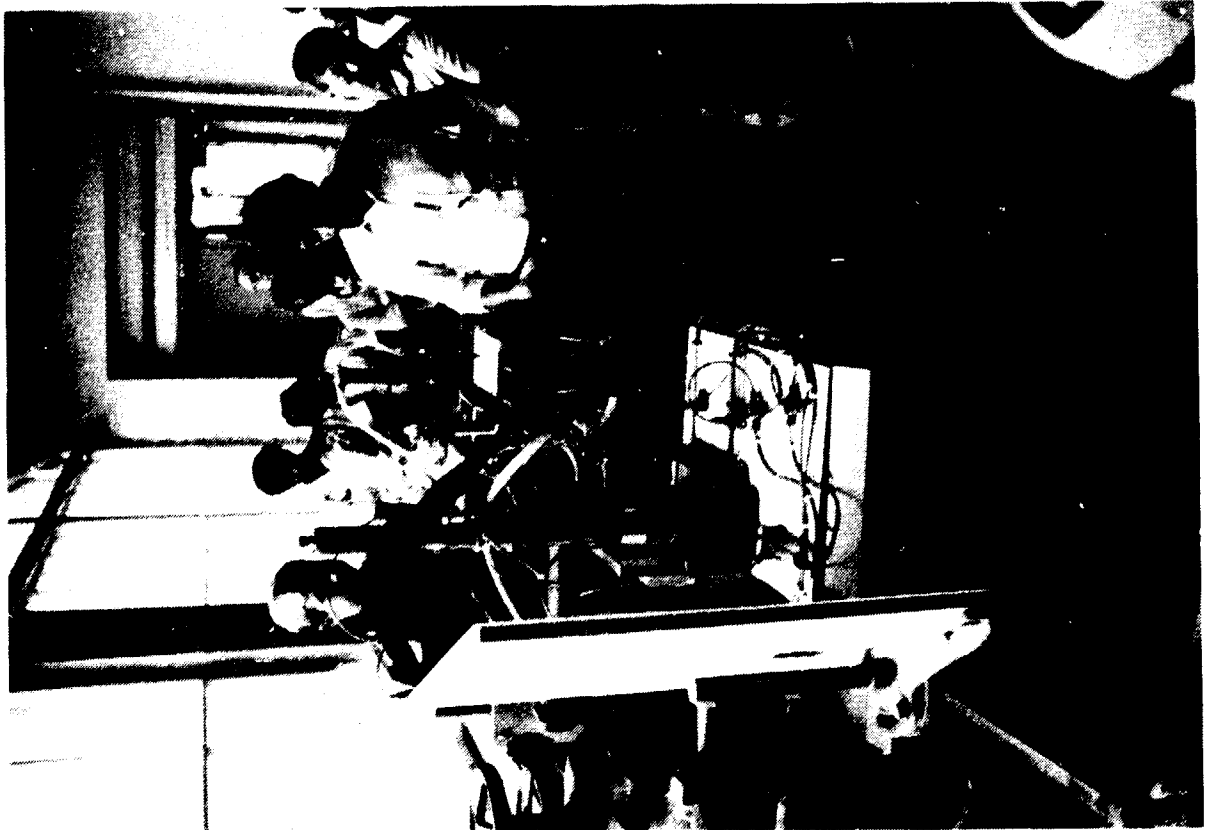


Fig. 6

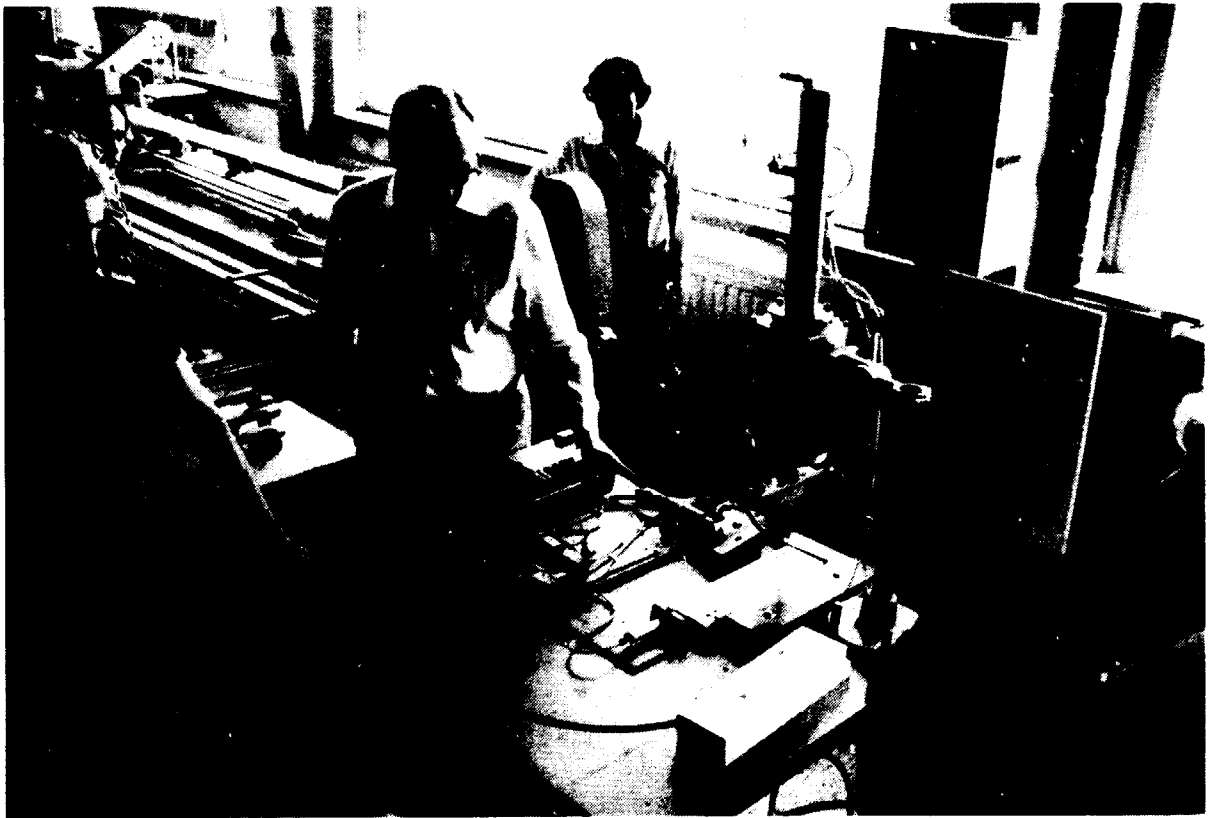


Fig. 7

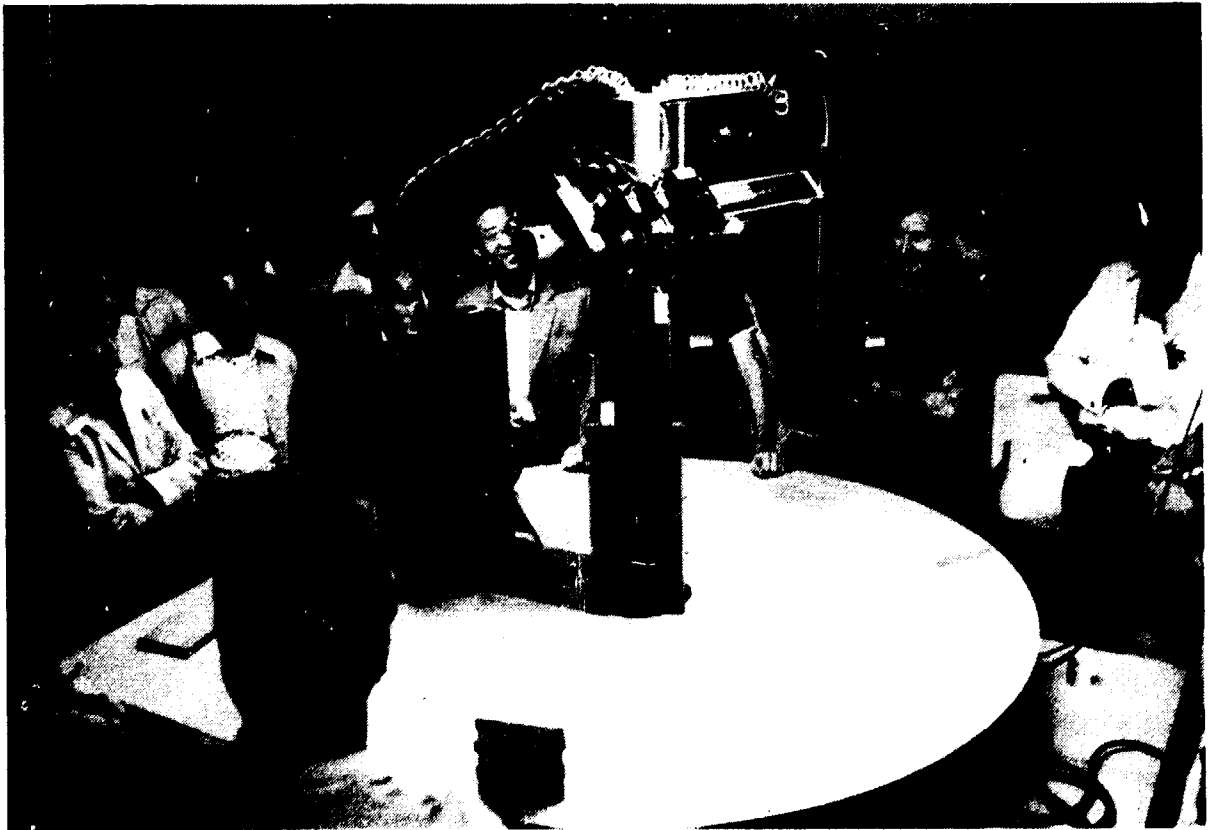


Fig. 8

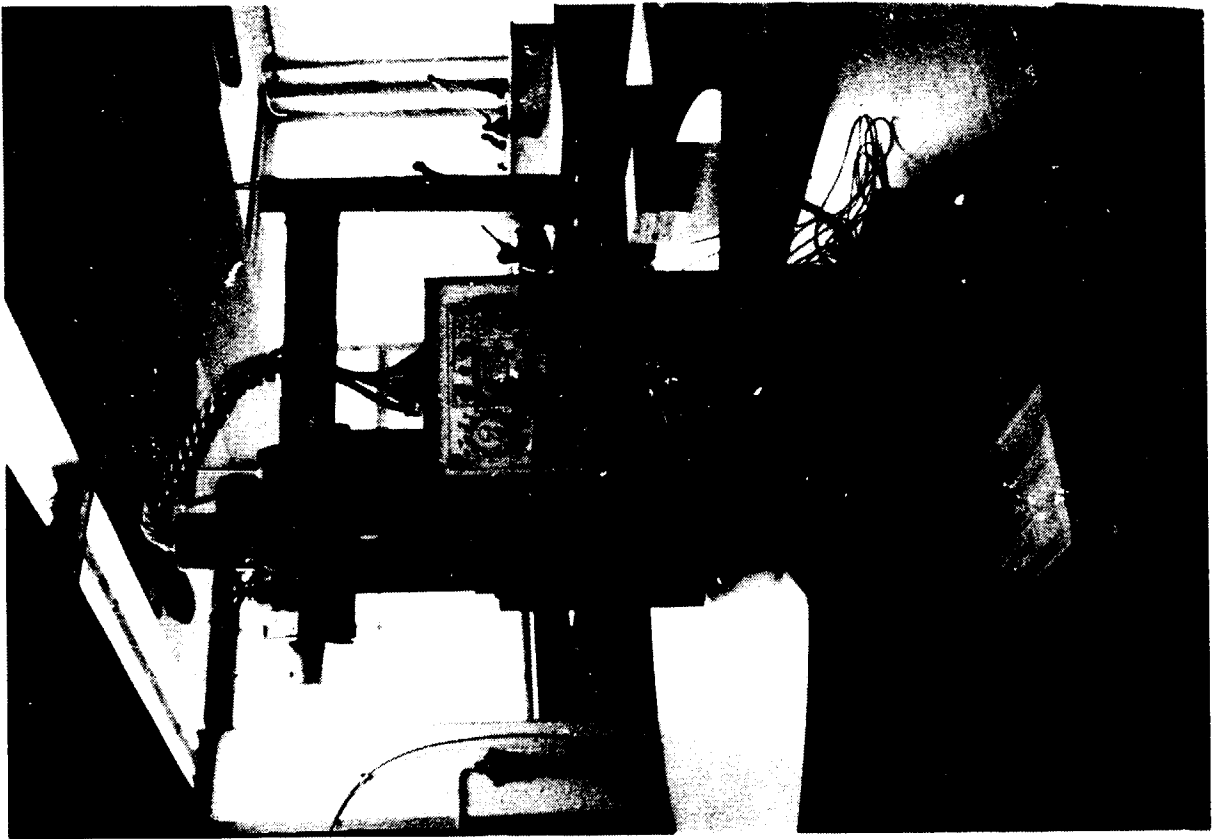


Fig. 9

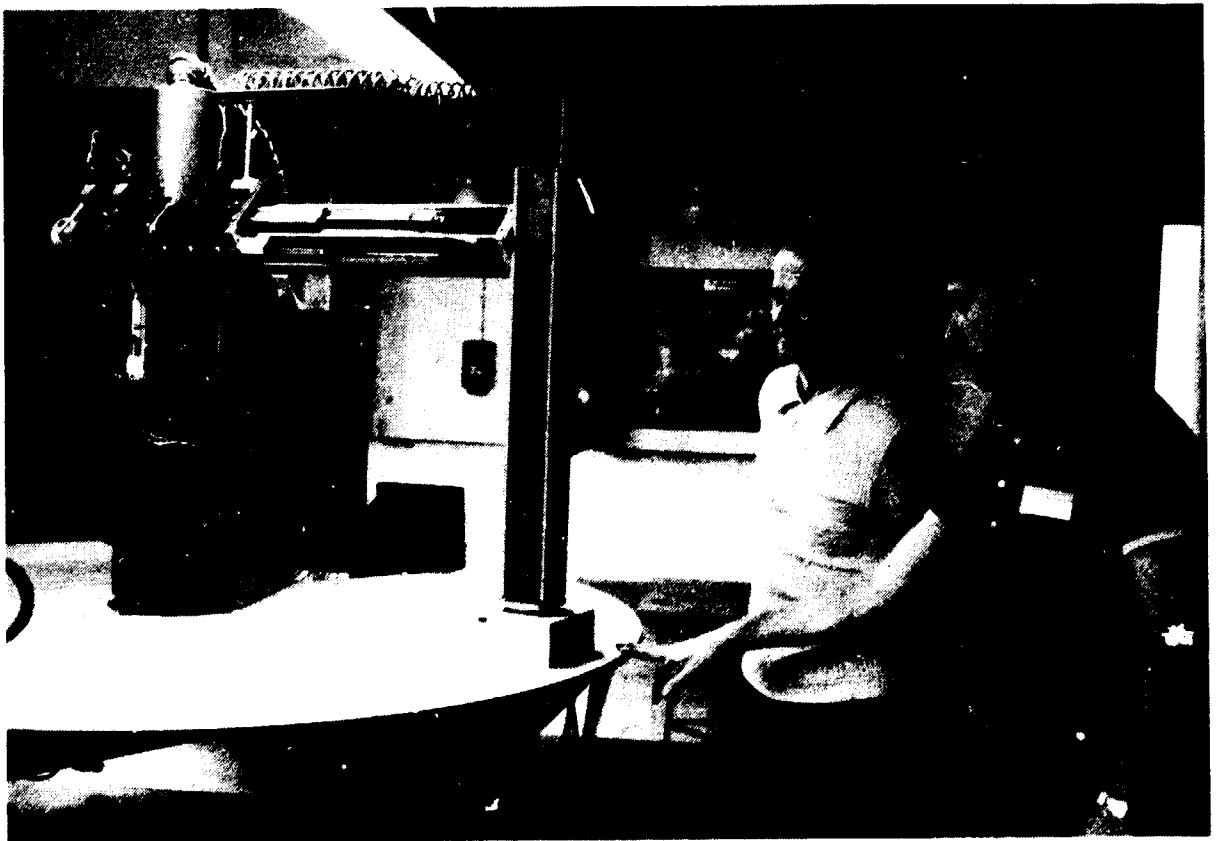


Fig. 10



Fig. 11



Fig. 12



Fig. 13

ANNEX VIII

In-country Course on Furniture and Joinery Industries in Tanzania

1. Objectives

- To train the factory owners, managers and supervisors so that they are able to use the knowledge gained in their own factories, both in the form of plant level technical improvements and training of factory employees;
- To support the local industry and institutes so that they are later able to use the training package and instructor skills for further in-country training programmes;
- To follow-up in each factory with expatriate technical personnel to ensure implementation of proposed factory improvements.

2. Programme

- Short consultancy mission to visit the industry, select course participants, identify assistant instructors for Lahti instructor seminar and identify the training institute which will co-operate to conduct the course;
- Final selection and training of 2-3 assistant instructors in Lahti;
- Preparation for the seminar including final selection of companies, participants, factory visits;
- Preparing and translating the training package in Swahili;
- Preparation and running of the 3-week course, probably at the Technical College in Arusha in co-operation with the Forest Industries Training Institute in Moshi;
- Preparation and follow-up of individual, in-company development plans.

