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Environmental History as an Emerging Field in Ottoman Studies: An Historiographical Overview

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Osmanlı Araştırmalarında Oluşan Bir Alan Olarak Çevre Tarihi: Tarih-yazıcılığı Açısından bir Değerlendirme

Özet ■ Çevre tarihi insanlar ve etraflarındaki doğal ortam arasındaki karşılıklı ilişkiyi inceleyen bir alt disiplindir. 1970'lerden itibaren iklim değişikliği gibi küresel çevre sorunlarının artmasıyla beraber oluşan manevi kaygılarla doğmuştur. Çevre tarihi, çevresel değişimin insan hayatına olan etkisini, insanların etraflarındaki doğal ortamı nasıl kullandıklarını, algıladıklarını ve koruduklarını araştırır. Çevre tarihi şüphesiz tarihsel değişimlerin anlaşılmasında yeni bir bakış açısı getirmektedir. Osmanlı tarihçilerinin çevre tarihinin perspektifinden bakmaya başlaması ve Osmanlı İmparatorluğu'nda yaşanan siyasi, ekonomik, sosyal değişimlerin çevresel boyutlarına olan ilgisi henüz çok yeni bir olgudur. Bu makalenin amacı Osmanlı tarihçilerinin ilgisini çevre tarihine çekmek ve çevre tarihinin Osmanlı tarihçilerini keskin coğrafi, siyasi ve ulusal sınırların ötesinde yeni bir tarih anlayışını geliştirebilecekleri konusunu irdelemektir.

Anahtar kelimeler: Çevre tarihi, Osmanlı İmparatorluğu, Tarih yazımı, Eko-Tarih

As global environmental problems such as climate change, ozone depletion, rainforest deforestation, desertification, urban sprawl, and water and air pollution have become more serious, growing numbers of individuals, groups, governmental, and non-governmental actors, as well as businesses, have become more involved in environmental decision-making and issues. Environmental problems

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of a different kind, especially global warming, have raised the awareness and environmental consciousness of the global community. Historians have begun to take part in environmental debates and have suggested that current environmental issues are not only a recent problem or something that may happen in the future, but are complex issues with a long historical past. Environmental history is an emerging field in Ottoman studies which acknowledges the interrelation between ecological change and historical transformations in the Ottoman Empire. This article is an attempt to introduce historians, researchers, and students of the Ottoman Empire to this new field, to review the existing methods and approaches in Ottoman environmental history, and to discuss recent studies that deal with the environmental history of the empire.

What is Environmental History?

Environmental history first appeared as a new sub-discipline in the United States in the 1960s and 1970s and since then has spread to all parts of the world. The American environmental historian Roderick Nash was the first to explore the definition of the term “environmental history.” He argued that environmental history “refers to the past contact of man with his total habitat.”¹

After Nash, environmental historians throughout the world have attempted to define environmental history, identify its key concepts, and produce theories and methods in the field. Donald Worster has defined environmental history as “the interaction between human cultures and the environment in the past.”² John R. McNeill has suggested that environmental history is “[...] the history of the mutual relations between humankind and the rest of nature.”³ Environmental historians tend to see their fields in different ways but, as a very basic definition, environmental history is a discipline that researches the interaction between humans and their natural environment throughout time and explores the impact of environmental change on people’s lives as well as people’s use, perception, management, and conservation of their surrounding environment.

