DEFORESTATION IN SIXTEENTH CENTURY ANATOLIA: THE CASE OF HÜDAVENDİGAR (BURSA) *SANCAK*

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Introduction

Ecological change, a vital issue in today's world, has gained much importance in recent years, has many components, and requires international cooperation. Deforestation is one of the most important components of ecological change and has recently become a controversial issue of current research[1] with the deforestation in the tropical region. As also seen in the FAO statistics, in the years between 1990-1995 deforestation was mostly experienced in such countries situated on the equatorial belt as Brazil, Indonesia, and Zaire.[2] However, deforestation has not been a major concern of only the modern world or the last century; the concern on deforestation goes back long in history. Therefore, the history of the deforestation should be researched documented for a better understanding of its present conditions, as in all issues whose roots lie in the past.

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[1] For more information on deforestation, see P. M. Fearnside, "Deforestation in Brazilian Amazonia: the effect of population and land tenure", *Ambio* 22 (1993), pp. 537-545; T. Rudel-J. Roper, "The paths to rain forest destruction: Crossnational patterns of tropical deforestation 1975-1990", *World Development* 25 (1997), pp. 53-65; R. Sierra, "Dynamics and patterns deforestation in the western Amazon: the Napo deforestation front, 1986-1996", *Applied Geography* 20 (2000), pp. 1-16; F. Achard et all., "Determination of deforestation rates of the world's humid tropical forests", *Science* 297 (2002), pp. 999-1002; D. Armenteras et all., "Patterns and causes of deforestations in the Colombian Amazon", *Ecological Indicators* 6 (2006), pp. 353-368.

[2] FAO *Forestry Department* 1997 ve 1999. Also see Erol Tümertekin-Nazmiye Özgüç, *Ekonomik Coğrafya*, Çantay Kitabevi, İstanbul 1999, p. 278.

Deforestation is usually defined as the loss of forest. FAO defines deforestation as converting forests to another land use or the long-term (more than 10 years) reduction of tree-canopy cover below the 10 percent threshold. Depending on how it is estimated, over 15 million ha and a half of natural forest is lost in the tropics every year. This is more than the area of Nepal or Arkansas in the United States.[3] It is a well-known fact that mankind has destroyed the forests on earth since the discovery of fire. Depending on the increase in population, vast areas of forests have been destroyed for different reasons: for agriculture and opening grazing lands, for heating, obtaining energy for mining, accommodation, for opening roads, hunting, for keeping safe from wild animals and giving harm to the enemy during wars.

Eight thousand years ago at the advent of sedentary agriculture, forests covered approximately 40 per cent of the world's land area or about 6,000 million hectares. For the next 7,500 years, farm and pasture lands gradually crept into the forests, covering the most fertile, most accessible soils. The areas mostly affected were the Middle East, the Mediterranean watershed, South Asia, and the Far East. Forest removal in Mesopotamia and the Mediterranean Basin was well advanced in pre-Christian times. Those forests that do remain are in many cases badly degraded. For example, in Turkey, in the forests of *Pinus brutia* only the tallest, the straightest trees have been selectively cut for centuries.[4] Relying on different assumptions on this issue, it can be said that about 8-10,000 years ago (c. 8-10,000 years BP) 50 % of the earth was covered with forests, whereas today this amount has drawn back to about 30 %, most of which can even be said to have lost originality. In this regard, it can be concluded that in the last 10,000-15,000 years, with the effect of human activities, half of the forests in the world have been destroyed.[5]

The destruction of the middle belt forests in Europe which began in the Mesolithic and Neolithic eras and continued until today by gradually speeding up has always been one of the main subjects of attraction for researchers. The tens of thousands years of deforestation in this belt occurred in Central and Western Europe especially in the 200 years following 1050 AC.[6] Deforestation, which continued in the following years, became intense and extensive in the world particularly from the middle of the 19th century on. "Between 1850 and 1980, 15 per cent of the World's forests and woodlands were cleared. The world forest area has now shrunk to 3,500

[3] http://www.snvworld.org/cds/rgSFB/forest/1.1.4/index.htm.

[4] http://www.rcfa-cfan.org/english/issues.12-3.html.

[5] For more information, see: Tümertekin-Özgüç. *a.g.e.*, pp. 272-280; Hayati Doğanay, *Genel Beşeri ve Ekonomik Coğrafya*, Aktif Yayınevi, İstanbul 2003, p. 300.

[6] H. C. Darby, "The clearing of the woodland in Europe", in ed. W. L. Thomas, *Man's Role in Changing the Face of the Earth*, Chicago 1956, pp. 183-216, Also see: Tümertekin-Özgüç, *a.g.e.*, pp. 272-273.

million hectares as a consequence of human exploitation, most of which occurred in the latter half of the 20th century".[7]

It is possible to say that the long-lasting and most extensive deforestation occurred in the old settlements of the world, particularly in the Middle East and its surroundings, depending on their history and increase in population. Anatolia shared the same fate and faced deforestation from its early times. Though the reasons of this deforestation can be anticipated from the climactic, geomorphologic, geologic and soil characteristics of Anatolia, no research has been conducted to put forward these reasons with the allegation that there are no or enough data on the issue. According to M. Williams, knowledge about the worldwide deforestation is not too much in the past. Thus, past deforestation of Anatolia is defined as "*dark ages and dark areas*"[8], as M.Williams emphasizes it.

The findings of the researche on the vegetation of Anatolia indicate that 10,000 years ago (c. 10,000 years Before Present), in early Holocene, a vast area of land was covered with steps of trees in the surroundings of the salt lake in Central Anatolia and in the Southeast Anatolia. Apart from this, all other parts of Anatolia were covered with various kind of forests. Until the c. 5,000 years BP, the structure of the land did not change much, and the only change that took place was the expansion/spreading out of the steps of trees. Until about 8,000 years ago, with the foundation of many Neolithic settlements in Anatolia, mankind began its ominous effect on nature. In this regard, the anthropogenic effects began 5,000 years ago, which means that in the change of vegetation cover in nature humanity has been playing the major role for 5,000 years. As found, the forest areas around Lake Beyşehir, Lake Söğüt and Lake Köyceğiz were destroyed, and with the influence of excessive grazing the existing steps in Central, Eastern and Southeastern Anatolia were well expanded.[9] A study on the Roman Classical Period indicates that Turkey's Western and South coastal regions that are barren or degraded today had vast forest cover.[10] According to the findings of the palynological researches done in a limited area, the forest areas are observed to

[7] http://www.rcfa-cfan.org/english/issues.12-3.html.

[8] M. Williams, "Dark ages and dark areas: global deforestation in the deep past", *Journal of Historical Geography* 26 (2000), pp. 28-46.

[9] For more information, see: F. Hafner, Son Beş Bin Yıl İçinde Anadolu'nun Orman Örtüsü, *OGM Teknik Haberler Bülteni* 16 (1965), pp. 146-156; S. Bottema et. al., "Palynological Investigation on the Relation Between Prehistoric Man and Vegetation in Turkey: The Beyşehir Occupation Phase", in *Proceding of 5. OPTIMA Meeting*, (1986), pp. 316-332; İbrahim Atalay, *Türkiye Vejetasyon Coğrafyası*, Ege Universitesi Basımevi, İzmir 1994, pp. 91-103; Y. Çağlar, "Türkiye Ormanlarındaki Değişmeler", in ed. Z. Boratav, *Türkiye'de Çevrenin ve Çevre Korumanın Tarihi Sempozyumu*, Tarih Vakfı Yurt Yayınları, İstanbul 2000, pp. 62-79; Neil Roberts, *The Holocene: An Environmental History*, Hong Kong 2002, pp. 87-159, W. Van Zeist-S. Bottema, *Late Quaternary Vegetation of the Near East*, Weisbaden 1991.

[10] O. Reale-P. Dirmeyer, "Modelling the effects of vegetation on Mediterranean climate during the Roman Classical period Part I: Climate history and model sensitivity", *Global and Planatery Change* 25 (2000), p. 168.

gradually get wider in the period between 12,000 and 4,000 years ago. However, in the last 2,000 years, a serious withdrawal in the forest cover is seen due to the extreme human intervention and exploitation of natural resources. This withdrawal is much more outstanding in the last 500 years.[11]

Though deforestation has taken place in time in all the places of Anatolia where there is human existence, it has taken place especially in the Central, Eastern and Southeast regions of Anatolia which have continental climate and in which the rainfall is inadequate. Since the forest areas in these regions could not renew themselves because of the climatic conditions, they became steppes due to the destruction that had taken place throughout history. As a result of this process, which still continues, the regions under consideration are today almost deprived of forests. However, the forests on the coastal regions, depending on the adequate rainfall and appropriate climatic conditions, could renew themselves and have continued their existence until the present, though they are scanty when compared with the past. This is why in these regions the most qualified trees and forests occupy the largest space in Anatolia.[12]

Even today, Turkey is quite suitable for the growth of rich vegetation in terms of climate, geomorphology, soil and the other conditions. In terms of the number of plant species (8,472), the number of endemic plant species (2,711) and the amount of endemism (32 %), Turkey is the richest country of the Mediterranean basin.[13] In normal conditions, apart from some areas in Central, eastern and Southeastern Anatolia, about 70 % of Turkey should have been forest areas. Taking into consideration the fact that forests occupy only 26 % space, it can be said that a large amount of forest areas were destroyed from the time human beings began to live in Anatolia until the present.[14] The major difference between them originates from the fact that forests could not renovate themselves after the deforestation in the deep past, depend on the forests could not renovate themselves in the inner region where the continental climate sway. When the related literature is investigated, it is seen that there are few studies on the deforestation in Anatolia,[15] and these studies do not focus on Anatolia but investigate it together with

[11] Çağlar, *a.g.e.*, p. 66.

[12] For more information on the vegetation geography of Turkey today, see: İbrahim Atalay, *Vegetation Geography of Turkey*, Ege Üniversitesi Basımevi, İzmir 1994.

