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SAWNWOOD EXPORTS OF TURKEY

by

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SYMBOLS USED

m ³	- cubic meters
(r)	- roundwood
(RWE)	- roundwood equivalent
o.b.	- over bark
u.b.	- under bark
(s)	- sawnwood
MOF	- Ministry of Forestry
FAO	- Food and Agriculture Organization
AAC	- Annual Allowable Cut

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INTRODUCTION

A. Selection of the Subject:

The major reason for selecting sawnwood exports as a topic is its being a current issue within the economy for the last five years. Although all wood products including pulp and paper are of importance from the point of view of industrialization, sawnwood has an additional importance from the point of view of exports and a source of foreign exchange.

It is well known that the Turkish government has been encouraging exports through various incentives to decrease the present balance of payments deficit. As part of an extensive investigation of the total resources of the country that are potentially promising for generating a flow of foreign exchange, the forest resources were also studied with the cooperation of the experts from the FAO. According to the inventory made recently, it was realized that Turkey possessed 18,273,193 ha. of forest area which was previously known to be 10.5 million ha. Next, a committee headed by Prof. Osara who is the ex-forestry minister of Finland, was invited by the FAO authorities to study the forest resources. Their report that was submitted by April 1969 declared that Turkey had extensive resources that could provide a considerably positive flow of foreign exchange for the economy. However, certain preliminary improvements within the sector had to be undertaken. On the condition that the forestry policy of the government was renewed and production techniques were improved, industrial roundwood production could be substantially increased. Furthermore, Prof. Osara declared, with the increasing demand of the European and Mediterranean countries for forest products, exports could attain a considera-

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level.

With this background material, it is the purpose of the present paper to study the sawnwood export prospects of the Turkish industry, to discover the bottlenecks that will be encountered, to consider foreign supply and demand conditions, to reveal the chances of Turkish exports vis-a-vis competitors and to conclude the extent to which sawnwood exports can be a source of foreign exchange. In developing the analysis, firstly roundwood production potentials will be discussed; secondly, a general discussion of sawnwood as a product will be made; thirdly, the sawnwood market structure will be surveyed followed by the survey of the marketing aspects of the industry; fifthly, the demand and supply conditions and their trends in the European and the Middle Eastern countries which are the main markets for Turkish sawnwood will be studied; sixthly, the competitors of Turkey will be enumerated and their forestry industries briefly described; next, the past and potential exports of Turkey will be discussed followed by a set of proposals and suggestions for improving the sector; also, the eighth and final chapter will include a discussion of the institutions that can undertake exports. The summary of the thesis, the opinions and views concluded from the study will be given in the concluding chapter.

B. Method of Research:

For the collection of the necessary data, both primary and secondary sources were used. The secondary sources are listed in the bibliography of the paper. The primary sources were interview made with different people from different institutions. Among these are the following: Mr. P. Jones, the sawnwood expert of the FAO committee in Ankara; Mr. F. Kiliçaslan, Production Director of the Ministry of Forestry; Mr. Ö. Erturan, Export Director of MOF; Mr. T. Waite, a Director of the Bambergers Company of U.K.; various sawmillers and retailers

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CHAPTER I

INDUSTRIAL ROUNDWOOD PRODUCTION AND CONSUMPTION

A. Forest Resources

1. General Forest Area

In the Forestry Act of 31.8.1956, number 6831, a forest is defined as any group of trees that grow naturally or that are grown with personal effort, together with the area they occupy. The following are not considered as forest:

- a. Marshland,
- b. Steppeland,
- c. Thornbrush,
- d. Parks,
- e. Trees in cemeteries,
- f. Trees in privately owned agricultural areas,
- g. Trees in privately owned areas which are not beside public forests and the sizes of which do not exceed three hectares,
- h. Fruit trees grown in privately owned areas,
- i. Olive plantations,
- j. Other areas without the characteristics of maki forests.

According to this definition, the total forest area of Turkey is 18,273,193 hectares. Compared to the total area of Turkey which is 78,057,600 hectares, this forest area occupies approximately 23% of the nation's land. Until 1963, the forest area was thought to consist

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of 10,5 million hectares. In 1963, new techniques of inventory taking which mainly rested upon air photographs, were adopted and, up to the present, studies on 8 out of 23 districts were completed. Studies on the remaining 15 districts are being continued and it can be anticipated that as soon as the inventories of these regions are updated, the total forest area will be greater than 18 million hectares since the increase from 10,5 million to 18 million hectares was due to the revision of the figures of only 8 districts.

Of the total forest area, 52% are high forests and the rest are coppices. The productive portion of the high forests is 51,5% and that of the coppices is 28.9%.

Table 1: Productive and Non-Productive Portions of High Forests and Coppices: (1)

	<u>Hectares</u>	<u>% of Forest Area</u>	<u>% of Total Land</u>
High Forests			
Productive	4,861,399	27	6,2
Non-Productive	<u>4,583,104</u>	<u>25</u>	<u>5,9</u>
Total	9,444,503	52	12,1
Coppices			
Productive	2,554,978	14	3,3
Non-Productive	<u>6,173,712</u>	<u>34</u>	<u>8,0</u>
Total	8,828,690	48	11,3
Grand Total	18,273,193	100	23,4

(1) Asmaz, Hasan, "Dünya ve Türkiye Orman Kaynakları", Türkiye Orman Mühendisliği III. Teknik Kongresi, T.M.M.O.B. Orman Mühendisleri Odası, Book I, page 6

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In terms of the wealth of the forests, the total volume of both high forests and coppices is 839,3 million m³. High forests contribute 736,9 million m³ and coppices contribute 102,4 million m³.⁽²⁾

2. Distribution of Forests by Geographical Regions:

Turkey is divided into six geographical regions. The following table indicates the forest areas within each region and the ratio of this area to the total forest area.

Table 2: Distribution of Forests by Geographical Regions:⁽³⁾

<u>Region</u>	<u>Forest Area (Ha.)</u>	<u>% of Total Area</u>
Marmara	1,781,601	9,8
Black Sea	5,094,525	27,0
Aegean	2,869,071	17,7
Mediterranean	4,527,233	24,7
Central Anatolia	1,596,349	8,7
Eastern "	<u>2,404,414</u>	<u>13,2</u>
Total	18,273,193	100,0

It can be observed that the greatest portion of forest area (27%) is located in the Black Sea region. This is due to the favorable soil and climatic conditions for forests mainly of beech, fir and spruce.

3. Distribution by Species:

Of the two tree families, the coniferous and the broadleaved Turkey possesses 54.4% and 38.7% of each respectively. The remaining 6.9% are maki plants.

(2) Fırat, Fehim, "Dünyadaki ve Türkiye'deki Orman Kaynaklarının Genel Durumu", Türkiye Orman Mühendisliği III. Teknik Kongresi, T.M.M.O.B. Orman Mühendisleri Odası, Book I, page 12

(3) Asmaz, Hasan, "Dünya ve Türkiye Orman Kaynakları", Türkiye Orman Mühendisliği III. Teknik Kongresi, T.M.M.O.B. Orman Mühendisleri Odası, Book I, page 6

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Table 3: Composition of Forests With Respect to Tree Species ⁽⁴⁾

<u>Family</u>	<u>Species</u>	<u>Hectares</u>	<u>% of Forest Area</u>
Coniferous	Pine	7,035,179	38,5
	Fir	1,242,577	6,8
	Spruce	365,464	2,0
	Cedar	639,562	3,5
	Juniper	639,562	3,5
	Other	<u>18,273</u>	<u>0,1</u>
Total		9,940,617	54,4
Broadleaved	Oak	3,873,917	21,2
	Acorn Oak	219,278	1,2
	Beech	1,553,221	8,5
	Chestnut	255,825	1,4
	Poplar	146,186	0,8
	Hornbeam	493,376	2,7
	Ash	73,093	0,4
	Alder	164,459	0,9
	Lime	91,366	0,5
	Other	<u>109,685</u>	<u>0,8</u>
Total		7,071,726	38,7
Hardleaved		<u>1,260,850</u>	<u>6,9</u>
Grand Total		18,273,193	100,0

It can be observed that pine and fir are the most common species within the coniferous family while oak and beech are the most common ones within the broadleaved family.

(4) Ibid., Table 7

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Table 4: Age Distribution of Forests.⁽⁵⁾

<u>Age Classes</u>	<u>Coniferous</u> ⁽⁶⁾ %	<u>Broadleaved</u> ⁽⁷⁾ %
1 - 20 years	0,4	0,1
21 - 40 "	6,5	3,1
41 - 60 "	26,8	11,8
61 - 80 "	25,0	13,6
81 - 100 "	19,6	16,5
101 and above	21,7	54,9

It can be observed that among the coniferous trees, the largest proportion of trees are in the 41-60 years' age bracket. Among the broadleaved forests, the largest proportion of trees are above 101 years old. These forests can be considered to be more aged than necessary and, according to Prof. Osara, due to decay, the quality of these forests is rapidly declining.

4. Annual Volume Increments

Annual volume increment of productive and non-productive high forests is approximately 8.7 million m³. The average volume increase per hectare is 1.492 m³. However, this figure is 1.774 m³ for the districts whose management plans have been put into effect.

(5) Osara, N.A., Rydbo, Polke, Vakomies, Peter J., Türkiye Milli Ormançılık ve Orman Sanayii Ana Hatlarını Hazırlamakla Görevli Heyetin Raporu, Ormançılık ve Orman Sanayii Bölümü, FAO/ROMA Nisan 1969, page 5

(6) Coniferous forests of Mugla, Denizli, Antalya, Çanakkale, Bolu, Zonguldak

(7) Broadleaved forests of Çanakkale, Balıkesir, Bolu, Zonguldak

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B. Industrial Roundwood Production:

Industrial roundwood production volumes with the product types for the years 1955-1967 are given below:

Table 5: Industrial Roundwood Production by Product Types ⁽⁸⁾

<u>Year</u>	<u>Sawlogs</u>	<u>Poles</u>	<u>Mine Props</u>	<u>Other</u>	<u>Total</u>
1955	1,119,700	38,357	97,094	54,493	1,309,644
1956	1,306,202	81,885	170,532	91,301	1,649,920
1957	1,575,124	46,072	208,587	56,528	1,886,311
1958	1,460,405	35,412	231,494	89,795	1,817,106
1959	1,528,365	36,112	226,712	55,115	1,846,304
1960	1,595,267	17,650	231,309	54,654	1,898,880
1961	1,254,109	26,154	332,101	139,166	1,751,530
1962	2,091,891	32,216	505,265	125,497	2,754,869
1963	2,018,143	26,844	277,095	114,422	2,437,226
1964	2,019,075	22,758	274,317	125,311	2,441,461
1965	3,062,113	46,789	391,691	135,549	3,636,142
1966	2,959,890	47,122	407,709	154,529	3,569,250
1967	3,167,911	39,818	385,722	194,320	3,787,771

Of the total industrial roundwood production in 1967, 83.6% was in the form of sawlogs, 1.1% poles, 10.2 mine props. Although there have been minor divergences, this pattern of breakdown has, since 1955, been more or less uniform.

In 1967, coniferous trees have constituted 79.5% of total sawlog production while the broadleaved trees have contributed 20.5%.⁽⁹⁾ Within the coniferous species, pine occupied 58% of the total sawlog production and fir came next with 17.3%. Within the other group, beech occupied the largest place with

(8) Orman Genel Müdürlüğü Genel İstatistik Albümü 1938-1967,
Orman Genel Müdürlüğü 1969, Ankara, page 43

(9) See Appendix A for detailed breakdown of sawlog production into species.

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17.5%. This breakdown has been the general pattern since 1955.

All of the preceding figures are official production figures. However, considerable illegal cutting is carried on in the forests and the following table gives estimates of such cutting:

Table 6: Illegal Cuttings of Standing Timber (10)

<u>Year</u>	<u>m3</u>
1955	427,616
1956	176,552
1957	162,377
1958	139,513
1959	249,213
1960	220,792
1961	150,049
1962	152,280
1963	122,422
1964	121,691
1965	125,192
1966	123,001
1967	111,535

These figures seem like a small proportion of total production but it is believed that illegal cutting is larger than these figures.

C. Industrial Roundwood Production Trends:

The production potentials of forests are indicated in the following table. The figures for the first 8 districts are final while those of the remaining 15 districts are estimates which are calculated on the basis of the resemblance of each district to the ones whose management plans have been put into effect.

(10) Orman Genel Müdürlüğü Genel İstatistik Albümü 1938-1967,
Orman Genel Müdürlüğü, 1969, Ankara, page 35

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Table 7: Annual Allowable Cuts of Productive and Non-Productive Forests: (11)

District	Normal Forest Area Ha.	Annual Allowable Cut per Ha. m ³	Annual Allowable Cut m ³	Note
Antalya	785,777	1.570	1,234,673	Definite AAC
Isparta	330,187	0.884	292,001	" "
Mugla	745,694	1.254	936,354	" "
Denizli	430,359	0.918	394,996	" "
Balıkesir	340,437	1.567	532,552	" "
Çanakkale	314,064	1.343	421,698	" "
Bolu	516,681	3.174	1,641,112	" "
İngözü	340,580	3.806	1,297,766	" "
Adana-Maraş	1,304,982	1.254	1,636,470	Estimated AAC
Kastamonu	571,341	3.806	2,174,523	" "
Amasya	584,431	3.174	1,842,288	" "
Giresun	309,968	3.806	1,179,738	" "
Trabzon	192,454	3.806	732,480	" "
Artvin	221,842	3.806	844,330	" "
Eskişehir	458,857	1.567	719,029	" "
Bursa	244,027	1.567	382,390	" "
Ankara	271,242	1.567	425,034	" "
İstanbul	61,420	1.567	96,245	" "
İzmir	396,644	1.567	621,541	" "
Adapazarı	137,034	1.567	214,322	" "
Erzurum	168,642	1.567	264,262	" "
Mersin	581,300	1.570	912,641	" "
Elazığ	140,541	0.884	124,238	" "
Total	9,444,503		18,921,103	

(11) Kaptan, Rüstem, Nevzi Kılıçaslan, Liya Uner, Orman Bakanlığı 3. Bes Yıllık Dönem Sonunda (1977) 20 Milyon m³ Üretim Hedefine Göre 1970 Yılı Üretimi İçin Alınması Gerekli Tedbirlerle Yatırımlara Ait Ön Rapor, Orman Bakanlığı, 1969, page 6

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From the preceding table it can be observed that the annual allowable cuts of high forests can reach 18,921,103 m³ which is 10 million m³ more than the present figure.

Another method for estimating the productivity of high forests is by multiplying the ratio of annual allowable cut to total wealth computed for the districts whose management plans have been put into effect with the total wealth of Turkish forests. This procedure yields the estimated volume increases of the total forests when the management plans of the remaining 15 districts are put into effect.

This ratio for the 8 districts is 2.06%. The product of this figure with the total wealth which is 739 million m³, yields 15.2 million m³. In planned regions, it has been observed that wealth increased by 22%. When this rate is projected to the remaining 15 districts, wealth rises to 829 million m³. Multiplying this figure by 2.06%, an annual allowable cut of 17.065 million m³ is obtained. Thus, with both methods, it is observed that the annual production potential of the high forests can reach 17 or 18 million m³.

In order to reach these production levels, radical changes within the forestry sector must be undertaken. In his report, Prof. Osara gives some suggestions that must be taken into account when preparing the forestry management plans. These are:

1. Inventory updating: The management programs require the completion of the forest inventories in as short a period as possible. Furthermore, inventories must be renewed periodically to make sure that the latest conditions of forests are known.
2. Reforestation: Up to the recent years, selective cutting was the effective method employed in harvesting forests. However, according to FAO experts, this method proves to be unproductive in addition to being costly and time consuming.

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The harvesting technique must be shifted to clear cutting and reforestation must be emphasized.

3. Planting unproductive forests and coppices: As soon as the forest inventory is terminated, the unproductive portions of forests can be identified. Clearing these areas and improving their soil through fertilizers and planting new trees will enable raising new forests. Coppices which constitute 48% of the total forest area are useless for commercial production. Therefore these lands must be cleared and replanted to increase total productive resources.
4. Analysis of different soil conditions: Different areas possess different qualities of soil. The description of each kind of soil will enable proper afforestation of the suitable species to the respective regions, thus increasing productivity.
5. Analysis of market structure: The analysis of the quality and quantity of products demanded in the market will enable efficient utilization of resources.
6. Administrative considerations: At present, the commercial and public services of the Ministry of Forestry converge, leading to inefficiency and high costs. The reorganization of the sector from the point of view of economic efficiency is essential.

Prof. Osara⁽¹²⁾ believes that if these changes are undertaken and the management plans are properly administered, industrial roundwood production can reach 14 million m³ (underbark) in 1980, 17.5 million m³(u.b.) in 1990, 21 million m³ (u.b.) in 2000. This reorganization will not only result in the increase of production but will also bring astonishing wealth increases such that the present wealth will double within a period of 50 years.

(12) Osara, N.A., Folke Rydbo, Peter J. Vakomies, Türkiye Milli Ormancılık ve Orman Sanayii Ana Hatlarını Hazırlamakla Görevli Heyetin Raporu, Ormancılık ve Orman Sanayii Bölümü, FAO/Roma, April 1969

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The production estimates of the FAO are as follows:

Table 8: Industrial Roundwood Production Targets (13)

Years	Industrial Roundwood Production (u.b.)	Annual Allowable Cut (u.b.)
1968	4.1	Not calculated
1972	6.3	14.6
1977	10.3	14.6
1982	14.6	14.6

It can be observed that within a period of 14 years, production will increase by 10 million m³ which is equivalent to a 9.5% increase annually. Although the annual allowable cut between 1972 and 1982 is 14.6 million m³, production remains below this figure until 1982 when total potential is utilized.

The Ministry of Forestry makes two sets of production estimates, one pessimistic and the other optimistic, for the years 1970-1977. The pessimistic set of estimates are based on the assumption that the past trend of production which increased by 12.5% annually, will persist in the future. The following figures have been obtained by projecting a 10% annual increase between 1970 and 1977:

Table 9: Estimated Industrial Roundwood Production (14)

	1970	1971	1972	1973	1974	1975	1976	1977	1000 m ³
<u>Estimated Prod.</u>	4900	5310	5720	6130	6540	6950	7360	7770	

The optimistic set of estimates are based on the assumption that the forest management plans are put into effect. The following table indicates annual production volumes:

Table 10: Estimated Industrial Roundwood Production (15)

	1970	1971	1972	1973	1974	1975	1976	1977	1000 m ³
<u>Estimated Prod.</u>	5700	6885	8071	9256	10442	11627	12813	13998	

(13) Forest Industries Preliminary Development Plan To 1982

FAO/UNDP/SF 293, October 1969, Page 3

(14) (15) Op.Cit. Aaptan, Rüstem, Fevzi Kiliçaslan, Ziya Uner, p.9

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When the estimates of the Ministry of Forestry (MOF) are compared with those of the FAO, it is observed that MOF is more optimistic than FAO since it targets a production level of 14 million m³ in 1977 whereas FAO targets such a level to 1982. Both foresee the realization of the management plans prerequisite for the attainment of these production levels; however, MOF assumes that these plans will be put into effect within seven years while FAO believes that the plans will not be realized in such a short period.

D. Industrial Roundwood Consumption:

The following table indicates the consumption of industrial roundwood between 1958 and 1968.

Table 11: Consumption of Forest Products,⁽¹⁶⁾

Year	Sawlogs	Mine Props	Poles	Other	1000 m ³
					Total
1958	1251	241	31	101	1625
1959	1378	217	19	90	1704
1960	1486	295	18	55	1853
1961	1404	347	18	192	1961
1962	1629	387	18	111	2145
1963	1832	353	26	109	2320
1964	2107	370	22	129	2629
1965	2618	363	28	175	3184
1966	2840	293	33	168	3334
1967	3128	431	36	173	3766
1968	3243	419	40	189	3890

It can be observed that the average annual rate of increase of consumption has been 14%. This ratio is 15.9% for logs, 7.4% for mine props, 2.9% for poles and 8% for other industrial wood. Assuming that these rates continue into 1970, total consumption in 1970 will be 4,980,000 m³. The breakdown

(16) Ibid. page 11

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of this figure into different products is as follows: (17)

<u>Wire Props</u>	<u>Poles</u>	<u>Logs</u>	<u>Total</u> (m3)
481,000	63,000	4,489,000	4,980,000

The preceding figures are based on annual sales and differ from the FAO's figures which are chiefly based on industry field surveys. According to FAO, industrial wood consumption was 4,640,900 m3 in 1968, (18) and will reach 6.7 million m3 (u.b.) in 1972, 9.6 million m3 (u.b.) in 1977, 13.6 million m3 (u.b.) in 1982. (19)

Table 1 2: Industrial Roundwood Production Targets and Balances 1962-1982: (20)

	(million of m3 u.b.)				
<u>Item</u>	<u>1962</u> ^a	<u>1968</u> ^b	<u>1972</u>	<u>1977</u>	<u>1982</u>
Resource Potential (AAC)	x	x	14.6	14.6	14.6
Production targets	2.8	4.1	6.3	10.3	14.6
Domestic demand	2.9	4.6	6.7	9.6	13.6
Export balances -	0.1	- 0.5	- 0.4	0.7	1.0

a Actual

b Preliminary

x No definite AAC calculated

The above table which is taken from the FAO's report, indicates that the Turkish forestry industry will depend upon imports up to 1972 after when it will be able to export its surplus.

According to MOF, a surplus of 725,000 m3 is foreseen for 1970. This figure which is the difference between the production estimate of 5.7 million m3 and the consumption estimate of 4.9 million m3, can be exported.

(17) Ibid.

(18) See Appendix B for a breakdown of this figure into industries.

(19) (20) Forest Industries Preliminary Development Plan to 1982, page 3

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E. Conclusion:

In the present chapter, total forest resources, past and potential industrial roundwood production and consumption were discussed. Resources were considered with respect to forest area, forest wealth, tree species, and annual wealth increments. It can be concluded that Turkey has substantial forest resources although they are not in the best condition presently. Turkish forests are mainly composed of softwoods, pine and fir, but hardwoods, mainly beech and oak, are also abundant. Softwoods are mostly found in Southern Anatolia and hardwoods in the Black Sea region. The age distribution of forests is poor since forests are above the age bracket of 101 and over. This, of course, leads to low quality harvests.

However, if the management plans are put into effect, the productivity and quality of forests can rise within a short period. These plans involve radical changes from present practices. The harvesting techniques, the administrative organisation, and the transportation means must be altered in addition to the new emphasis on proper reforestation, education and research. Assuming that these changes are undertaken, both MOF and FAO agree that the annual allowable cut for forests can reach 14 million m³ (u.b.). However, the time when this level will be reached is a controversial matter between the two institutions. The consumption estimates of both of them are practically the same. However, since production estimates differ, export prospects differ also.

The resolution of the two diverging opinions is difficult and it will only be commented that whatever the duration for the application of the management plans be, the realization of any sizeable sawnwood exports depends upon the increase in the raw material supply, industrial roundwood, 76% of which is consumed by the sawnwood industry.

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Before going into a survey of the sawnwood market structure, the next chapter will give a brief description and definition of the product under discussion, namely of sawnwood.

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CHAPTER II

DESCRIPTION OF SAWWOOD

Despite the fact that there are numerous products that are derived from the raw material of industrial roundwood, the thesis will concentrate upon one main product, sawnwood, which consumes 76% of all industrial woods.

A. Characteristics of Sawnwood:

Sawnwood is a product obtained through the conversion of logs into square-edged, rectangular cubes. Logs arrive at sawmills in the form of debarked tree trunks. Here they are converted into sawnwood through different cutting techniques for various kinds of timber; different uses also require different cutting methods. Softwoods which are mainly used for construction, are cut with the consideration of achieving the best specifications with the minimum waste. In the case of hardwoods, sawing can be according to the "through and through" method where the log is sliced into unedged boards, or it can be according to the "wainscot sawing" method where the heartwood which usually contains defects is excluded by cutting the log into two halves and the boards are obtained at right angles to this initial cut. One of the best but expensive sawing methods is "quarter sawing" where each board's face is at right angles to the growth rings of the tree. The advantage of this method is the fact that defects due to shrinkage in width are minimized.