American environmental historians with their definitions, theories, and novel ideas and approaches have always been the most active, organized, and prolific

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- 1 Roderick Nash, “American Environmental History: A New Teaching Frontier,” *Pacific Historical Review* 41 (1972): 363.
 - 2 Donald Worster, ed., *The Ends of the Earth: Perspectives on Modern Environmental History* (Cambridge; New York: Cambridge University Press, 1988), 289.
 - 3 John R. McNeill, “Observations on the Nature and Culture of Environmental History,” *History and Theory* 42, no. 1 (2003): 5–43.

among their colleagues in the discipline. *The Environmental History Newsletter*, first published in April 1974, was the first scholarly periodical in the field. In the March 1976 issue of the newsletter the authors called for the establishment of a journal as well as an organization. In 1976, a quarterly journal, *Environmental Review*, was launched, continuing as *Environmental History Review* in 1990, and as *Environmental History* in 1996. Finally, the American Society for Environmental History (ASEH), the first academic organization in the field of environmental history, was founded in 1977. Since then, American environmental historians have become established in a number of universities and research institutions; launched various undergraduate and graduate degree programs; organized annual meetings and conferences; published volumes of books, journals, documents, reports, and newsletters; formed active academic organizations, pioneered new directions in environmental historical studies, and promoted the establishment of environmental history as a more mature sub-discipline.

Following the work of their colleagues in the United States, academics in other regions and countries in the world have launched environmental history studies. In Europe, environmental history has developed concomitantly with environmental problems such as deforestation, air and water pollution, acidification of lakes in Northern Europe, and the Chernobyl disaster of 1986 in Ukraine. It has thrived within various institutions such as the Center for Environmental History, European Association for Environmental History, European Society for Environmental History, and the Institute for Environmental History (IEH).⁴ In Europe, there are several journals in the field of environmental history, such as *Environment and History*, *Environmental Values*, *Economic and Ecohistory*, and *Global Environment*.

Scholars have researched various aspects of environmental history in the Ottoman Empire from different angles. Existing studies have examined the human impact on natural and urban environments, changing ecology of the past, human adaptation to changing ecological circumstances, and the effects of government policies with environmental consequences. Although such studies help us to rediscover the ecological past and provide valuable information about the long-term relationship between human and environment in countries that once constituted the Ottoman Empire, the majority of these studies have been classified

4 Verena Winiwarter, ed., "Environmental History in Europe from 1994 to 2004: Enthusiasm and Consolidation," *Environment and History* 10, no. 4 (2004): 501-30. For further information about the Center for Environmental History (Zentrum für Umweltgeschichte): http://umweltgeschichte.uni-klu.ac.at/home_en.php; European Association for Environmental History (EAEH): <http://www.uea.ac.uk/~e490/eah.htm>; the European Society for Environmental History (ESEH): <http://eseh.org/>; and the Institute for Environmental History (IEH): <http://www.st-andrews.ac.uk/institutes/envhist/>

under geography, ecology, and different sub-fields of Ottoman history, such as economic, fiscal, agricultural, and political/social.⁵ Each of these sub-fields is more or less related to environmental history. Fragments of information about environmental conditions can be found in the studies of economic, social, fiscal, or agricultural historians of the Ottoman Empire, and this verifies the scholarly interchange between environmental history and other sub-disciplines.⁶ Nevertheless, despite this interaction and interchange, historians have generally identified themselves with one of the sub-fields, but not with “environmental history.” Nor have articles attempting to formulate the history, theory, and methodology of Ottoman environmental history appeared in Ottoman history texts. In other words, Middle East and Ottoman historians have been latecomers to environmental history and the field is still very small.

The vastness of the Ottoman Empire, spanning three continents and over two million square miles, as well as its longevity of more than six centuries make an all-encompassing historiographical study of the empire a difficult task. Therefore, in this article I prefer to review the existing studies on Ottoman environmental history categorically, by subdividing them into several categories and themes. This preference is due to two reasons. Firstly, a review or an assessment that is made on the basis of political geography can be misleading because political boundaries, nation-states, designations, and constructs lose their meanings in environmental historical studies. A political or geographical entity with nothing in common with neighboring entities in terms of its political, economic, or cultural characteristics, can have much in common in its ecological, topographical, or climatic conditions. Or, a region that is politically uniform can be diverse in its botanical, zoological, and biological characteristics. For example, the autonomous district of Mount Lebanon, which is smaller than the U.S. state of Connecticut, was ecologically