[13] I. N. Vogiatzakis-A. M. Mannion-G. H. Griffits, "Mediterranean ecosiystems: problems and tools for conservation", *Progress in Physical Geography* 30 (2006), p. 184.

[14] http://www.tck.org.tr/academics_index.php?academics_id=11&action=read.

[15] Though not on the whole of Anatolia, some studies can be mentioned here. For example, see: G. Willcox, "A History of deforestation as indicated by charcoal analysis of four sites in eastern Anatolia", *Anatolian Studies* 24 (1974), pp. 117-133; S. Bottema-H. Woldring, "The Prehistoric Environment of the Lake İznik Area. A palynological Study", in ed. J. Roodenberg, *The Ilıpınar Excavations, I. Five Seasons of Fieldwork in NW Anatolia 1987-1991*, (1995), pp. 9-16; W. D. Hütteroth, "Ecology of the Ottoman Lands", in *The Cambridge History of Turkey*, Vol. 3, Cambridge University Press, Cambridge 2006, pp. 18-43.

its surrounding[16], that is, Europe[17] or the Middle East.[18] When we analyse from the deep past to the period of the Ottoman Empire, it is evident that the situation isn't different and present studies are in the form of publication of Ottoman archival documents.[19] It is noteworthy that in the studies on the 16th century the issue is handled with respect to the increase of population and it is said that in order to meet the nutritional needs of the increasing population, new agricultural areas should be opened, the only way of which is to destroy forest areas.[20] However, none of these studies focus directly on deforestation and the term is even not mentioned.

This study aims to show that it is possible to access proof of deforestation in the 16th century and, relying on this proof, to investigate the reasons of deforestation, the ways it occurred, its extent and the effect of the increase of population in this period on it. However, due to the multiplicity of the documents belonging to the 16th century,[21] only those studies and archival documents on certain regions of Anatolia are investigated, and though the issue is taken against the background of the whole of Anatolia, the focus is essentially on the example of Hüdavendigar (Bursa) *sancak/liva*.[22] This field has been chosen for study because detailed archival documents on it belonging to the 16th century were published. Moreover, due to its nearness to Istanbul and the ability of its forests to renovate themselves, it has undergone deforestation in all periods, and thus it is possible to find proof of deforestation for all historical periods in it.

This study is the first on deforestation in the 16th century, one of the centuries in which great increase of population took place in the history of settlement and

[16] Y. Yasuda et al., "The earliest record of major antropogenic deforestation in the Ghab Valley, northwest Syria: a palynogical study", *Quaternary International* 73/74 (2000), pp. 127-136.

[17] See: B. Huntley-H. J. B. Birsk, *An Atlas of Past and Present Polen Maps of Europe 0-13.000 years ago*. Cambridge, 1983; B. Huntley, "Europen vegetation history: paleovegetation maps from polen data-13000 years BP to present", *Journal of Quaternary Science* 5 (1990), pp. 103-122.

[18] See: W. Van Zeist-S. Bottema, *Late Quaternary Vegetation of the Near East*, 1991; N. F. Miller, "The Near East", in ed. W. Van Zeist et al. *Progress in Old World Plaeobotany*, A. A. Balkema, Rotterdam, 1991, pp. 133-177.

[19] See: A. K. Yiğitoğlu, *Türkiye'de Ormancılığın Temelleri, Şartları ve Kuruluşu*, Ankara, 1936; H. Kutluk, *Türkiye Ormancılığı ile İlgili Tarihi Vesikalar 893-1339 (1487-1923)*, Vol. I, İstanbul 1948; Anonymous. *Osmanlı Ormancılığı ile İlgili Belgeler*, Vol I, Ankara 1999.

[20] See: M. A. Cook, *Population Pressure in Rural Anatolia 1450-1600*, Oxford 1972, pp. 15-29; M. Öz, *XV-XVI. Yüzyıllarda Canik Sancağı*, Türk Tarih Kurumu Yayınları, Ankara 1999, pp. 42-52.

[21] If other documents are left aside and only the *tahrir defters* are investigated, these books will be seen to be as many as 1850, and so they can be investigated in a long time and only by founding a workgroup. See: H. İnalcık, *438 Numaralı Muhasebe-i Vilayet-i Anadolu Defteri, Giriş (937/1530)*, Devlet Arşivleri Yayınları, Ankara,1993, p. 1; also see: O. Gümüşçü, Internal migrations in sixteenth century Anatolia, *Journal of Historical Geography* 30 (2004), p. 233.

[22] The definitions of such terms are given below.

population in Anatolia; it is even an introduction to deforestation in Anatolia in the past.[23] In this article, firstly, an overview of deforestation in 16th century Anatolia will be given, and then the extent of deforestation in that century, in which the greatest increase in population took place, will be presented. Since there is no possibility of scanning all the archival documents for the whole of Anatolia, in the context of Hüdavendigar Sancak will be examine in detail the purpose of deforestation, locations and size of deforestation and some issues related to the population growth. After that this subject will be examined in detail in the context of Hüdavendigar Sancak, in addition to this detail it will be analysed for the whole of Anatolia by giving examples from the other parts of Anatolia. As there is no study for other period of Anatolian History, this study is important and it will make a small contribution to the studies for the whole world in terms of environmental change in the past. In other words, the outlines of one component of environmental change, which has occurred up to now, will be illuminated generally.

Deforestation Data in the Ottoman Archival Documents

As mentioned briefly above, the forests of Anatolia have been subject to deforestation by humans from early times. However, to have access to data of the deep past is hard, and, if any, since they are indirect and undetailed, it is difficult to take any clear knowledge from them, if any. In contrast, the data of the period under consideration can be said to be clearer and to include more definite knowledge. Thanks to the documents belonging to the Ottoman period, we have the chance to access clearer and much more definite knowledge on the deforestation in the 15th and 16th centuries.

The documents used in this study are primarily *tahrir defters*.[24] The other documents used are such sources belonging to the 16th century in the Ottoman archives as *mühimme defters* (the *defters* in which important *Divan* (Ottoman Imperial Council) decisions are

[23] On the increase of population in the 16th century and its speed, various studies have been conducted and different ideas have been presented. However, since the studies employ the method of exemplification, it has not been possible to have a total view of Anatolia. We want to announce here that we conduct a study entitled "Population growth and increase rate sixteenth century Anatolia", which will be completed and published in the following years.

[24] For more information on the *tahrir defters*, see: Gümüşçü, "Internal migrations", pp. 231-234 and O. Gümüşçü, *Tarihi Coğrafya*, Yeditepe Yayınevi, İstanbul 2006, pp. 224-227, 317-353; and also see: O. Gümüşçü, "The Ottoman Tahrir Defters as a Source for Historical Geography", *Belleten* 265 (2008), pp. 911-941, (paper presented at the XIIIth International Conference of Historical Geographers, Hamburg, August 2006); see also M. M. Coşgel, "Ottoman Tax Registers (*Tahrir Defterleri*)", *Historical Methods* 37 (2004), pp. 87-100.

recorded), *kanunnames* (code of laws), and *şeriyye sicils* (*kadi* court records).[25] This variety of sources on the whole of Anatolia is also valid for Hüdavendigar *sancak*. The fact that the *mufassal* (detailed) *tahrir defters* used for the *sancak* are already translated to today's letters[26] much facilitated the collection of data for this study. However, it should be noted here that in Hüdavendigar *sancak tahrir*/survey was done in three different years (1487, 1521 and 1573), and that though there is no problem in the 1521 and 1573 *tahrirs*/surveys, there are some defects in the original version of the 1487 *tahrir defter*, and the same defects are also present in its published version. Hence, as will be seen below, the numbers belonging to the year 1487 are generally not taken into consideration. As a matter of fact, the *tahrir defters* do not present direct numerical data on the issue. However, as those on other issues, the data were recorded, as exemplified below, indirectly and so that they could be representative of the whole field in terms of deforestation. The data used in the present study are obtained by counting the indirect records under consideration one by one.

Though the terms and explanations derived from these documents regarding the issue are recorded in a standard and organized way according to the aims of their preparers, they are easy to collect if some time is spent on it. Actually, the handling of the issue in the archival documents is in accordance with the approach of contemporary historians, who take the issue in terms of opening new agriculture areas for collecting taxes rather than of deforestation. Although such terms and explanations in these documents, especially in the *tahrir defters*, as '*balta yeri*' '*baltalık*', '*ormandan açılub*', '*kuhiden açılub*', '*genden tarla açmak*' do not have standard meanings, generally speaking, they mean opening grazing and agriculture lands by cutting trees and clearing bushes.[27]

The subject studied in this article is expressed in the *tahrir defters* and other documents with the following terms and explanations:

> 'taşın ağacın arıdub', 'bir yerün kimesne kökün sökse', 'sonradan kütiğin söküb açılan yerler', 'kendü baltasıyle sahib-i arz marifetiyle açub tarla idüb yiğirmi yıldan berü ziraat eyledüği yerleri', 'bu yirde oturanlar kendüler baltalarıyle çalısun kurub açdıkları yirden öşr virmeyeler', '[bir raiyyet] baltasıyle yeni bir [yer] açа öşrin raiyyet sahibi alur', 'baltalarıyle açdıkları tarlanın öşrlerin dahi kendü sipahilerine virirler', 'baltası ile feth idüb hasbeten lillah zaviye mamur

[25] For general information on the Ottoman archival documents, see: www.devletarsivleri.gov.tr; Anonymous, *Başbakanlık Osmanlı Arşivi Rehberi*, Devlet Arşivleri Yayınları, İstanbul 2000 and E. Afyoncu, *Osmanlı Devlet Teşkilatında Defterhane-i Amire (XVI-XVIII. Yüzyıllar)*, Unpublished Ph. D. thesis, Marmara University, İstanbul 1997.

[26] Ömer Lütfi Barkan-Enver Meriçli, *Hüdavendigar Livası Tahrir Defterleri I*, Türk Tarih Kurumu Yayınları, Ankara 1988.