Timber which is the only replenishable natural resource in the world, is of an extensively complex structure. The complex cellular structure of timber is composed of several forms of cells which differ somewhat in the

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case of hardwoods and softwoods. The cell walls are composed of lignin, and cellulose and intercellular pits exist which enable the flow of sap. The structure of the heartwood which is used for storage of gum, resin, etc., is different from the outer portion of the tree, the sapwood, which enables the continuous flow of sap through the life of the tree. In a transverse cut of a log the growth rings which are like concentric rings, will be seen. Trees of the temperal regions display more emphasized rings than those of tropical regions, since these trees are faced with a growing season followed by a dormant season. Growth is accomplished in two steps, one of which is during spring and the other during summer. The former produces a layer of a more porous tissue called the springwood than the latter, the summerwood. The degree of difference between the appearance of these tissues depends upon the species and can be used as a guide in differentiating between hardwoods and softwoods.

A detailed description of the biological structure of wood will not be attempted here but certain characteristics that must be considered for the commercial use of wood which constitutes 69% of the final value of sawnwood, will be mentioned. Firstly, an understanding of the hygroscopic nature of wood is essential for commercial purposes. Wood contains moisture in its cell cavities in addition to cellular walls. As changes in temperature and humidity occur, moisture content of the cells and the cell walls change accordingly. In the drying process, the moisture in the cells evaporate first, and then the cell walls start drying. The former step does not affect the shape of the wood while the latter causes both longitudinal and lateral shrinkage. Since cellular walls have spiral strands of cellulose which contract with dryin any change in their shape affects the shape of the wood.

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Longitudinal movement is small enough to be disregarded in most cases but lateral movement, consisting of both tangential (around the growth rings) and radial (toward the center) movements, is important for the shape of the wood. Tangential movement results in larger distortions in the shape of the wood than radial movement. Thus when timber is quarter-sawn, it is less apt to lose its shape than when 'through and through' sawn.

Although sawnwood is not dried (seasoned) in Turkey before sale unless specified, it is necessary to indicate that to produce a reasonably good quality product, sawnwood must be dried to certain levels of moisture content.⁽²¹⁾ When a tree is felled, its moisture content is more than 100%. If it is to be used indoors, 8-12% M.C. is necessary to prevent any distortions in shape afterwards. For external use, 18% M.C. is sufficient. Although most timber is affected by shrinkage during the drying process, the elastic properties of wood enable it to keep its shape under controlled seasoning which consists of stacking timber in such a manner that each piece is pressed equally by others. Furthermore, in controlled seasoning, the speed of drying is fixed and unequal drying of different parts is prevented. Since evaporation can take place only at the surface, a too speedy drying of the surface would cause a large shrinkage tension there while the inner parts would be relatively expanded. Also, too speedy drying may cause the ends to split.

The next characteristic of timber which has commercial importance is its heterogeneity. Each tree has its own

(21) Moisture content is measured as follows:

$$\begin{aligned} \text{M.C.} &= (\text{Moisture} \times 100) / \text{Dry weight} \\ \text{or} \\ \text{M.C.} &= (\text{Wet weight} - \text{dry weight}) \times 100 / \text{Dry weight} \end{aligned}$$

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configuration, different from the others. Even from one log, identical boards cannot be obtained. In order to overcome this non-homogeneity, systems of grading which are based upon the number and size of defects affecting the strength and appearance of the wood, have been developed. Before discussing these systems, the different kinds of defects will be enumerated.

1. Knots: These are defects due to the tree branches. The branches may have been existing when the tree was cut, leading to a live knot, or they may have fallen before the tree was cut, leading to a dead knot.
2. Distorted grain: This is due to a twisted growth of the tree together with the close development of knots or limbs.
3. Pitch pockets: These defects are due to the separation of fibers.
4. Growth rate: Since springwood is more porous and weaker than summerwood, the number of each on the tree will determine its strength. During the growth of softwoods, springwood, consisting of thin-walled tracheids with large cavities, is produced in addition to hard summerwood. If the tree grows too fast, more springwood is produced, leading to a weaker material. It is generally accepted that the greatest strength is achieved when growth rate is 12 rings per inch of radius for softwoods. In the case of hardwoods, more summerwood with stronger tissues is produced during speedy growth. Therefore, an average growth rate of 6-10 rings per inch of radius achieves maximum strength.
5. Abnormal wood: Defects may occur due to the abnormal growth of a tree such as leaning or twisting.
6. Defects during seasoning: Improper stacking or drying may lead to splits, bows, twists or cups in sawnwood.

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7. Discoloration: This is a defect due to blue stain fungal attack. It does not affect the strength of wood but affects its appearance.

One of the most common grading systems of softwoods is the "defect system", which consists of grading sawnwood according to the number and size of defects in a given piece of board. In the case of hardwoods, the "cutting system" is usually used. It is based upon the number and size of clear boards that can be obtained from a log. (22) (23)

B. Uses of Sawnwood:

Sawnwood is a product used in most industries which may or may not be direct users of timber as their raw material. At one extreme, industries like furniture production are dependent on sawnwood as their raw material, and at the other extreme, industries like fruit and vegetable production rely on sawnwood for their packaging. (24)

The following table gives the main uses of sawnwood in Turkey and the amounts consumed by each industry in 1968:

Table 13: Turkish Sawnwood End Use Estimates: (25)

1000 m3 (s)

1. Construction

Residential

Houses (single and double)	380
Apartments	1200
Gecekondus	200
Commercial and Industrial	180

(22) See Appendix D for the Turkish grading system.

(23) Clear is defined as having one face free of defects and the other having sound defects.

(24) See Appendix C for a list of sawnwood uses.

(25) Forest Industries Preliminary Development Plan to 1982,
page 18

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2. Fruit and vegetable boxes	170
Other packing	
Glass and clay products	40
Other	20
3. Truck bodies	20
4. Furniture and fixture	300
5. Manufactures of wood	50
6. Other miscellaneous	<u>40</u>
	2600

It can be observed that the main area of consumption making up 75% of the total is construction. The second largest industry is the packaging industry which makes up approximately 9% of total consumption.

C. Conclusion:

Summarizing the chapter, sawnwood which is a square-edged rectangular product obtained from logs, is a more complex material than generally assumed to be. In order to produce high quality sawnwood, the technological knowledge of wood is essential. Most of the foreign customers of sawnwood have declared that cutting techniques in Turkey are very primitive. The hygroscopic nature of wood is a determining factor in high quality production. For a high quality product, the best method of sawing is "quarter sawing" which is expensive since it leads to wastes. The "through and through" sawing method is more economic but gives less qualitative product. In order to prevent changes in the shape of the wood, due attention must be given to seasoning.

Since the structure and properties of different species of wood vary, the end uses of sawnwood changes accordingly. In general, in Turkey, softwoods are mainly used for purposes of construction and joinery while hardwoods are used for furniture and internal decoration. Other uses have been enumerated in Appendix C.

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CHAPTER III

TURKISH SAWNWOOD PRODUCTION

In the preceding chapters the raw material and the characteristics of sawnwood have been discussed. The present chapter will firstly handle the structure of the industry and then sawnwood production and consumption.

A. Sawnwood Supply:

Despite the fact that the state owns nearly all of the natural forests from which the raw material of sawnwood is obtained, the private sector dominates the sawnwood industry both with respect to the number of sawmills and the volume of production. Of the total number of sawmills in 1968, only 14 were owned by the public sector; the rest totaling to 5890 were owned by the private sector.

Between 1964 and 1968, the number of mills has risen by 47%. According to the FAO report, the average increase in the number of sawmills between 1957-1959 was 205, and between 1967-1969 449.⁽²⁶⁾ It is declared that the production of every additional million cubic meter of logs induced the establishment of 640 private mills in the past.

Total sawnwood production since 1955 is given in the following table which also indicates the contribution of the public and private mills to the total:

Table 14: Sawnwood Production 1955-1968: ⁽²⁷⁾

1000 m3 (s)

<u>Year</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>
1955	95	468	563
1956	95	547	642

(26) Ibid., page 12

(27) Ibid., page 13

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<u>Year</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>
1957	102	656	758
1958	98	652	750
1959	102	724	826
1960	130	760	890
1961	105	737	842
1962	162	965	1127
1963	151	955	1106
1964	152	1209	1361
1965	180	1200	1380
1966	202	1808	2010
1967	195	1918	2113
1968	188	2390	2578

Although the number of public mills is noticeably lower than the private mills, it can be observed that the production of the public mills is high. This is due to the considerable size and capacity of the public mills. The average annual output of the public sawmills was 14,300 m³/mill in 1968, totaling to a public capacity of approximately 200,000 m³ of sawnwood per year.⁽²⁸⁾

The capacities of the private mills are much lower than those of the public mills. Average annual output of individual sawmills is less than 500 m³ of sawnwood.

The output of the private sector has been 2,390,000 m³ of sawnwood in 1968. Although the number of the private mills is rapidly increasing, as mentioned above, there is no observable tendency of size and capacity increases.

With respect to technology, the public mills are more advanced than the private ones. Although world technology is far beyond that of the public sector, the difference between the public and private mills must be appreciated.

(28) See Appendix E for the location and capacity of each public mill.

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Some of the public sawmills have attained partial automation in their transportation systems and most use gangsaws compared to the bandsaws of the private mills.⁽²⁹⁾

The following table indicates the total sawnwood industry:

Table 15: Sawmill Industry Public and Private.⁽³⁰⁾

District	Number of mills	1968	Quantity Sawn (r)	Operating rate %	Lumber prod. 1000 m3	Recovery rate
		Annual ^x Capacity (8 hours) (r) u.b.				
Adana	324	611	199	33	143	72
Adapazarı	671	377	145	37	102	70
A masya	352	378	100	26	770	70
Ankara	255	611	405	66	284	70
Antalya	302	316	109	34	75	69
Artvin	38	78	40	51	28	70
Balıkesir	252	297	175	59	138	79
Bolu	218	445	378	85	272	72
Bursa	462	311	170	55	121	71
Çanakkale	165	156	175	48	56	74
Denizli	200	216	80	37	60	75
Elazığ	373	554	115	21	75	65
Erzurum	117	126	70	56	50	72
Eskişehir	161	299	167	56	122	73
Giresun	88	171	50	29	36	71
Isparta	174	225	95	42	67	71
İstanbul	406	537	237	44	171	72
İzmir	314	339	110	32	80	73
Kastamonu	105	354	266	75	197	74
Mersin	246	368	141	38	103	73
Muğla	253	273	110	40	80	73
Trabzon	248	277	100	36	73	73
Zonguldak	<u>180</u>	<u>562</u>	<u>250</u>	<u>44</u>	<u>175</u>	<u>70</u>
Total	5904	7891	3587	45	2578	72

(29) Only 1% of private mills use gangsaws.

(30) Ibid. page 47

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x At 270 days per year.

It can be observed that the recovery rate of sawnwood is 72%. This figure is an average for the industry since the recovery rate of sawnwood varies with different tree species. For pine, it is 70% while for fir it is 75-80%. The physical structure of the tree is the main determining factor of recovery. Also, log care affects it because logs split if they stay long in the open and these parts are useless. Inefficient cutting techniques is another factor which reduces the recovery rate.

The above table indicates that the average capacity utilization rate is 45%. The reasons behind this low rate can be divided into two. Firstly, small, rural mills operate only when they acquire logs, the auctions of which are only during the second half of the year. These mills do not keep large stocks due to financial problems but also due to low sales. Secondly, the lack of managerial knowledge leads to low utilization rates. Mills which keep large stocks cannot utilize their full capacities because production is not well organized.

Due to this excess capacity in the industry, the FAO projections limit the investments to an unchanging figure of 100,000,000 TL. between 1973-1982, and this is only for integrated mills that are export oriented.⁽³¹⁾

B. Sawnwood Consumption:

Sawnwood consumption was 2,580,000 m³ in 1968. The breakdown of this figure into different industries has been given in table 13. The following table indicates the FAO estimates up to 1982:

(31) Ibid., page 21

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Table 16: Sawnwood Consumption Estimates (32)

<u>Year</u>	<u>1000 m³ (s)</u>	<u>m³(s)/1000capita</u>
1972	3080	82.4
1977	3920	92.2
1982	5040	104.6

These estimates are based on the assumption that consumption will increase by 4.9% annually and that past trends will persist. However, there are some indications that future consumption will differ from the present trend. It is expected that panel products whose production is estimated to increase rapidly during the coming years, will substitute sawnwood in construction, packaging, and in the manufacture of furniture and fixtures.

In order to give an idea about per capita consumption in Turkey, the figures of other countries for comparison are given below:

Table 17: Per Capita Sawnwood Consumption, 1964-66 Average: (33)

<u>Country</u>	<u>m³(s)/1000 capita</u>
Austria	266.5
Belgium	164.2
Bulgaria	198.1
Czechoslovakia	215.5
Finland	528.4
France	179.5
Greece	87.8
Italy	95.5
Rumania	150.6
Spain	81.7
Sweden	629.9
Turkey	47.9
U.K.	192.3

(32) Ibid. page 5

(33) Ibid. page 52

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Although Turkish per capita figures doubled between 1964 and 1968, from 42 m³ to 75 m³ per 1000 capita, it is still below the figures of other countries. In 1982, per capita consumption of Turkey will exceed the 1964-66 figures of Spain, Italy, and Greece.

C. Sawnwood Production Estimates:

FAO's estimates for 1972, 1977 and 1982 are given below:

Table 18: Sawnwood Production Estimates.⁽³⁴⁾

<u>Year</u>	<u>RWE</u>	<u>(s)</u>	<u>1,000,000 m³</u>
1972	4.4	3.2	
1977	5.8	4.0	
1982	7.6	5.3	

With the preceding consumption estimates, the balance for exports, according to FAO, is 100,000 m³, 100,000 m³ and 300,000 m³ for 1972, 1977, 1982 respectively.⁽³⁵⁾

Since any projections into the future with respect to the production and consumption of sawnwood by any institution outside FAO such as MOF were not found, only FAO estimates are taken into consideration.

D. Conclusion:

In the present chapter, it has been observed that the Turkish sawnwood industry is composed of both private and public mills. The former ones are much larger in number but their capacities are considerably smaller than the latter. In the following chapters, it will be seen that the capacities of the public mills are much lower than the ones existing in the developed countries. The world trend is towards the establishment of large integrated plants that produce all products ranging from sawnwood, plywood, particleboard to pulp and paper products. Such plants are also being promoted by the government, but no step towards the establishment of

(34) (35) Ibid. page 4

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one has yet been taken. On the contrary, the number of small sawmills is increasing and the figure has reached 6000 in 1968.

Sawnwood production in 1968 was 2,578,000 m³. The capacities of the mills have not been fully utilized since annual capacities of the total mills was 7,891,000 m³. This gives an average utilization rate of 45%. It is declared by the FAO experts that since the industry has excess capacity, no further investments need be made into the sector except in the case of integrated plants and/or those which might have an export capability. (36)

Consumption has kept up with production in the past and is expected to maintain this pattern. However, if the past consumption trend changes and sawnwood consumption falls, export balances will be available. Also, if production of roundwood increases faster than the FAO foresees, again, export balances will be made available. Artificial restriction of domestic demand for releasing export balances may lead to price rises but the restriction of the building boom which is harmful to the economy since too much money is going into housing, by the latest tax moves will lead to the reduction of sawnwood demand. Also, the substitution of panel products for sawnwood will inevitably lead to lower consumption. Thus, within the near future sawnwood consumption will lag behind production, leading to exportable supplies.

In the present chapter, comparisons between the per capita consumption of Turkey and other countries were made. Although Turkish consumption is much lower than elsewhere, this need not be a discouraging factor since, according to Mr. Paul Jones of FAO, the Special Fund Project in Turkey, Turkey does not show the characteristic consumption trends of most of the developed economies during their development

(36) Ibid. page 1

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stages. It is his opinion that Turkey will not reach the levels of sawnwood consumption that these developed countries have, mainly because of the fact that the substitutes of sawnwood have started being produced in the country.

Summarizing the chapter, it can be concluded that export prospects seem favorable. Consumption is expected to decline and if production rises by the enforcement of the management plans, exportable supplies will be released. However, the analysis of the present chapter was at a macro level and when the industry is viewed from a micro level, it will be seen that a number of problems will arise. The following chapter will undertake this analysis.

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CHAPTER IV

DOMESTIC MARKETING OF SAWNWOOD

Instead of discussing each marketing characteristic of sawnwood separately, the present chapter will combine these topics under the two headings of pricing and grading. (36a)

A. Pricing:

The following factors determine the price of sawnwood.

1. Log prices
2. Production and other taxes
3. Transportation costs
4. Handling costs
5. Operation costs
6. Sales costs

It must not be forgotten, however, that these set only the minimal level of prices and the actual levels are determined by supply and demand.

1. Log prices: Log prices which compose 70% of the total cost of sawnwood are the main factor in determining the price of timber. The government being the only supplier plays the major role in setting the log prices. Turkish prices are very high in comparison to other countries. This is, firstly, due to the lack of organization, planning, and, therefore, inefficiency in harvesting. Also, there is no mechanization in felling which is done by primitive methods, mainly by axes. These two lead to low productivity per worker and high costs. In removing logs from the forest, the same problems are encountered. Logs are pulled out of the forest by oxen.

(36a) Data given in this chapter have been obtained from sawmillers and retailers interviewed.

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This is very time consuming and has one other disadvantage, namely the fact that longer logs which are scarce in the market are cut into short lengths by workers since oxen cannot carry them out. Felling is done and must be done by the forest peasants according to the Forestry Act numbered 6831. During an interview with Mr. Fevzi Kılıçalan, Production Director of MOF, he has made the point that although mechanization is needed, it will be resisted by peasants whose main source of income is the forest.

Secondly, a portion of logs felled by peasants is allocated to them under the title of "personal needs" at a very small fraction of the normal price and the rest of the cost of these logs are allocated to the ones which are sold in the auctions.

Thirdly, it is the policy of MOF, that the costs of public services done for the members of this ministry be added to the log prices. For example, the expenses of the Forestry Faculty are allocated to log prices.

Fourthly, preservation of logs is very poor, and in beech, log damages due to decay is about 50% which is a big surplus to the cost of logs. Since most of the forest roads are very poor and out of service under rain or snow, logs which are felled cannot be removed till the next season. This, of course, ends up in more and more decaying logs.

Fifthly, last year, as a provision to meet export subsidies, domestic log prices have been increased by 6%.

Finally, the most important factor increasing the log prices is the excess demand and the method of log sales. Logs are sold irrespective of their prices due to the shortage of supply. As stated earlier, government being the only supplier, there is no other source to satisfy demand.

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Log sales are done by auction and practically everyone can bid and increase the price. This creates an intermediary class from whom sawmills may buy but at a higher price. The importance of this point is that the time lag between the purchase of logs and their sale as timber is about 3 or 4 months during when a considerable capital is tied. Most of the sawyers, except perhaps 15 or 20, being very low in production capacity and capital, are in a position to buy from secondhand suppliers. The situation is worsened by the fact that the auction season is from the late August to February and during the rest of the year, log prices increase further.

2. Taxes: There is 12% production tax, 3% commisionary tax and 3.5% local tax on logs which are sold in the auctions. All of these taxes total to 18.5% of the sales price.
3. Transportation costs: As stated in Chapter I, Turkish forests are mainly located along the Black Sea and the Mediterranean coast. A great proportion of the private forest industry, on the other hand, is located near big cities more or less distant from the forests. Therefore, transportation of logs, for example, from Artvin and/or Antalya to Istanbul is very costly. Since fir logs give 20-22% wastage and pine logs give 25-30% wastage, the transportation of the whole log leads to a surplus cost of 25%.

It is cheaper to transport by sea, mainly by small coastal vessels which may carry between 300 to 1000 m³ of logs. Such a transportation would cost about 60 TL/m³ from Artvin to Istanbul and 50 TL/m³ from Antalya to Istanbul. However, during winter, this mode of transportation cannot be utilized. Also, the purchases of most mills are smaller than 300 m³ and cannot fill up one

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vessel. Another means of transportation is truck, which is safer and quicker but more expensive. An average truck of 7 tons can carry 15 m³ of logs. This would cost 70 TL/m³ from Denizli and Kastamonu, 110 TL/m³ from Alanya and 90 TL/m³ from Sivas to Istanbul.

4. Handling costs: Handling costs include the loading and unloading of trucks or boats. In the former case, since trucks can go right into the forest depots and bring logs directly to the sawmill, handling costs vary between 8-10 TL/m³. In the case of boats, logs must be brought to the port from the depots by trucks first and then loaded into boats. The converse is true at the destination ports. Therefore, handling costs can be as high as 25 TL/m³. Fork lifts may be useful in lowering these costs, but at present no sawmill is making use of the vehicles.
5. Operation costs: Private sawmills can be divided into two groups: (a) those with capacities up to 1000 m³/year (u.b.), (b) those with capacities between 1000 and 10,000 m³/year (u.b.). There is only one mill which is located in Isparta, with a capacity over 10,000 m³/year.

Small sawmills are mostly located in small towns where labor is considerably less expensive since social insurance and labor laws are not applied. Cost of operation of these mills is between 30-40 TL/m³ of roundwood. These mills close down when there are no logs and start again when logs are available. Due to their low cost of operation, some construction contractors buy logs themselves and have them sawn in such mills. This practice is mainly prevalent in the sawmills near Bolu and Düzce.

Medium size sawmills are most located in big

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cities like Istanbul where skilled labor is more expensive and above mentioned laws are enforced. As a result their costs are high and vary between 50-60 TL/m³.

None of these sawmills have fully automatic saws, machinery and handling devices which are employed in the developed countries. In France, a fully automatic sawmill has a capacity of 125,000 m³/year with only 5 laborers whereas a Turkish sawmill which has been visited has a capacity of 9,000 m³/year with 25 workers.

Percentage of waste is important in costs since sawmills are not integrated and waste is not made use of. It is sold at a very low price as fuel. (15 kş./kg.)

6. Sales expenses: It is very hard to arrive at figures on this subject since there is no available data. In general, timber is marketed in small shops with storing capacities of 200 m³ at the most. Usually the owner serves as salesman, accountant and purchasing agent. In this manner, selling expenses are kept at a minimum. Most timber retail outlets are located close to each other and the buyer has the opportunity to compare quality and price. Sometimes, they are in one big separate market as in Ankara and sometimes in one or two districts of towns like Unkapanı, Yenikapı and Kadıköy markets in Istanbul.

In large cities, there are a few firms which have bigger organizations with diversified selling, purchasing and accounting functions. In an interview with a firm of this nature, it has been found out that cost of these functions composes 9% of the total cost and selling expenses about 2.5%. These, however, are the figures of only one firm and does not represent the whole market.

It has been found out that there is practically no advertisement made in this sector. No other selling effort

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such as sending out salesmen or providing other services is made. In one case, the above mentioned firm employed a salesman with a car who went directly to construction contractors. The firm was satisfied with the results and now plans to expand its activities in this field.

Although all of the official components of price have been discussed in the preceding paragraphs, there is one more factor that leads to price differences. This is the dimensional tolerances of sawnwood. The accepted standard thickness of a board is 24 mm. In practise, such a board is sold as 26 mm. in thickness with a 2 mm. difference, leading to an 8% increase in price. This procedure is accepted by both sellers and buyers in the market. However, at times this 2mm. difference becomes bigger and reaches 4 mm, which means a difference of 19% in price. The following example will make the problem clearer:

Assuming that a buyer is buying a board of 24 mm. x 20 cm. x 4 m. at 800 TL/m³, the volume of this board would be .0192 m³. He pays 15.26 TL. If he buys 26 mm. instead of 24 mm., he would be buying .0208 m³ and paying 16.64 TL. Although the product is the same, the difference between the two prices is 8%. When a board of 22 mm. thick is sold as 26 mm., the purchaser would buy a board of 22 mm. x 20 cm. x 4 m., which is .0176 m³, and he would pay 16.64 TL. instead of 14.08 TL., with a difference of 19%.