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- 5 The Annales School has significantly influenced Ottoman studies and historians have investigated long-term changes in the Ottoman Empire. Historians of demographic change in the Ottoman Empire were the first to adopt the Braudelian notion of “*temps de longue durée*”. Later, it has been taken by world-system theorists and others. For some studies under the influence of the Annales, see Ömer L. Barkan, “La Méditerranée de Fernand Braudel vue d’Istanbul,” *Annales, E.S.C.* (1954): 189-200; Michael Cook, *Population Pressure in Rural Anatolia 1450-1600* (London; New York; Toronto: Oxford University Press, 1972).
 - 6 For some economic, social, fiscal, and agricultural historical studies that include information about environmental conditions, see Wolf-Dieter Hütteroth and Kamal Abdul Fattah, *Historical Geography of Palestine, Transjordan, and Southern Syria in the late Sixteenth Century* (Erlangen: Palm & Elke, 1977); Bruce McGowan, *Economic Life in the Ottoman Empire: Taxation, Trade, and the Struggle for Land, 1600-1800* (Cambridge: Cambridge University Press, 1981); Nenad Močanin, *Town and Country on the Middle Danube 1526-1690* (Leiden; Boston: Brill, 2006).

more diverse than many other larger districts and provinces in the empire. Secondly, a chronological review is not an easy task because environmental history does not follow a linear chronological path and environmental historians do not necessarily resort to the periodization made by political, economic, and social historians. Environmental historians focus on processes rather than events and think in terms of decades and years instead of weeks and days. They look at the “big picture” and understand long-term interactions between humans and their natural environment. In this respect, the environmental historian’s periodization of Ottoman history is not rigidly divided into the classical period, the early modern period, and the modern period. His division of time into historical periods can be parallel to but independent from the major political events, issues, and personalities.

Before Global Warming: The Little Ice Age

Political and public debates regarding global warming and its effect on the planet have triggered the interest of historians in climate history. Despite a growing interest in global warming and its impact on people, climate change in the past is still one of the neglected themes of Ottoman environmental history. The neglect of the effect of climatic change on environment and population is due to the combination of two facts: the Ottoman sources regarding the climate are scattered and the existing evidence has not been investigated in depth by researchers.

Ottoman history has not been explored from a historical-climatological point of view due to the scarcity of information regarding temperature, precipitation, wind speed and direction, snow-cover, and atmospheric pressure in the past. A major obstacle is that meteorological observations in Turkey and other succeeding nation-states of the Ottoman Empire did not begin until the 1920s. One way to reconstruct the climate history of the Ottoman Empire, which has not yet aroused the interest of historians, is to use other types of existing documents and accounts, such as travelers’ descriptions, consular reports, government correspondence, and any other kind of written documentation about earlier centuries. Although some are written with bias and inaccuracy, these documentary sources are of great value to the historians of the Ottoman Empire. They give detailed information about weather conditions, periods of bitter cold, heavy snow, drought, precipitation, rainfall and floods, agricultural production and harvest in specific regions and time periods.

Only a handful of historical climatologist and glaciologists have studied the climate in the Ottoman Empire. Jean M. Grove, with Annalisa Conterio, has examined the letters and reports sent to the doge by the Venetian merchants and

emissaries on Crete to study climatic change in the Eastern Mediterranean. These letters included information about weather conditions and have helped Grove and Conterio to reconstruct the climate of Crete in the 16th and 17th centuries. Focusing on the “Little Ice Age,” they have presented the change of climatic conditions in Crete between 1548 and 1648 under different subheadings such as winter and spring droughts, exceptionally severe winters, deluges, summer rains, all explained by statistics, charts, and graphics.⁷ The Little Ice Age, which stretched roughly from the mid-16th to the late-17th century, had an overwhelming impact on living creatures of every kind, and manifested itself in the Ottoman Empire, as in many other places, as a steady decline in temperature, characterized by freezing winters and wet summers, which caused heavy snow and rainfall and inundations.⁸ The failure of crops during the Little Ice Age contributed to the political, economic, and social crises in Anatolia in the 16th and 17th centuries.