[27] For comparison, see bkz: Cook, *a.g.e.*, p. 79.

> etmiş', 'balta açuğu', 'kuhi ve ormanlar açılub ziraat olınsa', 'kuhiden açdıkları yirleri', 'mezraa[28] ... kuhiden ihya etmek şartıyle verildüği tafsil olındı'.[29]

As can easily be seen, all these terms and explanations in different documents express deforestation, that is, the cutting of trees and the destruction of forest cover.

In the 1653 Sofyalı Ali Çavuş code of laws (*kanunname*), there are articles that do not presuppose punishment for those who establish settlements by cutting trees from forests. For instance, in one article it is said: "if latecomers or nomads open agriculture areas or establish new settlements as village or *mezraa* (temporary settlements for agriculture) in steppes, woodlands and mountains by destroying forests or cutting trees, such settlements are called '*hariç-ez defter*," (When some people were discovered to be not recorded during the *tahrir*, they were later recorded in a new *defter*, which was called *hariç-ez defter* [not recorded in the register]).[30] As can be observed, the article does not presuppose a certain punishment for the above-mentioned people, but to prevent their flight from *tahrir* (and thus to make them pay taxes), they were recorded in *hariç-ez defter*.

In the Hüdavendigar *liva tahrir defters*, though there is no standard in the data relating to the subject, the data include explanations that are adequately informative. The relevant records detected in the *Defters* that form the basis of this study are recorded as follows:

> 'ormandan açılmış yerlerdir', 'genden açılmış yerlerdir', 'baltaları ile açtıkları yerlerdir', 'kuhiden ve genden açdukları yerler', 'kendü baltasıyla açmıştır', 'dağdan açılmış ziraata kabil yerler', 'yeni açılmış yerdir', 'sonradan açılmış yerdir', 'baltalarıyla açtıkları ormanlıkların öşri alınmıya', 'dağdan açdıkları yerler', 'dağdan ve bayırdan açılmış yerler, 'genden ve kuhiden açılan yerleri ziraat edenler', 'raiyyet yerlerinden ve müsellem ve piyade çiftliklerinden gayri ormanların ve ağaçların baltalarıyla açdukları yerlerin kanun-ı kadim üzere öşürleri alınmıya, deyü buyurulmuşdur', 'çayırdan bazı sökülüb ziraat olunub', 'kendü baltaları ile açdukları yerlerine sipahi taifesinden kimesne dahl etmiye, öşrlerin ve rüsumların almıya', 'dağdan ve genden açılmış yerler, 'genden ve kuhiden açılan yerlerinin dahi öşür rüsumın sipahi alur', 'kendü baltasıyla açılmış, nim', 'Çayır-ı Kazık, evvelde koru imiş', 'kuhiden açılmış yerler: İshak açması ve Duran açması ve Cafer b. Mustafa açması', 'Osman kışlası, kuhiden

[28] For more information on *mezraa* (temporary settlements for agriculture), see: İlhan Şahin, "Mezraa", *Diyanet Vakfı İslam Ansiklopedisi (DİA)*, Vol. 29, İstanbul 2004, pp. 546-548; Halil İnalcık, *Osmanlı İmparatorluğu'nun Ekonomik ve Sosyal Tarihi*, Eren Yayınevi, İstanbul 2000, pp. 209-215. This book of H. İnalcık was published by Cambridge University Press in 1994 with the title "*An Economic and Social History of the Ottoman Empire*". The Turkish translation of the book came out in 2000. All our references to the book are to the Turkish translation.

[29] For the sources and explanations including these terms, see: Cook, *a.g.e.*, p. 79.

[30] Sofyalı Ali Çavuş, *Sofyalı Ali Çavuş Kanunnamesi*, İstanbul 1992, p. 107, such articles also exists on p. 119.

açılmış yerdir', 'Halayık ormanında genden açılmış yer', 'Küçük orman ve büyük orman mezraaları genden açılmış yerlerdir' (pp. 81-474).

As seen, except one term and explanation, the terms and explanations recorded in the Hüdavendigar *liva defters* are undoubtedly all associated with deforestation. The only exception is the term '*gen*', which is open to discussion. However, as seen below, the fact that it has alternative definitions makes this term less problematic for the purpose of this study. It is possible to have different understandings of the term '*gen*' that frequently takes place in the *tahrir defters*. In the *Tarama Sözlüğü*, '*gen*' is defined as an empty space, an unpluoghed and unsowed field, a field not touched by humans.[31] Likewise, in the *Derleme Sözlüğü*, it is defined as: "an area not sowed, ploughed or touched for a period of time and thus covered with bushes; a field opened from an untouched area.[32] In the Dictionary of Turkish[33], it is defined as a field that is left empty without being sowed for a period of time, and in Redhouse as: 'wide, loose, abundant, much'.[34] When we take these definitions and the knowledges in the *tahrir defters* into consideration, the generally accepted definition of the term *gen* can be said to be: 'a raw piece of land or a prairie made appropriate for agriculture by clearing the bushes, trees and grasses on it'.

In the *defters* we have investigated, there is information supporting this definition of *gen*. For instance, the expressions *"kuhiden ve genden açtıkları yerler, Halayık ormanında genden açılmış yer, Küçük orman ve Büyük orman mezraaları genden açılmış yerlerdir, dağdan ve genden açılmış yerler* (the places they open from *kuhi* and *gen*; the place opened from *gen* in the *Halayık* forest; small and large *mezraas* are places opened from *gen*; the places opened from *gens* and mountains)" both indicate that *gen* and forest are used interchangeably and express that *gen* is an opened area in a forest. Furthermore, as will be seen below, when an area in the region on which Hüdavendigar *liva* exists is left unsowed, due to the the climactic conditions and the amount of rainfall, bushes and trees grow on it by themselves in a short time. Such expressions in the *defters as 'dağ yeri olup ziraat olunmamağla orman olmuş'* (' [it is a] mountainous area that became a forest because it was not cultivated) (p. 252)', '*evvelde koru imiş, haliya mezraalıkdan çıkub Hazret-i Hüdavendigar korusu olmuş (*it was previously covered with bushes, but now it has ended up being a cultivated piece of land and become the bush of the Sultan at present*)* (p. 219), and so on indicate that the area becomes a forest when left empty and unsowed.

[31] Anonymous, *Tarama Sözlüğü III*, Ankara 1967, p. 1633, [a Turkish dictionary composed as a result of country-wide survey].

[32] Anonymous, *Derleme Sözlüğü VI*, Ankara 1979, pp. 1988-1989, [a Turkish dictionary composed as a result of a survey on Turkish literature].

[33] Anonymous, *Türkçe Sözlük I*, Ankara 1999, p. 836.

[34] J. Redhouse, *Turkish and English Lexicon*, İstanbul 1992, p. 1558.

Relying on these definitions and explanations, the term *gen* is taken in the present study as the proof of deforestation.

Deforestation in the Hüdavendigar *Sancak*

As has been the case for other states and societies, besides the deforestation done for naval and mining purposes and for satisfying other public needs, in the Ottoman state we come across-the kind of deforestation done by people throughout history. In the Ottoman period, opening agricultural lands, the stockbreeding activities of settled or semi-settled people, the cutting of trees for settlement, for the production of instruments and for fuel requirements, and forest fires, all played their role in the destruction of forests.

It is also known that, one of the main reasons of deforestation results from socio-economic structure of the Ottoman Empire. There is no forestry consciousness in the Ottoman society in today's context, just like other medieval societies in the Middle East. In contrast to agriculture areas that were valued for their revenue generating function, forests were regarded as nothing more than '*reserve places*' that could be used when needed. In accordance with the bullionist economical system employed in the Ottoman state[35], one of the most important incomes of the state was the taxes collected from the public, and thus the economic politics of this state were based on always increasing the tax amounts in the classical Ottoman Period. In the documents, it is even frequently emphasized that one of the main duties of those doing *tahrir*/ survey was to increase the amount of collected taxes[36]. When this point is handled according to the purpose of this study, in this period it is seen that the forests were left open to public use and to the use of the state whenever needed, and for that reason, a flexible and a somewhat indefinite regulation was applied to the forests.[37] Keeping these conditions in mind and taking into consideration the increase of population in this century, the record in the documents of the gradually increasing deforestation towards the end of the 16th century becomes more understandable.

As a natural result of the economic system, in addition to the opening of grazelands and areas for agriculture for more income, the promotion of people or institutions that established settlements also had an ominious effect on forests. For instance, the presence in the documents of such expressions as "*raiyyet yerlerinden ve müsellem ve piyade çiftliklerinden gayri ormanların ve ağaçların baltalarıyla açdukları yerlerin kanun-ı kadim üzere öşürleri alınmıya, deyü buyurulmuşdur* (in accordance with the ancient

[35] For more information on the Ottoman economical structure, see: Mehmet Genç, *Osmanlı İmparatorluğu'nda Devlet ve Ekonomi*, İstanbul 2002, pp. 43-87.

[36] Barkan-Meriçli, *Hüdavendigar*, p. 35; Afyoncu, *Osmanlı Devlet*, pp. 16-20.

[37] M. T. Pehlivanoğlu, "Tanzimat'tan Sonra Orman Yıkımı ve Çevre Tahribi", in *Tanzimat'tan Cumhuriyet'e Türkiye Ansiklopedisi*, Vol. 6, İstanbul 1985, p. 1575.

law it was ordered that people pay no tithe for the areas they open in forests with their axes except for the farms of the tax-paying subjects and those of the auxiliary foot soldiers (p. 180)", and "*kendü baltaları ile açdukları yerlerine sipahi taifesinden kimesne dahl etmiye, öşrlerin ve rüsumların almıya* (*sipahis* (cavalrymen) should not intervene in and collect taxes and tithes for the places people open with their axes)" (p. 221) indicates that people in special positions as *derbendci[pass-guards]*, *köprücü [bridge-keepers]*, *zaviye* ve *tekke* [dervish hospice] servants (these are some of the privileged groups that are exempt from paying tax due to the particularity of their jobs) were regarded as exempt from paying taxes when they established settlements in forests. These expressions also explain the paradoxical situation in the data when it says some people pay taxes when they do deforestation while some others are exempt from paying taxes.

