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ASSISTANCE TO TECHNICAL TRAINING IN WOOD PROCESSING

XP/TUR/85/003/11-01

TURKEY

Terminal report\*

Prepared for the Government of Turkey  
by the United Nations Industrial Development Organization

Based on the work of Manfred Kluge,  
Consultant in furniture and wood industry

Backstopping officer: S. Cinar, Agro-Based Industries Branch

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### Explanatory Notes

1. The rate of exchange of the Turkish Lira (T.L.) to the US Dollar (US\$) during September 1986 was: US\$ 1.00 = T.L. 680.00.
2. The following abbreviations are used in this document:  
  
UNDP: United Nations Development Programme  
UNIDO: United Nations Industrial Development Organization  
WED: Woodworking Education Department  
TCDC: Technical Cooperation among Developing Countries  
ORÜS: General Directorate of Forest Products Industries
3. The mention of firm names and commercial products does not imply the endorsement of the United Nations Industrial Development Organization (UNIDO).

A B S T R A C T

The study of the Woodworking Education Department (WED) of the Faculty of Technical Education of Gazi University indicates that currently used course syllabus, laboratories and workshop facilities are not in line with the requirements of the industry.

A survey of the current needs of the furniture and joinery industries in Turkey shows that about 15% of all the existing techno-managerial staff need training in modern techniques on a continuous basis and that the new graduates do not meet industry's requirements.

A project to address the immediate needs of both the WED and the industry is proposed.

TABLE OF CONTENTS

Chapter		Page
	INTRODUCTION	1
I	FINDINGS	3
	A. The Furniture and Joinery Industries	3
	B. The Gazi University	7
II	RECOMMENDATIONS	8
	A. To the Forest Administration	8
	B. To the Furniture and Joinery Industries	8
	C. To the Gazi University	8
A N N E X E S		
I	Expert's Job Description	10
II	List of persons met	12
III	Existing Course Programme of the Woodworking Education Department of Gazi University	14
IV	Project Proposal entitled "Modernization of Secondary Wood Industries"	17
Appendix I	Project work plan	32
Appendix II	Project budget covering Government contribution in kind (In local currency)	33
Appendix III	Project budget covering UNDP contribution in US Dollars.	34
Appendix IV	Fellowship programme	37
Appendix V	Study tour programme	38
Appendix VI	List of equipment to be purchased by UNDP/UNIDO	40
Appendix VII	List of equipment to be provided by the Woodworking Education Department	43
Appendix VIII	The layout of the Faculty of Technical Education and the location of the Woodworking Education Department	44

## INTRODUCTION

Turkey's forest regions cover 26% (approximately 20 million hectares) of the country's total area. They are subdivided into two categories: good and bad quality. Good quality forests are situated mainly in northern regions throughout the Black Sea Coast and in western and southern parts of Turkey.

In Turkey, furniture, doors and windows are produced both by workshops and factories. Workshop type of production has a long history whereas most of the existing factories and big workshops have been installed after 1975.

The workshop owners are members of the Federation of Woodworking Artisans and Small Industries. The Federation estimates that there are around 250,000 manufacturers in the whole country. There is a continuous flux of creation and cessation of activities in the sector. Some artisans are not registered with the Federation.

The workshops are located mostly in Siteler-Ankara, Inegol, Istanbul and Eskisehir. Siteler-Ankara has the largest number of such workshops, which typically employ up to 10 workers. Workshops employing 100 workers also exist. They are mostly equipped with locally manufactured machinery. The working conditions are generally primitive.

There are also more than 30 modern factories and big workshops. The share of the factories' manufacture is around 15% of production. Large scale furniture and joinery factories, currently operating, are listed in Annex III of the Technical Report UNIDO/IO/R.245..

Local demand for wooden products in Turkey increased while at the same time a small export grew, mainly to Arab countries. (See Annex IV of the above report). Bigger furniture, door and window factories produce in series to cover the demands of the larger construction firms. Since there were no educated specialists, the production problems grew, especially because raw materials in Turkey do not meet the requirements for mass production. Production costs are very high because of the lack of technical know-how.

The workshops are trying to solve existing production problems. There are some very good ones, but the majority of the smaller wood processing workshops do not manage to overcome their production difficulties because of poor professional know-how.

Most of the owners and workmen of the workshops never had any proper professional education. As was the tradition, they entered this profession as young, unskilled workers without any professional training. Vocational schools have been founded between 1960 and 1965. Unfortunately, these are no longer in a position to cover the education requirements of modern woodworking industries due to the following reasons:

- The new technologies are not covered by the course syllabuses used presently in the education establishments at various levels. Therefore, the factories using modern machinery, equipment and processing methods find the graduates not trained to operate them and use the technology they have invested in.

-Aspects related to inter-acting factors between materials, for example, in the case of wood gluing, the inter-action between the wood, glue, temperature, pressure, and preparation of wood surface-preparation of glue are not covered and/or coordinated.

-Different syllabuses of different teaching establishments have different approaches to the same subject and its coverage irrespective of the requirements of the modern industry. Instead of covering new and modern materials, equipment and production methods, out-dated technologies are being taught in detail and the workshop practices are also based on these and on the use of traditional equipment.

The faculty of Technical Education was founded in 1937 originally as an industrial teachers' Training School for men with departments for metalworking, woodworking and fitting. In 1982, in accordance with the new law of higher education, this school was turned into a faculty of Gazi University. The Faculty occupies an area of 140,000 m<sup>2</sup>. About 3,500 students are enrolled and there are about 110 full time and 70 part time staff members. The Faculty consists of the following main departments:

1. Machinery Education Department
2. Electrical and Electronics Education Department
3. Construction Education Department
4. Metallurgy Education Department
5. Woodworking Education Department
6. Higher School of Industrial Education.

Currently about 200 students are being educated in the Woodworking Department whose courses last four years. Approximately 50 students graduate per year and 50% of these graduates take up a job in governmental teaching institutions as teachers of special subjects as well as in national institutes. Most of the remaining graduates enter the furniture and joinery industry as technical experts. The graduates have very good vocational chances since education is very practice-oriented. There are in all about 3,000 professionals in this sector in Turkey who have finished their studies at the Woodworking Education Department of the Gazi University or its predecessor body.

The weak aspects of the wood processing industry are well known to the Woodworking Department. The technology used by the furniture industry in Turkey has developed very rapidly, as new plants, using the latest know-how were created. This new technology could not be passed on to the students because of the Faculty's lack of financial means and technical support. It has been noticed that the growing technology gap has also partially contributed to the increase of the workshops' problems.

There is no programme for the systematic up-grading of the teaching personnel. Because of financial restraints, educational aids as well as up-to-date literature is missing and the study of new techniques in the wood processing sector cannot be undertaken. The only way whereby the University lecturers get to know about new processing techniques is from private enterprises.

In order to provide the necessary technical advice to the Gazi University to develop its ability to serve the expected modernization of the industry, the Government of Turkey requested the United Nations Industrial Development Organization (UNIDO) through the United Nations Development Programme (UNDP) to provide the services of a furniture and timber industry training expert to advise the Gazi University on the ways to improve the workshop and laboratory facilities and the syllabuses of the Woodworking Education Department of the Faculty of Technical Education. The request was made by letter through UNDP/Ankara on 26 October 1984.

This report covers a consultancy by Manfred Kluge, expert in furniture and timber industry and training, split into five weeks during the period 26 February to 1 April 1986 and a further 3 weeks during the period 20 August to 11 September 1986. During the period from 1 to 8 September 1986, Mr. Kluge was accompanied by Sinan Cinar, a UNIDO Associate Industrial Development Officer in the Department of Industrial Operations, who assisted him and participated in the drafting of Annex IV. A copy of the expert's Job description is given in Annex I. An interim technical report was prepared (UNIDO/IO/R.245) after the first phase and this report is complementary to that interim technical report, and is to be read in conjunction with it.

Chapter I gives an account of the expert's additional observations and findings during his visit to selected firms and factories and the Gazi University. Firms and persons contacted during these visits are contained in Annex II. In this chapter shortcomings affecting the Gazi University and the performance of the sector are identified.

Chapter II outlines the expert's final recommendations to the forest administration, furniture and joinery industries and the Gazi University.

A project proposal entitled "Modernization of Secondary Wood Industries" is attached as Annex IV.

## I. FINDINGS

### A. The Furniture and Joinery Industries

During the expert's first mission in March 1986, a meeting was held at the Woodworking Education Department with the participation of representatives from the Government counterpart, ministries, institutes, professional organizations and trade and industry sectors.

On a separate occasion, the expert visited a number of furniture and joinery workshops and factories in and around Ankara and had informal discussions with the owners and managers.

The findings of the expert from the above meetings and visits are contained in Pages 2 to 10 of the interim technical report covering the first phase of the project.

During this second phase of the split mission, in August/September 1986, the expert placed special emphasis on a programme of visits to selected wood processing workshops and factories in various parts of Turkey in order to get more practical information on their performance.