The turmoil of this period can be further researched by studying dendrochronology and dendroclimatology.⁹ Both disciplines involve the study of tree rings in order to understand the amount of rainfall in the past centuries. In fact, dendrochronology and dendroclimatology, when used in conjunction with other methods, can offer historians valuable insights about vegetation and precipitation in the past. Peter Ian Kuniholm has directed the Dendrochronological Project of Cornell University and, with Cecil L. Striker, has shown the use of systematic dendrochronology as a tool in the understanding of environmental change in the Eastern Mediterranean. In their articles, Kuniholm and Striker have suggested that the Celali revolts in the Anatolian countryside in the late 16th- and early 17th-century went hand in hand with severe

7 Jean M. Grove and Annalisa Conterio, “The Climate of Crete in the Sixteenth and Seventeenth Centuries”. *Climate Change* 30 (1995): 223-47. For another study of Grove and Conterio, see “Climate in the Eastern and Central Mediterranean 1675-1715,” *Paleoklimaforschung: Paleoclimatic Research* 8 (1992): 274-85.

8 For detailed information on the Little Ice Age, see Emmanuel Le Roy Ladurie, *Times of Feast, Times of Famine: A History of Climate since the Year 1000* (Garden City, N.Y.: Doubleday, 1971); Hubert H. Lamb, *Climate, History, and the Modern World* (London; New York: Methuen, 1988); Jean M. Grove, *The Little Ice Age* (London; New York: Methuen, 1988); Christian Pfister, Rudolf Brázdil, and Rüdiger Glaser, *Climatic Variability in Sixteenth-century Europe and its Social Dimension* (Dordrecht [The Netherlands]; Boston; London: Kluwer Academic Publishers, 1999); Jean M. Grove, *Little Ice Ages: Ancient and Modern* (London; New York: Routledge, 2004); and Rudolf Brázdil, *Historical Climatology* (Dordrecht [The Netherlands]: Springer, 2005).

9 Dendrochronology is the science dealing with the study of the annual rings of trees in determining the dates and chronological order of past events. Dendroclimatology is the science of determining past climates from tree rings.

climatic conditions.¹⁰ The Laboratory of Tree-Ring Research at the University of Arizona has also applied dendrochronology to improve understanding of natural environmental variability in climatic, hydrologic, geomorphic, and ecological systems and their interactions with human societies. In this project, Ramzi Touchan, in collaboration with Malcolm Hughes and other colleagues, has conducted the first large-scale systematic dendroclimatic sampling for the Eastern Mediterranean and the Middle East and published several articles with information about large-scale climatic patterns. Data generated by Touchan and his colleagues' researches has provided an understanding of climate history of the Mediterranean and the Middle East in the past and are of great value for Ottoman historians.¹¹

Two historians who have used both dendrochronological data and European and Ottoman literary sources in their studies should be mentioned. The first is William J. Griswold, who has emphasized the role of climate in the Celali revolts and proposed that climatic change may have contributed to the "awful social malaise" of that time.¹² By establishing the causal link between harsh climatic conditions and the Celali revolts, Griswold has contributed to Ottoman political, military, and socio-economic history from a climatic point-of-view. The second is the American environmental historian Sam White, who has studied the impact of the Little Ice Age on the socio-political and socio-economic life of Ottoman society in the 17th and 18th centuries. In his comprehensive study, White has explored the sharp demographic, socio-political, and economic contraction the Ottomans experienced in the late-16th and 17th centuries from the perspective of environmental history. He has argued that the dynamics of the socio-economic

10 Peter Ian Kuniholm and Cecil L. Striker, "Dendochronological Investigations in the Aegean and Neighboring Regions, 1977-1982" *Journal of Field Archaeology* 10, no. 4 (Winter 1983): 411-20; and Idem., "Dendochronological Investigations in the Aegean and Neighboring Regions, 1983-1987" *Journal of Field Archaeology* 14, no. 4 (Winter 1987): 411-20. In their articles, Kuniholm and Striker attempt to understand ecological change through the systematical investigation and analysis of tree rings in Greece, Cyprus, and Turkey.