To handle the issue in the context of Hüdavendigar *sancak* after these introductory explanations, it is better to give some information on the administrative system to make the issue more understandable. It is at least necessary to understand what is meant by 'Hüdavendigar *sancak*' (Figure 1). The smallest administrative unit in the Ottoman administrative system, depending on an administrative structure going back to old times, was the village, whose borders were certain.[38] Up to 50-100 villages/*karye* formed a sub-district/*nahiye*, the co-existence of sub-districts formed districts/*kaza*, of districts *sancaks*/*livas* (sub-provinces) and of sub-provinces the provinces/*eyalets*/*beylerbeyiliks*/states.[39]

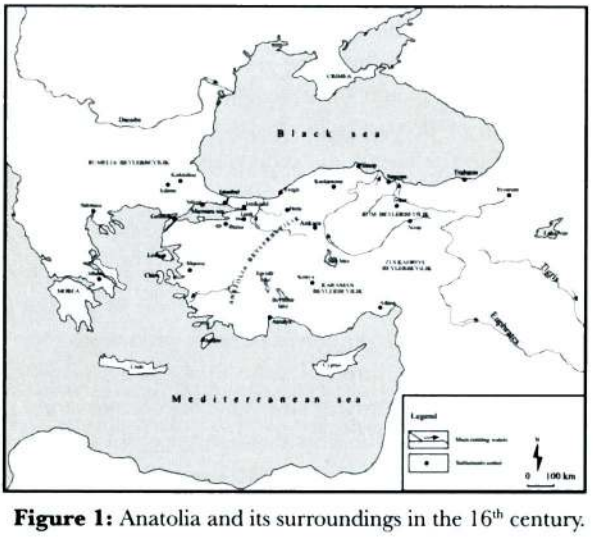

Figure 1: Anatolia and its surroundings in the 16th century.

[38] For more information on village and village borders, see: O. Gümüşçü, "The Concept of Village Boundary From the Ottoman Time to Present", *Archivum Ottomanicum* 24 (2007), pp. 37-60.

[39] For more information on the Ottoman administrative system, see: Halil İnalcık, *The Ottoman Empire The Classical Age 1300-1600*, Phoenix 1995, pp. 104-110.

Hüdavendigar *sancak* (sub-province) (Figure 1) is situated in the northwest of Anatolia, along the southeast coast of the Marmara Sea, roughly speaking, in the area called Bthynia in ancient times and Bursa province today. As this *sancak* corresponded to the area where the Ottoman state was founded, it was the first administrative unit and the administrative core of the state. The *sancak* did not have geographical integrity and thus was characterized with the intervention of other *sancaks* to its borders, which was in a way caused by its being the administrative core of the state. Though changed in different historical periods, according to the 16th century documents, with its about 15,600 km² area, the *sancak* was one of the largest/greatest ones in the period. The *sancak* included a total of 14 districts (*kaza*), one of which being the center, 14 towns, 1,457 villages, 530 *mezraa*s and more than 2,000 settlements (including temporary ones). As a matter of fact, the districts and areameter of the *sancak* frequently changed after its establishment, and became somewhat fixed, as others in the whole of Anatolia, only with the 17th century.[40]

In the south of the *sancak*, there is Uludağ and to its east the western part of the Köroğlu mountains. In terms of climate, it is situated in a passageway for the Mediterranean climate from the west, the black sea climate from the north and continental climate from the east, and so its climate shows the effects of the three climates.[41] When handled with regard to agricultural activities and vegetation cover, the area is quite appropriate in terms of rainfall and temperature for vegetation cover, and thus the climactic conditions make the growth and renewal of vegetation cover possible. The forests existing in the area on which Hüdavendigar *sancak* is situated surpass the average forests in Turkey. These forests are regarded as good in quality and include *fir*, *poplar* and *juniper* trees along the southern side of Uludağ; *Abies bornmulleriana* (Uludağ *köknarı*), *Pinus nigra*, *Populus tremula*, and *Juniperus nane*. On the other hand, over the places near the Coast of Marmara Sea *quercus*, *Pinus brutia*, *tilia*, *fagus* and *fagaceae* trees are spread, while the lower parts are covered with maquis types. In short, in the area there is a rich vegetation cover with forests consisting of *quercus*, *Pinus nigra*, *Pinus sylvestris*, *Pinus brutia*, *Abies*, *juniper*, *fagus*, *fagaceae* and *carpinus* trees.[42]

As can also be seen below, the forests surrounding the Marmara Sea, due to their being close to İstanbul, were constantly exposed to deforestation from the foundation

[40] For more information on the establishment and development of Hüdavendigar *sancak*, also see: Feridun Emecen, "Hüdavendigar Sancağı", *DİA*, Vol. 18, İstanbul 1998, pp. 285-286.

[41] For more information on the climate of the area, see: B. Geyer, Données Géographiques, in ed. B. Geyer-J. Lefort, *La Bithynie au Moyen Âge*, Paris 2003, pp. 27-30; Asaf Koçman, *Türkiye İklimi*, İzmir 1993.

[42] For more information on this subject, see: J. Argant, Données Palynologiques, in ed. B. Geyer-J. Lefort, *La Bithynie au Moyen Âge*, Paris 2003, pp. 175-200; G. Willcox, Les Macrorestes Végétaux, in ed. B. Geyer-J. Lefort, *La Bithynie au Moyen Âge*, Paris 2003, pp. 201-205; Anonymous, "Bursa", in *Yurt Ansiklopedisi*, Vol 3, İstanbul 1982, pp. 1618-1619, 1695-1696.

of the Ottoman state onwards. Especially, the Bolu-Izmit-Bursa forests that cover a large area in the southern and eastern parts of the region were used for naval purposes until the middle of the 19th century and faced deforestation to a great extent.[43] Affirming this fact, the name of the 'Gemlik' town situated in this area, in which the Ottoman state was founded, possibly mean a place where ships were made and came from the word '*gemilik*' (meaning 'shipment', 'the building of ships').

Hüdavendigar *sancak* is an administrative unit containing the city of Bursa, which remained as the second greatest city of the Ottoman Empire (the first being İstanbul) throughout the Ottoman history. As can also be observed in the table below (Table 1), while the population of the city of Bursa consisted of 6,190 household in the year 1521, in 1573 it increased to 12,832 household. Apart from the city of Bursa, the population of the districts increased in the given years from 6,642 to 26,699 household, and that of the whole *sancak* (sub-province) from 20,037 to 39,531 household. Relying on the method Darby[44] proposed for England and Barkan[45] for the Ottoman, the total population can approximately be calculated by multiplying the number of household with the coefficient '*5*'.[46] According to this calculation, the total population in Hüdavendigar *sancak* in 1521 was about 100,000, while in 1573 it increased to approximately 200,000. In brief, these numbers indicate that the population in the *sancak* was doubled in 52 years, which means that the forests were doubly damaged as more and more forests were destroyed for opening grazing and agriculture lands, for satisfying the increasing population's energy, heating and accommodation needs, and for producing equipment.

[43] Pehlivanoğlu, "Tanzimat'tan", p. 1576.

[44] R. A. Butlin, *Historical Geography*, Arnold, London 1993, p. 77.

[45] Ö. L. Barkan, "Tarihi Demografi Araştırmaları ve Osmanlı Tarihi", *Türkiyat Mecmuası* 10 (1953), pp. 1-26.

[46] For more information, see: Gümüşçü, *Tarihi Coğrafya*, pp. 335-336.

Table 1: The total population of the districts over the *sancak* and of the villages where deforestation occurred.

District/ Population	Total household			Total number of *mücerred* (landless single peasant)			The number of household in the villages where deforestation occurred			The number of *mücerred* where deforestation occurred		
	1487	1521	1573	1487	1521	1573	1487	1521	1573	1487	1521	1573
The city of Bursa	0	6,190	12,832	0	1,813	73	0	0	0	0	0	0
The district of Bursa	0	1,258	2,383	0	480	748	0	0	0	0	0	0
Inegöl	350	927	1,710	0	350	1,699	188	172	422	58	88	375
Yarhisar	182	369	893	0	144	233	0	15	57	0	1	20
Ermenipazarı	77	107	416	0	54	114	49	70	136	0	16	39
Domaniç	345	431	936	106	133	784	111	164	381	29	26	270
Yenişehir	198	970	2,506	0	296	937	19	68	256	0	19	92
Söğüd	248	889	1,591	80	295	947	55	78	279	20	21	103
Göl	424	752	1,474	103	341	1,175	124	101	134	25	59	149
Taraklu	661	799	1,568	175	425	1,484	386	429	922	118	255	981
Geyve	357	831	1,487	0	288	1,354	55	45	182	13	13	112
Akyazı	451	778	1,832	0	339	1,816	80	72	201	17	38	231
Akhisar	278	917	1,379	0	407	1,754	16	32	31	2	6	50
Göynük	1,302	1,479	2,327	0	785	2,535	145	158	325	44	95	275
Beypazarı	2,437	3,340	6,197	698	2,317	7,610	143	155	496	45	88	604
Total	7,310	20,037	39,531	-	8,467	23,263	1,371	1,559	3,822	371	725	3,301

Source: Al the tables are collected from Barkan-Meriçli's work entitled *Hüdavendigar Livası Tahrir Defterleri.*

The subject of population increase, which is the main reason for deforestation, can be clearer and more interestingly presented by comparing the total population of the *sancak* with that of the villages where deforestation occurred. As seen in the the table below (Table 2), while the percentage of the change of the population over the *sancak*[47] from 1521 to 1573 was 1,97, that in the villages where deforestation occurred was 2,45. In other words, the population in the villages where deforestation occurred increased faster than the total population of the *sancak* in general, which is the very reason of the destruction of forests in these villages.