The list of firms and organizations visited is given in Annex II.



In order to collect consistent information from the firms and institutions visited, a questionnaire was prepared and used which had the following specific questions:

- What is the current situation and problems of the firm and the suggestions and plans of the management for their solution.
- What are the targets of the firm.
- What qualifications/skills are required from the vocational school leavers and university graduates studying woodworking.
- What kind of cooperation exists or is desired among industry and between industry and universities.
- What are the suggestions for, or opinions on, a programme of technical seminars for the industry.
- What are the needs of the industry for a development association or centre.

The expert's analysis of the answers given to the above questions by the individual firms are given below:

The current situation and problems of the companies:

During the questioning and discussions with the management, it became apparent that most companies had problems in areas of product design, product quality, raw material supply, production planning and control, operating personnel and management. This was a confirmation of the problems already identified in the interim technical report.

The targets of the companies:

The companies that have been interviewed had identified the following points as their targets:

- Better maintenance of machines and equipment
- Lower investments
- Better education/training of the techno-managerial staff
- Improved quality of finished products
- Lower production and material costs
- Better management of resources
- High volume sales on a continuous basis
- Larger batches/series in production
- Entering export markets
- Use of computers as an aid to better use of resources

Education and qualification of graduates:

The existing syllabus of the woodworking course at the Gazi University does not comply with modern technical demands to satisfy the need for knowledge for the education of professional experts and to help the furniture and joinery industry, created in the last five years, solve its problems.

The present syllabus (Annex III) is a very traditional one and does not give enough importance to the new technologies and does not cover to a sufficient depth economical educational subjects.

The companies require recent graduates to have studied the additional following subjects:

- Materials science and technology
- Product costing and cost control with respect to characteristics of the production
- Production planning and control
- Production management
- Factory management
- Value analysis
- Woodworking machines and auxiliary machines and equipment
- Woodworking tools
- Turkish (TSE), international (ISO) and other foreign standards related to the sector
- Mass production technology and methods

A new syllabus is currently being prepared in order to better meet today's requirements in practice.

The firms also require the students to have practical training not only in the university workshops but also in the industry. Furthermore, the students must be able to choose an area of the sector to specialize in so that when they graduate, each of them have a more thorough knowledge in at least one area.

#### Possibility of cooperation among industry and between industry and universities:

During his visits to selected wood processing factories the expert observed that each masters a special task better than the others. For example, some factories displayed examples of good designs, some were able to utilize their wood raw material fully, some others were practicing wood drying properly while others had well equipped machine and tool maintenance workshops. There were also some companies who had their strong points in production planning or in operations management and marketing and sale of their products.

The expert observed no cooperation among industry for the exchange of experience and information.

However, good examples of cooperation between industry and universities existed. For example, the Faculty of Technical Education of the Gazi University has signed a protocol with the Confederation of Workers Unions of Turkey (TURK-İS) on 19 June 1986 to enable the employees from the industry, to participate in special training and skill development courses.

#### Technical seminars for the industry:

During the discussions, all the firms visited showed their interest in the seminars and stated their willingness to send between 2 and 15 employees for further training lasting 1 to 2 weeks.

According to a projection, 15% of all the professionals employed in the Turkish wood industry would attend these technical seminars every year. It is estimated that the profile of the participants would be 10 percent from higher management, 20 percent technical and engineering staff and the remaining 70 percent would require special training in specific subjects.

Some of the companies are willing to bear the cost of seminar fees and board, lodging and pocket money for their employees participating in these seminars, while others were prepared to pay for the board, lodging and pocket money of their employees but not the seminar fees.

The management of the firms were particularly interested that the following topics be covered by the seminars:

- Production techniques
- Machine maintenance
- Tool maintenance
- Quality control
- Productivity (Cost reduction and cost control)
- Production management (Production planning and control)
- Work preparation and scheduling
- Kiln drying of wood
- Gluing techniques
- Surface preparation and treatment
- Industrial product design

Some of the competent professionals and experts from the industry have agreed to and offered their support for technical seminars for the industry by preparing short reports and lecture notes on the following subjects:

- Production techniques
- Quality control
- Product standardization
- Kiln drying of wood
- Tool maintenance

A large number of firms agreed also to the suggestion to train technical personnel from other developing countries in their factories, once they have solved their existing problems. They are willing to host these trainees for about 2 to 3 weeks and cooperate with the organizers of international technical seminars if held in the future.

The industry's needs for a Development Association or Centre:

The idea to establish a development association and/or centre to provide specialized services to the furniture and allied industries has been approved in principle by the industry. According to the industry's views, this association should give priority in providing the following services:

- Dissemination of information on up-to-date techniques and developments
- Translation of important technical information and literature into Turkish and its distribution to the sector
- Comparison of the domestic costing procedures with those of the industrialized countries and taking measures and/or making recommendations for the improvement of the costing procedures currently used in Turkey
- Organizing general and specific technical seminars for the industry on a continuous basis
- Collecting samples of raw materials, and comparison of their advantages and disadvantages with the existing ones and making recommendations for their adaptation and use in Turkey.
  
- Collection of technical documentation such as furniture standards, research reports, manuals, short-cut and video films and make them available to the industry.
- Adapt foreign national standards and/or develop new ones.
- Undertake export market research and development and export promotion activities.
- Organize study tours to specialized fairs and establishments and institutions abroad.
- Organize furniture design competitions at the national level to encourage the formation of a furniture designer profession.
- Foster cooperation among industry on commercial and technical matters.
- Give ad-hoc specialist advice to individual firms on queries in production, management, marketing, design, plant layout, machine and tool selection both through its own technical staff and outside consultants.

#### B. THE GAZI UNIVERSITY

During his first mission the expert spent most of his time in the Woodworking Education Department, and, in cooperation with the counterpart staff, identified its current situation with special emphasis on:

- Course syllabus and teaching personnel
- Laboratories and workshop facilities

The details of the expert's findings on the above are contained in pages 13 to 15 of the interim technical report referred to above.

During his second mission in August/September 1986, the expert probed more into the possibilities to support the Woodworking Education Department to enable it to develop its ability to serve the needs of the industry to provide an appropriate training to its graduates.

In the light of the step by step assistance for the modernization of the Woodworking Education Department, recommended in Annex XIII of the interim technical report a project proposal covering the most immediate technical assistance required is given in Annex IV of this report.

This project proposal includes also the first inputs needed for the creation of a development association by the industry.

## CHAPTER II

### RECOMMENDATIONS

#### A. To the Forest Administration

1. Wood as a raw material should receive proper treatment from the Forest Administration also in the forests. Chemical treatment of freshly felled logs against fungal and insect attack and speedy extraction methods should be used to eliminate degrade and end cracks. Loggers and graders should be more thoroughly trained to put an end to such mis-doings as bucking to short lengths, poor grading and assortment of logs.

2. More attention should be given to preserve the inherent qualities of wood during the primary conversion and further processing.

If the above negative factors are eliminated, Turkey could turn its present wood supply deficit into a surplus.

#### B. To the furniture and joinery industries

1. Companies should start cooperating with each other so that an exchange of experience between management takes place. In this way the Turkish wood industry would be operating much more economically and be in a stronger position for exporting.

2. The industry representatives should decide on the establishment of a development association as a common ground for the above cooperation and contacts to take place.

3. The Turkish wood industry must make more use of existing engineering knowledge, introduce modern management systems and techniques based on team work, exercise better planning, be careful about costing of their activities and products, aim at more realistic objectives and mobilize their available resources for their realization, give more importance to information flow and feedback between their staff and between different departments of the company.

4. The factories and workshops should seek the services of foreign consultants and experts in order to attain higher levels of productivity and quality with minimal waste of time and resources. Since the value of wood processing industries is quite substantial in the economy of the country, investment to improve the current situation of the sector will have very short pay back times.

#### C. To the Gazi University

1. The Gazi University should serve as focal point (counterpart) for the proposed technical assistance project (Annex IV). All the activities of the project such as on-the-job training of lecturers by the international experts, fellowships, seminars for the industry and symposiums will deepen their knowledge and experience in:

-Coordination and cooperation with industry

-Establishing common grounds for exchange of practical and research experience between industry and university

-Specialized know-how on specific areas such as planning of activities and costing

-Brain storming and training of trainers

2. With its special position in woodworking education, vocational education and existing ties with the industry, the Gazi University should collaborate with the industry in the preparation of the foundations for the establishment of a Furniture and Joinery Industry Development Association or Centre. The key representatives and entrepreneurs of the woodworking industries sector should be invited to round table discussions lasting a few days in order to stimulate the setting up of targets and tasks of such an association or centre and assist the participants in taking a decision in this respect.



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

Assistance to technical training in wood processing

JOB DESCRIPTION

RP/TUR/85/003/11-01/31.7.A.

**Post title**      Adviser in furniture and timber industry training

**Duration**      2 months (split mission)

**Date required**      As soon as possible

**Duty station**      Ankara (with local travel)

**Purpose of project**      To improve facilities at Gazi University in Ankara for the training of technicians by upgrading and modernizing their workshop and by training staff on the use of new equipment; the curriculum will also be revised.

