FORESTS AND FORESTRY IN KOCAELI PROVINCE: THE LONG HISTORICAL PERSPECTIVE

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The implicit question posed by this paper is whether – due to mounting pressures imposed by meeting its own domestic need for building materials coupled with increasing exposure to world market demand in the nineteenth century – traditional Ottoman conservation priorities and practices governing the use of the empire's woodland resources underwent change on a significant scale. A related question concerns the precise effects of more intensive logging practices in particular local areas and sub-districts of Kocaeli and the neighbouring districts of Bolu sancak. We are to verify these effects by using the detailed local statistics provided in the provincial yearbooks (*salnames*) of the late imperial era.

It bears remembering that the boundaries and extent of Kocaeli province changed dramatically over the course of the several administrative restructurings carried between Ayni Ali's account of 1609 that names the 14 sancaks which comprised the sprawling province of Anatolia – incorporating at that time Hüdavendigar, Kastamonu, Bolu and Karesi– and the fundamental redrawing of the provincial boundaries carried out in the Tanzimat and post-Tanzimat eras that resulted in the creation of more compact territorial units with precise sub-districts (*kazas*). These boundary changes complicate the task of making precise comparisons especially ones based on statistics and economic data drawn from sources drawn up in diverse eras. One thing that seems certain however is that between 1600 and 1900 the pace of change affecting the woodland resources of north-west Anatolia – including the zone between the Gulf of Izmit and the coastal areas of the Black Sea to the northeast included within the boundaries of Kocaeli as it was configured in the latter part of the nineteenth century – underwent change at a very slow pace. Significant change to the natural environment on a scale sufficient to cause degradation of the natural environment came only with the effects of massive urbanization and the creation of a modern highway network both of which gathered pace only in the second half of the twentieth century, with dramatic intensifying effect from the 1980s onwards.

We know of the exploitation, in some areas even intensive exploitation, of naturally occurring woodland resources in the Eastern Mediterranean coastal areas and their inland

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extensions on the part of the rural communities of the region starting from the antique period. However, despite continuous use over long centuries, because of the regenerative capacity and adaptive resilience of the several native tree species common to particular parts of the region with the heaviest annual rainfall, there is no evidence to suggest, before the coming of the modern age, that over-intensive tree harvesting resulting in deforestation or degradation of the natural environment occurred to any significant extent.[1] The Ottomans relied on the same forest reserves in the same districts of Bythinia and Paphlagonia as had their Byzantine and Roman predecessors. For such heavy demand purposes as house building and ship building the forest reserves most accessible to the imperial capital that were located within easy reach of either the Gulf of Izmit or the shores of the Black Sea for ease of transport had already been identified and exploited for more than a millennium before the Ottomans came onto the scene.[2] Yet despite the continuousness and, in particular locations, the intensiveness of the exploitation of these forest reserves, no extensive or permanent harm to the regenerative capacity of the heavily forested zones in the inland regions seems to have resulted under the watch of either empire in pre-industrial times. This result was partly fortuitous, but there is no doubt that careful monitoring, control and measured use of existing forest tracts under state managements as part of the crown preserves (miri ormanları) played a contributing role.

Izmit (1893)

We know of the minimal scale of man's impact on the forested areas bordering the Black Sea coast even as late as the early industrial era from the observations of travellers to the region who left detailed accounts of their journeys in the direction of Akceşehir (i.e, Akçakoca) and Karadeniz Ereğlisi setting out from the postal station at Hendek on the main highway between Adapazarı and Düzce. Their accounts have been exhaustively

1 For relevant studies focusing on the ecology of the Greek lands in antiquity see Oliver Rackham, "Land Use and Native Vegetation in Greece" in M. Bell and S. Limbrey (eds.), *Archaeological Aspects of Woodland Ecology* (Oxford, 1982), pp. 177-198. For a survey of conditions in the post-antique period in the Greek lands, see Archie Dunn, "The control and exploitation of the arboreal resources of the late Byzantine and Frankish Aegean region", in S. Cavaciocchi (ed.), *L'uomo de la foresta: secc. XIII-XVIII* (Firenze, 1996), pp. 479-49; especially p. 480.