This difference is substantial especially in the shuttering timber market where quality and dimensions are not as important as price and where there are wide price differences from one shop to another. Since price is the determining factor, selling with full dimensions becomes unprofitable.

Another factor that affects the price level of sawnwood is the quota allocation of timber to special users who get more timber than their need at special low prices and sell the

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excess at below market prices. Recently, the Forestry Directorate has taken steps to prevent this.

Finally, the diffusion of the illegally cut logs into the market especially small sellers who do not ask for invoices disturbs the price levels. Since this sort of timber is sold at a considerably lower price, it affects the price level as a whole.

In addition to all these factors a very keen competition has its impact on the price level. To take Istanbul as an example, only on the European side, there are more than 700 timber retailers.

At present timber can be bought on 3 to 5 months' credit, resulting in difficult liquidity problems if one takes into consideration the fact that at least 3 months elapses in converting logs into timber and selling it. The total time lapse amounts to 6 to 8 months before cash is debited. Under these conditions, fastest turnover is the most profitable policy and so lower prices are adopted to realize this purpose. On the whole, profitability of timber seems to vary between 12 to 18% on turnover.

B. Grading:

1. Logs: Logs are primarily classified as 1st, 2nd, 3rd classes in accordance with their quality. Each class is divided into long lengths (more than 5 m.), normal lengths (between 3 and 5 m.), short lengths (between 1.5 and 3 m.) and "other" up to 1 m. long.

First class logs of both fir and pine are only 10-12% of the total amount offered for sale by the Forestry Department. Therefore, 1st class prices are very high; in 1969 log prices of 1st class pine in Alanya varied between 680-750 TL/m³. Of course, first class timber, in this case, is sold up to 2000 TL/m³.

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Second class fir logs are not too difficult to find but still far from meeting demand. Prices ranged between 390-430 TL/m³ in 1969; in 1970, in a recent auction in Mengen, they have gone up to 510 TL/m³. Second class logs are preferred by most of the sawyers mainly because of their relatively lower prices and their yield of 50% of joinery grade timber and 30% shuttering grade timber.

Third grade logs are abundant especially pine logs, because of not having utilized forests properly for many years and, therefore, having trees approaching to poor quality age. In fact, due to the large potential of Mediterranean forests, this class is accepted to be the most promising one for exports. Prices of 3rd grade pine logs were about 225 TL/m³ in 1969 and now about 250 TL/m³.

Fir logs of 3rd grade are not as abundant and their prices are high enough to approach those of 2nd grade.

Beech logs are graded in a different manner with respect to length and quality. Their grading can be summarized as follows:

	1st <u>Class</u>	2nd <u>Class</u>	Merchantable	3rd <u>Class</u>	4th <u>Class</u>
Very short length (50-95 cm.)	"	"	"	"	"
Short length (100-170 cm.)	"	"	"	"	"
Normal length (180 cm. and above)	"	"	"	"	"

Beech logs are put on auction in very small quantities due to several reasons. Firstly, plywood and parquet factories using beech as their raw material are given a priority. Secondly, the domestic market for sawn beech is small and

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private beech mills are few. Since beech milling is difficult and needs specialization in steaming, sawing, log care, etc., the private sector is unwilling to undertake beech milling. Thirdly, there are big public mills operating on beech logs such as Ardesen, Bolu, Düzce and Ayancık. Fourthly, preservation of beech logs is difficult. Due to poor log extraction facilities, logs stay in forests and depots up to 5 or 6 months. It is estimated that 30% of beech logs are completely ruined after felling and 20% or more additionally lose their quality.

2. Sawnwood:

a. Sawn softwoods: The official grading system for sawn softwoods is in Appendix D. This system classifies softwoods according to size, defects and quality. It is applied mainly in public mills. In the private mills and retail outlets, this grading system is disregarded and a rough grading system where sawn softwoods are classified according to appropriate uses, is used. Since the private sector's production of softwoods is greater than that of the public mills, this grading system is the dominating one in the domestic market. According to this grading system, softwoods are classified as joinery and shuttering grades. Within each grade, an unofficial breakdown with respect to dimensions of the sawnwood, exists. A chart indicating these classifications is as follows:

Shuttering Grade	Thickness	Width	Very short length	Short length	Normal length	Long length
Boards	24 mm.	10-30cm.	1-2 m.	2-3 m.	3-5 m.	5 m. and over
	20 mm.	"	"	"	"	"
Squares	38 mm.	48 mm.	"	"	"	"
	48 mm.	78 mm.	"	"	"	"
	98 mm.	98 mm.	"	"	"	"

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<u>Shuttering Grade</u>	<u>Thickness</u>	<u>Width</u>	<u>Very short length</u>	<u>Short length</u>	<u>Normal length</u>	<u>Long length</u>
Planks	38 mm.	12-30 cm.	very few	very few	3-5 m.	5 m. and over
	48 mm.	"	"	"	"	"
	98 mm.	"	"	"	"	"

Joinery Grade

Planks	38 mm.	12-30 cm.	very few	very few	3-5 m.	5 m. and over
	48 mm.	"	"	"	"	"
	98 mm.	"	"	"	"	"

The shuttering grade has boards, squares and planks while the joinery grade has planks only. This is a rough classification of the softwood grading procedures, especially in the case of joinery grade whose variety in the market is numerous.

Softwoods are divided into two with respect to their uses. Fir and spruce are used for shuttering mainly and pine is used for joinery. Fir is made up of a loose cellular structure and when unnailed from a shutter it does not crack easily as pine does. Therefore it is preferred to pine. Pine is more durable and can last for 5 years in ground contact without decaying while fir can only last for 2 years. Thus it is preferred for external joinery.

Standardization of sawnwood according to grades is negligibly small, if not totally non-existent. Most sales and purchases are carried on through bargaining. The purchaser inspects different products offered and chooses the one that seems the best fit, especially when buying joinery grade timber.

- b. Sawn hardwoods: The situation is different in the case of hardwoods since mainly public mills operate with them and their grading rules are enforced. A detailed grading system is given in Appendix D.

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One peculiarity of beech sales is the fact that 1st and 2nd grades are sold together, mainly because of the low production of 1st grade sawn beech which is only 3% of total production. Therefore, the mills prefer selling both grades together. Their price is determined in the auctions. This combination is a negative point for exports.

The following table indicates the softwood prices for 1970, which are merely averages of the fluctuating market prices:

Table 19: Softwood prices for 1970: (37)

	TL/m3							
	Long length		Normal length		Short length		Very short length	
	5 m. and over		3-5 m.		2 - 2.5 m.		1 - 1.5 m.	
	<u>Fir/spruce</u>	<u>Pine</u>	<u>Fir/spruce</u>	<u>Pine</u>	<u>Fir/spruce</u>	<u>Pine</u>	<u>Fir/spruce</u>	<u>Pine</u>
<u>Shuttering grade</u>								
Boards	-	-	800	720	700	600	-	450
Squares	-	-	800	720	700	600	-	450
Planks	930	850	840	750	780	700	-	450
<u>Joinery grade</u>								
Planks								
1st grade	-	-	1500	2000	-	-	-	-
2nd grade	-	1700	1300	1500	-	-	-	-
3rd grade	-	1500	1100	1300	850	850	-	-

The following table gives beech prices that are mainly marketed by public mills. Since it was difficult to obtain exact prices, the ranges of each grade is given:

Table 20: Beech prices for 1970: (38)

	TL/m3		
	<u>Normal length</u>	<u>Short length</u>	<u>Very short length</u>
1st - 2nd grade	1500-1700	1100 - 1200	800
Merchantable	1200-1300	900 - 1000	600 - 700

(37) (38) Obtained from a major retailing firm dealing mainly in softwoods.

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	<u>Normal length</u>	<u>Short length</u>	<u>Very short length</u>
3rd grade	800 - 900	650 - 700	500
4th grade	600 - 700	450 - 500	350 - 400

These prices are tentative since beech is sold through auctions and in periods of high demand, prices rise and in slack times, they fall. However, the general level of the different grades of sawn beech has been observed to fluctuate within these ranges.

C. Conclusion:

In the present chapter, a general picture of the sawnwood market has been given. In the pricing section, different activities involved in the marketing of sawnwood have been discussed. This discussion has included all activities that start from the acquisition of logs to the final sales of sawnwood to customers. It is clear that the log prices which are unnaturally high in Turkey, constitute 70% of the final cost of sawnwood. It will be seen in the last chapter that the reduction of the log prices is essential for profitable exports.

The chapter has divided sawmillers into two categories, one of which operate at capacities up to 1000 m³/year and the other of which operate at capacities between 1000 and 10,000 m³/year. The first are not as efficient as the latter but since their costs are lower, they profit from their activities. On the other hand, the bigger mills are the only ones that can be considered for achieving sizeable exports.

Sales effort including retailers is not found in the sawnwood market mainly because this is yet a sellers' market. Supply is short and any product, irrespective of quality, is sold.

The production of sawnwood is a process that needs high capital since log stocks must be kept for periods of 6-7 months on the average. Log sales are made during one half of the year and intermediaries have been established to sell logs to sawmills

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that are not able to keep stocks. However, these middlemen, naturally, sell at higher prices.

The retailers' market is competitive despite the fact that it is a sellers' market. Price is the main factor of competition and quality comes next. A major price distortion is due to the dimensional tolerance differences. Although such practise is accepted by the domestic market, it must be given up when exports are undertaken since foreign customers wish to pay for the exact size of the product. This may influence domestic sellers to prefer selling internally.

Another factor that distorts price and leads to unequal conditions of competition is the diffusion of illegally cut logs. Since these are cut at low cost, their sales are at low prices. Somestimes such supplies lead to lowering the general level of prices.

In the grading section of the chapter, it was emphasized that the two different tree families are different in their grading and that both have official grading systems, but that grading for softwoods is rarely applied by the private sector. Softwoods produced by the private sector have two grades, namely shuttering and joinery, each of which is subdivided according to different dimensions. Since hardwoods are processed mainly by public firms, the official grading system dominates the market. However, the official grading is different from international ones and must be revised substantially in the case of exports.

In the final section of the chapter, the prevailing softwood and hardwood prices were given. It was emphasized that these prices were only tentative since they fluctuated frequently and also since softwoods did not have rigid grading applications. These prices will later be compared with international prices to determine the degree of competitiveness the domestic producers can have in the international market.

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From the chapter, it will be observed that sawnwood is composed of a variety of products , differing according to tree family, species, grade and size. If all of these are taken up separately, the discussion will be unnecessarily complicated. Furthermore, obtaining such specific data about the international market is impossible. Therefore, the discussion will be limited to the two kinds of sawnwood, namely sawn softwoods and hardwoods. Only the last chapter will handle a detailed discussion of each type of product since price comparisons can be made only for specific products. Even in this case, the specifichness of the discussion will be limited since the grading systems of other countries do not correspond to the Turkish one directly.

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CHAPTER V

SAWWOOD EXPORTS

A. Present Situation:

Turkey is considered a net importer of forest products although its net deficit is small. Its deficit in 1955 was 600,000 m3 (RWE), in 1960 200,000 m3 (RWE), and in 1965 200,000 m3 (RWE).⁽³⁹⁾ In the early 50's, sawnwood imports amounted to substantial portions of total imports, but after 1960, imports of sawnwood have been reduced to a minimum while imports of pulpwood have risen to occupy the main import items.

Turkey was a net importer of sawlogs and sawnwood up to 1960 after when it has become a net exporter of these products. Nevertheless, the quantities of exports have been very small and the exports show no definite pattern. The following chart show that exports have fluctuated since 1955:

Table 21: Sawlog and Sawnwood Exports.⁽⁴⁰⁾

Year	Sawlog		Sawnwood	
	m3	TL	m3	TL
1955	9080	2,701,740	8296	2,111,150
1956	8514	2,650,632	8340	2,771,159
1957	7258	1,959,945	773	159,377
1958	8580	3,173,757	158	17,400
1959	1816	138,327	955	106,157

(39) Consommation, Production et Commerce du Bois en Europe
Evolution et Perspective-Nouvelle Etude, 1950-1980,
Organisation des Nations Unies Pour L'alimentation et
L'Agriculture, Geneve 1969, Volume 1, page 198.

(40) Orman Genel Müdürlüğü Genel İstatistik Bülteni, page 124

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Year	Sawlog		Sawnwood	
	m3	TL	m3	TL
1960	5459	4,520,404	6396	2,160,390
1961	6856	7,052,846	3347	1,642,096
1962	13462	7,574,830	1224	627,895
1963	19645	12,200,162	2868	1,349,722
1964	8839	9,976,819	3437	1,866,085
1965	10665	11,506,190	5302	2,582,669
1966	12231	11,706,907	8325	4,061,895
1967	8101	10,602,570	8436	4,974,794

This irregularity in exports can be observed also with respect to the composition of exports. Although hardwood exports show a frequent dominance over softwoods, shifts of emphasis to softwoods are not uncommon as it can be seen below:

Table 22: Sawn Hardwood and Softwood Exports (41)

Year	Softwood		Hardwood	
	m3	%	m3	%
1955	116	1	8180	99
1956	500	6	7840	94
1957	706	91	67	9
1958	-	-	158	100
1959	400	42	555	48
1960	3394	53	3002	47
1961	964	29	2383	71
1962	602	49	622	51
1963	964	34	1904	66
1964	2697	78	740	22
1965	2049	39	3253	61
1966	902	11	7423	89
1967	553	7	7883	93

(41). Ibid. page 134

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It can be concluded from this table, that sawnwood exports consist, on the average, of 65-70 % hardwoods and 30-35% softwoods. The main softwood species exported is cedar, with a small quantity of pine. Of the hardwoods, beech occupies first place followed by walnut. In the case of sawlog exports, the role of softwoods is negligibly small and almost 100% of the exports consist of hardwoods, of which walnut occupies first place followed by beech.

The countries which have been Turkey's main sawnwood export markets are Syria, Lebanon, Israel and Greece. Since 1965, the European countries among which are Spain, Italy, Switzerland and Austria, have started buying our products. Greece has quadrupled its imports from 1962 to 1963 and has become our largest market both with respect to quantity and value of imports. Our second largest market between 1963 and 1967 was Lebanon importing 24.3% of the total volume of exports and 20.1% of the total value of exports.

As it has been previously stated, sawnwood exports of Turkey are small in comparison to total exports. This branch of activity has not received due attention in the past, and the irregularity and randomness of the activity can be attributed to the neglect of the governments. There was no foreign exchange crises, no declared government export policy such as exists now. Also, the inability of sawnwood exports to grow cannot be explained solely by the negligence of governments since there are a number of factors that prevent the natural growth of the sector such as prices, quality, supply, organization. Thus, the forestry sector has never been considered seriously as a source of foreign exchange. The potentials in this sector have lately been realized and it is the purpose of this paper to discuss them. Any statement as to the comparative advantage of the sector with respect to the other export sectors will not be mentioned due to the fact that the other economic sectors are beyond

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the scope of this study.

B. Potential Exports:

1. Production Capacity and Possible Export Volumes: In Chapter I, it was stated that the forestry resources of the country have substantial potentials despite the fact that they are not utilized efficiently at present. When the management plans are put into effect in all of the 23 districts, industrial roundwood is estimated to rise to 14.6 million m³ (u.b.) or, equivalently, 20 million m³ (o.b.) in 1982 according to the preliminary estimates of FAO.⁽⁴²⁾ In contrast to this estimate, MOF estimates that industrial roundwood production can rise to 14 million m³ (u.b.) in 1977.⁽⁴³⁾ Both assume that the management plans will be put into effect when making their respective estimates.

FAO's preliminary estimates of total industrial wood consumption for 1982 are 13.6 million m³ (RWE) with exports of 1 million m³ (RWE). The balance between production and consumption of industrial roundwood is shown below:

Table 22: Balance Between Production and Consumption of Industrial Roundwood:⁽⁴⁴⁾

Year	Production Targets	Consumption Estimates	Balance Million m ³ (RWE)
1962	2.8	2.9	- 0.1
1968	4.1	4.6	- 0.5
1972	6.3	6.7	- 0.4
1977	10.3	9.6	0.7
1982	14.6	13.6	1.0

(42) Forest Industries Preliminary Development Plan, page 3

(43) Orman Bakanlığı 3. Bes Yıllık Dönem Sonunda (1977) 20 Milyon/m³ Üretim Hedefine Göre 1970 Yılı Üretimi İçin Alınması Gerektiği Tebirlerle Yatırımlara Ait Ön Rapor, p.7

(44) Forest Industries Preliminary Development Plan, page 3.

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Thus Turkey is expected to remain a net importer of industrial roundwood to 1977 and a net exporter between 1977 and 1982. However, export earnings before 1977 are estimated to reach 80 million TL.⁽⁴⁵⁾ This amount is for 1973-1977 during when 25,000 m³ of beech, 18,000 m³ of pine and 15,000 m³ of cedar are expected to be exported. The value of these three items will make up 22 million TL and the rest of the 80 million TL will be acquired from the exports of linerboard.⁽⁴⁶⁾ FAO estimates that between 1978-1982, forestry exports will total 200 million TL, 1/3 of which will be earned from the exports of beech, pine and cedar in volumes of 40,000 m³, 100,000 m³ and 25,000 m³ respectively. Higher volumes than these, according to the FAO report, can be achieved only if (1) domestic demand is restricted, (2) investments in this sector rise more rapidly than estimated, (3) an organized marketing activity is directed towards foreign countries in Europe and the Middle East.⁽⁴⁷⁾

Although FAO foresees substantially larger quantities of sawnwood exports within the near future than the amounts realized up to the present, the quantities suggested are not encouraging with respect to the contribution of sawnwood to total trade. The total export volume of 1968 was \$ 496 million. It is estimated that, in the 1970 program, exports of 1969 will be \$ 550 million. According to the 1969 program, the average rate of annual increase of exports between 1963-1967 was 9%. If this figure is projected to the future, the 1972 export volume will be \$707 million. The projected sawnwood export earnings of 1972 is 2.5 million dollars⁽⁴⁸⁾ which is only .35% of total exports for that year.

(45) (46) (47) Ibid. pages 1,8

(48) Ibid. page 8; 22 million TL is converted to dollars with the past rate of exchange of 9 TL/dollar.

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At this point, it must be emphasized that the FAO figures used in the paper are not final and that they are the preliminary estimates of the FAO project team in Turkey. They are not official yet but official estimates will be issued when the project ends in 1971.

Although the FAO is pessimistic about sawnwood exports, substantial volumes are being undertaken presently and that their projections for 1972 have already been realized in 1970. According to the Export Director of MOF, the public mills have made contracts for 95,000 m3 of exports during 1970 and it is his belief that with the efforts of the private sector, this volume will be further increased. When the FAO authorities were asked about these contradictions, they responded that the public mills were exporting at a fairly high cost to Turkey, i.e. buying foreign exchange at a rate exceeding 15 TL/dollar.⁽⁴⁹⁾ Furthermore, they said that the public mills were making engagements for more sawnwood than their capacities, and that repeat business is uncertain.

The FAO proposes that the utilization of industrial woods within the country for the purpose of import substitution will be more beneficial to the economy than exporting part of this production and minimizing what could be huge quantities of pulp and paper imports. According to them, subsidization of exports is not to the best benefits of the country. Exports can be acceptable only if internal prices are reduced to international levels through increased productivity, restricted domestic demand and the substitution of sawnwood by panel products. Firstly, increased productivity will increase the supply of sawlogs and reduce their

(49) Since the discussion was made before the Turkish Lira was devalued, their comments do not take it into consideration. After the devaluation of 10th August, this argument loses much of its meaning.

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prices. Since sawlogs constitute 70% of the final value of sawnwood, a reduction in their prices will directly affect the price of sawnwood. Secondly, restriction of domestic demand will lead to reduced sawnwood prices. At present domestic demand is unnecessarily inflated due to the building boom. However, with the recent increased taxes on real estate, building activities will slow down, leading to lower demand for sawnwood. Thirdly, panel products whose production is rapidly rising, will replace sawnwood and thereby result in reduced sawnwood demand and prices.

According to Mr. Paul Jones, the sawnwood expert of the FAO project team, pulp and paper imports could reach \$ 200 million in 1982. Reducing this import volume by undertaking production at home seems more important than exporting forestry products and importing pulp and paper. However, if industrial roundwood production is increased to a level which satisfies both of these purposes, sawnwood exports are surely beneficial.

In addition to the discussions held with FAO, discussions were also held with the MOP authorities to take their point of view. The basis of the discussion was the governmental decree of July 1969 No. 6/11976 entitled "Encouragement and Development of Forestry and the Export of Forest Products-Aims and Principles of Application" estimating an export volume of 5 million m³ of forestry products in 1977.⁽⁵⁰⁾ This volume is far beyond the FAO proposals and comprise the optimistic extreme of the situation. The evaluation of the Production Director of MOP of this figure is as follows: in order to stimulate the

(50) Assuming that sawnwood will be the main export item within the near future and that it will constitute 75-80% of forestry products exports, sawnwood exports will be around 4 million m³ (RWE) or 2.8 million m³ (s).

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exports of sawnwood which have been almost non-existent up to the present, the State Planning Organization has thrown forth an impossibly large figure to activate related offices for promoting exports. Since the demand of the pulp and paper industry is estimated to be 5 million m³ in 1977 according to the same authority, and since this industry is of prime importance for the economy, it will be satisfied first. This leaves only 9 million m³ of industrial roundwood for the domestic demand, assuming that the 14 million m³ production level is reached, and exports. If 5 million m³ of exports are undertaken, only 4 million m³ will be left for the domestic market which is estimated to reach 6.4 million m³, excluding pulp and paper, in 1977.⁽⁵¹⁾ Thus the export figure of 5 million m³ is quite unrealistic and exports are expected to be somewhere between the optimistic and pessimistic estimates.

It is essential, at this point, to state that exports are limited mainly by the raw material supply. Since sawmills are operating at 45% capacity, any increase in the raw material supply will not create a bottleneck in the production phase and will be consumed by this excess capacity. However, since most plants are small and cannot produce in large quantities, integrated forest products plants which will produce sawnwood as part of their output, must be established. Since public mills are in a process of modernization, their contribution to total sawnwood exports is expected to be substantial, especially in the exports of beech.

(51) Forest Industries Preliminary Development Plan, page 3

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According to the Production Director of MOP, industrial roundwood production can be increased with increasing demand in a rather short period by increasing the production facilities and the labor supply but not changing the production techniques. This method of increasing supply will lead to increased costs and, therefore, he said that increased productivity through mechanization is the only answer to the problem of increasing production. Such productivity rises will lead to decreased costs due to reductions in per unit fixed costs and transportation costs.

In contrast to this authority's views, it must be stated that production can be increased without increasing the production facilities and the labor force but merely by utilizing the same facilities more intensively. This is true for the production of industrial wood and sawnwood. If state mills went on to two or three shifts without increasing the work force, production can be doubled or tripled with the same facilities. This would inevitably lead to lower costs and prices.

Nevertheless, these provisions are for the short-term and in the long-term, the degree of mechanization must be increased. However, the process of mechanization must be gradual. The new equipment must come in slowly so that the work force is ready, both educationwise and organization wise, to utilize them most efficiently.

One major problem with respect to mechanization concerns the forest villagers. In the Forestry Act, Article 40, Section VII, it is stated that all removal, transportation, planting, production and road construction must be done through the employment of villagers in the vicinity. If this labor supply is inadequate, or if it is too unskilled to carry on the job, only then can additional labor be brought to the forest. With the backing of this article,

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the villagers will most likely prevent mechanization which will reduce the number of workers employed in the production process. In order to introduce mechanization, the forestry act must be ammended or revised. However, this is not sufficient, and as a second step, the goodwill of the forest villagers must be obtained since without their concession, the machinery and equipment brought into the forests can not be safeguarded. According to the Production Director, this factor is of primary importance.

Although this factor seems to be formidable in the short-run, it will not be a great problem in the long-run when newer opportunities of employment offered in a more industrialized economy will attract these villagers.