Besides the increase in the number of households, there is another piece of evidence that supports the role of population in deforestation. This is the fact that the number of what is recorded in the *defters* as *mücerred* - men who were single and did

[47] The inrease or change index used for population here and for land in the following pages is based on a simple coefficient aquired by dividing the number of the last year with that of the first year.

not own a land - increased faster than the household owning a land. As seen in Table 2, while the increase rate of the total population of the *sancak* is 1,97, it is 2,74 in the population of *mücerred*. When the same values are compared with the villages where deforestation occurred, it is noteworthy that both values are higher in the villages (the increase rate of the household is 2,45 and of the *mücerred* 4,55). In fact, the studies on not only Hüdavendigar *sancak* but on all Anatolia of the period have demonstrated that the population of *mücerred* increased quite fast towards the end of the 19th century.[48] According to the Ottoman law, the *mücerred*s had to get married in order to be able to own land, and, since there was an increase in the population, they were given lands when married either by dividing the already existing lands into smaller parts or by opening new lands in natural areas. When the tables and explanations above are taken into consideration, it can be observed that in Hüdavendigar *sancak* both processes, the increase of population and deforestation, worked concurrently. As can be understood from the greater increase of population in the villages where deforestation occurred, the forests were destroyed to a greater extent in the places where the population increase was higher than others.

Table 2: The total population in the *sancak* and the increase rate of population in the villages where deforestation occurred.

	Household		Increase in household	*Mücerred*		Increase in the *mücerred* population
Year	1521	1573	-	1521	1573	-
Total population of the *sancak*	20,037	39,531	1,97	8,467	23,263	2,74
The population of the villages where deforestation occurred	1,559	3,822	2,45	725	3,301	4,55

It is possible to indicate the pressure of population on land, that is, the opening of new lands for the increasing population also in the Hüdavendigar *sancak tahrir defter*s. The subject will be better understood when the number, quality and approximate width of the agriculture areas recorded in the *defter*s are investigated. When the following tables (Table 3 and 4) are observed, it is seen that in the year 1521 there were 1,931 çifts[49] (çift=holding farm) and 2,012 *nim* çifts (half a çift) in the *sancak*, while in 1573 the

[48] For more information, see: Cook, *a.g.e.*, pp. 26-27. Also see: H. İslamoğlu-İnan, *Osmanlı İmparatorluğu'nda Devlet ve Köylü*, İstanbul 1991, pp. 172-176.

[49] In the Ottoman agriculture system, the word çift was used for the lands that could be ploughed with a couple of ox. A çift was about between 60-150 acres depending on the fertility of the agriculture area. If

number of çifts decreased to 1,641 as the number of *nim çifts* increased to 2,451. On the other hand, the number of *ekinlü* (married peasants in possession of 1/3 a çift) decreased in 1521 from 2,341 to 2,031 as the number of *bennak* (married peasants in possession of ¼ a çift) jumped from 2466 to 8056. These numbers indicate that, similar to what is already said about the Larende district,[50] holding farms whose division was strictly prohibited according to the Ottoman law[51] were divided. As a matter of fact, the division of land supports the thesis of this study not directly but indirectly. However, when the table below is observed, newly-obtained lands can be seen to exist beside the division of the already existing ones. Otherwise, it would be difficult to explain the expansion of the total agriculture land in the *sancak*. Furthermore, the newly-obtained lands do not include the agriculture lands that were acquired through deforestation and that we handle here in detail relying on *zemin*[52] records.

Table 3: Total agricultural lands in the districts of the *sancak* (ha).

District	1487				1521				1573			
	Çift	Nim çift	Ekn	Ben	Çift	Nim çift	Ekn	Ben	Çift	Nim çift	Ekn	Ben
Bursa					192	105	2	470	294	233	72	765
Inegöl					247,5	117	18	280	262	331	85	466
Yarhisar					56,5	21	17	37	51	75	3	274
Ermenipazarı	3	4	2	10	5	1	1	5	8	11	1	42
Domaniç	174	45	2	69	132	-	10	57	142	127	47	222
Yenişehir					149	65	25	178	399	468	9	650
Söğüd	95	45	4	69	129	?	15	51	101	112	14	183
Göl	71	116	105	97	122,5	?	114	102	126	210	88	497
Taraklu	61	155	201	132	118	?	323	109	28	69	206	385
Geyve					98,5	?	258	176	22	24	91	591
Akyazı					116	?	301	168	9	44	180	830
Akhisar					104	252	104	202	17	84	23	558
Göynük					115	397	308	197	48	136	275	621
Beypazarı	441	775	421	367	346	1,054	845	434	134	527	937	1,972
Total					1,931	2,012	2,341	2,466	1,641	2,451	2,031	8,056

the area was *ala*/fertile, the çift was between 60-80 acres; in a place of medium quality/*evsat* 80-120 acres; but if the area was not well-qualified/*edna*, then the çift was between 120-150 acres. *Nimçift* was half of a çift, *ekinlü* was a 1/3 a çift, while *bennak* was a quarter (1/4) of a çift. In some *sancaks*, *bennak* meant a landless married peasant, whereas *mücerred* meant a landless single peasant in all the *sancaks*. For more information on the çift, *nimçift*, *ekinlü* ve *bennak* in the Ottoman agriculture system, see: Ö. L. Barkan. "Avarız, Çiftlik, Öşür, Timar", in: *MEB İslam Ansiklopedisi*; İnalcık, *Osmanlı*, pp. 187-201.

[50] Osman Gümüşçü, *XVI. Yüzyıl Larende (Karaman) Kazasında Yerleşme ve Nüfus*, Türk Tarih Kurumu Yayınları, Ankara 2001, pp. 196-212.

[51] İnalcık, *Osmanlı*, pp. 193-194.

[52] For more information on *zemin*, see: Cook, *a.g.e.*, pp. 76-78.

Table 4: The agricultural lands in the villages where deforestation occurred (ha).

District	1487				1521				1573			
	Çift	Nim çift	Ekn	Ben	Çift	Nim çift	Ekn	Ben	Çift	Nim çift	Ekn	Ben
Bursa												
İnegöl	39	3	1	50	38	1	2	35	6	6	4	63
Yarhisar	-	-	-	-	7	4	-	2	3	5	3	28
Ermenipazarı	3	4	2	10	4	-	-	2	7	9	1	17
Domaniç	47	5	2	17	22,5	-	-	17	36	43	18	49
Yenişehir	-	-	-	-	16	14	1	22	33	34	-	42
Söğüd	18	4	2	13	28	9	4	7	17	29	4	61
Göl	21	1	27	33	35,5	1	18	11	16	30	9	48
Taraklu	47	6	97	75	61,5	8	133	69	17	51	137	252
Geyve	5	9	9	15	12	-	10	7	6	3	7	43
Akyazı	1	1	32	22	14	-	38	15	3	3	110	103
Akhisar	2	3	-	4	-	-	-	-	-	6	1	8
Göynük	17	6	35	33	23	54	43	31	8	24	5	94
Beypazarı	30	7	20	33	24	52	40	27	16	8	8	175
Total	230	89	27	305	284,5	143	289	242	192	340	487	992

In addition to the numbers of çifts, the thesis of this study can also be reinforced by presenting the spatial measurement of çifts, that is, by dwelling on their areameter. Relying on the information given in the *kanunname* of *Hüdavendigar sancak*, it is possible to broadly say that 'a çift is 100 acres, *nim çift* is half of the çift, *ekinlü* 1/3 and *bennak* ¼ of a çift.'[53] If we accept all the çifts in *Hüdavendigar sancak* as medium in quality, that is, if we take the *evsat* (medium) çift as 100 acres (1 acre = 920 square meters),[54] we can derive the conclusion that in *Hüdavendigar sancak* there was a total of 3988200 square meters (398,8 ha) agriculture land in 1521 and a total of 5,113,360 square meters (511,3 ha) in 1573. These values indicate that the total agricultural land in the *sancak* extended 1,125,160 square meters (112,5 ha) in 52 years, and this number becomes more when the space records in the *defters* and the destroyed areas are added to it.

It is possible to support the explanations above also by investigating the increase rate in the size of the land in the given years. When for a clearer and easily understandable comparison we change all the agriculture lands to the size of a çift (as shown in Table 5), it can be seen that there were approximately 4,335 çift across the *sancak* in 1521, while -with a 1,28 increase- this number was 5,558 in 1573. However, when the increase rate in the villages where deforestation occurred is investigated, in the given years the 512,8 çift number can be observed to have increased to 772,3, which means that the increase rate was 1,50. In terms of areameter, the increase was

[53] Ö. L. Barkan, *XV ve XVI. Asırlarda Osmanlı İmparatorluğu'nda Zirai Ekonominin Hukuki ve Mali Esasları Kanunlar*, İstanbul 1943, p. 2.

[54] İnalcık, *Osmanlı*, p. 192.

from 471,776 to 710,516 square meters, and this indicates that the increase rate of land in the villages where deforestation occurred, as is the case of the population increase rate, surpasses the general rate across the *sancak*. In other words, the increase rates of the population and the land take place concurrently, and the existing agriculture and grazing lands were expanded to the disadvantage of forests for meeting the needs of the surplus population.