2 For a study of the exploitation of the natural resources of Kocali and the surrounding area by the Byzantines, see Klaus Belke, *Paphlagonien und Honorias [Tabula Imperii Byzantini*, Vol. 9] (Wien, 1996), in particular pp. 139-140: "Forstwirtschaft". For Kocaeli's forests in the Ottoman period, see Resul Narin, "Osmanlı Devleti Zamanında Kocaeli Ormanları", *Belleten* LXXV/ 274 (2011).

mined for their geographical and natural historical content in the meticulous work of the French scholar Louis Robert published in 1980.[3] Several of the authors who recorded their impressions in a series of accounts that span the period between the 1880s and the 1910s, including Bernhard Schwarz whose travelogue was published in 1889,[4] marvelled at the untouched landscapes of the Alpine forested zone contiguous to the rain soaked shores of the Black Sea coast and the southern facing slopes of the mountain chains that merged with the sharply contrasting landscape at their base in the Anatolian interior. These south-facing slopes and the lowlands at their base shared common features with the Mediterranean climatic zone that was more intensively settled and exploited for its agricultural potential. The geographic distance as the crow flies between the Black Sea coast and the more densely inhabited zone of the interior was relatively small, but the two worlds were more or less cut off from one another and communication between them was – except for the likes of Western archaeologists and geological surveyors in search of either antiquities or the commercially significant commodities and mineral riches of the region – relatively infrequent. In describing the upland forested regions several of the authors wax poetic about the beauties of the uninhabited forest belt scarcely touched by the footprint of man by likening it to a desert, but in this case a green one.[5]

Other travellers described the densely forested mountainous terrain consisting of thick beech groves with towering over the scattered settlements of herders at their base as "seas" of green, cut off almost completely from the "mainland", sometimes described as "islands", of human habitation. This "sea" of green vegetation and trees remained even for them, the nearest inhabitants, largely unknown and uncharted *terra incognita*. One German traveller who traversed the same region in 1906 spoke of travelling a whole day's journey consisting of 5-6 hours march without ever leaving the canopy provided by the immense beach trees that blanketed the northern facing slopes of the mountains facing the coast as he travelled on foot from Akçakoca to Üsküb in the interior located at base of the southern flank of the same mountain chain.

With woodland reserves of an extent to be described in such monumental terms and casually compared with the vastness of the deserts and the oceans of the world we are reminded of the fact that in the late Ottoman era, at a time nearly within living memory, what we are confronted with in terms of the region's timber resources is an area of such huge proportions that only a small percentage of it could be effectively managed or exploited for human use. Much of the territory was inaccessible, even on foot, let alone within easy reach of developed harbour facilities. Even if such facilities had existed, they would have been cut off from the interior by the steep cliffs which bordered the forest zone in most parts. Thus, apart from a few stands that were situated near river banks where transport of the heavy logs to centres for milling and finishing could be affected, the physical obstacles to extensive and intensive exploitation of the area's timber supply potential were, to all intents and purposes, insurmountable. The area that could be exploited for timber (especially pine wood) for use in house and ship construction was situated in a band contiguous to the course of either the Sakarya River or the Melen Çayı.

These physical and geographical realities and the limitations they placed on Ottoman forestry potential in the district of Bolu, which included at that time the districts of both Düzce and Hendek, are acknowledged in a report on the region's natural resource base prepared around 1918 and incorporated in the Annual Yearbook/ Almanac (*salname*) for the same year.

3 Louis Robert, ÀTravers L'Asie Mineure: Poetes et Prosateurs, Monnaies Greques, Voyageurs et Geographie (Paris, 1980).
4 Bernhard Schwarz, Quer durch Bithynien: ein Beitrag zur Kenntniss Kleinasiens (Berlin, 1889).
5 Louis Robert, *À Travers L'Asie Mineure*, p. 23.

It is clear from the statistics found in this report that the proportion of managed woodland (*miri ormanları*) made up only a small proportion of actual forested zone which consisted then, as even today, of between one-quarter and one-half of the land surfaces of the districts included within the administrative makeup of the *sancak*. The extent of wild or unmanaged virgin forest stands at the turn of the twentieth century can be presumed to be greater than at present even though the capacity for precise measurement and survey were absent at the time. As an average for the whole *sancak* the figure of between 25 and 30 per cent of forest cover is given as the proportion of the available land surface that was forested. To achieve this figure as an average would mean that some districts would have had well in excess of 50% forest cover. Of the total land surface of the sancak, estimated in 1918 to consist of 35,000 km2 (3,500,000 hectares), only a small proportion consisting of 542,000 hectares or 15.5% was designated as forest land (i.e., managed woodland). This state forest (miri orman) was sub-divided into 251 parcels of which a lesser part, consisting of 80,914/ 542,000 or roughly 15% of the forest area, was being actively exploited for cutting timber. The zone for cutting wood (baltalik yeri) consisted mostly of younger trees that were destined for use as wood for heating and cooking or for the production of wood charcoal. The remaining 461,125 hectares (85% of the wooded area) consisting of the older forest were conserved as part of the forest reserve (koruluk).[6]