2. Exportable Products: In Chapter II, it is stated that 54,4% of the forests are softwoods and 38,7% are hardwoods. Among the hardwoods, oak and beech are the most common ones while among the softwoods, pine, fir, spruce and cedar are the dominant species. Although softwood resources are greater than those of hardwoods, exports of the latter have dominated past exports. Beech was mainly exported to the European countries, namely Spain, Italy and Greece. Pine has been exported to the Middle Eastern countries, mainly to Syria, Lebanon and Israel. Thus the general pattern of exports has been in the direction of selling hardwoods to Europe and softwoods to the Middle East. This is mainly due to the fact that Turkey has not been able to compete with the North European, Russian and Canadian softwoods with respect to price, quality and market possession within Europe. However, hardwoods are relatively in short supply in Europe and Turkey has been able to sell them. Hardwoods are mainly supplied by Rumania, Yugoslavia, France, West Germany and Denmark. Hardwoods supplied by countries outside of Europe are

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U.S.A. and the developing countries which possess mainly tropical species.

Turkish beech can be competitive in the European market if its handling processes are improved, i.e. log care, sawing techniques, seasoning are developed.

Although beech is the main hardwood to be exported, there is no reason why oak, the total hectares of which are larger than beech cannot be exported.

As for softwoods, the main exportable species are pine and fir. However, since domestic demand for these species is high, their exports are limited. Of total consumption in Turkey, hardwoods are consumed one eighth as much as softwoods. If softwood demand is reduced through lower construction and through the substitution of panel products, its exports can increase. However, it may be more economic to direct this surplus into pulp and paper as is happening in certain European countries and in America.

C. Conclusion:

Past sawnwood exports, potential sawnwood exports and exportable species were the main topics under discussion in the present chapter. Past exports have been relatively small and irregular. Although hardwood exports have dominated softwood exports, a definite pattern did not exist mainly because of the negligence of the forestry industry in the past. Future exports are promising under two conditions: (1) Supply of industrial woods must be increased. This will be done in two aspects-firstly, the organization must be improved; secondly, mechanization must be introduced. Although the first step can be undertaken immediately, the second step must be gradual to attain maximum levels of efficiency. Also, the first step is a prerequisite for the second, i.e. mechanization cannot be effective without a proper organization. (2) Sawnwood

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prices, and thereby sawlog prices, must be reduced to international levels. This is achieved through increased productivity, reduced domestic demand and the substitution of panel products in the domestic market.

The major dilemma in the allocation of industrial woods is whether to reduce the pulp and paper imports by undertaking production at home and thereby reducing exports, or whether to undertake substantial exports and thus continue importing pulp and paper.

Hardwood exports have dominated past exports and this trend may continue in the future unless domestic demand for softwoods which is eight times as large as hardwoods is reduced. At this point, another question is raised: is it more economic to direct softwood sawlogs into the pulp and paper industry as some of the European countries are doing?

So far the paper has viewed the problem from the point of view of supply. The next chapter will investigate the demand side of the problem and will suggest markets for Turkish sawnwood.

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CHAPTER VI

SAWLWOOD PRODUCTION AND CONSUMPTION IN EUROPE AND IN THE MIDDLE EAST

Since the two regions of the world, Europe and the Middle East, are the major markets for Turkish sawnwood, the other regions will be disregarded for the purposes of this paper.

A. European Production and Consumption of Sawnwood:

1. Sawn Softwoods: European production of coniferous sawnwood has increased by 7.5% from 1955 to 1965, reaching a figure of 57.32 million m³. The following table indicates the production volumes of the European countries in the three years, 1955, 1960 and 1965, together with the rates of change in between.

Table 24: Coniferous Sawnwood Production in Europe Between 1955 and 1965: (52)

			million m ³ (s)	
	1955	1960	% fluctuation of production between 1955 and 1960	% fluctuation of production between 1960 and 1965
Eight net exporters	32,50	34,27	5,4	35,13
Sweden	7,70	7,78	1,0	9,72
Finland	6,08	7,70	26,6	6,48
Yugoslavia, Portugal	1,81	2,37	30,9	2,85
Austria, Poland, Roumania, Czechoslovakia	16,91	16,42	- 2,9	16,08

(52) Consommation, Production et Commerce du Bois en Europe
Evolution et Perspective-Nouvelle Etude, 1950-1980,
page 32

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	1955	1960	% fluctuation of production between 1955 and 1960	1965	% fluctuation of production between 1960 and 1965
Rest of Europe	20,73	20,31	- 2,0	22,19	9,3
West Germany	6,46	6,23	- 3,7	7,05	13,2
Bulgaria, Spain, Greece, Hungary, Turkey	1,91	2,32	21,5	3,75	61,6
East Germany	2,88	2,48	- 13,9	1,50	- 39,5
Others	<u>9,48</u>	<u>9,28</u>	<u>- 2,1</u>	<u>9,89</u>	<u>6,6</u>
Total Europe	53,23	54,58	2,5	57,32	5,0

It can be observed that the production of Sweden has risen by approximately 2 million m3 in contrast to the decline of .08 million m3 of the rest of the exporters. The share of Sweden in the total production of the exporting countries has risen from 23% in 1960 to 28% in 1965.

The remaining countries of Europe have shown a slight decline in production between 1955 and 1960 by 2%, but production has risen by 9.3% between 1960-1965, reaching 22.19 million m3.

The production estimates of coniferous sawnwood for the years 1970, 1975 and 1980 are as follows:

Table 25: Production Estimates of Coniferous Sawnwood: (54)
million m3 (s)

1970	59,1
1975	60,8
1980	61,7

It is declared by the FAO study that in order to reach the figure of 1975, 103 million m3 of sawlogs is necessary. (55)
Although European resources are enough to supply this quantity one of the following three conditions may take place in the utilization of industrial roundwood:

(53) (54) Ibid. page 35

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- a. Europe may produce all of its needs from its resources,
- b. Part of the resources which may be used as sawlogs can be directed into the production of other products, mainly pulp and plywood,
- c. Due to competitive demand for wood residues from such industries as pulp and panel products, producers may decrease their production of sawnwood obtainable from one unit of sawlog.

It seems that a combination of the last two alternatives is more likely than the first and that Europe will still remain a net importer of sawnwood until 1980.

Of the total consumption of sawnwood, coniferous sawnwood makes up most of this figure which was 70,4 million m³ in 1955 and has risen to 85,5 million m³ in 1967. In 1950, 78% of total consumption was coniferous sawnwood. This ratio has fallen to 77% in 1965 and is estimated to be slightly above 76% in 1980. The following table indicates the situation of coniferous sawnwood consumption between 1950-1980.

Table 26: Apparent Consumption of Coniferous Sawnwood in Europe Between 1950 and 1980: (55)

	million m ³ (s)						
	<u>Total Europe</u>	<u>Northern Europe</u>	<u>EEC</u>	<u>British Isles</u>	<u>Central Europe</u>	<u>Southern Europe</u>	<u>Eastern Europe</u>
1950	48,17	7,98	15,49	6,25	3,67	1,42	13,37
1955	54,95	8,43	18,75	7,69	3,18	2,07	14,82
1960	58,94	8,52	20,80	8,25	3,85	2,57	14,96
1965	66,14	10,12	24,12	9,51	4,41	4,47	13,50
1970(est.)	68,7	10,3	24,7	9,7	4,8	5,3	13,9
1975 "	71,5	10,6	26,1	10,0	5,1	6,1	13,7
1980 "	73,5	10,8	27,0	10,1	5,3	6,8	13,5

(55) Ibid. page 29

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	Total Europe	Northern Europe	EEC	British Isles	Central Europe	South- ern Europe	East- ern Europe
	<u>Per Capita Consumption</u> (m ³ /1000)						
1950	117	427	98	118	131	22	151
1955	128	432	114	142	108	30	159
1960	131	421	121	149	125	34	154
1965	139	482	133	166	135	55	135
1970 (est.)	138	472	131	163	139	60	133
1975 "	137	466	134	161	141	64	126
1980 "	135	457	134	158	140	65	120

	<u>% Fluctuations of Per Capita Consumption</u>						
1950-1955	9,4	1,2	16,3	20,3	-17,6	36,4	5,3
1955-1960	2,3	-2,5	16,1	4,9	15,7	13,3	-3,1
1960-1965	6,1	14,5	9,9	11,4	8,0	61,8	-12,3
1965-1970 (est.)	-0,7	-2,1	-1,5	-1,8	3,0	9,1	-1,5
1970-1975 "	-0,7	-1,3	2,3	-1,2	1,4	6,7	-5,3
1975-1980 "	-1,5	-1,9	-	-1,9	-0,7	1,6	-4,8

It can be observed that after a peak of 1965 when per capita consumption was 139 m³ per 1000, per capita consumption started to decline. Only in the case of Central and Southern Europe did consumption per capita increase until 1975 after when some stability is found. The main reason of this stability is the fact that the construction industry has slowed down its activity since 1964 although not as rapidly as it was expected.

The balance between production and consumption of soft sawnwood is as follows:

Table 26: Past and Future Balance of Coniferous Sawnwood: (56)
million m³ (s)

	1950	1955	1960	1965	1967	1970	1975	1980
	(estimations)							
Apparent consumption	48,2	55,0	58,9	66,1	65,3	68,7	71,5	73,5

(56) Ibid. page 35

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	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1967</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
	(estimations)							
Production	48,8	53,2	54,6	57,3	56,7	59,1	60,8	61,7
Net exportation	0,6	-	-	-	-	-	-	-
Net importation	-	1,8	4,3	8,8	8,6	9,6	10,7	11,8
Production as % of apparent consump- tion	101	97	93	87	87	86	85	84

It can be observed that production exceeds demand only in 1950. From 1955 until 1980 production is short of consumption at increasing rates and Europe maintains its status as a net importer.

2. Sawn Hardwoods: In the case of sawn hardwoods, consumption rose by 68% from 1950 to 1965 reaching a level of 17,3 million m3. Their share in total sawnwood consumption has risen from 16.5% to 20% during the same period.⁽⁵⁷⁾ The production of broadleaved sawnwood has not been far behind consumption between 1955-1965 and it is not estimated to fall short extensively until 1980 either.

Table 27: Broadleaved Sawnwood Production in Europe:⁽⁵⁸⁾

	million m3 (a)					
	<u>1955</u>	<u>1960</u>	<u>% fluctuation of production between 1955 and 1960</u>	<u>1965</u>	<u>% fluctuation of production between 1960 and 1965</u>	
Eight net exporters	4,48	6,34	31,0	8,15	28,5	
France	2,49	2,75	10,4	2,99	8,7	
Roumania	0,67	1,17	74,6	2,11	80,3	
Yugoslavia	0,58	0,84	44,8	1,19	41,7	
Other countries ^a	1,10	1,58	43,6	1,86	17,7	
Rest of Europe	6,57	6,88	4,7	8,31	20,8	
East Germany	1,35	1,49	10,4	1,85	24,2	
Italy	0,93	0,99	6,5	1,23	24,2	

(57) Ibid., page 35

(58) Ibid., page 39

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	<u>1955</u>	<u>1960</u>	<u>% fluctuation of production between 1955 and 1960</u>	<u>1965</u>	<u>% fluctuation of production between 1960 and 1965</u>
U.K.	1,36	1,28	- 6,3	1,15	- 10,3
Other countries	<u>2,93</u>	<u>3,12</u>	<u>6,5</u>	<u>4,08</u>	<u>30,8</u>
Total Europe	11,41	13,22	15,9	16,46	24,5
a Austria, Bulgaria, Denmark, Finland, Turkey					

It can be observed that all of the countries except U.K. have displayed rises in their production, the highest of which was realized by Roumania, Yugoslavia, West Germany and Italy. Total production reached 16,46 million m3 in 1965 which was 0,8 million m3 short of demand.⁽⁵⁹⁾

Table 28: Production Estimates of Sawn Hardwoods⁽⁶⁰⁾

	<u>million m3 (s)</u>
1970	17,9
1975	18,9
1980	19,6

The consumption of broadleaved sawnwood has steadily increased from 1950 to 1965 and is estimated to increase until 1980. However, the fastest rate of increase was observed between 1960-1965. All of the countries except U.K. which had artificially increased its consumption of hardwoods after the war due to the restrictions put on the utilization of softwoods reduced its consumption as soon as these restrictions were eased and it has shown a decline of hardwood consumption since 1955.

(59) Since the 1965 consumption was 17,26 million m3 as it will be seen in Table 29, the difference between the two figures is 0,8 million m3.

(60) Ibid. page 40

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Table 29: Apparent Consumption of Sawn Hardwoods in Europe
Between 1950 and 1980: (61)

	<u>million m3 (s)</u>						
	<u>Total</u> <u>Europe</u>	<u>Northern</u> <u>Europe</u>	<u>EEC</u>	<u>British</u> <u>Isles</u>	<u>Central</u> <u>Europe</u>	<u>Southern</u> <u>Europe</u>	<u>Eastern</u> <u>Europe</u>
1950	10,28	0,40	4,47	2,64	0,57	0,41	1,80
1955	11,81	0,49	5,33	2,14	0,56	0,70	2,60
1960	14,25	0,68	6,05	2,15	0,80	0,88	3,70
1965	17,26	0,80	7,31	2,10	1,08	1,34	4,64
1970 (est.)	19,0	0,9	8,0	1,9	1,3	1,6	5,3
1975 "	20,3	0,9	8,6	1,9	1,4	1,9	5,6
1980 "	21,3	1,0	8,9	1,9	1,5	2,1	5,8

Per Capita Consumption m3/1000

1950	25,0	21,2	28,3	49,1	20,4	6,4	20,3
1955	27,5	25,2	32,5	39,5	18,8	10,0	28,0
1960	31,6	33,7	35,2	38,7	26,0	11,7	38,2
1965	36,4	38,0	40,2	36,5	33,1	16,4	46,3
1970 (est.)	38,2	39,4	42,3	32,1	37,5	18,6	50,7
1975 "	39,1	40,5	43,9	30,9	39,7	19,7	51,5
1980 "	39,1	41,6	44,3	29,3	40,9	20,3	51,7

% Fluctuation of Per Capita Consumption

1950-55	10,0	18,9	14,8	-19,6	-7,8	56,3	37,9
1955-60	14,9	33,7	8,3	- 2,0	38,3	17,0	36,4
1960-65	15,2	12,8	14,2	- 5,7	27,3	40,2	21,2
1965-70(est.)	5	4	5	-12	13	13	10
1970-75 "	2	3	4	- 4	6	6	2
1975-80 "	-	3	1	- 5	3	3	-

It can be observed from the table that the highest per capita consumption of sawn hardwoods was Central Europe in 1965, more than doubling the 1950 figure. The highest rate

(61) Ibid. page 36

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of increase between 15 years was displayed by Southern Europe where consumption tripled and per capita consumption rose 2.5 times.

The broadleaved consumption kept rising between 1965 and 1967 but at slower rates. In contrast to softwoods, the consumption of hardwoods is expected to keep rising until 1980 with the only exception of U.K.

The balance between the consumption of sawn hardwoods will be negative until 1980 but by smaller amounts than in the case of sawn softwoods.

Table 30: Past and Future Balance of Broadleaved Sawnwood in Europe: (62)

	million m3 (s)						
	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
	(estimations)						
Apparent consumption	10,3	11,8	14,2	17,3	19,0	20,3	21,3
Production	9,9	11,4	13,7	16,5	17,9	18,9	19,6
Net importation	0,4	0,4	0,5	0,8	1,1	1,4	1,7
Production as % of apparent consumption	96	97	96	95	94	93	92

Europe will be a net importer of broadleaved sawnwood until 1980. Imports include mainly tropical species whose volumes are substantial.

The above mentioned consumption estimates of sawnwood for Europe are based upon the intermediate of a set of three different projections developed upon different assumptions. Two sets of projections are based upon the assumption that 1965 was the year with the highest per capita consumption and that this figure will decline in the future. The third projection is based on the assumption that the decline in per capita consumption between 1965-1967 was due to temporary

(62) Ibid. page 40

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conditions and that the 1965 level will be reached in 1970 and sustained. In all of the three cases, the rate of increase in sawnwood consumption is lower between 1965-1980 than between 1955-1965.

In spite of the fact that European consumption of sawnwood will be declining due to the competition of other materials such as particle board, metallic products and other construction materials, it will not be a speedy decline. Construction will consume a higher portion of sawnwood in 1975 than it did in 1960, 58% in contrast to 52%.⁽⁶³⁾ Since the construction sector is projected to grow until 1975, the absolute volume of sawnwood consumption will increase. The fast rate of consumption is especially in the area of non-residential construction such as week-end and vacation resorts, garages, bungalows, etc. Furthermore, the preference for wooden houses in contrast to stone houses has prevented the rapid decline in the consumption of sawnwood. Also, wider impregnation practices have contributed to this end.

The packaging industry absorbed 13.5% of total consumption in 1960.⁽⁶⁴⁾ Although other products may replace sawnwood, the absolute value of sawnwood consumption will not decline since packaging demand is rapidly rising.

The portion of furniture in total consumption was 9% in 1960.⁽⁶⁵⁾ This rate is expected to increase to 1975 when it is expected to start declining slowly.

B. Sawnwood Production and Consumption in the Middle East and North Africa:

The following countries are included into this group: Israel, Jordan, Iraq, Cyprus, Lebanon, Syria, Saudi Arabia, Libya, Algeria,

(63) (64) (65) Ibid. pages 25, 27

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The forest resources of these countries are as follows:

Table 31: The Forest Resources of the Eight Near Eastern Countries: (66) (67)

	<u>Forest land</u>	<u>1000 hectares</u>
Israel	66	
Jordan	67	
Iraq	1500	
Cyprus	173	
Lebanon	80	
Syria	449	
Libya	501	
Algeria	3070	

It can be observed that the forest areas of the countries are negligibly small and their main supply of sawnwood is imports. Sawnwood production volumes of these countries are small as the following table indicates.

Table 32: Sawnwood Production in the Eight Near Eastern Countries (68)

	<u>Coniferous</u>		<u>Broadleaved</u>		<u>Total</u>	
	<u>1965</u>	<u>1966</u>	<u>1965</u>	<u>1966</u>	<u>1965</u>	<u>1966</u>
Israel	2,0 ^{xx}	-	8,0	-	10,0	-
Jordan	-	x	0,5	x	0,5	x
Iraq	-	-	3,6	4,0	3,6	4,0
Cyprus	22,4	16,9	0,4	0,4	22,8	17,3
Lebanon	16,0	x	10,0	x	26,0	x
Syria	3,3	x	1,7	x	5,0	x
Libya	-	-	5,0	4,0	5,0	4,0
Algeria	45,0	x	13,0	x	58,0	x

x not available

xx 1956 figure

Despite the fact that the production volumes of these countries are low, their consumption is rapidly rising.

- (66) Figures for Saudi Arabia could not be obtained.
 (67) Yearbook of Forest Products 1967, Food and Agriculture Organization of the UN, Rome 1968, page 133
 (68) Ibid., pages 26-29

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Table 33: Sawnwood Consumption: (69)

	Total		Per 1000		Average annual rate of change in total consumption	
	1960-62	1975	1960-62	1975	1956-61 actual	1961-75 estimated
	(million m3)		(m3 per 1000)			%
Near East	0,65	1,20	57,0	69,0	4.7	4.2
South West Asia	0,53	1,00	13,0	18,0	11.8	5.1
Arabian Peninsula	0,15	0,20	10,0	12,0	5.1	2.0
Northern Africa	1,01	1,70	18,0	21,0	4.6	3.9

Although annual production and consumption figures of these regions cannot be matched to find their specific deficits due to difficulties in obtaining statistical data, it can still be observed that their production is far from satisfying domestic demands. The import volumes of these regions will help in giving an idea:

Table 34: Sawnwood Imports of the Eight Countries: (70)

	Coniferous		Broadleaved		1000 m3 (s) Total	
	1965	1966	1965	1966	1965	1966
Israel	274	161	25	24	299	186
Jordan	40	42	4,2	7,6	44,2	49,6
Iraq	55	92	31	32	86	124
Cyprus	35	29	1,1	2,1	36,1	30,1
Lebanon	119	149	x	x	119	149
Syria	75	x	13	x	88	x
Libya	60	115	0,8	7,1	60,8	122,1
Algeria	127	x	22	x	149	x

x not available

Since consumption is estimated to rise by 4.2% in these Near Eastern countries, by 5.1% in the South Western countries, by 2% in the Arabian Peninsula and by 3.9% in North African countries, the import figures of these regions will also rise between 1961-75 because of the limited forest resources in these regions.

(69) Wood, World Trends and Prospects, Food and Agriculture
organization of the UN, 1968, page 79
(70) Yearbook of Forest Products 1967, page 50

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C. Export Markets for Turkish Sawnwood:

Geographically Turkey is situated in a region with a deficit of forests. Therefore, finding a market for its sawnwood need not be difficult. According to the Export Director of MOF, Turkey does not face the problem of a shortage of demand, and if there is sufficient supply, exports can be very high since, at present, customers are coming in search of sawnwood but due to a shortage in supply, they are returning without being satisfied. This statement can be verified by the previous discussions in the chapter. Both Europe and the Middle East are expected to have a deficit on their balance of production and consumption of sawnwood. Although Europe has resources to satisfy its sawnwood demand, it will remain a net importer since sawlogs will be consumed partly by other industries such as pulp and paper, and also sawnwood production from a unit of sawlog will fall, due to the competitive demand for residues. However, the Middle Eastern countries are bound to be net importers because their forest resources are very scarce and far from satisfying their domestic demands.

The net softwood importers in Europe are located in Central and Southern regions. U.K., although in Northern Europe, is an important softwood importer, also. Since Turkish sawnwood will face keen competition from the other sawnwood supplying countries such as Sweden, Finland, Yugoslavia, Roumania, North America and U.S.A., it is more rational to consider the Middle Eastern countries as the main market for Turkish **sawn** softwood. The same need not be true in the case of sawn hardwoods since these products have a good chance of sales if they are properly marketed. Therefore, the market of sawn hardwoods can be either Europe or the Middle East, whichever pays the higher price. The main sawn hardwood importers in Europe are U.K., Italy, Greece, West Germany and Spain. The major exporters are Yugoslavia, Roumania, Denmark, and France.

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According to Mr. Paul Jones and Mr. Tim Waite, who is a director in the British Bambergers Co., both Roumania and Yugoslavia are restricting their sawn hardwood exports, mainly of beech, to export these wood resources as furniture, a more finished product. This trend will consolidate the position of Turkish sawn hardwoods in Europe and exports will be higher.

D. Conclusion:

The present chapter has attempted to survey the demand prospects for Turkish sawnwood by studying the supply and demand conditions of both sawn softwoods and hardwoods in the the most important markets, namely Europe, Middle East and North Africa. It is found out that European production of sawn softwoods in 1965 was 57,3 million m³ in contrast to the sawn softwood consumption of 66,1 million m³ in 1965. A net deficit of 8,6 million m³ for 1965 is expected to grow to 11,8 million m³ in 1980. Despite the fact that per capita consumption of sawn softwoods declines between 1965 and 1980, total consumption rises. In the case of hardwoods, a net deficit of 0,8 million m³ in 1965 is expected to grow to 1,7 million m³ in 1980. Per capita consumption keeps rising until 1980.

Coming to the Middle Eastern and North African markets, the present chapter has revealed that the forest resources in these two regions are negligibly small and that imports are the main sources of supply. Sawnwood consumption was 2,34 million m³ in 1962 and will reach 4 million m³ in 1975. Almost all of this amount is expected to be imported.

As a general summary, it is concluded that Turkey could export all of its surplus which is dependent upon the degree to which it can increase domestic production and reduce domestic demand.

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CHAPTER VII

CUSTOMERS AND COMPETITORS OF TURKISH SAWWOOD

The present chapter will identify and briefly describe the customers and competitors of Turkey. The customers have been identified in the previous chapter. The competitors will be identified according to their size of exports. The FAO's Yearbook of Forestry Products published in 1967 is the source for comparing the annual exports of different countries. Since the latest publication that includes all of the countries of the world is this one, the figures for 1965 and 1966 will be under discussion.