**Duties**      The adviser will be attached to the Woodworking Education Department within the Faculty of Technical Education at the Gazi University. He will be expected to help the staff of the Woodworking Education Department to upgrade the existing training facilities and to improve the course syllabus to be more in line with the demands of the modern wood processing industry.

In particular, he will be expected to:

1. Evaluate and critically appraise the present course and equipment.
2. Hold discussions with industry representatives to determine their needs in terms of technicians in the foreseeable future.
3. Draw up the technical specifications for the equipment to be purchased in Turkey and abroad for the workshop.
4. Train the counterpart staff and instructors in the use of the machinery and in the new curriculum.
5. Prepare a detailed report outlining his findings and recommendations.

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Applications and communications regarding this Job Description should be sent to:  
Project Personnel Recruitment Section, Industrial Operations Division  
UNIDO, VIENNA INTERNATIONAL CENTRE, P.O. Box 300, Vienna, Austria

UNITED NATIONS



NATIONS UNIES

**Qualifications:** Engineer or wood technologist with extensive knowledge and experience in secondary wood processing (furniture and joinery production) and training.

**Language:** English (some Turkish an asset)

**Background Information:**

Turkey possesses a significant forest resource and the wood processing industries have attained a fair degree of development. Nevertheless, the secondary wood processing sector is still in great and urgent need of modernization and of well trained technical personnel. The Government is anxious to provide the necessary technical advice to the Gazi University which is the main center of technical education in woodworking.

In this respect, the Government has turned to UNIDO for assistance in the required technical expertise for the University of Gazi to develop its ability to serve the modernization of the wood industry in general, where the University has a large potential in this field. Its Faculty of Technical Education was founded in 1937 as an industrial teachers' school. In 1982, it became a faculty of Gazi University with 180 staff members for 3500 students. It has six departments, one of which is the Department of Woodworking Education/Wood Processing which has been targetted for strengthening and improving teaching purposes and to provide training and extension services for industry.



ANNEX II

LIST OF PERSONS MET

GAZI UNIVERSITY, ANKARA

Mr. Ramazan Ozen, Dean and Head, Faculty of Technical Education

Mr. Abdullah Sommez, Associate Professor, Woodworking Education Department

Mr. Mustafa Altinok, Assistant Lecturer, Woodworking Education Department

UNDP

Mr. W. Holzhausen, Resident Representative

Mr. P. Van Hanswijck de Jonge, Deputy Resident Representative

Mr. R. Tourigny, Programme Development Officer (UNDP)

Mr. W. Dreusch, Junior Professional Officer (UNIDO)

ORUS - BOLU

Mr. Selahattin Turhal

Mr. Yasin Cetin.

ORUS - DUZCE

Mr. Yucuf Eroglu

Mr. Fethi Unal

FOREST AREA HEADQUARTERS

Mr. Ali Sirtli

Mr. Turan Ceylan

FACULTY OF FORESTRY - Istanbul

Doc. Dr. Ramazan Kantay

TEKSAN TEKIRDAG WOOD INDUSTRY CO. - TEKIRDAG

Mr. Babus Balkir

FOREST AREA HEADQUARTERS - BURSA

Mr. Nevzat Ozer

Mr. Kamil Canan

Mr. Uzeyir Karabicak

ISTAS FURNITURE FACTORY - INEGOL

Mr. Mehmet Yildiz  
Mr. Ethem Ince

ANADOLU FURNITURE FACTORY - ESKISEHIR

Mr. Davut Aydin  
Mr. Fahri Urazel

KELEBEK FURNITURE FACTORY - DUZCE

Mr. Husnu Karagozoglu

FACULTY OF FORESTRY - TRABZON

Doc. Dr. Orhan Ozdas  
Doc. Dr. Mehmet Serez  
Doc. Dr. Harsemsah Hafizoglu  
Mr. Kadir Malkocoglu

STATE FOREST PRODUCTS FACTORY - ARDESEN

Mr. Mehmet Aslan  
Mr. Sabri Ozal  
Mr. Kadir Oztürk

KORUSAN FOREST PRODUCTS FACTORY - CAYELI

Mr. Tuncer Ergüven  
Mr. Mustafa Yilmaz  
Mr. Yüksel Ust

KUZUY FURNITURE FACTORY - TRABZON

Mr. Ali Osman Kurt  
Mr. Oktay Bayazit  
Mr. Tuncay Maytapoglu

EAST BLACK SEA FOREST RESEARCH DIRECTORATE - TRABZON

Mr. Ali Kenan Eyüboğlu  
Mr. Mustafa Akyüz

EXISTING COURSE PROGRAMME OF THE  
WOODWORKING EDUCATION DEPARTMENT OF GAZI UNIVERSITY

<u>Year - Semester</u>	<u>Subjects</u>	<u>Credit Hours</u>
1 - 1	Mathematics	4
	Physics	3
	Chemistry	3
	Wood Design and Construction I	2
	Drawing Geometry	2
	Equipment Science	2
	Practical Woodworking	8
1 - 2	Mathematics II	4
	Physics II	3
	Chemistry II	3
	Materials Science	2
	Furniture Design	3
	Practical Woodworking	10
2 - 1	Statics	3
	Statistics	2
	Wood Technology	2
	Woodworking Machines I	3

<b>Year - Semester</b>	<b>Subjects</b>	<b>Credit Hours</b>
2 - 2	Electric Science	3
	Building Science	2
	Furniture Styles I	2
	Woodworking Machines II	3
	Materials Science II	2
	Furniture Design II	3
	Practical Woodworking	10
3 - 1	Technology of Surface Treatments	3
	Furniture Styles II	2
	Project I	4
	Perspective and painting Techniques I	2
	Practical Woodworking	10
3 - 2	Economics	2
	Technology of Surface Treatments II	3
	Project II	3
	Perspective and Painting Techniques II	2
	Esthetics	2
	Technology of Decoration	2
	Practical Woodworking	10

<u>Year - Semester</u>	<u>Subjects</u>	<u>Credit Hours</u>
4 - 1	Technology of Serial Production	2
	Project III	5
	Perspective and Paint Techniques III	3
	Practical Woodworking	10
4 - 2	Quality Control in Wood Industry	3
	Project IV	5
	Perspective and Paint Techniques IV	3
	History of Art	2
	Practical Woodworking	10

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

.....TURKEY.....  
(country)

PROJECT DOCUMENT

Title: Modernization of Secondary Wood Industries

Number: DP/TUR/87/

Duration: Two years

Primary function: <sup>a/</sup> Institution Building

Secondary function: Direct Support

Sector: (Govt. Class.) \_\_\_\_\_ (UNDP class. and code) 0510: Industrial

Sub-sector: (Govt. class.) \_\_\_\_\_ Development Support Services

Government Implementing Agency: Woodworking Education Department, Faculty of Technical Education, Gazi University, Ankara.

Executing Agency: United Nations Industrial Development Organization (UNIDO)

Estimated starting date: (month, year) January 1988

Government inputs: T.L. 57,400,000. (in kind) UNDP inputs: US\$ 362,795  
(local currency) (US dollars)

N/A (in cash)  
(local currency)

Government Cost-Sharing: (if any) N/A  
(US dollars or other freely convertible currency)

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
          on behalf of the Government  
  
          \_\_\_\_\_ Date: \_\_\_\_\_  
          on behalf of the Executing Agency  
  
          \_\_\_\_\_ Date: \_\_\_\_\_  
          on behalf of the United Nations  
          Development Programme

<sup>a/</sup> If the primary function is direct support and the project furthermore is investment-oriented, the entry should read as: Direct Support (I-0).

## PART I. LEGAL CONTEXT

This project document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of Turkey and the United Nations Development Programme, signed by the Parties on 21 October 1965.

The Government Implementing Agency shall, for the purposes of the Standard Basic Agreement, refer to the Government Co-operating Agency described in that Agreement.

## PART II. THE PROJECT

### A. Development Objective

To assist the Government in implementing its economic development plans to increase productivity and quality in the country's secondary wood processing industries sector which in turn will increase export earnings.

### B. Immediate Objective

1. To develop a national capability at the Woodworking Education Department (WED) of the Faculty of Technical Education of Gazi University to provide industrial training courses for senior technicians and managers of the furniture and joinery industries.

2. To enable the secondary woodworking industry representatives in Turkey to create a professional association to develop the sector.

### C. Special Considerations

It is envisaged that at the end of this project the Woodworking Education Department will have the required experience, expertise and the teaching materials to organize successful industrial training seminars and/or courses for participants from other developing countries to upgrade their skills in the techno-managerial aspects of the secondary wood processing industries, thus promote the technical cooperation among developing countries (TCDC).