3. Implementation and Time-Table

The programme will be implemented during 1987. The study will be done by two experts in the factories in January/February and the 3 trainees will participate in Lahti in August. The course preparation will take place in September and the implementation of class-room training in October. Factory follow-up is scheduled for November and December.

ANNEX IX

Follow-up of Seminar on Furniture and Joinery Industries in Mauritius

1. Objectives

- To support the Mauritius Seminar and Lahti Seminar participants in putting new acquired knowledge into practice;
- To analyse each factory, give recommendations and to provide technical assistance in production improvement;
- To provide on-the-job training to supervisors and key workers responsible for introducing and implementing changes.

2. Scope of Technical Assistance

There is need for expertise in machine and plant operations and maintenance, finishing, packaging and crating and product development. The technical assistance will be given by four (4) expatriates; two (2) in maintenance for 3 months each, one (1) in finishing and quality control for 2 months. The detailed need for technical assistance in each factory would be established during the course follow-up.

3. Scope of In-Plant Training

In-plant training will involve on-the-job instructor course. the participants would be supervisors or production managers, one from each factory. they would be selected by expatriates during the preparatory mill visits. The "4-step" method of job instruction would be learned in a class-room. Where the important topics of technical assistance would also be taught. After the 2-week course the immediate follow-up of on-the-job training in practice would take place in the factories.

4. Implementation and Time-Table

The programme would take time 8-9 months and start with the preparation, class-room training and plant follow-up. After that the detailed technical assistance would take place. The time-table is presented in the next page.

Time-Table

Activity	3 months	9 months
1. Preparation from		
- training materials	xx	
- selection of trainees	xx	
2. Job Instructor Seminar		
- class-room training	xxxx	
- factory programme	xx	
3. In-Plant Follow-up		
- preparation	xx	
- technical advising	xxxxxxxx	
- on-the-job training	xxxxxxxx	
4. Evaluation and Report		xxxx
5. Detailed In-Plant Technical Assistance 14 months		
- millwright		xxxxxxxxxxxxxxxxxxxx (3 m/m)
- machinery and plant mainten.		xxxxxxxxxxxxxxxxxxxx (3 m/m)
- finishing		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx (6 m/m)
- packaging and crating		xxxxxxxxxx (2 m/m)

ANNEX X

Lahti Seminar Programmes

1. Advanced Technical Seminar

Considering the response of previous participants in both the Lahti and Mauritius courses related to the conduct of the respective courses, the attached syllabus is proposed as a complementary solution to the indicated revisions of the former Lahti and Mauritius training courses on the manufacture of furniture and joinery products.

Without reducing the total time allocated to lectures (in fact it is proposed to be longer by a few hours), emphasis on laboratory demonstrations and plant visits (field trips) was increased. Thus, the seminar will require a total of 137 hours, and, together with the official and social activities usually included in such courses, the Advanced Technical Seminar will require a total of 4 weeks. The allocation of seminar hours is presented in the following table.

<u>Topics</u>	<u>Manner of delivery</u>	<u>Lecture</u>	<u>Total number of hours</u>	
			<u>Laboratory demonstration</u>	<u>Panel discussion</u>
I. <u>Materials for the Industry</u>				
(a) Solid wood as a raw material in furniture	Lecture	3.0	-	-
(b) Wood seasoning and preservation	Lecture and Lab Demonstration	2.0	2.0	-
(c) Wood-based panels used in furniture manufacturing	Lecture	2.0	-	-
(d) Adhesives used in furniture manufacturing	Lecture	3.5	-	-
(e) Foams (rubber, polymethane, etc.) used in upholstery	Lecture	1.5	-	-
(f) Surface preparation and finishing materials	Lecture and Lab Demonstration	3.5	4.0	-
(g) Knock-down fittings	Lecture	2.0	-	-
	Sub-total, hours:	<u>17.5</u>	<u>6.0</u>	<u>0</u>
II. <u>Product design/development</u>				
(a) technical product design	Lecture	3.5	-	-
(b) Furniture design	Lecture	1.5	-	-
(c) Introduction to product development	Lecture	2.0	-	-
	Sub-total, hours:	<u>7.0</u>	<u>0</u>	<u>0</u>