In the case of sawn softwoods, a minimum export volume of 1,0 million m³ and in the case of sawn hardwoods, a minimum export volume of 0,3-0,35 is set to consider a country a sizeable exporter.⁽⁷¹⁾ The only exception is Denmark which exports around 100,000 m³ at present but is a potential competitor in the beech market due to the speedy growth of its exports. Of course, proximity is another criterion in selecting competitors.

A. Major Customers:

1. U.K.: The forest resources of U.K. are as follows:
120,000,000 m³ commercial forest volume, 1,400,000 ha. commercial forest area all of which are plantations. Its 1967 harvest was 3,700,000 m³ and 620,000 m³ of sawnwood was produced. Of the total forest products needs, 92% are imported. The country has 800 sawmills, 200 of which produce 75% of total output.⁽⁷²⁾

(71) See Appendix F for a list of the export and import volumes of different countries.

(72) "World Wood Review 1969", World Wood, July 1969, Volume 10 No.8, page 12

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The following table gives the import figures of sawn softwood between 1965-1968:

Table 35: Sawn Softwood Imports of U.K.: (73)

	<u>Standards</u> (74)
1965	1,898,009
1966	1,678,990
1967	1,773,846
1968	1,933,149

The main softwood exporters to U.K. were Canada, Finland, Poland, U.S.S.R., Sweden and Czechoslovakia.

The temperate hardwood import statistics of the country are as follows:

Table 36: Temperate Hardwood Imports of U.K.: (75)

	<u>1966</u>	<u>1967</u>	<u>Thousand cu.ft.</u> (76) <u>1968</u>
Canada	1,265	1,354	1,086
Denmark	1,346	1,311	2,379
Finland	1,145	1,397	1,574
France	1,718	1,645	1,217
Yugoslavia	639	438	508
Roumania	2,909	2,745	3,356
U.S.	1,335	1,655	834

Beech is the main temperate hardwood import item making up 25.6% of the total imports including tropical species. In 1968, 8,067,000 cu.ft. have been imported. Of this quantity, Roumania, with 3,301,000 cu.ft., Denmark, with 2,224,000 cu.ft., and France, with 1,003,000 cu.ft., were the main suppliers. (77)

(73) "U.K. Timber Supplies in 1968", Timber Trades Journal, 26 July 1969, page 60

(74) One Standard equals 4.672 m³.

(75) Ibid., page 62

(76) One cu. ft. equals 0.028 m³.

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In U.K., there is a Timber Trade Federation to which the majority of importers, merchants, agents and brokers belong. This trade organization deals with matters concerning trade, preparation of standard trade documents, negotiation of agreements with the government, foreign shippers' organizations and nationalised industries.

Most exports to U.K. are carried by agents of different suppliers. These agents have an organization through which timber importers and merchants are contacted. Thus they relieve both the shippers and importers from making a large number of contacts overseas to sell or buy timber. Financially, agents can extend credit to importers and pay cash to exporters. Some of the agents of different exporters are the following: Pharaoh Gane and Co. in London is the sole selling agent of Exportlemn, Roumania; of the Pacific Lumber and Shipping Co. of Seattle, Wn.; Isweden Letsa C/Y of Sweden. Among the British importers, Lamberers (timber and Plywood) Co. is one of the largest softwood and hardwood importers. Since this is a large company, it goes beyond trading with agents and undertakes delivery of timber from different exporters throughout the world. Their organization consists of chartered ships, special port operations, depots ranging from Cornwall to Scotland and subsidiary internal distribution companies.

2. Netherlands: The forest resources of the country are as follows: 15,000,000 m³ of commercial forest volume, 190,000 ha. commercial forest area. The 1967 harvest was 806,000 m³. The country imports 82% of total forest products needs.⁽⁷⁷⁾ Imports of sawn softwood were 2,347,000 m³ in 1966, the major portion of which was imported from Sweden, Finland, Austria, Czechoslovakia and U.S.S.R.

(77) "World Wood Review 1969", World Wood, July 1969, page 16

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3. Italy: Forest resources of the country are as follows: 8,500,000 m³ of commercial forest volume, 6,145,665 ha. of commercial forest area. In 1967, 16,174,000 m³ was harvested and 3,635,500 m³ of sawnwood was produced. There are 2500 sawmills in the country, 200 of which produce 75% of total output.⁽⁷⁸⁾ Of the total forest products demand, 50% is imported.

Imports of sawn softwood were 2,448,000 m³ and 2,763,000 m³ in 1965 and 1966 respectively.⁽⁷⁹⁾ Austria was the main supplier in Europe followed by Roumania and Czechoslovakia. Large quantities were also imported from U.S.S.R. and U.S.

Sawn hardwood imports were 407,000 m³ and 479,000 m³ in 1965 and 1966 respectively.⁽⁸⁰⁾ Roumania, Yugoslavia, France and Austria were the chief suppliers.

4. Greece: The forest resources of the country are as follows: 100,000,000 m³ of commercial forest volume, 50,000 ha. of commercial forest area. Its 1968 harvest was 380,000 m³ and sawnwood production was 200,000 m³. Per capita wood consumption is .11 m³. Of total consumption, 75% is imported. The sawn hardwood imports in 1965 and 1966 were 32,000 m³ and 53,000 m³ respectively.⁽⁸²⁾ The main suppliers were Yugoslavia and France.

5. Spain: The forest resources are as follows: 14,398,230 ha. commercial forest area. The 1967 harvest was 5,374,000 m³ and 1,888,000 m³ of sawnwood was produced. Per capita wood consumption is .29 m³.⁽⁸³⁾ Sawn hardwood imports were 80,000 m³ and 143,000 m³ in 1965 and 1966.⁽⁸⁴⁾

(78) Ibid., page 14

(79)(80)(82) Yearbook of Forest Products 1967, page 49

(81) "World Wood Review 1969", page 12

(83) Ibid., page 19

(84) Yearbook of Forest Products 1967, page 49

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6. North African and Middle Eastern countries: The following table indicates the forest resources of these countries:

Table 37: Forest Resources of the Near Eastern and the North African Countries: (85)

	Commercial forest area ha.	1967 Sawnwood production 1000 m3	No. of sawmills
Algeria	1,295,780	22,0	
Libya	462,000	14,3	13
Israel	23,500	4,6	18
Iraq	6,000	4,0	10
Syria	449,000	50,0	
Lebanon	80,000	26,0	141
Cyprus	173,000	29,6	74

Since Saudi Arabia imports 99.7% of its needs, its production and resources are negligibly small.

The imports of these countries are as follows:

Table 38: Sawn Softwood Imports of the Near Eastern and the North African Countries: (86)

	1965	1966	1000 m3 (s)
Algeria	127		
Libya	60	115	
Cyprus	35	29	
Iraq	55	92	
Lebanon	119	149	
Syria	75		
Israel	274	161	

The exporters to these countries are Austria, Finland, France, Canada, U.S.S.R., Sweden and Yugoslavia.

(85) "World Wood Review 1969", pages 38, 42, 48, 51, 52

(86) Yearbook of Forest Products 1967, page 50

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B. Major Competitors:

1. Sawn Softwood Exporters: Among these U.S.S.R., Sweden, Finland, Roumania, Austria, and Czechoslovakia can be considered. Although U.S. and Canada are very far from Turkey, they can compete from the Pacific Coast. In the following paragraphs, brief descriptions of these countries will be given.
 - a. U.S.S.R.: The forest resources of the country are as follows: 79,700,000,000 m³ of commercial forest volume, 690,700,000 ha. commercial forest area. In 1967, 286,900,000 m³ of industrial wood was harvested and 109,000,000 m³ of sawnwood was produced. Per capita consumption is 1.6 m³ and per capita sawnwood consumption is .47 m³. There are 1200 sawmills, 108 of which produce 75% of total production.

It is the aim of the country to improve the production of various forestry products together with increasing the rate of wood utilization with minimal residues and wastes. In the production of raw material, emphasis is put on mechanization and the elimination of labor intensive processes. Wood utilization was 51% in 1966 and is planned to be raised to 70% in 1970 and to 80% in 1980.⁽⁸⁸⁾ In order to achieve these goals, integrated forest products plants are being established. In addition to the two giant complexes located in the European Northeast and in Eastern Siberia, the installment of 13 or 14 additional complexes are planned within the next 20 to 25 years.⁽⁸⁹⁾

U.S.S.R. exports of sawnwood in 1965 and 1966 are as follows: 8,001,000 m³ and 7,993,900 m³.⁽⁹⁰⁾ The major

(87) "World Wood Review 1969", page 57

(88) (89) Ibid.

(90) Yearbook of Forest Products 1967, page 41

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European markets are U.R., East and West Germany and Hungary. U.A.R. is also an important market in Africa.

Since Russian exports are made by sea, and since the Northern ports are icebound most of the winter, delivery can take place only during the summer months, starting between April and June. This is called F.O.W. (first open water) shipment which is officially forty-eight hours after the ice is clear enough to permit any shipment. This selling procedure necessitates importers to carry stocks during winter and purchase large quantities during the shipment season. In addition to tying large quantities of capital to stocks, this purchasing method poses the critical question of estimating the winter demand.

The Russian government timber export organization, called Exportles, negotiates all sales of Russian timber for export at the beginning of the selling season which is usually between September and December of the preceding year. They publicize through their adverts the stocks and their prices for F.O.W. shipment. Since their softwoods are highly demanded, they give a few weeks for importers to deliver their specifications and orders. Sometimes importers have to contend with part of their subscriptions due to heavy demand for these softwoods, and at other times the Russian stocks are reoffered at different periods but at higher prices.

b. Sweden: The forest resources of Sweden are as follows:

2,400,000,000 m³ of commercial forest volume,
22,800,000 ha. commercial forest area. The 1967
harvest was 64,600,000 m³ and 9,428,000 m³ of sawnwood
was produced. This quantity was produced by

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4,465 sawmills 470 of which produce 75% of total sawnwood output.⁽⁹¹⁾ The trend in the industry is towards more concentrated units of production with increased automation in manufacture and handling, both in the forest and in the mill. With respect to transportation, there is an abandonment of the floating channels and a switch to railway transportation. A new concept in the industry is the introduction of terminals which are converging points of transport lines. From these points, sawmills can obtain their raw materials. Also, another kind of a terminal has been developed, where a number of sawmills each of which is too small to construct its drying, packaging, etc., facilities, join to make up a terminal near shipping points. The sawyers bring their sawnwood here and have all the necessary processing carried in addition to benefiting from the selling organization, transportation facilities and shipment. The terminal is equipped with a large kiln, stickering unit, trimmer sorter and packager. The terminal at Karlshamn serves seven small mills and is highly mechanized and conveyerized. Four other units will start operation in the 1970s. It is expected that the share of exports going through cooperative terminals will rise from 5% in 1972 to 25% in 1977.⁽⁹²⁾

Swedish exports of soft sawnwood in 1965 and 1966 were as follows: 5,282,000 m³ and 4,997,000 m³.⁽⁹³⁾ The main markets were in Europe-U.A., Netherlands, West Germany, Denmark, Greece and Spain. In Africa and Asia, small quantities were exported to Algeria, Morocco, Tunisia, Israel.

(91) "World Wood Review 1969", page 19

(92) Caplan, Basil, "Sorter Used By Scandinavian Mills", World Wood, August 1969, Volume 10, No. 9, page 4

(93) Yearbook of Forest Products 1967, page 41

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Shipments from Sweden are also made on F.O.W. basis since the bulk of its exports are made from the Northern ports. From the ice-free coasts of Scandinavia, car ferry type ships have been put into service between the Scandinavian ports and the Eastern ports of U.K. Here trailers carry the packed sawnwood from the mills in Scandinavia to their destination in U.K. Thus intermediary handling and storing is eliminated.

- c. Finland: The resources of the country are as follows: 1,410,000,000 m³ of commercial forest volume, 21,700,000 ha. commercial forest area. In 1968, 46,500,000 m³ was harvested and 4,882,240 m³ of sawnwood was produced. The country has 11,900 sawmills 600 of which produce 75% of total sawnwood output.⁽⁹⁴⁾ The industry is tending towards mechanization and integration due to the increased cost of labor and logs. Among the technical advances of sawmills, there are mechanical log sorters, mechanized kiln drying and stacking, automated handling, and computer utilization for optimal sawing. Log floating is no longer favored but transportation by land has become dominant. Since large scale log storage incurs high costs felling and haulage is synchronized to reduce storage costs.

Soft sawnwood exports in 1965 and 1966 were as follows: 4,064,000 m³ and 3,731,000 m³.⁽⁹⁵⁾ The major markets were U.K., Netherlands, Denmark, West Germany and France in Europe. In Africa and Asia, its purchasers were Algeria, Morocco and Israel.

The major part of Finnish softwood is exported on F.O.W. shipment from the Northern ports, but there are some exports made in the Southern Baltic shores, also.

(94) "World Wood Review 1969", page 10

(95) Yearbook of Forest Products 1967, page 41

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- d. Roumania: The forest resources of the country are as follows: 970,049,000 m³ of commercial forest volume, 6,111,068 ha. of commercial forest area. In 1967, 13,373,000 m³ was harvested and 5,311,000 m³ of sawnwood was produced. The country has 122 sawmills 62 of which produce 75% of total sawnwood output.⁽⁹⁶⁾ There is a tendency in the forestry sector to integrate the wood processing industry whereby the production of a variety of products such as sawntimber, veneer, plywood, particleboard, fibreboard and doors, will enable a higher utilization rate of timber. The rate of timber utilization ranges between 74 and 84% at present.⁽⁹⁷⁾

Exports of soft sawnwood in 1965 and 1966 were: 1,417,000 m³ and 1,625,000 m³.⁽⁹⁸⁾ Its main markets were in Europe-West Germany, Italy, France, Greece, Hungary.

- e. Canada: The forest resources of the country are as follows: 20,943,000,000 m³ of commercial forest volume, 420,328,000 ha. of commercial forest area. In 1967, 115,500,000 m³ was harvested and 25,100,000 m³ of sawnwood was produced. The country has 2,950 sawmills 230 of which produce 75% of total output.⁽⁹⁹⁾ Most production is concentrated in the British Columbia. Recently, there has been a trend of establishing sawmills in the interior of the country where they would be operated together with the pulp and paper mills. Due to increases in the costs of production mainly due to increasing wages, efforts are made to reduce labor costs through automatization.

(96) "World Wood Review 1969", 19

(97) Ibid.

(98) Yearbook of Forest Products 1967, page 41

(99) "World Wood Review 1969", page 21

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Canadian exports of soft sawnwood during 1965 and 1966 were: 14,457,000 m3 and 14,458,000 m3.⁽¹⁰⁰⁾ The main market was U.S. followed by Europe where U.K., France, Netherlands were the major purchasers. Japan and Israel which imported 41,000 m3 in 1965 and 6400 m3 in 1966⁽¹⁰¹⁾ were other smaller customers. Most Canadian timber is sold on delivered terms to importers, with or without the services of agents. Large carriers deliver the product into the main ports from where orders are directly distributed to destination.

Canada is one of the main countries in developing packaged timber. This facilitates loading and unloading together with speedy transportation. Also, packaging leads to standardization of size and length.

2. Sawn Softwood Prices: The following table gives the F.O.W. prices of imported sawnwood :

Table 39: Sawn Softwood Prices of Three Major Exporters to U.K.:⁽¹⁰²⁾

	Finnish			Russian			Swedish		
	Annual opening f.o.b. prices per standard for 7 inch unsorted redwood battens from South Finnish ports			Annual opening c.i.f. prices per standard for 3 in.x 7 in. unsorted redwood battens from Archangel			Annual opening f.o.b. prices per standard for 7 in. unsorted redwood from the Kärnösand district		
	£	s.	d.	£	s.	d.	£	s.	d.
1965	85	0	0	100	0	0	94	0	0
1966	87	0	0	102	0	0	96	0	0
1967	88	0	0	102	0	0	98	0	0
1968	104	0	0 ^x	115	0	0 ^x	118	0	0 ^x
1969	107	0	0	124	0	0	121	0	0
x Post devaluation									

(100) Yearbook of Forest Products 1967, page 41

(101) Ibid., page 105

(102) "North European Softwood Prices", Timber Trades Journal, Annual Special Issue 1970, page 75

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3. Sawn Softwood Grading: The grading of different species of softwood differs. Pacific Coast softwoods such as Douglas Fir, Western Hemlock, Sitka Spruce, and Western Red Cedar are graded according to the export grading rules adopted by the West Coast Lumbermen's Association and British Columbia Lumber Manufacturers Bureau. The following grades prevail in this system:

No. 2 Clear and Better

No. 3 Clear and Better

Selected Merchantable

No. 1 Merchantable

No. 2 "

No. 3 Common

The clear grades are obtained from the flanks of large trees and have very few defects. The selected merchantable grade is strong timber suitable for constructional uses but some knots in addition to small defects are permitted. No. 1 and No. 2 merchantable allow larger defects but provide good and strong timber that can be used for rafters. The last grade is composed of the remainings of the higher grades and any number of defects can exist.

In Northern Europe a wide variety of quality exists between producers of European Redwood and each producer sets his own standards and puts his own shipping mark on the timber. It is his responsibility to maintain the quality of timber he produces, and the reputation of each grade is thereby established in the market.

Production is graded into Unsorted (1st to IVth), Vth quality and sometimes VIth quality. U.S.S.A. is an exception. There, grades are Unsorted (1st to IIIrd), IVth quality and VIth quality. Since the quality of logs differ if they come from different regions, the same species of timber cannot be compared unless from the same region.

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The following table gives a rough picture of the classification of Redwood, Douglas Fir and Hemlock. Since each producer sets his own standard, it is not a definite rule:

Table 40: Grading of Douglas Fir, Hemlock and Redwood With Respect to Uses: (103)

	<u>Douglas Fir Hemlock</u>	<u>Russian Redwood</u>	<u>Swedish Redwood</u>	<u>Finnish Redwood</u>	<u>Polish Redwood</u>
High Class Joinery	Clears	Unsorted Kara Sea	Unsorted Gulf Ports	Unsorted first class stocks	
Standard Joinery		Unsorted White Sea/ Leningrad	Unsorted Central Swedish	Unsorted intermediate stocks	Unsorted
Cheap Joinery and/or good Carcassing	Selected Merchant- able	Unsorted Riga and Ventspils IVth quality Kara Sea	Vth quality Gulf ports	Unsorted lower group stocks	Unsorted
Carcassing	No.1/2 Merchantable	IVth quality White Sea and Leningrad	Vth quality Central Swedish Unsorted South Swedish Vith quality Gulf ports	Vth quality intermediate stocks Vith quality first class stocks	Vth quality
Low Grade Purposes	No.3 Common	IVth quality Riga and Ventspils Vith quality	Vth quality South Swedish Other quality	Vth quality lower group stocks Vith quality interme- diate stocks	

The origin of any product can be found out from the marks put on the timber. The shipping mark is stencilled on the ends of pieces and a different color is used for the different grades. Various combinations of letters, generally the exporters' initials, and other symbols are used.

(103) Willis, W.E., Timber From Forest to Consumer, Published by Ernest Benn Limited, 1968, page 40.

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4. Sawn Hardwood Exporters:

a. Roumania: Roumania has exported 1,645,000 m3 in 1965 and 1,702,000 m3 of sawn hardwood in 1966.⁽¹⁰⁴⁾ Its main market in Europe is Italy and U.K. Large quantities are also exported to U.S.S.R. Roumanian beech is well-known and is shipped throughout the world by Exportlemn in Bucharest.

b. Canada: Canada has exported 447,000 m3 in 1965 and 558,000 m3 in 1966.⁽¹⁰⁵⁾ Its main market is U.S. Its exports to U.K. were only 51,000 m3 and 38,000 m3 in these respective years. Negligibly small amounts were exported to the rest of the countries in Europe, Africa and Asia.

c. Yugoslavia: The forest resources of the country are as follows: 945,021,055 m3 of commercial forest volume, 7,153,673 ha. commercial forest area. In 1966, total industrial wood removal was 10,176,000 m3 and sawnwood production was 2,387,000 m3 of which 1,539,000 m3 was coniferous and 1,248,000 m3 was broad-leaved sawnwood. The country has 94 sawmills.⁽¹⁰⁶⁾

Exports of hardwood were 466,000 m3 in 1965 and 534,000 m3 in 1966.⁽¹⁰⁷⁾ Main markets were Italy, Greece, U.K., Spain and Netherlands in Europe; U.A.R. and Israel in Africa and Asia. In 1969, 17,250 m3 of beech which was only 8% of total beech imports of U.K. were imported by this country. This quantity was 5% lower than the exports of the previous year.⁽¹⁰⁸⁾

(104) Yearbook of Forest Products 1967, page 41

(105) Ibid., page 41

(106) "World Wood Review 1969", page 19

(107) Yearbook of Forest Products 1967, page 41

(108) Davis, Geoffrey, "Imported Hardwood Statistical Trends", Timber Trades Journal, 28 February 1970, page 31

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- d. France: The forest resources is as follows: 1,000,000,000 m³ of commercial forest volume, 13,022,000 ha. of commercial forest area. Total industrial wood removal was 25,093,000 m³ in 1965 and sawnwood production was 7,782,000 m³ of which 5,140,000 was coniferous and 2,642,000 m³ was broadleaved sawnwood. (109)

Exports were 339,999 m³ in 1965 and 320,000 m³ in 1966. Its main markets were West Germany, U.S., Belgium, Switzerland, Spain, Netherlands and Italy. In the African market, Algeria, Morocco and Tunisia were the purchasers.

The French government is trying to stimulate the activity of the timber industry by favoring one family houses which promote the consumption of timber on an increasing scale. In addition to the consumption of timber in housing which uses timber for 400,000 to 500,000 units per year, (111) attention is also given to the use of timber for decorative purposes. The main deficiency of the French timber industry is its negligence of marketing both at home and abroad. Salesmanship in France is far behind that of Britain or U.S.

- e. Denmark: The forest resources of the country are as follows: 60,000,000 m³ of commercial forest volume, 434,000 ha. forest area. Total industrial wood removals were 1,711,000 m³ in 1966 and sawnwood production was 775,000 m³ of which 380,000 m³ was coniferous and 375,000 m³ was broadleaved sawnwood in 1965. The country has 375

(109) "World Wood Review 1969", page 11

(110) Yearbook of Forest Products 1967, page 41

(111) Sherringham, John W., "French Timber Trade and Industries" Timber Trades Journal, Annual Special Issue 1970, page 83

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sawmills 100 of which supply 75% of total output. (112)

Exports of Denmark were 87,000 m3 in 1965 and 78,000 m3 in 1966. (113) In 1969, a record level of 102,000 m3, mainly beech, were exported. Although Denmark is new in the hardwood export market, it has become a keen competitor in it. Of the total exports of sawn beech, about two thirds go to U.K. and make up 20-30% of U.K.'s imports. After U.K., Sweden and Norway are secondary markets. India, Israel and U.S. are smaller but steady markets.

Danish beech is more suitable for bending and turning than Middle and Southern European beech. It is lighter in color also.

Denmark makes sure that its sawnwood is of homogeneous quality and is delivered in reasonably short periods. In addition to its quality and delivery advantages, Denmark has the advantage of geographical location being near export markets. An export organization was established by a number of sawmills in 1961 sponsored by private forest owners. The marketing of Danish beech has been successful through this organization.

5. Sawn Hardwood Prices: Average sawn beech prices in the British market during the last five years have been as follows:

Table 41: Average Beech Prices in U.K. (114)(115)

	Quantity 1000 m3	Value(c.i.f.) 1000 TL	Average Price TL/m3
1965	227	139,280	614
1966	207	126,580	611
1967	189	120,582	638
1968	228	135,151	592

(112) "World Wood Review 1969", page 10

(113) Yearbook of Forest Products 1967, page 41

(114) Exchange rate up to 1968 is 25.20 per £1.0.0; in 1968 21.60 per £1.0.0

(115) Waite, S.H., Ormançılık ve Orman Ürünleri, İlk Kısım, Kayın Kereseti İhracatını Geliştirme.