Table 5: The total of agriculture land across the *sancak* and the quantity of the land in the villages where deforestation occurred [55]

Across the *sancak*						The total of villages where deforestation occurred				
Land/ year	1521	Change[55]	1573	Change	Increase rate	1521	Change	1573	Change	Increase rate
	1,931	1,931	1,641	1,641	0,84	284,5	284,5	192	192	0,67
Nimçift	2,012	1,006	2,451	1,226	1,21	143	71,5	340	170	2,37
Ekinlü	2,341	781	2,031	677	0,86	289	96,3	487	162,3	1,68
Bennak	2,466	617	8,056	2,014	3,26	242	60,5	992	248	4,09
Total	-	4,335	-	5,558	1,28	-	512,8	-	772,3	1,50

As for animal husbandry as one of the main reasons of deforestation throughout history, tracing the records of grazinglands opened for animal husbandry in forests and thus the role of husbandry in deforestation in the Ottoman archives was impossible since no taxes were paid for grazinglands. However, though they do not definitely state it, the archives indirectly suggest the increase in the number of animals and the way this increase harmed to forests because, as it was in all periods, new grazinglands were opened not in the already existing agricultural lands but by giving harm to forests. Moving from this point, relying on the amount of tax taken for sheep and goats throughout the *sancak* (one *akçe* for two sheep or goats) and on the records of the collected tax in the *kanunname*, the number of animals in the *sancak* can be put forward as in the following table (Table 6). When the numbers in the table are observed, it is seen that while in 1521 the number of animals in the *sancak* was 15,986, this number increased to 39,830 in 1571. Therefore, this means that the forests were more and more exposed to deforestation and pressure for feeding the fast growing number of animals in the *sancak* in this 52-year period of time.

[55] During the change here, the total agricultural land is obtained by counting *nimçift* as ½ , *ekinlü* as 1/3, and *bennak* as ¼ of a çift.

Table 6: The number of sheep and goats throughout the *sancak* according to districts.

District	Tax collected/*Akçe*		The number of animals	
	1521	1573	1521	1573
Bursa	-	-	-	-
İnegöl	496	2,183	248	1,092
Yarhisar	40	140	20	70
Ermenipazarı	-	180	-	90
Domaniç	1,460	3,329	730	1,665
Yenişehir	1,730	5,600	865	2,800
Söğüd	220	2,365	110	1,183
Göl	770	4,455	385	2,228
Taraklu	646	6,428	323	3,214
Geyve	490	9,449	245	4,725
Akyazı	675	6,833	338	3,417
Akhisar	985	2,370	493	1,185
Göynük	7,459	7,807	3,730	3,904
Beypazarı	16,998	28,514	8,499	14,257
Total	31,969	79,653	15,986	39,830

As some defects are observed in the *defters* in the records of data concerning animal husbandry in the villages, as it is in the records of husbandry all over the *sancak*, a table was given in the present study to show the numbers related to husbandry in the villages where deforestation occurred. However, it is useful to underline a factor that attracts attention during the investigation of the *defters*. Firstly, the number of domestic animals in 1487 is seen to be higher than that in 1521. Secondly, in contrast to these two *tahrirs*, an obvious increase is observed in the last *tahrir* both in the villages dealing with husbandry and in the number of domestic animals.

When the records concerning this issue in the *defters* are investigated in the light of the information given above, it is seen that though there are no references to deforestation in the first *tahrir* of 1487 and the second *tahrir* of 1521, the last *tahrir*, that is, the one related to 1571 is full of such references. As a matter of fact, such references to deforestation began to be recorded not only in the Hüdavendigar *sancak* but also in all other *sancaks* from the mid 16th century. It is worth note that the date when deforestation began to be recorded was also that in which the population increase trend got faster and internal migration became more intensive[56] in Anatolia. When the documents are investigated in detail, though not concerning Hüdavendigar *sancak*, it is possible to find earlier deforestation records related to the whole of Anatolia. However, when the studies conducted are observed, it is seen that deforestation occurred most

[56] Gümüşçü, "Internal migrations", pp. 239-243.

in the period, that is, in the mid 16th century, when the pressure of the population over area was more than ever before.[57]

Table 7: References to deforestation all over the *sancak* according to districts.

District	The total number of village	The number of village referred to	The total number of *Mezraa*	The number of *Mezraa* referred to	The total number of farms	The total number of reference
Bursa	82	0	0	0	0	0
İnegöl	82	21	57	5	2	25
Yarhisar	35	4	27	1	1	6
Ermenipazarı	13	6	9	2	1	11
Domaniç	51	15	15	1	0	18
Yenişehir	90	7	84	1	0	9
Söğüd	48	9	21	0	10	14
Göl	64	34	52	1	3	16
Taraklu	119	53	13	3	1	60
Geyve	94	9	26	1	8	11
Akyazı	153	17	14	1	0	27
Akhisar	63	1	42	2	1	4
Göynük	265	17	128	1	13	19
Beypazarı	298	36	42	2	14	39
Total	1,457	229	530	21	54	259

To accept the *tahrir* records as factual, it is seen that there are 259 reference records of deforestation in 250 out of 2,041 settlements in Hüdavendigar *sancak* (Table 7). The fact that there is more than one record for some areas has led to an inbalance between the number of residences and the number of references. When all the references to deforestation are taken into consideration, deforestation records are observed to exist in 12,2 % of the residences all over the *sancak*. The district in which the reference record number is highest is Taraklu (60), which is followed by Beypazarı (39), Akyazı (27), İnegöl (25), and Göynük (18). When the following map (Figure 2) is investigated, these districts can be observed to be in the northern and northeast parts of the *sancak*, that is, along the mountainous terrains covered with forests. While deforestation mostly occurred in the forests in such districts as Taraklu, Beypazarı, Akyazı and Göynük, that is, those along the western extensions and southern side of the Köroğlu mountains, less deforestation is observed to have occurred, as in İnegöl, in the districts on the sides of Uludağ. It is noteworthy that the districts (such as Beypazarı, Yenişehir, Göynük, and Akyazı) where deforestation mostly occurred simultaneously have the highest population in terms of households.

[57] For example, see: Cook, *a.g.e.*, p. 11.

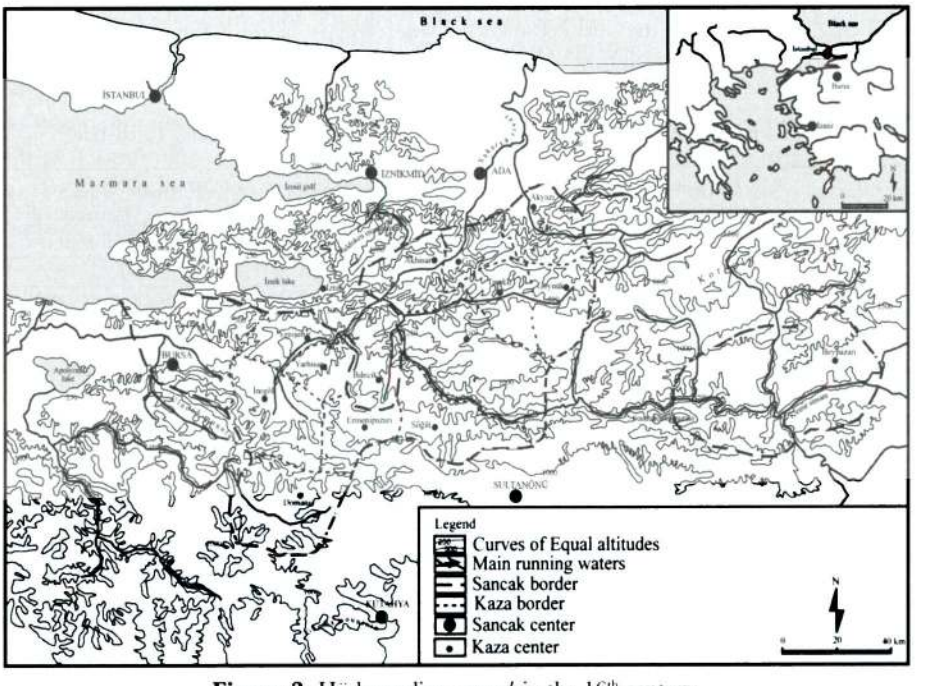

Figure 2: Hüdavendigar *sancak* in the 16th century.

Although the extent of deforestation in the places where forests were damaged was either not explicitly recorded or not recorded at all in the *defters*, the officials who did the *tahrir* gave some information which can be of help for calculating the area in some places (totally in 113 different places) (Table 8). Apart from such units as *çift*, *nim çift*, *resmi-i çift* (a land tax) and *resm-i zemin* (the tax for space) whose size and tax amount were specified in *kanunnames*, there were also lands named as *mudluk*, *kilelik*, *dönüm*, and *zevle*, all of which were smaller than *çift* and called in words indicating their area scale.[58] Even a certain tax collected in some places was sometimes recorded as a different tax in the name of *nakdiye* (cash). Although it does not seem possible to give the total areameter scale of the places where forests were damaged due to the different records and the indefinite proportions of these places in the records, a certain value can be determined depending on the scanty information given concerning the places in which deforestation occurred. When the table below is observed, it is seen that the total size of the area that faced deforestation was equivalent to 19 *çift* -which means 1,748,000 square meters (174,8 ha)-. Depending on *kanunnames*, it is also possible to easily determine the areas specified as *resm-i çift* (tax for *çift*) and *resm-i zemin* (tax for

[58] Or information on these measurement scales, see: İnalcık, *Osmanlı*, pp. 441-448.

space/area) (526,056 m²/52,6 ha). Similarly, when the total areameter scale of the *mudluk* ve *kilelik* places is calculated as 963,847, 2 m²/96,3 ha, the total scale of the areas in which deforestation occurred and on which information was given can be said to be 32,379,032 square meters (323,7 ha) in total. Supposing that the areas of the other 146 references whose units are not specified are not less than this value, the total area scale of damaged forests can be claimed to be two or three times higher than the one calculated here. This number may seem small at first glance and unimportant for a *sancak* that was 15,600 square kilometers. However, this number can be seen to be quite high when we take into consideration the facts that this number occurred in 52 years, which is a short time in natural history, that it is impossible for the forests damaged for agriculture and grazinglands to renovate themselves and that this period of time expressed a process that began before and continued afterwards.

Table 8: The areameter records of the places where deforestation occurred in the districts over the *sancak* in the documents of 1573.