Before proceeding to our analysis of the management of Ottoman forest reserves in the late nineteenth century it will be instructive for us to cast a comparative glance at land use statistics for the neighbouring province of Hüdavendigar in the same period. In the provincial yearbook for Hüdavendigar dated 1906 we are informed that the land surface of the province was 81,878 km2 much of it situated in inland districts and hosting a variety of natural environments and landscapes compared with Bolu's land surface of 35,000 km2. Bolu's northern districts conformed with a high degree of consistency to the microclimatic conditions typical of the Black Sea region.[7] The overall picture of land use in Hüdavendigar province in 1906 can be seen in the statistics provided in Tables 1 and 2 below.[8]

19. yüzyıl sonunda İzmit'te Şişli Yolu

6 *Müstakil Bolu sancağı salname-yi resmisi: 1334 sene-yi hicriyesine mahsus* (Istanbul, 1334/ 1918), p. 133.
7 *Hüdavendigar Vilayeti salname-yi resmisi: 1324 sene-yi hıcriyesine mahsus* (Bursa, 1324/1906), p. 218.
8 To provide consistency in the use of statistics given using a variety of different units of measurement in the yearbooks *ceribs* have been converted to *dönüms* by using a standard approximate multiplier of 4 *dönüms* to the *cerib*. For reasons of simplicity and consistency the ratio 10:1 can be used in converting dönüms to hectares. For further particulars, see SedadÇumralı, "Cerip", *Ankara BarosuDergisi* 2 (1953), pp. 112-116; in particular p. 115.

Table 1: Land Use in Hüdavendigar Province Circa 1906[9]

Category of Use	Land Surface (in dönüms)[10]	% of total land
Cultivated land	22,686,500[11]	25.5
Uncultivated (uninhabited) land and land for grazing	40,393,700	45.4
Forest Areas	5,242,800[12]	5.9
Unaccounted for	20,743,000[13]	23.2
TOTALS	89,066,000	100.0

Table 2: Distribution of Forest Reserves in Hüdavendigar Province Circa 1906[14]

District (sancak/nahiye)	Forest Area (cerib)	Equiv. in dönüms	% within province
Kütahya	353,200	1,412,800	27.0
Karahisar	215,000	860,000	16.4
Ertuğrul	107,000	428,000	8.2
Bursa	285,000	1,140,000	21.7
Karesi	350,500	1,402,000	26.7
TOTALS	1,310,700	5,242,800	100.0

What is significant about the data from Hüdavendigar in 1906 is that – despite the fact that a relatively small proportion of available land was accounted for by forest cover, amounting to just under 6% of the total land surface of the province as compared to the average of 15.5% found in the neighbouring districts of Bolu sancak,[15] – it shows the care and attention devoted to the protection of the surviving portions of forest set aside as state forest preserve (*miri orman*). This care is reflected in the number of salaried personnel assigned to the management of the state forests who numbered 146 across the province.[16] Having provided this brief glimpse at prevailing conditions in a nearby region of Western Anatolia we will now turn our attention to the more detailed information relating to Ottoman forestry practices provided in the Bolu sancak yearbook for the year 1918.[17]

A General Overview of the Condition the Natural Environment in the Bolu Region at the Turn of the Twentieth Century

To gain an idea of the inter- relation between managed woodland and forest reserve in those districts of the coastal regions of inner Anatolia that were situated in the vicinity of the Black Sea but remote from access to the more developed transport and shipping networks of the Marmara coastal region to the west, the best source available to us is the district forestry commissioner's report dated 1918. Although this report cannot reflect with complete accuracy the transport realities that prevailed in earlier centuries, it is provides the closest approximation of the conditions of that time available in the present state of our knowledge. The quotes from the forest commissioner's report provided below under the headings: (a) General Environmental Conditions, (b) Estimates of Commercial Potential and (c) Perceived Degree of Under Exploitation of the Empire's Forest Reserves are offered