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In 1970, average hardwood prices of the main exporters in U.K. were as follows:

Table 42: Average Hardwood Prices in 1970: (116)

	Quantity m3	Value(c.i.f.) £L	Average Price £L/m3
Denmark	4,364	94,262	626
France	1,981	42,780	457
Yugoslavia	1,315	28,404	648
Roumania	8,949	93,192	583
Canada	1,154	24,926	626

C. Conclusion:

The present chapter has identified the major customers and the major competitors of Turkey. Among the major customers, U.K., Italy, Greece, Spain, Netherlands and the Middle Eastern countries-Algeria, Libya, Israel, Iraq, Syria, Lebanon, Cyprus, Saudi Arabia-were mentioned. Among the competitors, U.S.S.R., Sweden, Finland, Roumania, Canada, Yugoslavia, France, Denmark were enumerated. Brief descriptions of these countries were given with respect to their resources, their sawmilling industries, their exports, their markets and their export procedures. At the end of the sawn softwood and hardwood sections, the prices of the respective products and their grading systems were presented.

From the discussions, it can be observed that the softwood suppliers in Europe are abundant and that Turkey need not enter this market unless the other market in the Middle East is too small to satisfy it, which at present does not seem probable. However, this does not mean that Turkey will be free of competition since most of these softwood exporters supply sawnwood to the Middle East also.

(116) 'Hardwood Statistics', Timber Trades Journal, 21 March 1970, page 44

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The major hardwood exporters are Roumania and Yugoslavia in Europe and when these two countries terminate their sawnwood exports, as it has been previously mentioned that they will, hardwood will be scarce in Europe and Turkey will have an opportunity to sell in this market as well as selling in its other market, the Middle East. However, such factors as quality, dependability on quality, continuity of supply, regular delivery, payment or credit terms will affect the sales of Turkish sawnwood. Unless these services are improved, the chances of sales are small. European countries would most likely prefer importing from more distant regions but under better conditions.

From the grading discussions in the chapter, it will be observed that the Turkish grading rules do not correspond to the rules used by other countries. However, this is not an obstacle for exports since most exports are made through personal contacts. Importers come and look at all the grades offered and then they choose the one that seems the most suitable grade. It is the responsibility of the exporter to supply the same quality product thereafter. This procedure is for circumstances when both parties are not acquainted. However, after the importer learns the grades of the exporter, such as in the European softwood market, purchases and orders can be forwarded through correspondence.

The prices of softwoods and hardwoods in the major European importer, U.K., were given. At present with the price rebates, Turkey can be competitive with these prices. A more detailed discussion of these rebates will be undertaken in the next chapter. However, as it was previously emphasized, price rebates should be temporary and that sawnwood prices should be reduced for economic and rational exports.

One minor point that must be noticed from the description of the different exporting countries is the fact that most

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of these countries have almost the same if not less forest resources than Turkey but produce many times more industrial wood and sawnwood. Why should not Turkey be as productive as these countries are?

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CHAPTER VIII

FACTORS TO BE CONSIDERED FOR ACHIEVING SIGNIFICANT SAWWOOD EXPORTS

In considering any segment of the forest products sector, the whole sector must be taken into consideration since such factors as quality, price and standardization start from the log in the forest.

A. Production Organization:

Efficient sawwood production is dependent upon speedy and efficient removal of appropriate logs from the forest. Removals can be broken up into:

1. Felling
2. Preservation
3. Logging
4. Grading
5. Transportation

Present felling practices are very primitive in Turkey. Productivity per worker utilizing manual saws and non-standardized axes is only 2 m³ per day. This makes a total productivity of 180 m³/season of 90 days. In contrast, one skilled worker utilizing motor chain saw can fell 14 m³/day making a total of 1260 m³/season.⁽¹¹⁷⁾ However, these two figures apply to the present system of selective cutting. With clear cutting and without power saws, felling could reach 1500 m³/year, according to Mr. Paul Jones. Therefore, as it has been emphasized previously, a shift to clear cutting is necessary to increase wood pro-

(117) Orman Bakanlığı 3. Bes Yıllık Dönem Sonunda (1977) 20 Milyon m³ Üretim Hedefine Göre 1970 Yılı Üretimi İçin Alınması Gerekli Tedbirlerle Yatırımlara Ait Ön Rapor, page 13

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duction. If this shift is made, production can be increased substantially without changing the present production facilities or the work force. Reforestation in clearly cut areas is highly productive since all trees can see sunshine. Growth in selectively cut areas is very slow since sunshine cannot penetrate into the ground. Therefore, a newly planted area can attain maturity within 40-50 years.

In the long run, mechanization must be introduced but gradually. The role of organization in the process of mechanization is of chief importance since without it mechanization cannot be effective. Therefore, organizational changes must be undertaken right away, and only afterwards should mechanization be considered.

A great percentage (nearly 50%) of non-durable hardwoods such as beech which is the most promising export product, are harmed extensively or even totally destroyed by decay fungus in the forest. In the case of softwoods, attack by sapstain fungi are degrading a great proportion of pine and fir.

These degradations are mainly due to the disunity between felling, logging and transportation activities. The depot system of the General Directory of Forestry leads to such a disunity. According to this system, logs are transported to the nearest roadsides within the area after felling and are there, they are transported to depots. Here they are stacked according to different sales parties and they remain in the depots until the final purchaser transports them to the mills. At each stop, the logs wait usually for quite a while. This system of felling and delivery must be better organized so that the sawmillers must obtain their parcels after a short period from felling. Unnecessary stops on the way must be eliminated.

However, even before this system is changed, losses can be prevented by efficient preservation activities. In some areas

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logs can be preserved by immediate transportation either to utilizing factories or to storage pools. In other areas, where this is not possible logs can be sprayed immediately after felling with preservative chemicals which will prevent fungus and insect damage for 3 to 5 months, by which time the log can be utilized. The total cost of such chemical preservation methods do not exceed 5 TL/m³, whereas damage caused to beech only by decay fungus (white rot, *fomes fomentarius*, *ustulina vulgaris*, and other fungi) is in excess of 75 TL/m³. It could be estimated that sapstain fungi cause 15-20 TL/m³ damage by degradation in pine.⁽¹¹⁸⁾

Present logging methods are also primitive and skidding and removal of branches are performed by oxen and hand tools respectively. In all modern timber producing countries these activities are fully mechanized by using tractor skidders, mechanical saws and debarkers. Primitive transportation methods necessitate cutting of logs into short pieces, thus reducing their value.

Grading is not performed according to world standards. This activity which affects the efficiency of sawmills, should be emphasized much more than it is today.

Lack of organization together with primitive transportation equipment results in an undue delay between felling and utilization. This, besides fungus attack, leads to other forms of degradation such as splitting and end checking.

Efficient removals must be followed by economic and well organized breakdown activities, which can be considered in terms of two phases:

1. Sawing
2. Seasoning

(118) This information was obtained from a major preservative producing firm in Turkey.

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In considering the sawmilling sector, one must keep in mind the great value of capital in such a developing country as Turkey. This means that even though Turkish sawmills are very small, labor intensive and wasteful when compared with modern integrated forest products plants, the best usage must be made of the present existing mills. The low cost of labor is a major consideration here. The Japanese sawmilling industry can be considered as a model for the future structure of Turkish sawmilling. Japan has 25,000 sawmills three fourths of which are using less than 10 kw. of energy.⁽¹¹⁹⁾ This does not mean that the shift to modern integrated plants is not necessary. It only means that the shift to such modern technology must be gradual making full use of present production capacity. A lot of technological improvements are necessary before major exports can be made. These can be affected by the circulation of know-how and new techniques about sawing, conveying, saw sharpening, seasoning, preservation and standardization. These are essential for higher recovery of better quality from the log. A central organization of sawmillers will be very useful in this sense and also will make it possible to control standardization practices.

B. Marketing Organization:

The present marketing structure of sawnwood starts with activities by MOF selling logs which have been removed from the forest. Auctions are held by MOF for each sizeable collection of logs in their depots. The main season for these auctions are from July to the end of the year. The districts publicize each auction by small newspaper notices and send lists of the logs to potential buyers. The auctions are public and open to anyone who is a member of the Chamber of Commerce or Industry.

(119) "Japanese Millmen Favor Edsaws", World Wood, November, 1969, Volume 10, No. 12, page 5-6

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The buyers usually come on the day of the auction since most of these are in remote places, and have a few hours to see the logs and pay the necessary downpayments before everyone collects in one of the district rooms for the auction. Each different party of logs (50-500 m³) is sold separately and the people interested bid publicly until the sale is made to the highest bidder.

The same system is also applied to sawnwood sales by the public sawmills.

Wholesaling is more or less non-existent in the sawnwood market. Sawnwood produced by the private sector and sawnwood sold by the public sector are directly bought by the retailers or consumers. The reasons for this are:

- (a) the fact that imports being cut off, and removals each year being left to the sole judgement of LOF, the supply level of logs and therefore sawnwood has always been below the demand level. This fact is also portrayed in continuously rising prices and has led to a 'sellers' market' where the seller is sure that eventually his product will be sold;
- (b) dominance of small operators in the private sector leading to a lack of wholesaling effort. Since the capacities of the private mills are very low, the purchases of consumers and retailers are satisfactory and any wholesaling effort is ruled out. In developed countries, the wholesaler exists due to the fact that the capacities of mills are large and the wholesaler guarantees a constant level of sales and finances this;
- (c) in public sawmills, although their capacities are higher than private mills, the wholesaling function is still ruled out due to the fact that sales are made by auctions in small parcels.

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Grading is roughly done by differentiating between joinery and shuttering grades by the private mills. Public mills have a more sophisticated grading system. Standardization in both cases is not adequate.

Promotional activities of sawnwood are restricted to small notices in newspapers by the public mills and lists are sent out to retailers.

Transportation is mainly carried out by trucks or by shore vessels. Any packaging consists of wiring boards or smaller pieces into batches of four.

It is obvious that this marketing organization is inadequate for exports of any size. Although the wholesaler, who existed before 1953-1954 when imports were terminated, seems to fit into the present situation for undertaking exports, due to the fact that the government does not favor such intermediaries, they cannot constitute the export marketing organization. The functions of a wholesaler are accumulating supply, financing these, promoting them, transporting them and extending other marketing services. Although at first glance, these seem to be the main deficiencies of the sawnwood market, at present the wholesaler cannot carry out exports because the government does not give raw material guarantees to any marketing institution. Furthermore, since the government encourages integrated plants, it does not give guarantees to mills below the capacity of 5000 m³/year.

The drawback of the wholesaler is not overcome by the introduction of a sawyers' cooperative as proposed by Mr. T. Waite of the Bambergers Co. or through the establishment of terminals as in Sweden. These institutions enable common grading and standardization rules. Also, they can provide for common seasoning facilities. Such services as promotion, transportation, packaging, arrangement of payment terms can also be

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undertaken by these institutions. However, in the case of either cooperatives or terminals, raw material guarantees are not given. Thus, both of these organizations cannot undertake exports.

The government promotes large forest products plants and the only institution that can undertake exports under the existing governmental policy is this one. The government guarantees raw material of any size to a plant above the capacity of 5000 m³/year. The exporting mill must show its export contract and state the price. If the governmental authorities are convinced that the capacity of the plant is suitable for the production of the stated quantity of exports, the logs are supplied at predetermined periods. If more than one exporter demands quantities that exceed the supply of MOF, the one that has made agreements at a higher price will be supplied since it is to the benefit of Turkey to bring the largest possible foreign exchange.

Integrated plants that are being established throughout the world have not been developed in Turkey yet, firstly because of the lack of raw material guarantee and secondly because of the structure of the domestic market. Since logs are offered by the General Directory of Forestry throughout half of the year in small parcels, the integrated plants cannot operate efficiently with these small parties. In public auctions, prices fluctuate according to demand and the raw material costs of the plant cannot remain constant. Also, transportation costs rise unnecessarily when raw material is transported a number of times in small parties. Raw material guarantees of the government will partially eliminate these problems.

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Another factor that has been against the establishment of integrated plants is the unfair competition in the domestic market. It has been previously stated that there is a large quantity of illegal cutting in the forests. These products enter the market with relatively low prices since their raw material costs are very small. Competition with these products is not economic.

When integrated plants are oriented towards the external market, most of these difficulties will be eliminated. Firstly, raw material guarantees will enable efficient operation, and secondly, the unfair price competition will not hinder their sales since they will be selling abroad where the illegally marketed products cannot penetrate. Thirdly, since quality and standardization is of importance to foreign customers, the standard production of these plants will be justified.

Although exporting is not very profitable at present until log prices fall, it has certain advantages. Firstly, there is the cash payment advantage. In the domestic market, the seller must tie his capital to stocks for a period of 2-3 months. Also, the sales terms are usually 4 months' credit. In the case of exports, cash is received immediately after shipping the product. Secondly, the purchasers' demand is known and production can be made according to their orders. A domestic retailer must keep in stock a variety of sawwood. Finally, the exporter does not have to keep a large purchasing organization since an application to the government suffices for obtaining the necessary sawlogs. In the case of a firm selling to the domestic market or not undertaking exports, all public auctions must be watched and men must be sent to each of them. During the year approximately 2000 auctions are

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held. Attending all of them requires a large purchasing organization.

The marketing organization of an integrated mill can be small since order quantities are large and a few orders can keep a plant in operation for a year. Such a plant would have an average capacity of 50,000 - 100,000 m³/year. Since most customers with whom contacts have been made, have ordered, on the average, between 40,000 to 50,000 m³, two such orders can satisfy the mill for a year.

Most countries have a few major importing institutions and periodic contacts with them is sufficient for obtaining orders. In Syria, Simex is the importing institution in the monopoly of the government. Israel has two major importing firms. Cyprus has one major importer, Hadjikakou. Algeria's case is similar with the main importer being Doirex. With one or two representatives, periodic contacts can easily be made with each of these firms. However, in a country like U.K. where the number of importers is large, an agency can be useful.

Other functions of the marketing intermediary such as transportation and packaging can also be handled by the plant. Packaging is gaining importance throughout the world due to the fact that wages are rising and there is an effort to reduce the number of workers in the handling of sawnwood. Transportation is no problem for a mill situated at the coast as one in Antalya was planned. For inland mills truck transportation to ports from where vessels can load is the best procedure.

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C. Pricing:

Thus far, sawnwood prices have not been discussed but it has been assumed that domestic prices could be competitive with the subsidization of the government. In this section, these subsidies and the comparison of domestic and foreign prices will be discussed.

According to the report of the Planning Committee dated May 20, 1969, number 44, the General Directory of Forestry was to return an amount equal to the difference between base export price and average selling price to the exporters. Also, a percentage tax return was to be made.⁽¹²⁰⁾ In the Official Gazette of July 30, 1969, the governmental decree numbered 6/12062, the base export prices and average selling prices together with the rates of tax returns were published. The following table is the duplicate of the one found in the Official Gazette:

Table 43: Base Export Prices, Average Selling Prices and Tax Return Rates of Exported Sawnwood - 1969:⁽¹²¹⁾

Sawnwood	Base Export Price TL/m3	Average Selling Price TL/m3	Tax Return Rate on Export Value
Pine:			
a. I-II, Class normal length	730	990	33
b. I-II. " short "	410	650	33
c. III. " normal "	420	660	33
d. III. " short "	240	480	33
e. IV. " normal "	240	460	33
f. IV. " short "	140	310	33

(120) Official Gazette, 25.6.1969, No. 13232

(121) Official Gazette, 30.7.1969, No. 13262

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Sawnwood

Base Export Price TL/m3	Average Selling Price TL/m3	Tax Return Rate on Ex- port Value
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Fir and Spruce:

a. I-II, Class normal length	720	970	33
b. I-II, " short "	420	670	33
c. III, " normal "	380	625	33
d. III, " short "	230	475	33
e. IV, " normal "	250	470	33
f. IV, " short "	160	370	33

Beech:

a. I-II, Class normal length seasoned	740	980	33
b. I-II, " short "	560	790	33
c. I-II, " very " "	360	530	33
d. Merchantable normal "	620	850	33
e. Merchantable short "	480	700	33
f. Merchantable very short length "	330	500	33
g. III, Class normal length "	370	610	33
h. III, " short "	280	520	33
i. IV, " seasoned	200	410	33

It is stated that the base export price and the average selling price need not be realistic prices but are only computed to indicate the amount that would be payed from the "social account" of the Directory of Forestry. This account was accumulated by adding 6% to the total cost of logs. This, of course is at the cost of the domestic consumer.

The returns and price differentials are reproduced each year and in 1970 the list was as follows:

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Table 44: Base Export Prices, Average Selling Prices and Tax Return Rates of Exported Sawwood - 1970: (122)

Sawwood	Base Export Price TL/m3	Average Selling Price TL/m3	Tax Return Rate on Export Value
Pine:			
a. I-II. Class normal length	740	1030	33
b. I-II. " short "	430	680	33
c. III. " normal "	430	700	33
d. III. " short "	310	540	33
e. IV. " normal "	230	480	33
f. IV. " short "	120	320	33
Fir and Spruce:			
a. I-II. Class normal length	730	1010	33
b. I-II. " short "	420	700	33
c. III. " normal "	455	730	33
d. III. " short "	305	540	33
e. IV. " normal "	250	500	33
f. IV. " short "	160	400	33
Beech: (seasoned or not)			
a. I-II. Class normal length	760	1020	33
b. I-II. " short "	600	820	33
c. I-II. " very short "	390	550	33
d. Merchantable normal length	620	800	33
e. Merchantable short "	490	740	33
f. Merchantable very short length	400	610	33
g. III. Class normal length	430	700	33
h. III. " short "	330	500	33
i. IV. " "	260	500	33

(122) Official Gazette, 19.3.1970, No. 13449

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It can be observed that the tax return rates have remained constant but base prices and average selling prices have slightly risen although their differentials have not changed much.

For those products not enumerated, a tax return of 25% on export value is provided.

A conversion formula has been developed for converting domestic prices into export prices:

$$P = (C - (P_a - P_b) - K) / 1.33 \times 9.0$$

where

P is the export price

C is the costs of production

P_a is the average selling price

P_b is the base export price

K is the profit

Exchange rate is \$ 1.00 = 9.00 TL

The sawn softwood prices that were given in chapter IV converted to export prices through this formula is as follows:

Table 45: Softwood Export Prices:

	Long length		Normal length		Short length	
	<u>Fir/spruce</u>	<u>Fine</u>	<u>Fir/spruce</u>	<u>Fine</u>	<u>Fir/spruce</u>	<u>Fine</u>
Shuttering						
Grade:						
Boards	-	-	44	38	39	21
Squares	-	-	44	38	39	31
Planks	55	49	47	40	46	39
Joinery						
Grade:						
Planks:						
1st class	-	-	102	143		
2nd "	-	118	84	102		
3rd "	-	102	69	86	51	51

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In the conversion, the shuttering grade was considered as 3rd grade and the return for that grade was used.

In chapter VII, the Finnish and the Swedish f.o.b. prices for 7 inch redwood battens were given. The Finnish price was \$ 55.82/m³ and the Swedish price was \$ 64.13/m³. The closest corresponding product to these are the long and normal length planks of third grade shuttering timber. When these prices are compared with those of the III. grade shuttering timber, it is observed that the Turkish prices vary between \$ 55 to \$ 40 and that they are below the Swedish and Finnish prices. However, a word of warning must be added at this point as to the degree of the comparability of these two kinds of products. Since Northern redwood is not the same timber as Turkish pine, their price comparisons cannot be very reliable. For export purposes, the best pricing procedure is bargaining between the two parties after inspecting the product. Any definite qualitative word about sawnwood cannot be stated without inspecting the product since each kind of timber obtained from different places displays different qualities. The above comparison was made to give an idea as to the price ranges of Northern and Turkish exporters. Below, the prices that have been offered to some importers are given. These prices have been accepted:

Table 46: Some Export Prices: (123)

<u>Species</u>	<u>Quality</u>	<u>Importing country</u>	<u>Price (f.o.b.)</u>
Fir/Spruce	III. normal length	Israel	\$ 49
Pine	III. short length	"	30
Pine	III. normal length	Cyprus	47

(123) The table was obtained from a retail firm that undertakes exports of softwoods.

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<u>Species</u>	<u>Quality</u>	<u>Importing country</u>	<u>Price(f.o.b.)</u>
Pine	II. normal length joinery	Cyprus	71
Fir/spruce	III. normal length	"	51
"	"	Greece	51

The prices for III. grade normal and short length pine and spruce/fir are higher than the minimum prices that can be offered by converting the domestic selling prices into export prices which are given on a previous page. However, the joinery grade prices which are domestically high, are lower than these minimum domestic prices converted into export prices. This means that exporters are lowering their profit margins in the case of joinery grade exports.

The beech prices that have been given in Chapter IV after being converted into export prices in terms of TL/m³ and \$/m³ are as follows:

Table 47: Beech Export Prices:

	<u>Normal Length</u>		<u>Short Length</u>		<u>Very Short Length</u>	
	<u>TL/m³</u>	<u>\$/m³</u>	<u>TL/m³</u>	<u>\$/m³</u>	<u>TL/m³</u>	<u>\$/m³</u>
I-II. Class	1240-1440	103-120	880-980	74-81	640	53
Merchantable	940-1040	78-86	650-750	54-62	400-500	33-41
III. Class	530-630	35-44	380-430	31-35		
IV. Class			210-260	17-21		

The f.o.b. export prices of beech given by the General Directory of Forestry is given below:

Table 48: Beech Export Prices of Different Sawmills:

	<u>Derince</u>	<u>Ayancık</u>	<u>Bartın</u>	<u>Cide</u>	<u>Samsun</u>	<u>\$/m³</u>
Ports						<u>Lazar</u>
Mills	<u>Düzce</u>	<u>Ayancık</u>	<u>Devrek,</u>	<u>Cide</u>	<u>Akkuş</u>	<u>Ardeşen</u>
			<u>Yenice,</u>			
			<u>Ulupınar</u>			
<u>Grades</u>						
I-II. Grade						
Normal length	75	74	73	73	73	72
I-II. Grade						
Short length	62	61	61	60	60	59

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Mills Grades	Düzce	Ayancık	Devrek, Cide Yenice, Ulupınar	Arkas	Ardeşen
I-II, Grade very short length	49	48	48	47	46
Merchantable normal length	62	61	61	60	59
Merchantable short length	51	50	50	49	48
Merchantable very short length	40	38	38	37	36
III, Grade normal length	45	41	41	40	39
III, Grade short length	34	32	32	31	30
IV, Grade	31	30	30	29	28

It is observed that these prices are lower than the converted market prices and the public mills do not profit on exports as much as they would through domestic sales.

From the preceding pricing discussion, it can be concluded that exports of lower grade softwoods and of beech are profitable but those of higher grade products require lower profit margins. In general, the recent subsidies have brought the Turkish export prices to a competitive level. It is highly desirable, however, that prices become naturally competitive through lower log prices, and that subsidies be eliminated in the near future.

D. Conclusion:

In the first section of the present chapter, suggestions were given to improve the efficiency of sawwood production. Firstly, it was suggested that efficiency in the felling phase would be considerably increased if production was shifted to the clear cutting system from the present system of selective cutting. Secondly, the use of widespread preservative practices was suggested to prevent decay and degradation. Thirdly, to improve the unity between felling, logging and sawing phases and again to prevent decay and degradation, it was proposed that the transportation facilities be mechanized and the intermediary

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depots be reduced.

In the second section of the chapter, the marketing organization of sawnwood was discussed. Firstly, the domestic market was surveyed and then institutions which will undertake exports were reviewed. It was observed that wholesalers were removed from the market after the restriction of sawnwood importation, mainly due to the fact that the sawnwood market is a sellers' market. Also, the scarcity of capital within the economy has led to the establishment of small mills which sell directly to customers overruling the need for intermediary institutions.