<u>Topics</u>	<u>Manner of delivery</u>	<u>Lecture</u>	<u>Total number of hours</u>	
			<u>Laboratory demonstration</u>	<u>Panel discussion</u>
III. <u>Manufacturing</u>				
(a) Furniture manufacturing technology	Lecture	6.0	-	-
(b) Furniture production	Lecture and Panel Discussion	3.5	-	4.0
(c) Production economics	Lecture	3.0	-	-
(d) Quality control in furniture/joinery production	Lecture	2.0	-	-
(e) Upholstery technology	Lecture	3.0	-	-
(f) Production jigs/fixtures	Lecture and Lab Demonstration	2.0	4.0	-
(g) Packaging furniture/joinery products	Lecture	2.0	-	-
	Sub-total, hours:	<u>21.5</u>	<u>4.0</u>	<u>4.0</u>
IV. <u>Industrial and plant engineering</u>				
(a) Plant and machinery lay-out	Lecture	3.0	2.0	-
(b) Selection of woodworking machinery/equipm.	Lecture	3.0	-	-
(c) Tool and machinery maintenance and repair	Lecture and Lab Demonstration	3.0	2.0	-
(d) Low cost automation	Lecture and Lab Demonstration	1.5	3.0	-
(e) General criteria for the establishment of production facilities	Lecture	1.5	-	-
	Sub-total, hours:	<u>12.0</u>	<u>7.0</u>	<u>0</u>

VII. Plant visits (field trips)

10 plants visited at an average of 4 hours for each plant (including travel time) 40 hours

VIII. Presentation of group course assignments

12 groups at an average of 0.75 hours per group 9 hours

IX. Background information

4 hours

SUMMARY

	<u>Hours</u>	<u>% of total</u>
A. <u>By topics (academic/practical)</u>		
Materials for the industry	23.5	30
Product design/development	7.0	9
Manufacturing	29.5	37
Industrial and plant engineering	19.0	24
	<u>79.0</u>	<u>100</u>
B. <u>By general activity groups</u>		
Lectures	58.0	44
Lab demonstrations	17.0	13
Panel discussions	4.0	3
Plant visits	40.0	30
Seminar group assignments	9.0	7
Background information	4.0	3
	<u>132.0</u>	<u>100</u>

2. Management and Marketing Seminar in Lahti - 3 weeks

I. Seminar Objectives

- To train the participants to understand and apply the modern management and marketing techniques, including strategic planning;
- To prepare a programme for each participant on how to implement this knowledge in their own managerial work, and including implementation follow-up.

II. Programme

- 1st day: Opening and introduction
Concept of management
Strategic planning
Company related case studies in groups (continuing every day)
- 2nd day: Strategic planning (cont'd)
Analysis of threats and opportunities
- 3rd day: Marketing (only aspects relevant to furniture and joinery marketing)
- 4th day: Marketing (cont'd)
- 5th day: Product development for export
- 6th day: Financial management
Costs and control of inputs (labour, capital, materials, techniques)
- 7th day: Financial management (cont'd)
- 8th day: Personnel management and productivity
Production planning and materials management
- 9th day: Production planning and materials management (cont'd)
- 10th day: Production management (cont'd)

11th day: Industrial engineering

Investment calculations and economics

Equipment selections

12th day: Case study reports

13th day: Written tests

Individual company programmes and follow-up (discussions with each participant)

14th day: Individual discussions (cont'd)

15th day: Summarizing the company programmes

Closing session

III. Participants

Post graduate students from technical seminars (Lahti Seminar)

IV. Training methods

The methods are lectures, group works with case studies and factory visits. Each participant should prepare a strategic plan for his company including the action programme. This can be followed up later.

3. Instructor Seminar - 1 week

I. Course Objectives

- To teach the participants the skill how to use the training package of the technical seminar;
- To finalize a programme when, where and how to transfer the know-how of the Lahti Seminar.

II. Programme

1st day: Opening and introduction

Presentation of teacher handbook and student workbook

Analysis of different training needs to be covered by the handbook
(group work)

2nd day: Lecturing techniques

Use of overheads, slides and video technique

Moderating the panel discussions

Individual presentations with video (group work)

3rd day: Demonstration materials and laboratory works

Programming the mill visits

Country modifications for demonstrations and mill visits (group work)

4th day: On-the-job training techniques

- 4-step method
- psychological aspects of instruction
- job analysis
- practical examples with video

5th day: Written tests

Programming the training and transfer of know-how

- setting objectives
- selecting participants
- facilities and techniques
- translations for students
- teacher resources
- testing and evaluation
- practical in-plant follow-up

Lectures, group work and reports

Closing session

III. Participants

- Persons familiar with Lahti Seminar;
- Managers who can train their own organization or assist in country seminars;
- Experienced teachers or instructors with full knowledge in furniture and joinery industry;
- Estimated number of participants is 15.