9 Based on information gleaned from the 1906 Provincial Yearbook for Hüdavendigar, p. 218.
10 For the equivalent figure in hectares (ha) divide by 10.
11 This category is divided into 3 sub-categories: arable land (20,067,000 dönüms), vineyards & orchards (1,927,800 dönüms) and meadows and clover plots (691,700 dönüms).
12 The information is recorded in the 1906 Yearbook for Hüdavendigar (pages 85 to 87) as 1,310,700 cerib. For details on forest cover in each of the province's component parts, see table 2 below.
13 This category included lakes, marshlands and other types of wasteland.
14 The data for this table was drawn from 1906 Yearbook for Hüdavendigar, pages 84 to 87.
15 See above, footnote 6.

in order to shed some light on the general situation of Ottoman forestry at the time.

(a) General Environmental Conditions

Dağların sırtlardan cah-be-cah göknar, ak-çamlar sarı-çamlar bazen de çamlar ve göknarlar[18]

Ayrı ayrı kıtaaalar teşkil ederler.

Cibal üzerine ise sanayi ve inşaatda fevkalade mühim ve daima aranılan meşe ile kain fazladır. Kuzey, yani güneşe maruz olmayan şimal ve şark mailelerinde kain meşe ile, nadiren kain göknar ile, güney, yani güneşe maruz olan cenub ve garb mailelerinde ise meşe, sarı ve kara çam ile mahluten bulunur. Binaenaleyh ormanlarımızı tezyin eden eşcarın yüzde doksanı çam, göknar, meşe ile kain ve gürgendir.[19]

Eşcarin hayat-i tabiyyesi cins ve nev'e ve şerait-I iklimiye-yi tabiyye'ye gore tahavvül eder. Çam envayı 150 ile 180, göknar 120 ile 150, kain ve gürgen 150 ile 200, meşe 180 ile 300, kestane 80 ile 90 sene tecessümata devameder.[20]

(b) Estimates of the Commercial Potential of Forestry in the Region

Her hektarda 3.5 metre mükaabı mevad-i haşebiye tecessüm ve tezayid ettiğini hesab ederek 542,000 kusur cerib ormanlarının senevi kıymet-i asliyye'ye halel gelmiyerek 1,897,000 metre mükaabı mevad-i haşebiye verebileceği tayin eder. Bir metre mükaabının li akall yiğirmi beş otuz guruş'a furuht edileceği teemmül edilirse, senevi 600,00 lira raddesinde varidat temin edeceği ve dolayısıyla sekeneyi livayi ihya edeceği tavazzuh eyler. Halbuki vesait-i nakliyenin fıkdanı yüzünden bu güzelim ormanlardan aldığımız varidat ma'ül-teesür azami olarak senevi otuz ile kırk bin lirayi tecavüz edemiyor.[21]

Ma haza, noksani'ye himemat-i bülendane ile ref ve nef edilmiş kapitulasyonlarla sermayeli kereste tüccarlarının bu memlekete girmemiş, ormanlarımızın tanıtılamamış olması da bir amil-I mühimmdir.

Zonguldak'ın altı saat bu'dunda madenlerde kulanılacak kerestelerden milyonlarca varken vesait-i nakliyenin mefkudunu ileri sürülerek bu madenler için Finlandya'dan ve Isveç'den senevi kırk elli bin liralık göknar cinsinden direkler celbedilmiş olduğu görülmektedir ki buna hayret ve teessür etmemek gayr-I kabildir. Halbuki kapitulasyonlar olmasa ve bu bedel mübayaanın bir seneliği ormanlar yollarının tesviyesine, tanzimine hasredilseydi hem bu para memleketimizde kalır varidat tekessür eder, hem de o yollar münasebetiyle ormanlarımız memleketimize intizamlı bir süret'te azmet-bahş olur ve suver-i saire-yi ticariye ile de şimdikinin üç beş misli irad ve servetleri tevlid eyler idi.

(c) Perceived Degree of Under Exploitation of the Empire's Forest Reserves

Kereste amillerinin de hadd u hududu fen dairesinde tayin kılınabilir ise, mikdarı henüz keşfolunamamakla beraber birkaç yüz bin hektar vusaatında bulunan ve içine balta girmediği tahakkuk eden Kara Dere, Uzun Öz ve emsali ormanlarlarda takriben dört milyon metre mükaabında ki mevad-i haşebiye'den yüzmil yonlarca guruşlar alınır.