### D. Background and Justification

Turkey has a natural forest area of about 18 million hectares which is about 23% of the land area of the country. This includes productive as well as non-productive forests. Most of the productive forests are situated on the coastal regions in the North, South and West of the country. The total quantity of wood extracted from the forests is about 16.5 million m<sup>3</sup> per annum of which about 6 million m<sup>3</sup> is industrial wood, (3 million m<sup>3</sup> coniferous sawnwood, and 1 million m<sup>3</sup> broadleaved sawn wood).

This natural resource supplies the raw material requirements of both the public and private sector enterprises. The secondary wood processing sector consists of about 300,000 units which manufacture a wide range of products ranging from pallets to furniture and joinery. The structure of the sector is based on small size carpentry/joinery workshops (craftsmen), medium size workshops, large size workshops ("mechanized craft" operations) and factories producing on an industrial scale. Production at the craft end has a long history in Turkey, whereas most of the existing factories and large workshops have been established since 1975.

The small workshops are located mostly in and around the cities as Ankara (Siteler), Bursa (Inegöl), Istanbul (Bayrampasa) and Eskisehir. The Siteler district of Ankara has the largest number of workshops. The number of workers employed by small to medium workshops is usually under 10. However, large workshops employing up to 100 workers also exist. They are mostly equipped with locally manufactured machinery and the working conditions are primitive. Most of the workshop owners and employees do not have appropriate professional education. As was the tradition, they started this profession as young and unskilled workers without any professional training and eventually became owners. Because of their lack of technical know-how and the lack of appropriate formal training facilities in this sector, the skills of their employees are also not being upgraded.

There are also about 30 medium to large size factories and/or workshops producing furniture and joinery. Their share is about 15% of the total production. Their owners and managers have little experience in industrial production techniques. Their previous experience was usually acquired in workshops and sales outlets or in other sectors such as the metallurgical, chemical, construction and food production industries.

In general, there is a lack of sufficiently skilled and well informed employees in the sector. Only a few know foreign languages, which is a handicap for acquiring know-how and modern technologies from industrialized countries.

Both the workshops and the factories are trying to solve their existing problems within the production. There are exceptions, but the majority of them cannot overcome their production difficulties because of insufficient and out-dated professional competence. Furthermore there is no professional institution from where they can obtain specialized advice.

The existing syllabuses used by both the vocational schools at post-primary and highschool level and by universities at degree level are based on traditional techniques of craftsmen and subjects which are far from meeting the current needs of the industry. The Gazi University in Ankara is in a special position because half its graduates take up teaching posts in the vocational schools. Therefore, even the vocational teachers are the products of a traditional training programme. In the absence of modern techniques and a wide range of topics, skills of the graduates are very limited, resulting in a situation where the trained craftsmen are the products of a training imparted by teachers using outdated and inappropriate syllabuses. Their capacity to solve floor-level problems and to absorb technical innovations and improvements is therefore severely limited.

The lack of appropriately trained personnel in the secondary wood processing industries in general and in the furniture and allied industries in particular has led to:

- Application and/or use of incorrect techniques and processes in production activities.

- Poor planning and control of production activities.



- Incapability to absorb results of research and new developments.
- High wastage of resources.

As a consequence, the furniture and joinery industries are characterized by:

- Low productivity.
- Low utilization of installed capacity.
- Low quality.
- Limited exports.

From the above it is obvious that:

- (i) The owners, managers and staff of the furniture and allied industries in Turkey are inadequately trained.
- (ii) The lack of a core of suitably trained personnel at the factory level has been a severe handicap in the transfer of technology for the manufacture of high quality products as well as for attaining optimum efficiency in production.
- (iii) The entrepreneurs are largely unaware of new developments in the sector in industrialized countries and do not know how to go about it.
- (iv) The Woodworking Education Department of the Gazi University lacks a core of suitably trained teachers/lecturers and an up-to-date curricula and laboratories.

The in-service training of a selected number of lecturers of the Woodworking Education Department and entrepreneurs and techno-managerial personnel from the industry in modern industrial practices and techniques and the supply of key laboratory and demonstration equipment for this purpose is an immediate necessity.

#### E. Outputs

##### To reach Objective 1

1. A core of trained national staff at the WED in the fields of furniture production technology, joinery production technology, plant layout and design, industrial furniture design, surface finishing, production planning and control, quality control, sawdoctoring and tool maintenance able to revamp the syllabuses of its present degree course, and to develop and conduct the following industrial training courses in response to the needs of the furniture and joinery industries (by December 1989):

-A series of one-week training courses for techno-managerial staff, two times per year beginning in 1990 each for about 15-20 production supervisors and junior managers. These courses will cover the following topics: industrial furniture and joinery production technology, Production planning and control, Quality control and testing, Plant layout, Tool maintenance, Industrial product design and development and Export marketing.

-Two-week training courses for professional staff two times per year beginning in 1990 for about 15-20 technicians and supervisors in sawdoctoring and woodworking tool and machine maintenance departments each time. The course will cover the following topics: Solid cutters, circular saw blades, band saw blades, planer knives, tool room equipment, grinding wheels and other auxiliary equipment and materials.

Documentation in the fields described above to be used as teaching material in training programmes for industry and students will also be prepared.

Vocational teachers will also be invited to attend the courses to up-date their knowledge and familiarize themselves with new developments, modern equipment and latest industrial practices.

#### To reach Objective 2

2. A core of key industry representatives and entrepreneurs familiarized with new developments in the secondary wood processing industries, through a series of seminars and symposiums, by October 1989.

3. A core of well informed national staff who would be called upon to operate a "Furniture and Joinery Industry Development Association" efficiently, if a decision for its creation is taken, by October 1989.

#### E. Activities

The following main and sub-activities will be carried out by the project staff:

<u>To produce Output 1</u>	Location	Starting Date/Dur.
1. Training of the counterpart staff in modern industrial practices.	Ankara/Europe	
a) Training of counterpart staff by the international experts in modern industrial practices and technologies. (By 11-01 to 11-50)	Ankara	May 1988/ to Oct.89
b) Training of four counterpart staff through fellowships, 2 months each (Appendix IV).	Europe	
Aug.1988*		
-One in the field of industrial furniture design,		(2months)
-One in quality control and testing. One in the field of quality labelling systems for the furniture		Aug.1989
-One in the field of industrial extension services. (1 month)		(2months)

\* The time of summer vacation.

- (c) Purchase and supply of imported equipment by UNDP/UNIDO Vienna July 88
2. Development of training programmes and materials Ankara  
by 11-01 and 11-09 and their Counterparts.
- a) Formulation of seminar curricula and schedules Ankara May 1988  
for industry by 11-01,11-09 and their Counterparts.
- b) Preparation of jigs and visual aids by Counterpart. Ankara June/July  
1988
- c) Preparation of lecture notes and lectures in Ankara June/July  
Turkish by the Counterparts with assistance of 1988  
11-01, 11-02 and 11-09 and their subsequent  
translation.
3. Implementation of each training programme for at least Ankara Aug. 1988  
two times.
- a) Conduct of two sets of two one week seminars for Ankara Sep. 1988  
industry on techno-managerial aspects of furniture Sep. 1989  
production. (One seminar each year) by 11-01 and the  
counterpart.
- b) Conduct of two, two week seminars for industry Ankara Sep. 1988  
on sawdoctoring and tool maintenance.(One seminar each year. Sep. 1989  
By 11-09 and his counterpart).

To produce Output 2

4. Development of symposium programmes and materials Ankara Aug. 1988  
by 11-01 in consultation with the counterpart.
- a) Formulate a symposium agenda on new developments in Ankara Aug. 1988  
the furniture and joinery industries sector, (By 11-01).
- b) Prepare visual aids and other symposium material Ankara Aug. 1988  
for participants. (By 11-01 and the Counterpart).
5. Convene the symposiums (at least on two occasions). Ankara Sep. 1988  
Sep. 1989
- Conduct a 3-day symposium for key industry represen- Ankara Sep. 1989  
tatives and entrepreneurs while the international ex-  
perts are in the field. (one in 1988 and the other in 1989.)  
(By Counterpart).

To produce Output 3

6. Familiarizing Government and industry representatives. Europe
- Familiarizing one Government and two industry repre- Europe May/June  
sentatives in the set-up, operation and services to the 1988  
industry of wood industry development associations  
through a study tour of 3 weeks duration. (See Appendix V).