For purposes of exports, different institutions were surveyed. Although wholesalers were seen fit to undertake exports, certain drawbacks that hindered their efficient operation were noticed. Other institutions such as sawyers' cooperatives and terminals as in Sweden were studied. These two also failed to fulfill the function of exports due to the chief drawback that prevented wholesalers' operation, which was namely the reluctance of the government to give raw material guarantees to any marketing institution. Therefore, it was realized that integrated forestry products plants were the most appropriate institution to undertake exports. Large plants that are found in most developed countries have not been established in Turkey yet and the reasons behind such a lack were discussed in the chapter. It was observed that although these mills were not economic for the domestic market, they were very appropriate for the export market from the point of view of production and marketing.

These discussions are valid for the short run. In the long run, when the supply of sawlogs and sawnwood increases substantially, the situation will alter. Firstly, raw material guarantees will not be critical. Secondly, intermediary marketing institutions will reappear. Changes in the governmental policy will determine the institution undertaking exports.

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In the third section of the chapter, the comparison of domestic and export prices was made. The tax returns, average and base selling prices for the years 1969 and 1970 were indicated, and a simple conversion formula for converting domestic prices into export prices was given. Next, the domestic prices of sawn softwoods and hardwoods were converted into export prices. When these prices were compared with the actual trade prices, it was observed that the third grade softwood prices were acceptable for foreign customers whereas the second grade joinery softwood prices had to be reduced to be acceptable. In the case of beech, it was observed that the prices offered by public mills were far below the market prices; only very short length merchantable, third grade normal and short length prices were generally within the range of domestic prices. These statements lead to the conclusion that lower grade products are internationally competitive in terms of price but higher grade products are not.

These price discussions are for exports within the short term. Large scale exports in the long term depend upon increased domestic production which simultaneously leads to lower prices. At this stage, subsidization must end, and domestic prices must be at international levels.

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CONCLUSION

Turkey possesses sizeable forest resources. The total forest area is a minimum of 18 million hectares which may be revised upwards after the total inventory is completed. This figure is highly significant when compared with Finland's 22 million or Sweden's 23 million hectares, both leading forest products exporters, especially if one remembers that Turkey is geographically located in the middle of a wood deficit area.

The present utilization of Turkish forests, however, is very low. Compared with 64 million m³ industrial wood removals of Sweden (1967) and 46 million m³ of Finland (1968), the total industrial roundwood production in Turkey was only 4 million m³ in 1968. The present annual allowable cut can safely be assumed to be around 14.6 million m³ (u.b.) Beyond this, efficient management, replantation and removal techniques aimed at both an area increase in forest land and higher yields per hectare can bring Turkey to a compatible level with Finland and Sweden in the long run. Even when one takes the short run allowable cut figure of 14.6 million m³, Turkey has an exportable surplus above its domestic demand for forest products. One has to face the fact, however, that even reaching this allowable cut figure in the short run is not going to be an easy task unless organizational and technological changes are introduced. The major change needed here is more efficient forestry practices leading to a higher volume of industrial roundwood removal at lower unit costs. This is both an organizational and technological change. In the short term, it can be only organizational and technological improvements can be gradually introduced towards the long term.

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In summation, the needed changes are:

- a. Completing inventories and updating the old ones constantly;
- b. Changing from selective cutting to clear cutting;
- c. Clearing and replanting unproductive forest lands;
- d. Becoming cost and technology conscious and efficient in all forestry activities and slowly introducing mechanization.

According to the FAO estimates which are as yet well known, production of 14.6 million m³ minus consumption of 13.6 million m³ in the year 1982 will leave an exportable balance of only 1 million m³ (RWE). On the other hand, ICF estimates an exportable surplus of 725,000 m³ (RWE) already in 1970 based on production of 5.7 million m³ minus consumption of 4.9 million m³. It is at this stage too early to assess how much the exportable surplus is really going to be. It is believed, however, that it will be above the FAO's somewhat pessimistic profit in its estimates, especially since the recently introduced property taxes are expected to decrease domestic construction activity and therefore domestic demand for sawnwood. In addition to this, domestic substitution of panel products will have a similar decreasing effect upon domestic sawnwood consumption.

It must not be forgotten that the above figures rest upon the assumption of certain conditions governing supply of raw material and consumption of sawnwood. Any significant increase in the supply of raw material or any decrease in the consumption of sawnwood or any further substitution of panel products for sawnwood thereby also decreasing sawnwood consumption would lead to higher export figures.

Another very important point which will have a very significant effect upon sawnwood exports, is the allocation of industrial roundwood among panel products, pulp and paper and sawnwood. Sawnwood exports must not become an end in itself, and it must be remembered that unless enough roundwood is allocated to pulp and paper production, Turkey may have to import as much as 200 million dollars worth of pulp and paper by the year 1980.

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It is apparent that Turkey has a ready export market for sawnwood of the proper quality it can offer at established regional world prices. It is a major advantage that Turkey is located in a region of acute forest deficit.

Europe is a net importer of sawn softwood and its deficit is expected to increase to 11.8 million m3 by 1980. Europe is also expected to have a deficit of 1.7 million m3 of sawn hardwood in the same year. The Middle Eastern and Mediterranean countries listed in Chapter VI, among themselves, can be expected to import a further 4 million m3 of sawnwood by 1980. Turkey, therefore, has a ready market for any sawnwood it can allocate for exports provided the quality and price requirements are met.

Sawnwood prices which were formerly very much above world prices, have been reduced to acceptable levels by recent rebates offered by the government to exports. The devaluation of 10th August also contributed significantly in this direction and even though the rebates were revised and generally lowered following the devaluation (sawnwood fixed rebates by 4.5 and the percentage rebates by 10 percentage points on the average,¹²³ the net situation is still higher returns to the exporters after the 66% decrease in the official value of the Lira.

It must be remembered that the rebates can be only a short term solution to the price differential problem and that in the long term the rebates must be replaced by more realistic log prices.

To fulfill the quality requirements and other necessities of proper export marketing, the structure of the domestic sawnwood industry and trade have to change considerably. One can safely expect larger firms to appear in the long term in both production and marketing. In production these will be in the form of integrated forest products plants. In marketing they will be in the form of large wholesalers or agents, although in

(123) Official Gazette, 10.8.1970 No.13575, 26.8.1970 No.13591

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the short run most of the exporting will still be done by sawmills above the annual capacity of 5000 m3.

In conclusion, it can be stated that although sawnwood exports of Turkey and especially the volume of any such exports shall depend upon the realization of a number of factors, it is clear that Turkey has a major export potential in sawnwood which it must exploit and with which it has probably more comparative advantage than many other sectors in face of the Common Market.

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APPENDIX A

Composition of Sawlog Production^x (%)

<u>Year</u>	<u>Fir</u>	<u>Pine</u>	<u>Spruce</u>	<u>Cedar</u>	<u>Other</u> <u>Soft-</u> <u>wood</u>	<u>Total</u>	<u>Oak</u>	<u>Poplar</u>	<u>Beech</u>	<u>Other</u>	<u>Notes</u>
1955	18,6	56,8	3,9	2,4	0,3	82,0	2,5	1,5	13,3	0,7	18,0
1956	18,0	59,0	2,8	2,2	0,5	82,5	2,8	1,0	12,7	1,0	17,5
1957	20,0	55,8	6,0	2,5	0,1	84,3	2,0	0,7	12,0	1,0	15,6
1958	18,0	56,2	5,8	1,0	0,2	81,2	1,4	1,0	15,4	1,0	16,8
1959	18,0	58,2	4,2	2,0	0,2	82,6	1,9	0,8	13,3	1,3	17,3
1960	20,1	53,7	6,1	1,6	0,1	81,6	2,3	1,1	14,0	1,0	16,4
1961	14,6	51,3	8,1	1,7	0,1	75,8	2,3	1,3	19,4	1,2	24,2
1962	24,1	51,9	6,0	1,3	-	83,3	1,7	0,9	13,6	0,5	16,7
1963	18,5	52,4	8,2	1,8	0,1	81,0	2,5	0,5	15,4	0,6	19,0
1964	16,5	54,1	6,7	2,4	0,2	79,9	2,2	0,8	16,4	0,7	21,1
1965	33,1	44,6	4,6	1,2	0,1	83,8	1,8	0,6	13,3	0,5	16,2
1966	21,5	53,4	5,1	1,2	0,1	81,3	2,2	0,5	15,2	0,8	18,7
1967	17,3	58,0	3,2	1,0	-	79,5	2,2	0,3	17,5	0,5	20,5

x Orman Genel Müdürlüğü Genel İstatistik Albümü 1938-1967,
Orman Genel Müdürlüğü 1969, Ankara, page 44

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APPENDIX B

Industrial Wood Consumed 1968^x

District	Sawmills	Box Plants	Plywood plants	Pulp and Paper mills	1000 m3 (r)	Total
					Other Industrial Wood using Industries	
Adana	179,0	12,0	-	-	15,0	206,0
Adapazarı	145,0	6,3	10,0	336,0	1,3	498,6
Amasya	100,0	3,7	-	-	16,3	120,0
Ankara	405,0	10,2	4,5	-	4,8	424,5
Antalya	104,0	10,0	-	-	3,0	117,0
Artvin	40,0	-	-	-	-	40,0
Balıkesir	173,0	6,0	-	-	6,2	185,2
Bolu	378,0	0,5	-	-	6,5	385,0
Bursa	170,0	5,0	-	-	4,6	179,6
Çanakkale	175,0	2,0	-	-	10,3	87,3
Denizli	80,0	0,6	-	-	5,4	86,0
Elazığ	115,0	-	-	-	2,0	117,0
Erzurum	70,0	-	-	-	2,7	72,7
Eskişehir	167,0	0,6	-	-	15,8	183,4
Giresun	50,0	0,6	-	-	6,7	53,7
Isparta	95,0	0,2	-	-	9,8	105,0
Istanbul	237,0	57,4	116,0	-	38,6	449,0
İzmir	110,0	45,0	-	-	5,0	160,0
Kastamonu	266,0	1,9	-	-	-	267,9
Mersin	121,0	23,0	-	-	8,0	152,0
Muğla	105,0	7,4	-	-	10,6	123,0
Trabzon	100,0	0,5	-	-	0,9	101,4
Zonguldak	250,0	-	-	-	273,0	523,0
Total	3,535,0	192,9	130,5	336,0	446,5	4,640,9
% of total	76	4	3	7	10	100

x Forest Industries Preliminary Development Plan to 1962, page 48

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APPENDIX C

End Uses of Sawwood^x

<u>End Use</u>	<u>Recommended Hardwoods</u>	<u>Recommended Softwoods</u>
Boat Building	Central American Cedar	Port Orford Cedar
	Rock Elm	Yellow Cedar
	Mahogany	Western Red Cedar
	Oak	Fitch Pine
	Teak	European Redwood
	Utile	Sitka Spruce
Boxes and crates	Elm	Silver Fir
	Poplar	Corsican Pine
		European Redwood
		European Whitewood
Bridge timbers	Afrormosia	Douglas Fir
	Apitong	Larch
	Greenheart	Fitch Pine
	Gurjun	European Redwood
	Jarrah	Scots Pine
	Karri	
	Keruing	
	Oak	
	Abura	
	Beech	
	Birch	
	Elm	
	Hornbeam	
	Horse Chestnut	
	Lime	

x Timber From Forest To Consumer, page 117

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APPENDIX C (continued)

End Use	Recommended <u>Hardwoods</u>	Recommended <u>Softwoods</u>
Building timber		Western Red Cedar Douglas Fir Western Hemlock European Redwood Canadian Spruce European Whitewood
Carving	Cherry Ebony Lime Oak Teak	Quebec Yellow Pine Western White Pine
Decking, ships and boats	Afrormosia Agba Gurjun Teak	Port Orford Cedar Western Red Cedar Douglas Fir Redwood
Flooring	Beech Birch Hornbeam Rock Maple Oak	Douglas Fir Western Hemlock European Redwood European Whitewood
Furniture	Ash Beech Elm Birch Cherry Sweet Chestnut Ebony Mahogany Oak Maple	Douglas Fir Parana Pine European Redwood Sitka Spruce

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End Use	APPENDIX C (continued)	
	<u>Recommended Hardwoods</u>	<u>Recommended Softwoods</u>
Gates	Sweet Chestnut	Douglas fir
Joinery	Oak	Larch
	Beech	Western Red Cedar
	Mahogany	Yellow Cedar
	Oak	Douglas fir
	Walnut	Western Hemlock
Lorry bodies		Spruce
	Ash	
	Hickory	
	Oak	
Matches	Poplar	Yellow pine
Musical Instruments	Beech	Yellow pine
	Ebony	Spruce
	Lime	
	Walnut	
	Hickory	
Skis	Ash	
Sports Goods	Hickory	
	Beech	
Toys	Birch	
	Cherry	
	Horse Chestnut	
	Lime	
	Poplar	
	Willow	
	Elm	
Wheelbarrows		

QUALITY CLASSES				
I (MERCHANTABLE)		III		IV
a- Thickness : mm Thin : 18 - 25 - 32 - 38, Thick : 51 - 58 - 63 - 70 - 76 - 98				
b- Width : Cm Narrow: 14 - 25		Wide : above 25 (with 1 Cm. increments)		
c- Length : At least 2 M. and above with 10 Cm. increments.				
Each party may contain 5 % 1.80 - 1.90 long lumber				
Thicker lumber may be manufactured if ordered and if conditions permit .				
1-	Things: 10 mm. thick, 15 mm. diameter not considered as defects. Narrow: On the clean face one knot of 30 mm. or two knots of 20 mm. dia. per M. are allowed. Narrow: On the opposite face one knot of 40 mm. or two knots of 25 mm. dia. per M. are allowed, on condition that it does not penetrate the clean face. Wides: On the clean face, one knot of 40 mm. or two knots of 25 mm. dia. are allowed per M. Wides: On the opposite face one knot of 50 mm. or two knots of 25 mm. dia. per M. are allowed provided they don't penetrate the clean face.	Things: 15 mm. thick, 25 mm. dia. are not considered defects. Narrow: On the clean face one knot of 40 mm. or two knots of 25 mm. per M. are allowed. Narrow: On the opposite face one knot of 50 mm. or two knots of 40 mm. per M. are allowed provided they don't penetrate the clean face. Wides: On the clean face one knot of 50 mm. or two knots of 40 mm. per M. are allowed. Wides: On the opposite face one knot of 60 mm. or two knots of 50 mm. per M. are allowed provided they don't penetrate the clean face.	Things: 20 mm. thick, 30 mm. dia. are not considered defects. Narrow: One knot of 100 mm. dia. or several knots with diameter totals not exceeding 200 mm. are allowed on each face per M. Wides: One knot of 100 mm. dia. or several knots with dia. totals not exceeding 200 mm. per M. on each face are allowed.	It may be knotty to extent suitable for use.
if its	Not considered as defects upto 10 mm. diameter. Narrow: On the clean face one knot of 30 mm. or two knots of 15 mm. dia. per M. are allowed. Narrow: On the opposite face one knot of 30 mm. or two knots of 20 mm. dia. per M. are allowed. Wides: On the clean face one knot of 30 mm. dia. or two knots of 20 mm. dia. per M. are allowed provided they do not penetrate the other face. Wides: On the opposite face one knot of 40 mm. or two knots of 25 mm. dia. per M. are allowed provided they do not penetrate the clean face. Not allowed with sound knots on the clean face. Narrow: On the opposite face one knot of 25 mm. or two knots of 15 mm. per M. are allowed provided they do not penetrate the clean face. Wides: On the opposite face one knot of 30 mm. or two knots of 20 mm. per M. are allowed provided they do not penetrate the clean face.	Things: Upto 10 mm. dia. Things: Upto 15 mm. dia. not defects Narrow: On the clean face one knot of 30 mm. or two knots of 20 mm. dia. per M. are allowed. Narrow: On the other face one knot of 40 mm. or two knots of 25 mm. dia. per M. are allowed. Wides: On the clean face one knot of 40 mm. or two knots of 25 mm. per M. are allowed. Wides: On the opposite face one knot of 50 mm. or two knots of 35 mm. are allowed provided they do not penetrate the clean face. Ones with upto 10 mm. dia. not defects. Narrow: On the clean face one knot of 30 mm. or several knots with dia. totals not exceeding 100 mm. per M. are allowed provided they do not penetrate the clean face. (per M.) Wides: On the clean face one knot of 30 mm. dia. or several knots with dia. totals not exceeding 100 mm. per M. together with sound knots. Wides: On the opposite face one knot of 40 mm. dia. or several knots with dia. totals not exceeding 125 mm. together with sound ones are allowed per metre.	Ones with upto 20 mm. dia. are not considered defects. Narrow: One knot of 60 mm. or several knots with dia. totals not exceeding 120 mm. per M. Wides: One knot of 75 mm. dia. or several knots with dia. totals not exceeding 150 mm. per M. are allowed. Narrow: One knot of 50 mm. dia. or several knots with dia. totals not exceeding 100 mm. per M. on both faces are allowed. Wides: One knot of 60 mm. dia. or several knots with dia. totals not exceeding 120 mm. per M. on both faces are allowed.	
th				
Superficial checks due to stemming or seasoning are not considered as defects.				
ing	Allowed on the faces and sides in depths not exceeding 1/3 of the thickness of the piece. Total length of splits cannot exceed 1/2 of piece length.	Allowed	Allowed	Allowed
May	Allowed on both ends, total length of the two longest splits can not be more than 1.5 times the piece width in pieces upto 3 M. for pieces longer than 3 M. 2 times the piece width.	Allowed on both ends, total length of the two longest splits can not exceed 2 times the width of the piece in 3 M. pieces not more than 2.5 times in longer pieces. Length of split is not important if a 10 Cm. piece can be extracted from between the splits.	Allowed on both ends, total length of the longest two splits can not exceed 2.5 times the width of the piece in pieces upto 3 M. longer, times in pieces longer than 3 M. length of split is not important if an 8 Cm. section can be extracted from between the splits.	May be present to an extent suitable for use. Splits longer than 1/2 the length of the piece are allowed. A piece of 8 Cm. width should be obtainable from between the splits.
	Length can not exceed 1/2 the width, depth can not exceed 1/2 the thickness of the piece.	Allowed within the limits as of the end splits.	May be present to an extent suitable for use	
	On one face 2 per meter allowed. Total of their length can't exceed 1/2 the piece width.	On both faces 3 per meter allowed, total length can't exceed the piece width.	Allowed	Allowed
	The whole heart can be red as long as it is sound.	Allowed	Allowed	Allowed
N	NO	NO	NO	May be present to an extent suitable for use
	NO	Allowed on one face only.	Allowed on both faces, in a 1/3 ratio of the surface at the most.	Allowed to an extent suitable for use.
	NO	Two on each piece at the most.	Allowed	Allowed
	Will be smooth	May be rough and mixed	Any kind fibre allowed	Any kind of fibre allowed
	Can not exceed 10 Cm. per M.	Can not exceed 15 Cm. per M.	Can not exceed 20 Cm. per M.	Can not exceed 10 Cm. per M.
	Can not exceed 3/1000 of length	Can not exceed 20/1000 of length	Allowed	Allowed
	One sided bow can not exceed 3 %, two sided bow 2 % of the length.	One sided bow can not exceed 4 %, two sided bow 3 % of the length.	Allowed	Allowed
ly)	Can not exceed 3 % of the width.	Can not exceed 5 % of the width.	Allowed	Allowed
	Can not exceed 2 mm. per M.	Can not exceed 2.5 mm. per M.	Can not exceed 10 mm. per M.	Allowed
	Can not exceed 3 % of the width	Can not exceed 4 % of the width	Can not exceed 5 % of the width	Allowed
	Stains less than 2 mm. deep allowed on both faces.	Stains less than 3 mm. deep allowed on both faces.	Allowed	Allowed
ounds	Allowed on both faces, its length can not exceed 1/2 of the piece width.	Allowed	Allowed	Allowed
	A slight decoloration is allowed.	Some decoloration is allowed	Allowed	Allowed
UE	Three defects are allowed	Four defects are allowed	Five defects are allowed	All kinds of defects are allowed to an extent suitable for use
	RED	GREEN	YELLOW	BLACK

Note : In all qualities, defects out side fixed dimensions are not taken into consideration.

CLASS I		CLASS II		CLASS III		CLASS IV		SMALL-DIMENSION
18-25-32-38-51-58-63-70-76 and 98		18-25-32-38-51-58-63-70-76 and 98		18-25-32-38-51-58-63-70-76 and 98		25-32-38-51-58-63-70-76 and 98		CROSS-SECTIONS: 18X18-25X25-32X32-38X38 51X51-58X58-63X63-70X70 76X76-98X98-12X76-18X76 25X51-25X58-25X76-38X58 38X78- Customers' requirements may also be provided. Short length: 20-60 Normal " : 65-120
Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	Narrow Lumber : 8-11 Wide Lumber : 12-40 Very Short Length : 50-95 Short Length : 100-170 Normal Length : 180-above	90-above		
N o	N o	N o	N o	N o	N o	It may be knotty to an extent suitable for use.	It may have splits to an extent suitable for use.	
	Narrow and superficial splits are allowed on the faces. Splits of 10 cm. maximum length shall be allowed on one end.		Narrow and superficial splits are allowed on the faces. Splits of maximum length of 1/4 of the lumber thickness are allowed on both faces.		Maximum split width shall be 1/100 of lumber width and maximum split depth shall be 1/2 of lumber thickness. Splits are allowed on both wide faces. Total split length shall not exceed the 2/3 of lumber length on each face. Superficial splits due to seasoning and steaming are allowed also.		The whole lumber may be red hearted.	
N o	On one face and one edge at 2/3 maximum rate red heart is allowed	N o	The whole lumber may be red hearted	Wane is allowed with maximum 5 mm. width and no longer than 1/2 of lumber length on one corner	Wane with maximum 10 mm. widths along the lumber on one corner is allowed.	Allowed	It may be stained to an extent suitable for use.	
N o	N o	N o	The first beginning of stain is allowed on one face.	Two insect damages are allowed on a single lumber.	The beginning of stain is allowed on 1/4 of both faces.	Allowed		
Smooth	Smooth	Straight fibre is not mandatory. No spiral grain is allowed	Straight fibre is not mandatory. No spiral grain is allowed	All kinds of fibre are allowed. Spiral grain shall not exceed 1/30 of lumber width in one meter length	Crookedness shall not exceed 3 mm. in one meter length. Warp shall not exceed 1 cm. in one meter length	Fibres of any kind are allowed		
Flat faces, straight edges	Flat faces, straight edges	Flat faces, straight edges	Flat faces, straight edges	Manufacturing defects to a certain extent are allowed	Form defects are allowed	Manufacturing defects are allowed.		
No manufacturing defects	No manufacturing defects	No manufacturing defects	No manufacturing defects	No manufacturing defects	No manufacturing defects	No manufacturing defects		
No steaming defects	No steaming defects	A slight decoloration as the result of steaming is allowed	A slight decoloration as the result of steaming is allowed	Decoloration as the result of steaming is allowed.	Decoloration as the result of steaming is allowed	Decoloration as the result of steaming is allowed		
No kind of defects is allowed.	One kind of defect is allowed.	Two kinds of defects are allowed	Three kinds of defects are allowed.	All kinds of defects to an extent suitable for use are allowed.	All kinds of defects to an extent suitable for use are allowed.	All kinds of defects to an extent suitable for use are allowed.		
Red	Red	Green	Yellow	Black	Blue			

Some as in the class I and II.

EXPLANATION : 1. Size :

a) Shows the thickness of air dried lumber in mm.

b) Shows the width of air dried lumber in cm. The width of lumber shall range in 1 cm. differences.

c) Lumber length ranges vary with 5 cm. difference for very short length and small dimension, and 10 cm. differences for short and normal length. 3-5 cm. to lumber length is added as over measure.

2. Sale :

a) I and II classes are sold together.

b) I and II, merchantable and III classes sale parties shall include 10-15% "narrow" lumber.

Kullanmaya mani olmayan telik ve vasıfta ve sayı bulunabilir.

Kullanmaya mani olmayan telikte ve sayıda bulunabilir.