16 *1906 Provincial Yearbook for Hüdavendigar*, p. 87.
17 The information summarized in the following paragraphs can be found in more detailed form in the *Müstakil Bolu sancağı salname-yi resmisi: 1334 sene-yi hicriyesine mahsus* (Istanbul, 1334/ 1918), pp. 133-138.
18 Fir, *pinaceaeabies*.
19 Hornbeam, horn beach.
20 The forest commissioner's report here emphasises the [Importance of harvesting each variety when or near the time when it has reached its full growth potential to allow space in forest for new growth]
21 Here the commissioner bemoans the fact that only 1/20th of the full potential commercial potential of the region's forest reserves are currently being realized.

The short quotes provided above are useful in drawing a general portrait of Ottoman forestry in the period, but thanks to the detailed information provided in the individual sections devoted to forestry in each of the nine *kazas* making up the sancak in 1918, were are able to draw a much more precise picture of forest management at the local level.

FROM THE GLOBAL TO THE LOCAL

In this part of the paper, instead of attempting to provide the full tabulation and analysis of the forest reserves of all nine of Bolu's kazas whose total extent was 542,000 hectares, I will instead focus on the local situation of forestry in the five districts where forestry occupied a prominent place in the respective districts' general economic profile. The total extent of forest cover in the five districts of Ereğli, Bolu, Bartin, Devrek& Düzce accounted for 393,299 hectares or approximately 73 % of the woodland area of the *sancak* as a whole.[22]

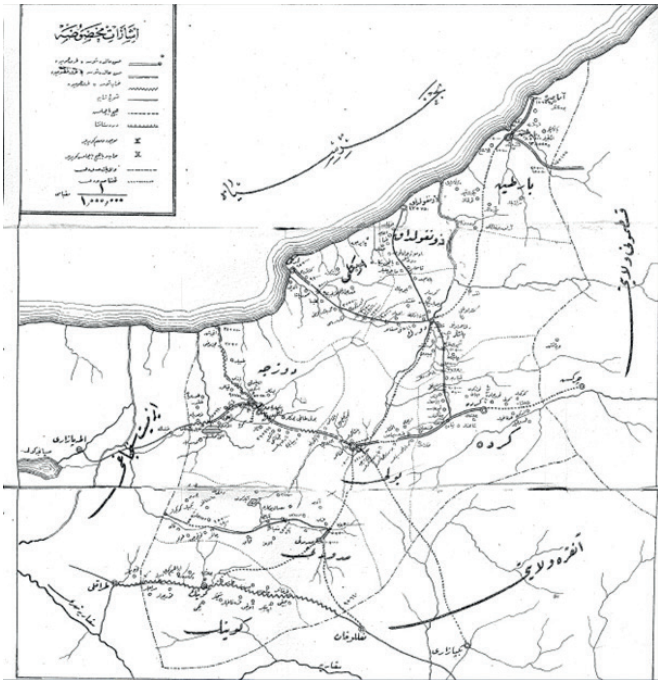
Before proceeding to this local perspective however it will perhaps be helpful if we present an overview of what can be concluded from the broader cross-regional perspective on Ottoman forestry presented above. In general it can be seen from the summary perspective that, despite some random remarks found in general accounts which assert that by the eighteenth century the Ottoman navy had over utilized the timber resources of the Kocaeli region and was therefore subjected to the necessity of repairing of old ships as opposed to the constructing of new vessels, there is relatively little hard evidence to suggest that this was in fact the case. There is plenty of evidence to indicate financially driven constraints influencing patterns of ship construction at the Naval Arsenal in Istanbul, but it cannot be assumed without further evidence that the source of the problem was scarcity of timber.[23] We know the level of the navy's annual requisition of supplies from the province in the mid seventeenth century from the account provided by Katib Chelebi in the *Esfar'ül Bihar* which indicates a standing yearly contribution (*ocaklik*) of 300,000 akçes worth of *kereste* (cut timber) was supplied each year,[24] but in the final analysis it would seem that this made little dent on the reservoir of available forested land since it is documented that until the early twentieth century the greater proportion of this forest reserve still remained intact. The preservation of this natural wealth in the form of trees was perhaps unintentional and by default since, until the era of steamship transport, the Ottomans lacked the capability and transport infrastructure for extracting the largest part of these timber reserves. Nevertheless, the net result is clear. Whether by accident or by design, by intention or default, the forest lands of north-western Anatolian and the hillsides inclining towards the Black Sea coast remained little changed in their extent and levels of concentration from the conditions that prevailed in late antiquity. These general conditions were largely maintained through the medieval and early modern eras. What preserved woodland density most effectively, apart from the fact that trees are a renewable resource, was the fact that, for the most part, the forest preserves were located in areas that were remote and inaccessible. Moreover, the stature and bulk of the older trees prevented easy cutting (by axe as opposed to modern mechanized saw equipment) while removal and transport was by means of the sole practical alternative which consisted at the time of floating the cut logs down river to the nearest outlet at or near the sea coast.