District	Number of deforestation	Farm	*Mudluk*	*Kilelik*	Other
İnegöl	25	3			
Yarhisar	6	2 *nim*			40 *dönüm*
Ermenipazarı	11	1,5			
Domaniç	18	2 *nim*, *Resm-i çift* 66			*Zevle rub* ()
Yenişehir	9	1 *nim*	45 *mudluk*		
Söğüd	14	1 *nim*	10 *mudluk*		
Göl	16	2			
Taraklu	60	*Resm-i zemin* 1584	1 *mudluk*	655 *kilelik*	922 *nakdiye*, *Hasıl* 1100
Geyve	11	1,5 , *Resm-i zemin* 5, *Resm* 2		45 *kilelik*	381 *nakdiye*,
Akyazı	27	6 , *Resm-i zemin* 184, *Resm* 20			*Hasıl* 210
Akhisar	4	2	23 *mudluk*		
Göynük	19	*Resm-i zemin* 66	8 *mudluk*	68 *kilelik*	*Hasıl* 787
Beypazarı	39	1 *nim*, *Resm-i zemin* 20	7 *mudluk*		521 *nakdiye*
Total	259	19 , *Resm-i çift* 66, *Resm-i zemin* 1859	94 *mudluk*	768 *kilelik*	

When the deforestation over the *sancak* is treated in terms of district and the population and area changes are investigated together, it is possible to arrive at the conclusions outlined in the following table (Table 9). As seen in the table, the greatest change in households took place in the districts of Ermenipazarı, Yenişehir, Yarhisar and Akyazı, while the greatest change in the population of *mücerred* is observed to have taken place in Domaniç, Akyazı, İnegöl, Geyve and Akhisar. As there had not

been any decrease throughout the century neither in the household nor in the *mücerred* populations, the change rate was always above "1". However, observing the presence of values less than/below "1" in the area change rate, it is worth noting that there occurred decreases instead of increases in the area rate. The most important change in the rate of sowed and ploughed land is observed to have occurred in the districts of Ermenipazarı, Yenişehir and Göl, while the least change occurred in Akhisar, Göynük, Taraklu, Geyve and Beypazarı, in which, as can be understood from the values less than "1", there had been a decrease in agriculture lands.

Table 9: Population and area change in the districts over the *sancak* between 1521-1573.

District/change	Change of population		Change of area	Number of references
	Household	*Mücerred*		
İnegöl	1,84	4,85	1,49	25
Yarhisar	2,42	1,61	1,42	6
Ermenipazarı	3,88	2,11	3,44	11
Domaniç	2,17	5,89	1,85	18
Yenişehir	2,58	3,16	3,40	9
Söğüd	1,78	3,21	1,41	14
Göl	1,96	3,44	2,06	16
Taraklu	1,96	3,49	0,89	60
Geyve	1,78	4,70	0,92	11
Akyazı	2,35	5,35	1,15	27
Akhisar	1,50	4,30	0,65	4
Göynük	1,57	3,22	0,77	19
Beypazarı	1,85	3,28	0,95	39
Total	-	-	-	259

The fact that deforestation did not occurr in most of the districts in which the greatest population increase took place should not be taken as a paradox to the general argument of this study. The correlation between deforestation and population increase sometimes does not seem to exist in the recorded data because the officials who did the *tahrir* were not always meticulous when taking the records or because things that occurred repeatedly were sometimes recorded as a whole to avoid registering the same things again and again. Such correlation may sometimes seem not to exist also because the administrative borders of the districts were not definite and sometimes villages that were related to one district in the first *tahrir* were related to another district in the second *tahrir*, which is an important challenge for the researchers conducting research on these districts and villages to cope with. In addition, the fact that no *tahrir* was

done in the *sancak* in the 52 years between 1521 and 1573 caused some facts during this period of time to be overlooked, such as recording lands opened by damaging forests as agriculture lands-especially when a long time passed from the opening of the land to the *tahrir*. Therefore, the rarity of the deforestation in the district where the population and agriculture lands greatly increased and where there was a forest cover points to the fact that either deforestation occurred just after the first *tahrir* and the case was forgotten and accepted as normal in time until the next *tahrir*, or such records were not taken for some other reasons.

Deforestation in Anatolia

Having analysed the Hüdavendigar *sancak* as far in detail as the the archival documents permit, it is also useful to dwell on other regions to show that deforestation was not limited to this area. When the documents of the period are investigated, it is seen that a great deal of deforestation data can be found also on many other regions of Anatolia, especially on the coastal regions which even today are intensely covered with forests. Among the studies conducted before, the first one that handled these records, including those on the 16th century, was M.A. Cook's book entitled as "*Population Pressure in Rural Anatolia*", which was published in 1972. As it is not the focus of his study, Cook deals with the subject of deforestation just in passing. However, to test his hypothesis of population pressure in Anatolia, Cook investigates the population rate to economic sources and the change of this rate in time in some districts, and he touches on the issue of deforestation in terms of the enlargement of agricultural areas to meet the needs of the increasing population. Relying on the proof he bases his idea on, he concludes that "*population increase goes ahead of the increase in the sowed areas.*" For calculating the population increase rate to the increase in cultivated areas between 1475-1575, Cook uses an index in which he determines the base point of this rate as 10 to 10 in 1475 and claims that this rate occurred as 12 to 17 in 1575. This means that while the population rate increased from 10 to 17, the area suitable for cultivating increased only from 10 to 12.[59]

The same situation was also valid for the Canik *sancak* in the north of Anatolia, which is studied by M. Öz only in terms of aquiring agricultural land. Certainly, the most important reason behind opening areas in forests is to aquire agricultural lands, but what is meant here is not the acquisition of agricultural lands but the consequence of the action taken, that is, the fact that agricultural lands are opened by damaging forests. In his study, M. Öz states that places of *balta yeri* (places for axe), that is, the places opened in forests in villages were mostly not recorded one by one with respect

[59] Cook, *a.g.e.*, pp. 10-30; İnalcık, *Osmanlı*, pp. 66-67.

to their *raiyyet* names but as a whole, which proves that the extent of deforestation is more than recorded. In the archival documents, the records are given as follows: "*mezbur karyenin hududu (dahilinde)nda reayası kuhiden açdıkları yerlerin mahsuliyle rüsumu (ve sonradan gelüb tavattun iden hariç reayanın rüsumu) karye-i mezbure hasılıyla mahsubdur* (the tax of the things produced in the lands people opened out of forests in the borders of the mentioned village is recorded as a whole together with all the other taxes of the village)". Cook underlines that in the last *tahrir*s the officials of the *tahrir* gave up recording the areas opened via deforestation in many places as *reaya* and preferred to record them together with others. However, in the Canik *sancak* such records in the last *tahrir* (1576) became less widespread when compared to that in 1554. As a matter of fact, the expressions of both *balta yeri* and *kuhiden* are used to refer to the same act. The first expression emphasizes clearing areas from trees and bushes, while the second one points to where the area takes place, that is, to the mountain. In the *defter* dated 1576 there are records of opening lands in forests/*kuhi* in 64 settlements of the Canik *sancak*. 2 of these records belong to Samsun, 19 to Kavak, 5 to Ünye, 12 to Satılmış, 15 to Arım, 8 to Bafra, and 3 to Terme. However, the total amount of deforestation should be noted to be more than that since these records were sometimes taken according to the person and sometimes as inclusive of the whole settlement.[60]

In his study,[61] A. Demir dwelled on the records of *balta yeri* and *kilelik* on the demand of the writers of this article and accessed the following record numbers on the issue in the last *tahrir*, that is, in the Tokat *defter* dated 1571. In the Tokat *sancak*, records of *balta yeri* and *kilelik* have been detected in 33 resedential areas of the district of Kilmigad and 19 areas of Kazabad, a total of 119 records being in the Kilmigad and 52 in Kazabad. These numbers indicate that the records of *balta yeri* that did not exist in the earlier *tahrir*s increased to a great extent towards the end of the century.

In the documents apart from the *Tahrir defters*, it is possible to have access only to indirect data on the issue. For instance, in a book[62] published by the Ministry of Forestry about forestry in the Ottoman period it is said that a petition sent in 1559 to the İznik *kadi* (Muslim judge) requested the obstruction of the cutting of trees for shipment from the forests on the mountains of Eşme, Dikme, and Sapanca (p. 3). Two petitions with similar content were sent in 1560 and 1565 to the Vize *kadi* and the *sancak* governor (p. 7 and 19). In another petition, dated 1565, there were requests concerning cutting trees for shipment from the mountains surrounding İznik (p. 17). Another one, which was sent in 1566 to the *kadis* of Hasköy/Khaskovo, Yanbolı/

[60] Öz, *XV-XVI. Yüzyıllarda*, pp. 45-46.

[61] Alpaslan Demir, *XVI. Yüzyılda Samsun-Ayıntab Hattı Boyunca Yerleşme ve Nüfus*, Ankara University, unpublished Ph. D. Thesis, 2007.

[62] Anonymous, *Osmanlı Ormancılığı*.

Yambol, Kırkkilise/Kırklareli, Ferecik/Ferea and Gümülcine/Komotini, requested not cutting trees from forests and using them for *kışlak* and *ağıl* (=temporary settlements established for stockbreeding) and not using forests for grazing livestock and hunting (p. 23). Two other petitions dated 1566 were also on the same issue (pp. 25-26). Together with the examples in the book under consideration, it is possible to find such records also in many other books,[63] and this shows the popularity of the subject in the period.