İncelerde: 20 mm., kalınlarda 30 mm., çapa kadar kusur sayılmaz

20 mm. çapa kadar kusur sayılmaz

Darlarında: Metrede her iki yüzde çapı 50 mm. yi geçmeyen bir, veya çapları toplamı 100 mm. yi geçmeyen müteaddit sayıda budak bulunabilir.

Kullanmaya mani olmayan recede olabilir. Parça gunun yarısını geçen us takti çatlıklar bulunabilir. Çatlıkların arasında en 8 cm. genişliğinde mal eld lebilmedir.

Kullanmaya mani olmayan recede bulunabilir.

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	K A L I T E S İ N İ F L A R I					
	I. SINIF	II. SINIF	MERKANTİL	III. SINIF	IV. SINIF	UFAK
EB'ADLAR	18-25-32-38-51-58-63-70-	18-25-32-38-51-58-63-70-	18-25-32-38-51-58-63-70	25-32-38-51-58-63-70-	25-32-38-51-58-63-70	
a) Kalınlık (mm.)	76- ve 98	76 ve 98	76 ve 98	76 ve 98	76 ve 98	Kesitler: 18X18-25X25-32X32-38X38-51X51-58X58-63X63-70X70-98X98-122X122-150X150-200X200
b) Genişlik (cm.)	Dar kereste : 8-11 Geniş » : 12-40	Dar kereste : 8-11 Geniş » : 12-40	Dar kereste : 8-11 Geniş » : 12-40	Dar kereste : 8-11 Geniş » : 12-40	8-40	Piyasa istekleri yapılabılır.
c) Boy (cm.)	Çok kısa boy : 50-95 Kısa boy : 100-170 Normal boy : 180-Yukarı	Çok kısa boy : 50-95 Kısa boy : 100-170 Normal boy : 180-Yukarı	Çok kısa boy : 50-95 Kısa boy : 100-170 Normal boy : 180-Yukarı	Kısa boy : 90-170 Normal boy : 180-Yukarı	90-Yukarı	Kısa boy : 20-170 Normal boy : 65-180
BUDAK	Y o k	20 cm. genişliğine kadar çok kısa ve kısımlarda 1, Normalde 2 adet çapı 1 cm. yi geçmeyen sağlam budak bulunabilir. 20 cm. den daha genişlerde çok kısa ve kısımlarda 1, Normalde 2 adet çapı 2 cm. yi geçmeyen sağlam budak bulunabilir.	Budak çapı kereste genişliğinin 1/10 unu kalınlığın 1/2 sini geçmemek şartıyla Metretulde azami 3 adet bulunabilecektir. Budak sağlam ve kaynamış olup çapı 3 cm. yi geçmez.	Budak çapı kereste genişliğinin 1/7 sini, kereste kalınlığının tamamını geçmemek şartıyla Metretulde azami 4 adet bulunabilir. Budaklar sağlam ve kaynamış olmalıdır.	Kullanılabilecek derecede budak bulunabilir.	
ÇATLAK	Y o k	Yüzlerde dar ve sathi çatlaklar bulunabilir. Bir başta azami 10 cm. çatlak olabilir.	Yüzlerde dar ve sathi çatlaklar bulunabilir. Kalınlığın 1/4 ü kadar derinlikte 30 cm. yi geçmeyen çatlaklar iki yüzdede bulunabilir.	Çatlak genişliği kereste genişliğinin 1/100 ünü, derinliği kalınlığının yarısını geçmez. Çatlaklar her iki geniş yüzdede bulunabilir. Beher yüzdeki çatlak bnyığı toplamı kereste boyunun 2/3 ünü geçmeyecektir. Kurumadan ve buharlamadan mütevelil sathi çatlaklar bulunabilir.	Kullanılabilecek derecede çatlak bulunabilir.	
KIRMIZI YÜREK	Y o k	Bir yüzünde ve bir kenarında azami 2/3 nisbetinde bulunabilir.	Tamamen Kirmizi yürek olabilir.	Tamamen kirmizi yürek olabilir.	Tamamen kirmizi yürek olabilir.	
SULAMA	Y o k	Y o k	Sulama genişliği 5 mm. yi geçmemek şartıyla yalnız bir köşede boyu 1/2 si kadar olabilir.	Sulama genişliği 10 mm. yi geçmemek şartıyla kereste boyunca bir köşede bulunabilir.	Olabilir.	
ÇÜREK	Y o k	Y o k	Yalnız bir sathta Ardak başlangıcı olabilir.	Satırların 1/4 ünde Ardak başlangıcı bulunabilir.	Kullanılabilecek derecede Ardak bulunabilir.	
KURT YENİĞİ	Y o k	Y o k	Y o k	Bir parçada azami 2 adet bulunabilir.	Kurt yenikleri olabilir.	
ELİYAF	Düzgün	Düzgün	Düzgün elyaf aranmaz. Burukluk olmayacaktır.	Her türlü elyaf olabilir. Burukluk 1 Metretulde genişliğinin 1/30 unu geçmeyecektir.	Her türlü Elyaf olabilir. Kullanılabilecek derecede buruk olabilir.	
ŞEKİL	Satırlar düz, kenarlar düzgün.	Satırlar düz, kenarlar düzgün	Satırlar düz, kenarlar düzgün	Kanburukluk 3 mm. yi geçmez. Eğrilik 1 Metrede 1 cm. yi geçmeyecektir.	Şekil bozukluğu olabilir.	
İMALAT	İmalat hatası olmayacaktır.	İmalat hatası olmayacaktır.	İmalat hatası olmayacaktır.	Az miktarda imalat hatası bulunabilir.	İmalat hataları bulunabilir.	
BUHARLAMA	Buharlama hatası olmayacaktır.	Buharlama hatası olmayacaktır.	Buharlama neticesi hafif renk bozukluğu olabilir.	Buharlama neticesi renk bozukluğu olabilir.	Buharlama neticesi renk bozukluğu olabilir.	
KUSURLARIN TOPLANMASI	Kusurlar toplanamaz.	Kusurlar toplanamaz	İki kusur toplanabilir.	Üç kusur toplanabilir.	Kusurlar toplanabilir.	
MARKA	K I R M I Z I	K I R M I Z I	Y E Ş İ L	S A R I	S İ Y A H	M A V İ

İZAHAT : I- EB'ADLAR : a) Kalınlık : Kalınlıklar mm. olarak Hava Kurusu halindeki kalınlığı göstermektedir.

b) Genişlik : Genişlikler cm. olarak Hava Kurusu halindeki kereste genişliklerini göstermektedir. Kereste genişlikleri (1) er cm. kademe iledir.

c) Boy : Boy Kademeleri ; Çok kısa boylarda ve Ufak mallarda (5) er cm. Kısa ve Normal boylarda (10) ar cm. dir. Kereste boylarında ayrıca 3-5 cm. lik üç payı bulunacaktır.

II- SATIŞ : a) I. ve II. Sınıf keresteler karışık olarak satılır.

b) I/II. —Merkantil—III. üçü sınıf kereste partileri %10-15 nisbetinde dar keresteyi ihtiva eder.

SOFT WOOD LUMBER STANDARDIZATION BEING APPLIED IN TURKISH FOREST SERVICE SAW-MILLS

	Q U A L I T Y C L A S S E S			
	C L A S S I	C L A S S II	C L A S S III	S T R I P
SIZE :	12-18-24-28-38-48-58-78 and 98	12-18-24-28-38-48-58-78 and 98	12-18-24-28-38-48-58-78 and 98	Cross Sections :
a) Thickness (mm)	8-10-12-15-17-19-22-25-28 and 30	8-10-12-15-17-19-22-25-28 and 30	8-10-12-15-17-19-22-25-28 and 30	8X24-12X24-18X48-24X48 mm.
b) Width (cm)	Short Length : 1-2,5 Normal " : 3-5	Short Length : 1-2,5 Normal Length: 3-5	Short Length : 1-2,5 Normal Length: 3-5	Short Length : 1-2,5 Normal Length: 3-5
c) Length (m)	Sound knots of 2 cm. maximum diameter are allowed. Bird eye knots are not considered as a defect.	Maximum knot diameter shall not exceed 4 cm. and 1/5 of the lumber width also. 2 sound knots are allowed on each face in one meter length. Sound knots of less than 1 cm. diameter and bird eye knots are not considered as defect.	All kinds of knots of 6 cm. maximum diameter and also not exceeding the 1/4 of the lumber width are allowed.	
KNOTS :				
a) Fir—Spruce	Sound knots of 2,5 cm. maximum diameter are allowed. Bird eye knots are not considered as defect.	Maximum knot diameter shall not exceed 5 cm. and also 1/4 of the lumber width. 3 knots are allowed on each face in one meter length. Sound knots of less than 1 cm. diameter and bird eye knots are not considered as defect.	All kinds of knots with diameter not exceeding 1/4 of the lumber width are allowed.	
b) Pine				
SPLITS :	Narrow and superficial splits as the result of seasoning are allowed.	Narrow and superficial splits are allowed. The length of the splits on each end shall not exceed 10 cm.	Deep splits not penetrating into the other face are permitted. The total length of the splits shall be 1/2 of the lumber length. Splits on both ends shall not exceed the width of lumber. Superficial splits as the result of seasoning are also allowable.	
WANE :	N o	Wane with maximum 5 mm. width along the lumber is allowed.	Wane is allowed with maximum 2 cm. width and no longer than 1/2 of lumber length along the piece.	
ROT :	N o	No rot is allowed. Blue colour in pine lumber and a slight decoloration having no effect on strength are acceptable.	Slight rot spots on each face, not covering the 1/20 of the surface and coming not against each other are allowed. The beginning of stain is allowed on the whole piece.	
INSECT DAMAGES :	N o	3 insect damages called bird eye hole are allowed on a single face.	Small holes are allowed caused by bark beetle on both faces. Large holes more than 3 on each face shall not be permitted.	
FIBRE :	Smooth (no spiral grain)	Straight fibre is not mandatory. Spiral grain rate shall not exceed 1/4 on the lumber width.	Straight fibre is not mandatory. Spiral grain rate shall not exceed the width of lumber.	
FORM :	Flat faces, straight edges.	The maximum warp of one piece shall not exceed 1 cm. in one direction and according to a single axis. Groove shall not exceed 3 mm.	The maximum warp of one piece shall not exceed 1 cm. in one direction and according to a single axis. Groove shall not exceed 5 mm.	
MANUFACTURING :	No manufacturing defect.	Slight manufacturing defects are allowed. The minimum sizes of lumber shall not be less than the standards given for each grade.	Manufacturing defects are allowed so as the minimum sizes of lumber shall not be less than the standards given for each grade.	
DEFECT ALLOWANCE :	No kind of defect is allowed.	2 kinds of defects of maximum rate shall not be permitted on a single piece whereas the slight ones are allowable.	2 kinds of defects of maximum rate are allowable on one piece; slight ones are also permitted on the lumber.	
MARKING :	Blue	Red	Green	Red

EXPLANATION : 1. Size : a) Shows the thickness of air dried lumber in mm.

b) Shows the width of air dried lumber in cm.

c) Lumber lengths are shown in meter ranging with 0,50 m differences. 3-5 cm is added to lumber length as over measure.

d) Squares and laths of the following dimension (customers' requirements may also be provided) are inserted in the concerned quality classes :
28X28 36X36 38X38 48X48 48X98 58X58 78X78 98X98 120X120-150X150 200X200

2. Sale : a) I and II classes are sold together unless special requirements received. They are marked with red colour when sold together.

b) Each quality might include 10% squares and laths. In case of necessity and if required squares and laths may be sold separately.

Shall be of I and II quality classes

APPENDIX E

Public Annual Sawmill Capacity^x

1968 and 1972

District	Mill	1968		1972	
		Capacity	Logs Consumed	One shift Capacity	One shift Capacity
Amasya	Bafra	15	9.8	5.5	15.3
Artvin	Borçka	15	15	-	15
Balıkesir	Dursunbey	15	19.9	-	19.9
Bolu	Bolu	40	42.2	-	42.2
Düzce	Düzce	30	-	24.4	24.4
Giresun	Akkuş	12	-	20.6	20.6
Isparta	Pazarçöy	3	3.6	-	3.6
Kastamonu	Ayancık	80	49.4	31.2	60.6
Cide	Cide	10	1.3	14.7	16
Trabzon	Ardeşen	10	-	14.1	14.1
Zonguldak	Devrek	30	-	14.3	14.3
Eskişehir	Eskişehir	15	20.6	-	20.6
Ulupınar	Ulupınar	12	-	12.6	12.6
Yenice	Yenice	30	-	14.3	14.3
Bartın	Bartın	-	-	-	-
Total		87	161.8	151.7	313.5

(a) 270 days, 8 hour shift

x Forest Industries Preliminary Development Plan to 1982.
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TÜRKİYE ORMAN GENEL MÜDÜRLÜĞÜNE AIT KERESTE FABRİKALARINDA TATBİK EDİLMEKTE OLAN YUMUŞAK KERESTE STANDARDİZASYONUDUR.

	K A L İ T E S İ N İ F L A R I			
	I S İ N İ F	II S İ N İ F	III S İ N İ F	Ç İ T A
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	12-18-24-28-38-48-58-78 ve 98	12-18-24-28-38-48-58-78 ve 98	12-18-24-28-38-48-58-78 ve 98	Kesitler : 8X24-12X24-18X48-24X48 mm.
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	8-10-12-15-17-19-22-25-28 ve 30	8-10-12-15-17-19-22-25-28 ve 30	8-10-12-15-17-19-22-25-28 ve 30	Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Azami 2 cm. Kutrunda Kaynamış Budaklar bulunabilir. Kuş gözü budaklar kusur sayılmaz.	Budak çapı azami 4 cm. den fazla olmayacak, kereste genişliğinin 1/5 inide geçmeyecektir. Budaklar düşer budak olmamak şartıyla metretulde ve her yüzde 2 adet bulunabilir. Çapı 1 cm. den küçük kaynamış budaklarla, Kuş gözü budaklar kusur sayılmaz.	Budak Çapı azami 6 cm. den fazla olmamak, kereste genişliğinin 1/4 ünüde geçmemek şartıyla her çeşit budak bulunabilir.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Azami 2,5 cm. kutrunda kaynamış budaklar bulunabilir. Kuş gözü budaklar kusur sayılmaz.	Budak çapı azami 5 cm. den fazla olmayacak, Kereste genişliğinin 1/5 inide geçmeyecektir. Metretulde ve her yüzde 3 adet bulunabilir. Çapı 1 cm. den küçük kaynamış budaklarla, Kuş gözü budaklar kusur sayılmaz.	Budak çapı kereste genişliğinin 1/4 ünü geçmemek şartıyla her çeşit budak bulunabilir.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Yüzlerde Kurumadan mütevellit dar ve sathi çatıklar bulunabilir.	Yüzlerde dar ve sathi çatıklar bulunabilir. Başlardaki çatıkların boyu 10 cm. yi geçmez.	Diğer yüze geçmeyen ve uzunlukları toplamı kereste boyunun 1/2 nisbetinde olan derin çatıklar olabilir. Başlardaki çatıklar kereste genişliğini geçmez Yüzlerde kurumadan mütevellit ayrıca sathi çatıklar bulunabilir.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Y o k	Sulama genişliği 5 mm. yi geçmemek şartıyla. kerestenin bir kenarında boydan boyca olabilir.	Genişliği kereste kalınlığının yarısını geçmemek şartıyla, azami 2 cm. lik sulama, kereste boyunca bulunabilir.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Y o k	Çürük Olmıyacaktır. Çamlarda Mavi renk ve Köknarlarda mukavemete tesir etmeyen hafif renk değişikliği bulunabilir.	Yüzlerde karşılıklı gelmemek şartıyla beher yüzünün 1/20'sini geçmeyen hafif çürük lekeleri olabilir. Kerestenin tamamında benüz ilerlememiş ardak başlangıcı bulunabilir.	
ENİĞİ : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Y o k	Kerestenin bir yüzünde Metretulde 3 Adet. Kuşgözü Kurt deliği bulunabilir.	Her iki yüzde küçük kabuk böceği delikleri bulunabilir. Büyük Kurt yeniği Metretulde her yüzde 3 adetten fazla olamaz.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Elyaf düzgün, burukluk olmıyacaktır.	Elyaf büyük ve karışık olabilir. Kereste boyundaki burukluk miktarı genişliğin 1/4 ünü geçmeyecektir.	Elyaf büyük ve karışık olabilir. Kereste boyundaki burukluk miktarı, kereste genişliği kadar olabilir.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Satırlar düz, kenarlar düzgün.	Her parçada 1 cm. yi geçmeyen tek taraflı eğrilik bulunabilir. Eğrilik bir mihvere göre olabilir. Olukluluk 3 mm. yi geçmez.	Her parçada 1 cm. yi geçmeyen tek taraflı eğrilik bulunabilir. Eğrilik bir mihvere göre olabilir. Olukluluk 5 mm. yi geçmez.	
AR : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	İmalât hatası olmıyacaktır.	Kerestenin en dar yerindeki ölçüsü o standarda ait ölçüden aşağı olmamak kaydıyla az miktarda imalât hatası bulunabilir.	Kerestenin en dar yerindeki ölçüsü o standarda ait ölçüden aşağı olmamak kaydıyla imalât hatası bulunabilir.	
ARIN MASI : Kısa Boy : 1 - 2,5 Normal Boy : 3 - 5	Kusurlar toplanamaz.	Bir parçada yukarıda yazılı kusurlardan ikisinin azamisi toplanamaz. Her kusurun cüz'i miktarları bir parçada bulunabilir.	Yukardaki kusurlardan ikisinin azamisi toplanabilir. Ayrıca her kusurun cüz'i miktarları bir parçada bulunabilir.	
	M A V İ	K İ R M İ Z İ	Y E Ş İ L	K İ R M İ Z İ

I. ve II. Sınıf Kalitesinde olacaktır.

- İ Z A H A T : I - EB'ADLAR : a) Kalınlık : Kalınlıklar mm. olarak Hava Kurusu halindeki kalınlıklarını göstermektedir.
b) Genişlik : Genişlikler cm. olarak Hava Kurusu halindeki kereste genişliklerini göstermektedir.
c) Boy : Boylar m. ile gösterilmiş olup, boy kademeleri (0,50 m.) iledir. Kereste boylarında ayrıca 3-5 cm. lik uç payı bulunacaktır.
d) 28X28-38X38-38X78-48X48-48X98-58X58-78X78-98X98-120X120-150X150-200X200 mm. eb'addaki ve icabında piyasa isteklerine göre yapılabilen Kadron ve Lâtarlar ait olduğu kereste sınıfına ithal edilir.
- II - SATIŞ : a) I. ve II. Sınıf Keresteler, hususi talep olmadıkça karışık olarak satılır. Karışık olarak satıldığında marka kırmızıdır.
b) Kadron ve Lâtarlar ait olduğu kereste partilerine %10 nisbetine kadar ilâve edilebilir. Talep ve lüzum halinde ayrıca satılır.

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APPENDIX E

Sawnwood Exports and Imports of European, North American, Middle Eastern and North African Countries^x

1000 m³ (s)

	Exports				Imports			
	Coniferous 1965	Broadleaved 1966	Coniferous 1965	Broadleaved 1966	Coniferous 1965	Broadleaved 1966	Coniferous 1965	Broadleaved 1966
Austria	2814	2735	61	58	8.4	9.3	34	33
Belgium-Luxem.	69	57	31	29	829	867	143	145
Bulgaria	36	33	46	32	105	97	-	-
Czechoslovakia	727	748	3.9	5	193	146	26	16
W. Germany	166	164	104	119	3945	3515	247	243
Denmark	15	12	87	78	1183	976	72	73
Finland	4064	3731	59	59	11	0.5	14	14
France	330	280	339	320	1406	1418	158	177
E. Germany	90	70			1417	1361	71	71
Greece	-	-	-	-	400	479	32	53
Hungary	5.1	115	5.1	23	788	795	38	52
Ireland	2.9	2.2	1.5	1.2	291	220	27	37
Italy	11	7	14	15	2448	2763	407	479
Netherlands	13	14	14	13	2655	2347	191	182
Norway	121	64	0.1	1.2	159	221	53	59
Poland	890	859	16	16	151	152	24	20
Portugal	397	379	4.5	2.7	7.9	8.9	14	23
Roumania	1417	1625	645	702	0.1	0.2	-	-
Spain	14	18	0.1	0.3	683	598	80	143
Sweden	5282	4997	12	12	143	85	99	96

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APPENDIX F (continued)

	Exports				Imports			
	Coniferous 1965	Coniferous 1966	Broadleaved 1965	Broadleaved 1966	Coniferous 1965	Coniferous 1966	Broadleaved 1965	Broadleaved 1966
Switzerland	2.8	33	12	18	296	284	73	86
United Kingdom	-	-	4.3	41	891	7938	846	822
Yugoslavia	271	259	466	534	52	61	1.2	0.8
U.S.S.R.	8001	7994	-	-	-	-	271	271
Canada	15457	14458	447	558	381	356	296	276
United States	1969	2051	295	351	11347	11032	781	987
Algeria					127		22	
Libya					60	115	0.8	7.1
Morocco	0.1		-	-	173		4.9	
Tunisia	0.1	0.1			73	79		
U.A.R.	-	-	-	-	460	477		
Cyprus	0.1	0.1	-	-	35	29	1.1	2.1
Iraq					55	92	31	32
Israel	-	-	-	-	274	161	25	24
Jordan					40	42	4.2	7.5
Lebanon	2	1			119	149		
Syria	-		0.1		75		13	
Turkey	-	0.1	4	8.1	-	-	-	-

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BIBLIOGRAPHY

- Consommation, Production et Commerce du Bois en Europe
Evolution et Perspective-Nouvelle Etude, 1950-1960,
Organisation des Nations Unies pour L'Alimentation
et L'Agriculture, Geneve 1969, Volume 1.
- Forest Industries Preliminary Development Plan No 1982,
FAO/UNDP/SF 293, October 1969.
- Kaptan, Rüstem, Nevzi Kılıçaslan, Ziya Üner, Orman Bakanlığı
3. Beş Yıllık Dönem Sonunda (1977) 20. Yılın 3
Üretim Hedefine Göre 1970 Yılı Üretimi Açın Alınması
Gerekli Tedbirlerle Yatırımlara Ait Ön Rapor, Orman
Bakanlığı, 1969.
- Orman Genel Müdürlüğü Genel İstatistik Albümü 1938-1967,
Orman Genel Müdürlüğü, Sıra No. 512, Seri No. 31,
Ankara 1969.
- Orman Kanunu, Kanun No. 6831, Kabul Tarihi 31/8/1956, Aın
Matbaası, İstanbul 1956.
- Osara, W.A., Folke Rydbo, Peter J. Vakosies, Türkiye Milli
Ormancılık ve Orman Sanayii Ana Kurumları Kurulması
Görevli Heyetin Raporu, Ormancılık ve Orman Sanayii
Bölümü, FAO/Roma, Nisan 1969.
- T.C. Resmi Gazete, 25/6/1969 No. 13232, 30/7/1969 No. 13262.
- Timber Trades Journal, issues for 1969 and 1970.
- Türkiye Orman Mühendisliği III. Teknik Kongresi, T.M.M.O.B.
Orman Mühendisleri Odası, Ankara 1970, Book 1.
- Waite, T.H., Ormancılık ve Orman Ürünlerini Geliştirme,
Kayın Kereste İhracatını Geliştirme, Milleçis
Milletler Kalkınma Programı/Özel Fon/ FAO 26 No.lu
Proje,
- Willis, W.E., Timber From Forest To Consumer, Ernest Benn
Limited, London 1968.

THESIS

ROBERT COLLEGE GRADUATE SCHOOL
BEBEK, ISTANBUL

PAGE

BIBLIOGRAPHY (continued)

Wood, World Trends and Prospects, Food and Agriculture
Organization of the United Nations, Rome 1968.

World Wood, issues for 1969 and 1970.

Yearbook of Forest Products 1967, Food and Agriculture
Organization of the United Nations, Rome 1968.