22 For further detail see Table Three below.
23 For tables indicating the slowdown of new construction in favour of repair activity, see Idris Bostan, *Osmanlı Bahriye Teşkilatı XVII. Yüzyıda Tersane-i Amire* (Ankara, 1992), pp. 99-100, tables 27-28.
24 Edition by Idris Bostan (Ankara: T.C. Başbakanlık Denizcilik Müsteşarlığı, 2008), p. 145.

The Local Picture Encountered in Districts 1-5 of Bolu sancak[25]

District 1 (Ereğli =Karadeniz Ereğlisi)

By the late nineteenth century the timber industry of Ereğli was in competition, both for deployable labour and for available transport, with the developing mining industry and coal pits which by that time were providing large-scale employment opportunities while at the same time contributing an estimated monthly sum of 20,000 liras (200,000 guruş) to the local economy.[26] Industrial competition for the available workforce can thus be seen as one of the factors contributing to the de facto continuation of the government's conservation policies with regard to Ereğli's woodlands in the late Ottoman period. The larger part of Ottoman shipping capacity in the Black Sea was also being used to transport coal from the Ereğli pits to urban centres such as Istanbul.



District 2 (Bolu)

By far the largest extent of forest cover in the five surveyed regions was found within the confines of Bolu district. Here too the primitive state of the transport as well as the mountainous character of the terrain played an unwitting role in preventing the intensive exploitation of the region's timber resources on a year-round basis. In the section on forestry in the merkez kaza of Bolu note is made of the fact that despite the far greater proximity of the provincial capital to overland roads linking with Adapazarı to the west, the route of preference for the extraction of timber was the harbour of Akçeşehir (Akçakoca) situated at the extreme north of the sancak. For large parts of the year (specified as the six month period between mid-September and mid-March) this preferred route was impassable due to the wet and muddy condition of the unpaved roads that consisted in places of little more than goat tracks.[27] Thus, again by default, geographical barriers and prevailing weather conditions played a role in halting the rapid expansion of the timber industry, especially in the regions farthest removed from the limited transport termini at the higher elevations. So far as the arboreal diversity of the Bolu region was concerned, we are informed of the relative prevalence of the following categories of trees within the district as follows:

25 Facts and figures relating to all five districts are found below in Table 3.
26 1334 *Bolu Salnamesi*, p. 185.

Category	Pine (Çam)	Fir (Göknar)	Horn beam / Beech (KainveGürgen)	Oak (Meşe)	Other
Percentage	30	40	15	8	7

District Three (Bartın)

This district was renowned for its timber reserves in earlier Ottoman centuries and was relatively heavily exploited for supplying the needs of the Imperial Naval Arsenal in the seventeenth century. However the 1918 salname takes note of the fact that – because the timber harvesting was carried out in a well-planned fashion and taking into consideration as well the high level of reforestation realised in the period since the early 1700s – significant stands of old trees were still to be encountered in the district. The area for exploitation had been reduced to a relatively small percentage of the overall hectarage of the district amounting to a mere 8.4% of the total available land surface, but what was left was old forest consisting of choice species. The distribution of tree species for Bartın in 1918 reveals a relatively high prevalence of valuable species such as beach and oak. The precise distribution was as shown in the following chart:

Category	Pine	Fir	Hornbeam & Beech	Oak	Other
Percentage	15	8	45	20	12

The narrative in this section of the salname reminds us that, while the Ottoman forestry regime could hasten or reduce the pace of planned cutting, the actual mix of species and their growth rates and adaptability to the soil and climactic conditions of the locality resulted not from management or human intervention, but the natural features of the particular habitats found in particular regions. One of the reasons why the Bartın region had achieved acclaim and been so heavily exploited for logging in earlier Ottoman centuries was the rapid rates of regeneration of woodland that could be achieved under localized soil and climate conditions for which the region was famous.[28]

District 4 (Devrek)

The narrative in this section of the salname indiicates that the entire extent of the district's forest preserves were set aside as state forest with only limited cutting permitted on a scale to provide for the limited needs of the sparse populations settled in the region. The observation is made that, with consistent and careful management together with a wholly restrictive approach to the harvesting of timber, the resource, covering in excess of 60,000 hectares, would remain virtually inexhaustible.[29] From such variation of practice it can be seen that the Ottomans actually did pursue a balanced approach to conservation of the natural environment by compensating for heavy use of timber resources in a particular district by the imposition of a virtual moratorium on cutting in an adjoining district.