11 Ramzi Touchan, et al., "Preliminary Reconstructions of Spring Precipitation in Southwestern Turkey from Tree-ring Width," *International Journal of Climatology* 23 (2003): 157-71; Ramzi Touchan, et al., "Reconstructions of Spring/Summer Precipitation for the Eastern Mediterranean from Tree-ring Widths and Its Connection to Large-scale Atmospheric Circulation," *Climate Dynamics* 25 (2005): 75-98; and Ramzi Touchan, et al., "May-June Precipitation Reconstruction of Southwestern Anatolia, Turkey During the Last 900 Years from Tree Rings," *Quaternary Research* 68 (2007): 196-202.

12 William J. Griswold, *The Great Anatolian Rebellion, 1000-1020/1591-1611* (Berlin: K. Schwarz, 1981) and Idem., "Climatic Change: A Possible Factor in the Social Unrest of Seventeenth Century Anatolia," in *Humanist and Scholar: Essays in Honor of Andreas Tietze*, ed. Heath W. Lowry and Donald Quataert (Istanbul: ISIS Press, 1993): 37-57.

system in the Ottoman Empire were altered by a combination of environmental and climatic factors. In other words, White has suggested that the Little Ice Age and its environmental stress played a major role in the breakdown of Ottoman provisioning systems and the outbreak of the Celali Rebellion and subsequent political crises. These crises, combined with the impact of recurring climate extremes, drove widespread population movements, shifts in land use, and demographic contraction.¹³ Indeed, there were many cases of unrest in the late 16th and 17th centuries, sparked by both social and environmental stress, which need to be explored by Ottoman environmental historians.

Landscapes Changed, Lives Transformed

The history of landscape change is one of the major subjects of environmental history. Changes in nature itself have always existed, but incessant human activity in the past few centuries has become the leading impetus for landscape change. The physical environment has changed rapidly and dramatically with the increasing scope and scale of human activities. In most cases, it is advancements in technology and science that have made it possible for humans to control, manipulate, and change the environment they lived in. At the same time, natural hazards, such as earthquakes, fires, floods, volcanic eruptions, droughts, and landslides, have an impact on the change of natural landscape.

Ottoman landscapes changed between the 13th and 20th century due to natural and non-natural factors. It is difficult to talk about an overall transformation of Ottoman lands since the empire was vast and home to diverse ecological systems, geological regions, and climatic zones. Geology, physiography, habitation, flora, and fauna varied from one region to the other, and even within the same *vilayet* or *sanjak*. Therefore, it would be fair to claim that the extent of change was not the same everywhere and each region in the empire has its own distinct history of landscape change, which was the result of local human activity, macro- and micro-scale environmental conditions, as well as climatic, ecological, and biological factors.

The Little Ice Age changed, if not transformed, Ottoman landscapes. Low-altitude landscapes suffered from inundations, epidemics, crop failures, and population decline during this period ranging over several centuries. As a result of climatic changes, low-lying plains all around the Mediterranean flooded, turning into marshy swamps and exposing the population to poverty, famine, and epidemics such as

13 Sam White, *The Climate of Rebellion in the Early Modern Ottoman Empire* (Cambridge; New York: Cambridge University Press, 2011).

plague, malaria, typhus, and cholera. During the Little Ice Age, the people of Anatolia and the Balkans deserted coastal plains and previously fertile valleys; around the Mediterranean basin the population moved to higher altitudes. The number of nomads, migrants, and *yürüks* occupying hillsides, plateaus, and mountain pastures increased in this period. People who previously migrated with their livestock to mountain pastures in the summers only settled permanently in the mountains. Grazing and herding turned from being a seasonal practice into a regular way of life in Anatolian and Balkan highlands in the 17th and 18th centuries. In short, a new system of human ecology was created in this period, in which the mountains came to play a basic part. Humans were influenced by their environment, but at the same time they were a significant force in altering the environment. Unfortunately, except some ethnographical and cultural historical studies, not much has been done on the interaction between *yürüks* and their natural environment.¹⁴