G. Inputs

1. Government Inputs

For the effective implementation of the project the Government of Turkey will provide counterpart staff, support personnel, local travel, counterpart equipment, miscellaneous, premises and buildings as detailed below:

(a) Professional Personnel	No. of Post	Date Duration	Salary Allowances '000 T.L.
11-01 National Project Director 1/	1	24.0 m/m	p.m.
11-02 National Project Coordinator 2/	1	24.0 m/m	p.m.
11-03 Counterpart to furniture production technology consultant	1	2.0 m/m	400
11-04 Counterpart to joinery production technology consultant	1	2.0 m/m	400
11-05 Counterpart to plant layout and design consultant	1	1.0 m/m	200
11-06 Counterpart to industrial furniture design consultant	1	1.0 m/m	200
11-07 Counterpart to surface finishing consultant	1	0.5 m/m	100
11-08 Counterpart to production planning and control consultant	1	2.0 m/m	400
11-09 Counterpart to quality control consultant	1	1.5 m/m	300
11-10 Counterpart to sawdoctoring and tool maintenance consultant	1	2.0 m/m	400
11.50 Counterparts to ad-hoc consultants	X	2.5 m/m	500

(b) 13-00: Administrative support personnel

13-01 Bilingual secretary English/Turkish	1	24.0 m/m	9,600
13-02 Office attendant	1	24.0 m/m	3,600
13-04 Ad-hoc support personnel for the installation of project-supplied equipment	X	3.0 m/m	1,000
13-51 Interpreter (English/Turkish)	1	6.0 m/m	2,400
13-52 Interpreter (German-Turkish)	1	6.0 m/m	2,400

(c) 15-00 Local travel

15-00 Ad-hoc travel expenses of counterpart staff			2,000
Local transport (car and driver) for int. staff			3,000

(d) 41-00 Expendable equipment

41-00 All the locally available auxiliary materials and supplies such as electric switches, cables, pipes, pipe connections and hoses, etc. necessary for the installation of the equipment bought by the project.			4,000
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1/ Dean of the Faculty of Technical Education, for advisory services only.

2/ Head of the Woodworking Education Department, compensatory payment is not possible under current financial rules of the Gazi University.

	'000 T.L.
41-00 All the materials such as timber, board materials, veneer, glues, paints and varnishes, hardware, accessories and fittings to be used for demonstration during the seminars and symposiums.	1,500
(e) <u>42-00 Non-expandable equipment:</u>	
42-00 Existing equipment, tools and instruments (Appendix VII) at the Workshop of the WED will be made available to the project for demonstrations during the seminars.	p.m.
42-00 Locally manufactured copy carving machine	10,000
42-00 Use of audio-visual equipment for seminars and symposia.	p.m.
(f) <u>50-00 Miscellaneous</u>	
i) Translation, reproduction and supply of all the seminar and symposium material in Turkish.	2,000
ii) Stationary and office supplies required for the implementation of the project.	1,000
iii) Postage, telephone and telex facilities and related costs.	1,000
iv) Sundries	<u>1,000</u>
(g) <u>43-00 Premises and buildings</u>	
i) Classrooms for the seminars and space for laboratories, demonstration rooms for the installation of equipment supplied by the project.	p.m.
ii) Cost of modifications and conversions and auxiliary installations for the spaces provided above.	5,000
iii) A conference room for about 50 persons with suitable facilities for the symposium.	p.m.

UNDP/UNIDO Inputs

To carry out activity 1.a:

11-00 International experts/consultants

	Duration -----	Estimated Cost_US\$
11-01 Senior project adviser. Specialist in the furniture and joinery industries with specific experience in planning and management, to be responsible for planning, formulation and organizing of a training programme for industry and for other activities envisaged in the project and to serve as a resource person in his field of specialization. He should liaise closely with project personnel and counterpart staff and interact with the national project director and the project coordinator.	3 m/m	31,000
11-02 Furniture production technology consultant. Specialist in all aspects of furniture production technology, product development, production management and specific experience in demonstration and teaching at techno-managerial and supervisor levels.	1 m/m	8,000
11-03 Joinery production technology consultant. Specialist in all aspects of joinery production technology, products development and production management with specific experience in demonstration and teaching at managerial and supervisor level.	1 m/m	8,000
11-04 Plant layout and design consultant. Specialist in the preparation and design of furniture and joinery plant layouts and calculation of parameters, with specific experience in demonstration and teaching.	1 m/m	8,000
11-05 Industrial furniture design consultant. Specialist in the design of assembled and knocked down furniture with interchangeable and standardized components suitable for manufacturing by the craftsmen and industrial production techniques for the export markets, with specific experience in demonstration and teaching.	1 m/m	8,000
11-06 Surface finishing consultant. Specialist in surface finishing technology with specific experience in the state of the art industrial practices, techniques, machinery and materials.	0.5 m/m	5,000
11-07 Production planning and control consultant. Specialist in work preparation, scheduling, materials, planning, work measurement, capacity planning and manpower planning with specific experience in small to medium size production units.	1 m/m	8,000

	Duration	Estimated Cost US\$
11-08 Quality control and testing consultant. Specialist in quality control of furniture components during and after processing and in testing of assembled furniture items.	1 m/m	8,000
11-09 Sawdoctoring and tool maintenance consultant. Specialist in all aspects of sawdoctoring such as sharpening, setting, tensioning of band and circular saws, and in maintenance of woodworking tools such as planer knives, plain cutter heads, profiled cutter heads, solid cutters, boring bits, hoppers, etc. with specific experience in planning and setting up of sawdoctoring tool maintenance stations and in demonstration and teaching to trainees at supervisor and operator level.	0.5 m/m	5,000
11-50 Short-term <u>ad-hoc</u> consultants as needed during the implementation of the project.	2.5 m/m	21,000

Each consultant will produce a manual in his field to be used as teaching material in the training programmes to be organized by the Woodworking Education Department for industry and will be made available to the industry as background documentation. These manuals and/or documents will be translated into Turkish and reproduced by the counterpart.

To carry out activity 1.b

<u>31-00 Fellowships</u>		US\$
31-00 Cost of a fellowship programme for 4 fellows as per Appendix IV.	Europe	37,600

To carry out activity 1.c

<u>41-00 Expendable equipment</u>		
41-00 Cost of expendable equipment to be imported.		16,000
<u>42-00 Non-expendable equipment</u>		
42-00 Cost of non-expendable equipment as per Appendix VI.		120,445
<u>51-00 Miscellaneous</u>		
51-00 Sundries and reporting costs		2,500

To carry out activity 2.a

11-00 International experts/consultants

11-01 Senior project adviser	0.5 m/m	5,000
11-09 Sawdoctoring and tool maintenance consultant	0.5 m/m	5,000

To carry out activity 2.b

51-00 Miscellaneous

51-00 Sundries and reporting costs		500
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To carry out activity 2.c

51-00 Miscellaneous

51-00 Sundries and reporting costs		500
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To carry out activity 3.a

11-00 International consultants/experts

11-01 Senior project adviser	0.5 m/m	5,000
11-02 Furniture production technology consultant	0.5 m/m	5,000
11-03 Joinery production technology consultant	0.5 m/m	5,000

51-00 Miscellaneous

51-00 Sundries and reporting costs		500
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To carry out activity 3.b

11-00 International experts/consultants

11-09 Sawdoctoring and tool maintenance consultant	1 m/m	8,000
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51-00 Miscellaneous

51-00 Sundries and reporting costs.		500
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To carry out activity 4.a

11-00 International experts/consultants

11-02 Furniture production technology consultant	0.5 m/m	5,000
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To carry out activity 4.b

51-00 Miscellaneous

51-00 Sundries and reporting costs		500
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To carry out activity 5

11-00 International experts/consultants

11-01 Senior project adviser	0.5 m/m	5,000
11-02 Furniture production technology consultant	0.5 m/m	5,000
11-03 Joinery production technology	0.5 m/m	5,000

51-00 Miscellaneous

51-00 Sundries and reporting costs		500
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To carry out activity 6

32-00 Study tour

32-00 Cost of a study tour programme for 3 persons as per Appendix V.		20,000
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51-00 Miscellaneous

51-00 Sundries and reporting cost.		---250
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H. Preparation of Work Plan

A bar chart covering the duration of the project and indicating the beginning and end of each project activity is attached as Appendix I.

A detailed Work Plan for the implementation of the project will be prepared by the Senior Project Adviser in consultation with the National Project Coordinator. This will be done at the start of the project and brought forward periodically. The agreed upon Work Plan will be attached to the Project Document as Appendix I and will be considered a part of that document.

I. Preparation of the Framework for Effective Participation of National and International Staff in the Project.

The activities necessary to produce the indicated outputs and achieve the project's immediate objective will be carried out jointly by the national and international staff assigned to it. The respective roles of the national and international staff will be determined by their leaders, by mutual discussion and agreement, at the beginning of the project, and set out in a Framework for Effective Participation of National and International Staff in the Project. The Framework, which will be attached to the Project Document as an annex, will be reviewed from time to time. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical co-operation.

#### J. Development Support Communications

The achievement of the objective to increase productivity and quality in the secondary wood processing industries sector so as to increase its share in the country's export earnings is very much dependent on the ability of the industry to close the technology and know-how gap which already exists. Having regard for this important consideration, communication will be developed by the project staff with the furniture and joinery industries at the start of the project for the preparation and implementation of an industry specific training programme on a continuous basis.

The training courses will be finalized after visits to representative factories and discussions with the industry personnel to insure that the courses are relevant to their present requirements and to local conditions.