District 5 (Düzce)

This district constituted the second largest in Bolu sancak with respect to the extent of its woodland resources. This was a feature achieved in spite of the fact that its southern part in the Düzce plain was very heavily exploited for its agricultural potential. The salname records the presence of 32 distinct forested areas covering in excess of 100,000 hectares scattered across the northern portions of the district in areas within relatively close

27 *1334 Bolu Salnamesi,* p. 209.
28 *1334 Bolu Salnamesi,* pp. 228-229: " Kaza'nın orman yetiştirmeye olan istirdadı icra kılınan katiyat-i müstemere'ye karşı yetişmiş eşcar ile ormanların muhafaza-yi mevcudiyet etmesiyle numayandur".

proximity to the Black Sea coast. On the other hand, once again, the primitive state of local transport conditions made intensive exploitation of this resource either impractical or prohibitively expensive.

In general the conclusion that emerges from our examination of the condition of Ottoman forests and forestry in the five key districts of Bolu treated above suggests that state ownership of the overwhelming majority of the regions' woodland reserves linked together with a deliberate policy of conservation that was supported by the real-world incapacity of the Ottoman economy in the pre-industrial age to overexploit , left the natural environment, if not fully intact, then at least in the less populated districts, only marginally under the destructive impact and intrusion of humankind.

Table 3: Extent of Woodland Areas within 5 of the 9 kazas (districts) making up the sancak of Bolu circa 1918

District Name	Surface Area of District in hectares[30]	Woodland Area (ha)[31]	% Woodland
Ereğli (Heraclea)	325,000	26,400[32]	8.1
Bolu	500,000	153,859	30.8
Bartin	585,000	49,040[33]	8.4
Devrek	355,000	60,250	17.0
Düzce	325,000[34]	103,750[35]	31.9
TOTALS FOR THE FIVE TABULATED DISTRICTS	1,790,000	393,299[36]	AVERAGE WOODLAND COVER (across all 5 districts) = 22%

29 *1334 Bolu Salnamesi*, p. 246.

30 Data for this column was drawn from pages 158,188,216,235 and 249 of the 1334 (1918) Yearbook for the Sancak of Bolu.

31 Data for this column was drawn from the general table on p. 135 and from pages 185,209,228, 246 and 267 of the 1334 (1918) Yearbook for the sancak of Bolu.

32 A break-down indicating the proportion of koru (forest preserve) as opposed to *baltalık* (area set aside for logging) indicates that in this district 10,800 ha were set aside as forest reserve (41%) while 15,600 ha (59%) was used for logging. The high proportion used for logging seemingly represents a long-standing pattern since at the time of survey only 8.1 % of the district's surface area still retained its tree-cover. This reflects the ease of extraction of timber cut from this district to nearby sea ports on the Black Sea coast.

33 The figure of 19,040 provided on page 228 of the salname is a misprint. The correct figure (49,040) is provided on page 135.

34 The figure for Düzce's total land surfaceis an estimate.

35 The northern part of Düzce was mountainous and heavily wooded. One of its sub-districts (nahiyes), Akçeşehir (mod. Akçakoca) whose total surface extent was 70,000 hectares, was more than 90% tree-covered with woodland accounting for 65,000 out of the 70,000 total hectarage. See Bolu sancağı salnamesi 1334 / 1918, p. 269. There was no logging in this district which was set aside in its entirety as koru within only insignificant quantities being used by the local residents to meet their daily needs.

36 The total of the 5 tabulated districts represents roughly 73% of the woodland area of the whole sancak recorded as 542,039 hectares on page 135 of the salname. The average density of forest cover for the sancak as a whole was 542,039 hectares / 3,500,000 hectares or 15.5 % whereas the average for the five northern districts situated in the mountainous regions in close proximity to the Black Sea was considerably higher, averaging 22% with much higher concentrations of forest in the remoter areas.