The Little Ice Age was followed by the introduction of Columbian [New World] crops, mainly tobacco, maize, tomatoes, beans, potatoes, tobaccos, and sunflowers, to Ottoman lands. During this period, the crops of the Columbian Exchange made living in the highlands easier. Like life in high altitudes during the Little Ice Age itself, little is known about the place of Columbian crops in ordinary people's life in the early modern Ottoman Empire. The contribution of Columbian crops to the migration of populations to mountainous areas has been studied by only a handful of historians. From these studies, we know that from the Black Sea to the mountains of Macedonia, people grew potatoes and corn both for their own consumption and for the market.¹⁵ Tobacco was another

14 For some general information on the nomads, migrants, and *yürüks* in Anatolia, see Xavier de Planhol, "Geography, Politics, and Nomadism in Anatolia," *International Social Science Journal* 11, no. 4 (1959): 525-31; Rudi Paul Lindner, *Nomads and Ottomans in Medieval Anatolia* (Bloomington, Ind.: Indiana University Press, 1983); Mehmet Eröz, *Yörükler* (Istanbul: Türk Dünyası Araştırmaları Vakfı, 1991); İlhan Şahin, *Osmanlı Döneminde Konar-göçerler: İncelemeler-Araştırmalar* (Istanbul: Eren, 2006); Hayati Beşirli and İbrahim Erdal, *Osmanlıdan Cumhuriyete Yörükler ve Türkmenler* (Ankara: Phoenix, 2008); Harald Böhmer, Josephine Powell, and Şerife Atlıhan, *Nomads in Anatolia* (Ganderkesee [Germany]: Remhüb, 2008); and Reşat Kasaba, *A Moveable Empire: Ottoman Nomads, Migrants, and Refugees* (Seattle: University of Washington Press, 2009).

15 Traian Stoianovich and Georges C. Haupt, "Le maïs arrive dans les Balkans," *Annales (Économies, Sociétés, Civilisations)* 17, no. 1 (Jan-Feb 1962), 84-89; Jean Andrews, "Diffusion of Mesoamerican Food Complex to Southeastern Europe," *Geographical Review* 83 (1993): 194-204; Huricihan İslamoğlu and Suraiya Faroqhi, "Crop Patterns and Agricultural Trends in Sixteenth-Century Anatolia," *Review* 2,3 (Winter 1979): 401-36, esp. see 422; and Richard I. Lawless, "The Economy and Landscapes of Thessaly during Ottoman Rule," in *An Historical Geography of the Balkans*, ed. Francis W. Carter (London; New York; and San Francisco: Academic Press, 1977): 507-33.

arrival from North America that was particularly cultivated in Central and North Anatolia, thereby contributing the agricultural diversity of the empire.¹⁶

The ebbing of the Little Ice Age in the 18th century changed the [Ottoman] way of life and made low-lying lands again suitable for human habitation. With the integration of the Ottoman Empire into the capitalist world-economy and the spread of commercial agriculture, the land brought under cultivation increased rapidly. People moved to low-lands and inhabited coastal plains in the 19th century. Deforestation and soil erosion in many mountain areas further stimulated this move. John McNeill, in his book *The Mountains of the Mediterranean*, has treated this period well and opened the path for future studies. McNeill has examined the historical degradation of mountain environments as a result of a combination of environmental, economic, and social factors and has argued that mountain areas first prospered but then underwent a long-term historical decline because of environmental degradation. Although the book studied the Mediterranean region as a whole within a larger chronological framework from antiquity to the 20th century, McNeill used the Taurus Mountains of southern Anatolia as a case study, too.¹⁷