While in the field, the internationally recruited consultants will visit on an ad-hoc basis selected manufacturers together with the counterpart staff to carry out technical advisory services to improve their operational skills in critical areas of the manufacturing process.

Two 3-day symposiums will be organized during the project for key industry representatives and entrepreneurs in the presence of the international experts. Participants will be briefed on new developments and modern practices in the sector and open discussions will be held. The project staff will play a moderator role in discussions and will give individual ad-hoc advice to the participants.

Such interaction between the project staff and the furniture and joinery industries through the above activities is expected to encourage the sector to improve the skills and know-how of its operational, supervisory and managerial personnel and contribute towards closing the present technology and know-how gap between the domestic and West European industries.

#### K. Institutional Framework

The project will be located at the Wood Working Education Department of the Faculty of Technical Education of Gazi University in Ankara. It will be implemented by the Government of Turkey through the University. All Government inputs will be channelled through the University, which will receive the necessary budgetary support for the Government inputs.

The faculty of Technical Education was founded in 1937 originally as an Industrial Teacher's Training School for men with departments for metalworking, woodworking and fitting. In 1982, in accordance with the new law of higher education, this school was turned into a faculty of the Gazi University. The Faculty occupies an area of 140,000 m<sup>2</sup>. The layout of the Faculty of Technical Education and the location of the Woodworking Education Department is given in Appendix VIII. About 3,500 students are enrolled and there are about 110 full time and 70 part time staff members. The Faculty consists of the following main departments:

1. Machinery Education Department
2. Electrical and Electronics Education Department
3. Construction Education Department
4. Metallurgy Education Department
5. Woodworking Education Department
6. Higher School of Industrial Education

Currently about 200 students are being educated in the Woodworking Department whose courses last four years. Approximately 50 students graduate per year and 50% of these graduates take up a job in governmental teaching institutions as teachers of special subjects as well as at national institutes. Most of the remaining graduates enter the Furniture and Joinery Industry as technical experts. There are in all about 3,000 professionals in this sector in Turkey who have finished their studies at the Woodworking Education Department of the Gazi University.

The Dean of the Faculty of Technical Education will be the ex-officio National Project Director. He will be supported by a full time National Project Coordinator to look after the day-to-day functioning of the project. Necessary counterpart staff and administrative support personnel will be provided by the Woodworking Education Department.

The team of internationally recruited experts will be led by the senior project adviser (11-01).

The National Project Director and the Senior Project Adviser together will be responsible for all matters concerning the implementation of the project.

#### L. Prior Obligations and Prerequisites

Since the minimum requirements for starting the project already exist at the Woodworking Education Department, no prior obligations and prerequisites are contemplated.

#### M. Future UNDP Assistance

Future UNDP assistance may be necessary to establish a national centre to provide such specialized services as design and product development, extension services, testing and quality control, training and dissemination of technical know-how on a regular basis to furniture and allied industries. This will, however, be reviewed towards the end of the project.

### PART III - SCHEDULES OF MONITORING, EVALUATION AND REPORTS

#### A. Tripartite Monitoring Reviews, Technical Reviews

The project will be subject to periodic review in accordance with the policies and procedures established by UNDP and UNIDO for monitoring project and programme implementation.

B. Evaluation

The project will be subject to evaluation in accordance with the policies and procedures established for this purpose by UNDP and UNIDO. The organization, terms of reference and timing of the evaluation will be decided in consultation between the Government, UNDP and the Executing Agency concerned.

C. Progress and Terminal Reports

The Senior Project Adviser will submit regular progress reports in accordance with the standing instructions. In particular he will produce six monthly progress reports on the project's activities, achievements and findings at the conclusion of his currently programmed six monthly visits to the project.

PART IV - BUDGETS

A. Government Contribution

Project Budget covering the Government contribution in kind is given in Appendix II.

B. UNDP Contribution

Project budget covering the UNDP contribution in U.S. Dollars is given in Appendix III.

## UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT WORK PLAN

Project Title: Modernization of secondary wood industries.

Project Number: DP/TUR/87/

Work Plan/Revision Number: 1

Date Prepared: November 1986

To be revised on:

For period from: 1 January 1988 to 31 December 1989

Outputs	Activities	Responsibility	1988						1989						
			J+F	M+A	M+J	J+A	S+O	N+D	J+F	M+A	M+J	J+A	S+O	N+D	
1. Trained national staff at the Woodworking Education Dept.	1. Training of national staff in modern industrial practices.	UNDP/UNIDO													
	2. Development of training programmes.	11-01, 11-02 11-09, Government			▬										
	3. Implementation of training programmes	11-01, 11-02 11-09, Government				▬									▬
2. Familiarize industry representatives	4. Development of symposium programmes and materials	11-01, 11-02 Government				▬									
	5. Convening of the symposium	11-01, 11-02 Government					▬								▬
3. Well informed national staff	6. Familiarize one Government and two industry representatives through study tour	UNDP/UNIDO			▬										

**PROJECT BUDGET COVERING GOVERNMENT CONTRIBUTION IN KIND**  
(In Local Currency)

Country: TURKEY

Project No.: DP/TUR/87/

Title: Modernization of Secondary Wood Industries

Appendix II

**10. Project Personnel**

**11. Technical professionals**

	TOTAL		1988		1989	
	m/m	TL (000)	m/m	TL (000)	m/m	TL (000)
11-01. National Project Director	24.0	p.m.	12.0	p.m.	12.0	p.m.
11-02. National Project Coordinator	24.0	p.m.	12.0	p.m.	12.0	p.m.
11-03. Counterpart to furniture production technology consultant	2.0	400	1.5	300	0.5	100
11-04. Counterpart to joinery production consultant	2.0	400	1.5	300	0.5	100
11-05. Counterpart to plant layout and design consultant	1.0	200	1.0	200	--	--
11-06. Counterpart to industrial furniture design consultant	1.0	200	1.0	200	--	--
11-07. Counterpart to surface finishing consultant	0.5	100	0.5	100	--	--
11-08. Counterpart to production planning and control consultant	2.0	400	2.0	400	--	--
11-09. Counterpart to quality control consultant	1.5	300	1.5	300	--	--
11-10. Counterpart to sawdoctoring and tool maintenance consultant	2.0	400	1.5	300	0.5	100
11-50. Counterpart to ad-hocconsultants	2.5	500	--	--	2.5	500

**13. Administrative Support Personnel**

Component total

-Bilingual secretary	24.0	9,600	12.0	4,800	12.0	4,800
-Office attendant	24.0	3,600	12.0	1,800	12.0	1,800
-Ad-hoc support personnel	3.0	1,000	2.0	600	1.0	400
-Interpreter (English/Turkish)	6.0	2,400	4.0	1,600	2.0	800
-Interpreter (German/Turkish)	6.0	2,400	4.0	1,600	2.0	800

**15. Official Travel**

Component total

-Travel expenses of counterpart and international staff		5,000		3,000		2,000
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**40. Equipment**

Component total

41. Expendable equipment		5,500		3,000		2,500
42. Non-expendable equipment		10,000		10,000		--

**43. Premises/Buildings**

Component total

		5,000		4,000		1,000
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**50. Miscellaneous**

		20,500		17,000		3,500
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**51. Sundries**

Component total

		10,000		4,000		6,000
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**99. GRAND TOTAL**

Component total

		125.5	57,400	68.5	36,500	57.0	20,900
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3. COUNTRY TURKEY	4. PROJECT NUMBER AND AMENDMENT DP/TUR/87/	5. SPECIFIC ACTIVITY J 13101
10. PROJECT TITLE Modernization of secondary wood industries.		

15. INTERNATIONAL EXPERTS (functional titles required except for line 11-50)	16. TOTAL		17. 1988		18. 1989		19.		20.	
	m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
11-01 Senior Project Adviser	4.5	46,000	3.0	31,000	1.5	15,000				
02 Furniture production consultant	2.5	23,000	2.0	18,000	0.5	5,000				
03 Joinery " "	2.0	18,000	1.5	13,000	0.5	5,000				
04 Plant layout consultant	1.0	8,000	1.0	8,000						
05 Industrial Furn. design cons.	1.0	8,000	1.0	8,000						
06 Surface finishing consultant	0.5	5,000	0.5	5,000						
07 Prod. planning consultant	1.0	8,000	1.0	8,000						
08 Quality control consultant	1.0	8,000	1.0	8,000						
09 Sawdoctoring and tool maint. cons.	1.5	15,000	0.5	5,000	1.0	10,000				
10										
11										
12										
13										
14										
15										
16										
11-50 Short term consultants Ad-hoc	2.5	21,000	0.5	5,000	2.0	16,000				
11-50 Sub-total-International experts*	17.5	160,000	12.0	109,000	9.5	51,000				
21. REMARKS										

\* If more than 16 experts are required check here  and attach continuation sheet 1A. This sub-total must include all experts.