It is also necessary to mention here some of the indirect data on social groups and communities whose lives depended on forestry. '*Tahtacılar*', lit. wood-cutters, took their name from their work and was one of the most outstanding communities of the period. This community, which continues to exist even at present, has been living throughout in the forests areas of the Mediterranean and Aegean regions and working in jobs related to trees and forests.[64] Apart from this group, communities named as *Cemaat-i Baltacıyan* and *Cemaat-i Bedevreciyan*, which directly lived on cutting trees and forestry. In the district of Sinop, the '*baltacıyan* community' was recorded to exist in four villages and to consist in 1487, of 17 household (h) and 4 *mücerred* (m), in 1530, of 29 h, in 1560, of 28 h and 6 m, and in 1582, of 26 h and 16 m, all of whom lived on cutting trees from forests for ship and tower buildings when needed. Similarly, the '*cemaat-i bedevreciyan* (the community of *bedevreciyan*),' which met the wood needs of these places, was recorded to include in 1487, 8 h and 6 m, in 1530, 9 h and 6 m, in 1560, *nefer* (a person of tax paying age) and in 1582 a total of 11 *nefer*.[65]

As understood from the documents, a great deal of the forests in the Ottoman lands faced deforestation due to the various reasons mentioned above. Keeping aside other reasons and taking into consideration only the deforestation made to meet the wood needs of the navy, it is seen in the documents that the wood needs of the navy were met particularly from the forests in the areas closely surrounding of İstanbul. However, since this process began in the Byzantian period, the forests in the area closely surrounding İstanbul were supposedly already quite damaged in the middle of the 16th century. İ. Bostan, who works in the navy, affirms this information and states that the wood used for ship building in the İstanbul Haliç Navy Yard was mostly supplied from the area surrounding İstanbul.[66] The fact that the Byzantians had navy yards in such centers as İstanbul and İzmit before the Ottomans shows the existence

[63] For more information, see: Yiğitoğlu, *Türkiye'de Ormancılığın*, Ankara 1936; Kutluk, *Türkiye Ormancılığı*, Ankara 1948; Çağlar, *Türkiye'de Ormancılık Politikası*, Ankara 1979; İ. Bingöl, *Geçmişten Günümüze Ormanlarımız ve Ormancılığımız*, Vol. I-II, Ankara 1990.

[64] For more information on *Tahtacılar*, see: Y. Z. Yörükan, *Anadolu'da Aleviler ve Tahtacılar*, Kültür Bakanlığı Yayınları, Ankara 1998; A. Selçuk, *Tahtacılar*, Yeditepe Yayınevi, İstanbul 2004.

[65] M. A. Ünal, *XV-XVII. Yüzyılda Sinop Kazası*, Fakülte Kitabevi, Isparta 2008, pp. 94-95.

[66] For more information on the issue, see: İdris Bostan, *Osmanlı Bahriye Teşkilatı: XVII. Yüzyılda Tersane-i Amire*. Türk Tarih Kurumu Yayınları, Ankara 1992.

of forests suitable for shipment in the region. Besides those mentioned above, the existence of such navy yards in the 16th century close to this region suchas Sapanca, Şile, Kefken, and those a bit farther such as Gelibolu, Silivri, Akçaşehir, Alaplı, Ereğli[67] is completely related to the forests in the region. When others are kept aside and only the acts of the navy yards in İstanbul are taken into consideration, it is observed that from 1527 to 1585 a total of 83 ships were built while 260 ships were maintained and repaired. When the same issue is investigated for the following years, the pressure on the forests in the region is seen to have increased instead of decreased. In the İstanbul navy yard from 1610 to 1701 a total of 317 ships were built and 808 ships were maintained and repaired. In the same study, it is possible to observe the increasing pressure on forests also by taking into consideration the fact that the forests used for shipment were accumulated over the areas in the eastern and southern parts of the Marmara Sea.[68]

As said above, when the documents are investigated, it is seen that until the mid 16th century the trees needed for shipment had either decreased or almost totally disappeared, and this indicates that trees from placesa bit farther away began to be requested for naval purposes. It is possible to confirm this fact from the documents published in the book mentioned above[69]: For instance, in a document dated 1559, there is a petition sent to the governor of Rhodes which stated the demand for trees suitable for shipment and requested the search for whether such trees were present in Rhodes and its surrounding areas (p. 5). In another document dated 1571, wood needed for naval purposes was requested from the Sinop *kadi* (p. 5).

Apart from these data that directly prove deforestation, we can also touch upon the efforts for changing the tree types in the forest cover. Actually, in an Ottoman lawbook (*kanunname*) dated H. 971/M. 1563, such records as

"dağlarda ve ormanlarda yetişen hudayi nabit ağaçları birisi sipahiden müsaade alarak aşılasa onlar aşılayanın mülkü olur, meyvesini o kimse toplayarak yalnız öşrünü sipahisine verir. Dağda ve ormanda yetişmiş hudayi nabit meyve ağaçları ki bunlar aşılanmamıştır, bunları yemişi ile sahipsiz arazilerde yetişen ota kim sahip çıkar toplar ve biçerse onun olur, bundan öşür alınmaz, ancak iyi muhafaza edilmesi şarttır (If by getting permission from the cavalryman/*sipahi* a person inoculates, looks after and reaps trees that grow by themselves on mountains or in forests, these trees become his own; however, he should pay their tax to the cavalryman (*sipahi*). The non-inoculated trees and grass that grow in nature are also subject to the

[67] Bostan, *Osmanlı Bahriye*, p. 29.

[68] Bostan, *Osmanlı Bahriye*; for the number of ship building, repair and check, see: p. 6 and pp. 99-100. And for the places from where the wood needs were met, see: the attached map.

[69] Anonymous, *Osmanlı Ormancılığı*.

same application; if a person reaps the trees and looks after the grass and saws it, he does not pay tax for the product, but he should take care of the trees and the grass and get the product without giving harm to the trees)" [70]

indicates that the tree types in the forest cover were changed. The presence of such articles in the *kanunnames*, though they are not direct expressions of deforestation, can be seen as facilitating deforestation by promoting the change of tree types in the forest cover. In the studies conducted on the issue, it is demonstrated that the tree types in the forest cover of Anatolia were changed due to the grazing of animals that lasted for thousands of years, and, among these studies, a study conducted by Hütteroth states that the wide forests of pine trees existing in Anatolia were changed into forests of oak trees after being destroyed.[71]

Conclusion

As can be seen, from the discussion so far, because of its geographical position and historical characteristics, Anatolia has been one of the main areas in the world subjected by humankind to deforestation from the beginning of its history. This process, which began with the invention of fire, has continued until the present and has been gradually speeding up with forest fires, acts of mining, and opening agriculture and grazing lands, settlements, and roads, all of which show the ominous effect of human intervention. While the deforestation before the Ottoman period was detected as far as recorded in historical data, which were most of the time indirect and touched upon the issue just in passing, it is possible via the Ottoman archives to have access to direct and indirect data on the deforestation in the Ottoman period that present much more definite information on where, with what purposes and to what extent deforestation occurred in this period.

Primarily from the *tahrir defters* and from such other documents as *mühimme defters*, *kanunnames*, and *şeriyye sicils* it is understood that the forests in the coastal regions of Anatolia were exposed to deforestation throughout the Ottoman period. The forests along the coasts of the Black Sea, Marmara Sea, Aegean Sea and Medirranean Sea, especially those around the capital city İstanbul with its huge population, always faced deforestation for ship building and minery, and for providing the increasing population with agriculture and grazing lands, settlements, heating facilities, equipment, and energy. This deforestation culminated particularly in the 16th century simultaneously with the rapid increase of population; forests were damaged in this century to meet

[70] Hadiye Tuncer, *Yavuz Sultan Selim Kanunnamesi*, Tarım Orman ve Köyişleri Bakanlığı Yayınları, Ankara 1987, p. 36.

[71] Hütteroth, Ecology, pp. 25-26.

the growing needs of the population and for the sake of opening new agricultural and grazing lands and establishing settlements. Certainly, though not much recorded in the archival documents, the forest fires that have taken place throughout the history of Anatolia -from the early times until the present- which still cannot be prevented, make the issue of deforestation more tragic.

The forests in the inner parts of Anatolia became in time anthropogenic steps after being destroyed because the geographical and climactic conditions were not appropriate for their revonation. In the coastal areas, on the other hand, depending on the appropriate climactic conditions, the forests that were destroyed could renovate themselves in a short while and thus in these areas the process of deforestation depended on the extent of destruction done by people. Since it was on the coast of the Marmara Sea, which had a rich forest cover that could renovate itself, the Hüdavendigar sancak faced deforestation from its early times onwards. In addition, its closeness to Bursa as well as to İstanbul, which were the greatest cities of the time, played an important and accelerating role in the deforestation. Among other reasons, the fast increase of the population in the sancak (as well as all over Anatolia) in the 16th century played a detrimental effect on forests, as more and more agricultural and grazing lands were opened to meet the growing needs of the population. As far as can be understood from the documents, in this process, from the mid 16th century to the end of the century, forests and other vegetation cover an area of approximately 323,7 ha, that is, 650-700 ha were destroyed and opened to agriculture. Particularly, deforestation was on a high level in areas situated in the southern and eastern parts of the sancak such as Taraklu, Beypazarı, Akyazı and İnegöl where there was a rich forest cover, whereas in other places less deforestation records exist. According to the calculations done here, the areawhich underwent deforestation in the sancak seems at first glance to be small when calculated in terms of the areameter of the sancak; however, the issue becomes much more important when one takes into consideration that the deforestation involved occurred in a 52-year period of time, which is rather short, the forests destroyed could not renovate themselves and that this process accelerated in the following periods.

We have also observed that deforestation occurred in the 16th century even in such a narrow area as Hüdavendigar sancak, which suggests the extent of deforestation which took place in Anatolia as a whole in this period. As it is in other regions of the world, the process of deforestation is known to have continued in Anatolia after the century under consideration.[72] Furthermore, it has doubtlessly accelerated in parallel to population increase and growing population needs. For whatever purpose and in whatever way it is done, deforestation is an important issue and has become today a means of ecological change that should be prevented. As a matter of fact,

[72] For the comparison and late Ottoman period deforestation see: Hütteroth, "Ecology", pp. 26-27.

though it has occurred throughout history, its danger for humanity and the ecology has been realized only in the last century. The subject of deforestation that has always been important in the history of Anatolia is today a much more crucial problem. Though this is true for the entire world, unfortunately studies on its process and solutions are conducted almost only in western countries. This study, which may be a small contribution to these studies, is in a way an introduction to the investigation of deforestation in Anatolia. Certainly, this short introduction is not enough and for a more comprehensive view of the matter in Turkey further studies should be conducted and in spatial terms a larger area should be explored.

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