PROJECT BUDGET/REVISION

UNIDO

4. PROJECT NUMBER DP/TUR/87	16. TOTAL		17. 1988		18. 1989		19.		20.
	M/M	\$	M/M	\$	M/M	\$	M/M	\$	
OPAS EXPERTS (functional titles required)									
12-01									
12-02									
12-03									
12-00 Sub-total-OPAS experts **									
ADMINISTRATIVE SUPPORT PERSONNEL									
13-00 Clerks, secretaries, drivers									
13-00 Freelance interpreters (non-UNDP projects)									
13-00 Sub-total-administrative support personnel									
UN VOLUNTEERS (functional titles required)									
14-01									
14-02									
14-03									
14-04									
14-00 Sub-total-UN VOLUNTEERS **									
15-00 Project travel									
16-00 Other personnel costs (including UNIDO staff mission costs)		3,000		1,500		1,500			
NATIONAL EXPERTS (functional titles required)									
17-01									
17-02									
17-03									
17-04									
17-05									
17-00 Sub-total-National experts **									
18-00 Surrender prior years' obligations									
19-00 TOTAL-PERSONNEL COMPONENT	17.5	163,000	12.0	110,500	5.5	52,500			

\*\* If additional individual budget lines are required, check here  and attach continuation sheet 1A. These sub-totals must include budget lines listed on page 1A.



4. PROJECT NUMBER DP/TUR/87	16. TOTAL		17. 1988		18. 1989		19.		20.	
	M/M	\$	M/M	\$	M/M	\$	M/M	\$	M/M	\$
<b>SUBCONTRACTS</b>										
21-00 Subcontracts										
28-00 Surrender prior years' obligations										
<b>29-00 TOTAL-SUBCONTRACTS</b>										
<b>TRAINING</b>										
31-00 Individual fellowships		37,600		37,600						
32-00 Study tours; UNDP group training		20,000				20,000				
33-00 In-service training										
34-00 Non-UNDP group training										
35-00 Non-UNDP meetings										
38-00 Surrender prior years' obligations										
<b>39-00 TOTAL-TRAINING COMPONENT</b>		57,600		37,600		20,000				
<b>EQUIPMENT</b>										
41-00 Expendable equipment		16,000		10,000		6,000				
42-00 Non-expendable equipment		120,445		94,445		26,000				
43-00 Premises										
48-00 Surrender prior years' obligations										
<b>49-00 TOTAL-EQUIPMENT COMPONENT</b>		136,445		104,445		32,000				
<b>MISCELLANEOUS</b>										
51-00 Sundries		5,750		3,750		2,000				
55-00 Hospitality (non-UNDP projects)										
58-00 Support costs (CC and DC projects only)										
58-00 Surrender prior years' obligations										
<b>59-00 TOTAL-MISCELLANEOUS COMPONENT</b>		5,750		3,750		2,000				
<b>60-00 PROJECT TOTAL</b>	17.5	362,795	12.0	256,295	5.5	106,500				

**FELLOWSHIP PROGRAMME**

No. Fellowship	Location	Starting date and duration	Estimated Cost (U. S. Dollars)
<b>1. Industrial Furniture Design</b>			
Study industrial furniture design principles and trends at the Guiseppe Meroni Institute in Lissone (Italy) and by visiting the Milan Furniture Fair in September.	Italy	01/08/1988 2 m/a	Fare: 1,000 DSA: 200 Stipend: 4,600 Fees: 2,000 Sub-total: 7,800
<b>2. Quality Control and Testing of Furniture</b>			
Study at the quality control laboratory of the Technologisk Institut the methods used by both the industry and the laboratory to insure high quality production and study market quality by sisiting the Danish furniture Fair in September	Denmark	01/08/1987 2 m/a	Fare: 1,200 DSA: 200 Stipend: 4,600 Fees: 2,000 Sub-total: 8,000
<b>3. Quality Labelling System</b>			
Study the "Möbelfakta" quality testing and labelling scheme at the Möbelinstituted in Stockholm for adaptation to Turkey	Sweden	01/08/1989	Fare: 1,500 DSA: 200 Stipend: 4,600 Fees: 2,000 Sub-total: 8,000
<b>4. Industrial Extension Services</b>			
Study at the Furniture Industry- U. K. Research Association, the organization, programming and promotion of industrial training seminars and extension services for and dissemination of technical information to the industry	U. K.	01/08/1989 1 m/a	Fare: 1,500 DSA: 200 Stipend: 4,600 Fees: 2,500 Sub-total: 13,800
<b>Grand Total:</b>		7 m/a	37,600

**STUDY TOUR PROGRAMME**

**Week 1: 2 to 15 May 1988**

- Sunday:** Departure from Ankara to Munich (By air).
- Monday: All day:** Visit to Möbelinstitut in Rosenheim.
- Tuesday: A.M.:** Visit to Möbelinstitut in Rosenheim.  
**P.M.:** Visit to Fachhochschule in Rosenheim.
- Wednesday: A.M.:** Visit to Institut für Fenstertechnik e.V. in Rosenheim-Aisingerwies  
**P.M.:** Travel to Copenhagen.
- Thursday: All day:** Visit to Wood Department of Technologisk Institut in Taastrup
- Friday: A.M.:** Visit to Danish Furniture makers Control Association in Taastrup.  
**P.M.:** Visit to various furniture showrooms in Copenhagen.
- Saturday: All day:** Visit to various furniture showrooms in Copenhagen.
- Sunday:** Travel to London (by air) and to Stevenage (by train).

**Week 2: 16 to 22 May 1988**

- Monday: All day:** Visit to Furniture Industry Research Association (FIRA).
- Tuesday: A.M.:** Visit to FIRA  
**P.M.:** Travel to London (by train).
- Wednesday:** Travel to Milan (by air).
- Thursday: All day:** Visit to "Interbimall '88" Woodworking Machinery Fair in Milan.
- Friday: All day:** Visit to "Interbimall '88" Woodworking Machinery Fair in Milan.
- Saturday: All day:** Visit to "Sasmill" ancillary materials for furniture fair in Milan.
- Sunday:** Travel to San Giovanni Al Natisone near Udine (by train).

**Week -3: 23 to 27 May 1988**

**Monday: All day: Visit to Centro Regionale Assistenza Technica Settore Sedie Mobili Legno (CATAS).**

**Tuesday: A.M.: Travel to Milan (by train).**

**P.M.: Travel to Vienna (by air).**

**Wednesday: All day: Visit to Austrian Wood Research Institute's furniture Testing Laboratories and discuss its quality label.**

**Thursday: All day: Discussions of Study Tour report at UNIDO Headquarters.**

**Friday: Travel to Ankara (by air).**

LIST OF EQUIPMENT TO BE PURCHASED BY UNDP/UNIDO

Pos.No.	Description and Purpose	Quantity	Est. Cost US\$
<b>(a) Wood Drying Test Equipment</b>			
1	Laboratory type drying oven, to dry wood samples, etc.	1	565
2	Laboratory type electronic scale to weigh test pieces.	1	1,130
3	Electronic moisture meter (portable) to measure the moisture of timber instantly.	1	400
4	Laboratory type wood drying kiln chamber with controls to conduct drying tests and demonstrations.	1	12,000
	Sub-total: (a)		14,095 =====
<b>(b) Surface Finishing Test Equipment</b>			
1	Wet film thickness gauge for checking freshly applied coatings and to calculate the dry film thickness which will remain (Range: 0-600 micrometer).	1	60
2	Magnetic coating thickness gauge for non-destructive testing of film thickness on steel and non-ferrous substrates. (Range: 0-1000 micrometer).	1	360
3	Cross hatch cutter for testing adhesion of films to substrates.	1	215
4	Flow viscometer with support for testing viscosity and consistency of paints and varnishes.	1	180
5	Filling Compound Wedge Tester for testing drying time of a wet layer and its filling power.	1	600
6	Pycnometer cups for paint, to determine the specific weight of paints and related liquids.	1	150
7	Film applicator with four different clearances of 30/60/90/120 mm., to produce homogeneous and defined film thicknesses of paints and similar coatings for testing and comparison.	1	180
8	Hardness Test Rod for testing the hardness of paints and varnishes on flat or curved surfaces.	1	255
9	Scar-Resistance Tester for testing resistance quality of surfaces to marks.	1	350
10	Cylindrical Mandrel Bend Tester to evaluate the adhesion and elasticity of film coats.	1	915
11	Corrosion Testing Instrument for testing the chemical resistance of paints and plastic to the action of acids, alkalines, salt solutions and other organic fluids under static conditions.	1	440
12	Two-Angle Reflectometer for measuring the gloss of paints. (Range: 20°/60°).	1	1,050

13	Cold-check test cupboard for lacquers	1	10,200
14	Timer (Stopwatch) to measure the duration of tests etc. (Range: 0-60 min.).	1	100
15	Digital thermometer to measure the temperature of paints and varnishes. (Range: -20 to +250°C).	1	250
16	Airless spraying equipment for demonstration.	1	1,350
	Sub-total (b):		16,655 =====

(c) Finger Jointing Demonstration Equipment

1	Finger jointing machinery unit consisting of: -Moulder for machining of finger joint (max. workpiece width: 100 mm. max. workpiece thickness: 75 mm.). -Press for pressing together the machined and glued wood pieces. (Max. pressure: 6 Kp/cm <sup>2</sup> , max. workpiece length: 2500 mm.).	1	17,000
	Sub-total (c):		17,000 =====

(d) Tool Maintenance Demonstration Equipment

1	Universal tool grinding machine for grinding of TCT and HSS cutters such as groove milling cutters, blank knives, dowel drills, router cutters, mortise chains, hollow tooth on TCT circular saw blades and others.	1	10,170
2	Dial type set gauge (metric) for measuring tooth set.	1	250
3	Vernier caliper (dial type) reading up to 150 mm.	1	50
4	Micrometer (metric) reading up to 25 mm.	1	50
5	Protractor. Range: up to 180°, length of leg 150 mm.	1	50
6	Circular saw setting device with dial indicator (Blade diameter 80 to 500 mm., Blade thickness 1 to 3.5 mm.)	1	250
7	Circular saw blade tensioning equipment set consisting of one dog hammer, one cross-face hammer, one anvil block, one set straight edges. (Blade diameter up to 500 mm).	1	2,300
8	Automatic knife grinder for sharpening of TCT and HSS knives up to 600 mm long. (Wet grinding of up to 4 knives simultaneously).	1	4,500
9	Knife balancing stand for balancing of loose knives before mounting on cutterblocks.	1	1,500
10	Brazing equipment for removing and brazing on carbide tips on circular saw blades needing servicing.	1	6,000
11	Machine for grinding one side of teeth on carbide tipped circular saw blades which already repaired.	1	4,500

12	Electric butt welder for bandsaw blades up to 50 mm wide.	1	2,000
13	Surface grinder for newly butwelded bandsaw blades	1	350
14	Bandsaw shears for straight cutting of bandsaw ends at right angle before brazing or welding.	1	300
15	Miscellaneous tools and supplies		<u>2,500</u>
	Sub-total (d):		34,770

(e) Testing Equipment for Assembled Furniture Items

1	General purpose testing machine for tables, upholstered chairs, arm chairs, setees, stools and upright chairs.	1	17,500
2	Set of designs and construction drawings of test equipment for doing standard impact, drop and arm loading tests on seating.*	1	2,500
3	Set of designs and construction drawings of test equipment for doing door operational and slamming tests, hinged table flap tests, shelf and door downward static load tests, shelf impacts tests, drawer slamming tests on cabinet furniture.*	1	3,500
4	Set of designs and construction drawings of test equipment for testing drawers, castors and other hardware.*	1	<u>2,500</u>
	Sub-total (e)		26,000

(f) Measuring Equipment for Quality Control

1	Hole position caliper for controlling the accuracy of hole positions on panels.	1	250
2	Panel bow indicator for measuring the flatness of panels.	1	200
3	Adjustable length gauge for measuring the accuracy of length on panel and solid wood parts.	1	300
4	Panel squareness gauge for measuring the errors in panel squareness in units of mm. per meter.	1	525
5	Particleboard tester for controlling the quality of different boards and establishing comparative procedures.	1	<u>650</u>
	Sub-total (f):		1,925

(g) Technical Literature

	Set of technical literature consisting of standards, research reports and manuals on laboratory and test procedures, short-cuts and video films, etc.	1	up to 10,000
	Sub-total (g):		10,000

Grand total: 120,445

\* The actual test equipment will be constructed at the Woodworking Education Department of the Faculty of Technical Education of the Gazi University.

LIST OF EQUIPMENT TO BE PROVIDED BY THE WOODWORKING EDUCATION DEPARTMENT

A. Existing equipment

Quantity	Description	Estimated Value (in '000 T L.)
8	Wood turning lathes	4,800
6	Bandsaws	3,000
3	Surface planers	3,000
4	Circular saws	4,000
2	Thickness planers	2,000
4	Spindle moulders	4,000
10	Boring machines	7,000
1	Dovetailing machine	350
1	Jig saw	150
1	Belt sanding machine	900
1	Grinder for knives	400
1	Band saw grinding machine	650
1	Circular saw grinding machine	650
1	Glue coating machine	1,000
1	Hydraulic press (warm)	3,600
1	Press (cold)	400
1	Glue mixer	200
1	Zig-zag Veneer glueing machine	1,000
1	Compressor	1,500
1	Spray booth (dry)	800
	Electric handtools and work benches	<u>1,000</u>
	Sub-total:	40,400

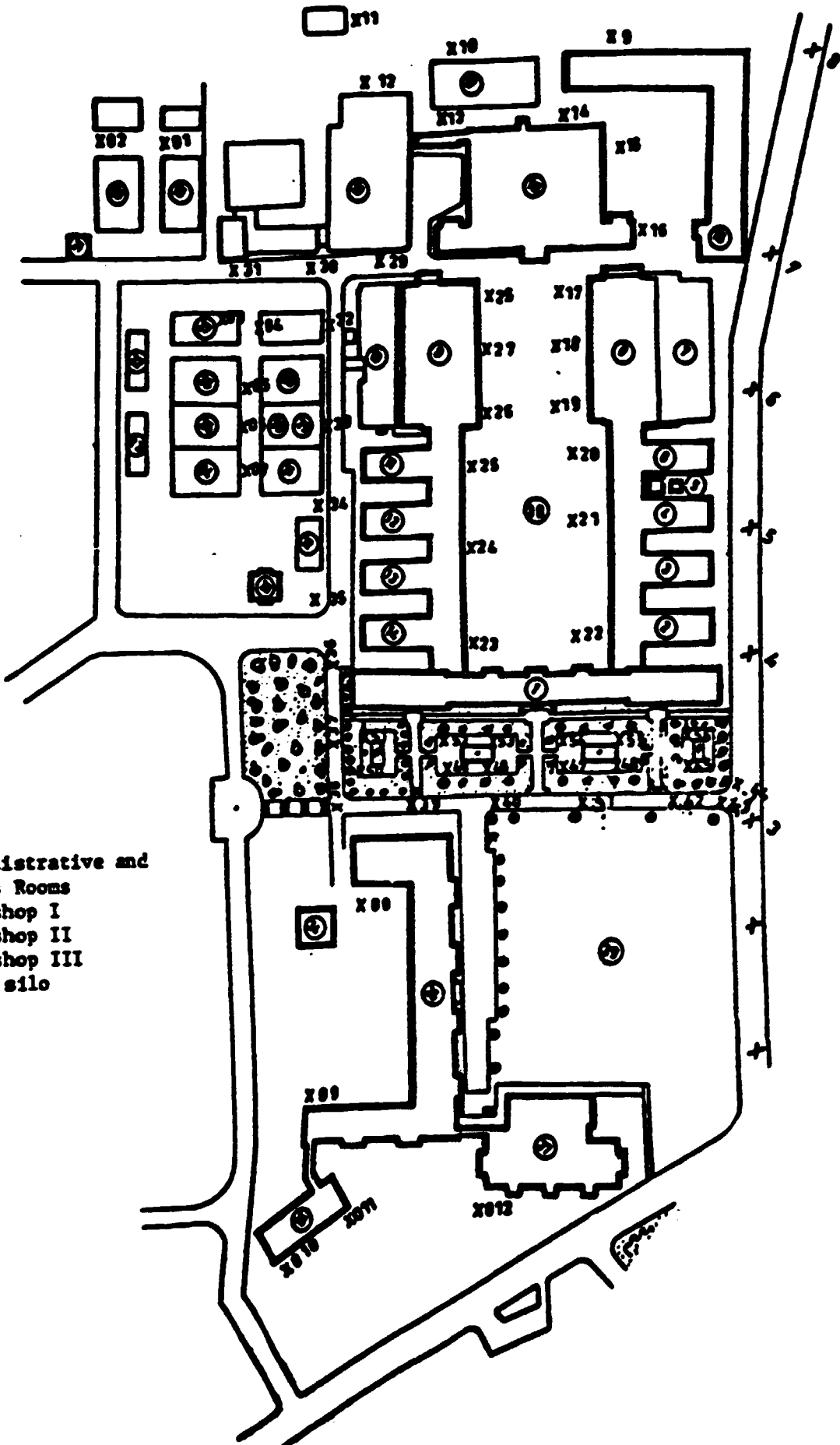
B. Equipment on order \*

1	Single-side edge banding machine (Cemil Usta M- 84 KP)	7,500
1	Water-wash spray booth	1,000
1	Sharpening machine for TCT, circular saw blades, milling cutters, drills and knives. (Original Vollmer CHHT-20)	3,000
	Sub-total:	11,500
	Grand Total:	<u>51,900</u>

\* This equipment will be delivered before start of the seminars.



The layout of the Faculty of Technical Education and the location of the Woodworking Education Department.



Legend:

- 1. Administrative and Class Rooms
- 2. Workshop I
- 3. Workshop II
- 4. Workshop III
- 5. Chip silo