Faruk Tabak, in his exploratory work, *The Waning of the Mediterranean*, has also examined the general economic and ecologic trends and the relocation of the center of gravity from the plains to the hillsides and mountains in the early modern period in detail. His research is a prime example of interdisciplinarity, in which he has studied the interaction of entire processes of social, political, and economic transformation in the Mediterranean basin in the 17th and 18th centuries with ecological changes, such as climatic variables, deforestation, soil erosion, sedimentation, and the growth of malarial swamps. In the study, Tabak also critically reexamined the so-called “decline paradigm” and emphasized the role of environmental and climatic changes in the changing balance of power in

16 For a detailed study on the history of tobacco in the Ottoman Empire, see Fehmi Yılmaz, “Osmanlı İmparatorluğu’nda Tütün: Sosyal, Siyasî ve Ekonomik Tahlili (1600-1883),” (Ph.D. Diss. Marmara University, 2005).

17 John R. McNeill, *The Mountains of the Mediterranean World* (Cambridge; New York: Cambridge University Press, 1992). For other studies on the deforestation in the Eastern Mediterranean region, see Marvin M. Mikesell, “The Deforestation of Mount Lebanon,” *Geographical Review* 59, no. 1 (1969): 1-28; Jack V. Thirgood, *Man and the Mediterranean Forest: A History of Resource Depletion* (New York: Academic Press, 1981); A.T. Grove and Oliver Rackham, *The Nature of Mediterranean Europe: An Ecological History* (New Haven, Mass.: Yale University Press, 2001); and J. Donald Hughes, *The Mediterranean: An Environmental History* (Santa Barbara, Calif.: ABC-CLIO, 2005).

the Mediterranean in the pre-industrial era.¹⁸ Tabak has filled an important gap in the field. Nevertheless, the ecological recovery in the Ottoman Empire, which was concomitant with the recovery of world-economic flows along the shores of the English Channel in the 19th century, and its impact on society and economy still remains imprecise.

Commercial Agriculture: From Field to Factory and Market

Indeed, the 19th century is particularly important for the Ottoman Empire—as in other places in the Mediterranean—since rural areas, lowlands, and plains in the Eastern Mediterranean and the Balkans were transformed as a result of the integration of the Ottoman Empire into the European-dominated capitalist world-economy, the investment of capital and new technology in commercial agriculture, the improvement of infrastructure of all sorts, and the consolidation of transport systems. Integration into larger market systems brought about a major physical and social change in urban and rural environments. Factors such as the growth of cities and towns, the expansion of population, and increases in production and consumption corroded eco-systems. There are numerous studies investigating the political and socio-economic transformations in the 19th-century Ottoman Empire. Nevertheless, few of them make even indirect references to the interrelation between humans and their natural environment. It is worth pointing out that the researchers who have produced these studies have not approached the radical transformations in the Ottoman Empire from an environmental perspective. They have mostly explored the issues from the viewpoint of agricultural history, which is, indeed, another sub-discipline that provides an insight into physical landscape change. The fact that agriculture was the basic activity and peasants comprised the great majority of population in the Ottoman Empire has long made Ottoman agriculture a popular subject among historians.¹⁹

One of the earliest studies exploring 19th-century agricultural transformations in the Ottoman Empire is Donald Quataert's work on agriculture in Anatolia

18 Faruk Tabak, *The Waning of the Mediterranean, 1550-1870: A Geohistorical Approach* (Baltimore; Md.: John Hopkins University Press, 2008).

19 Tevfik Güran, *19. Yüzyıl Osmanlı Tarımı* (İstanbul: Eren Yayıncılık, 1988); Idem., "Ziraî Politika ve Ziraatta Gelişmeler, 1839-1876," in *150. Yılında Tanzimat*, ed. Hakkı Dursun Yıldız (Ankara: Türk Tarih Kurumu, 1992): 219-33; Idem., "Osmanlı Tarım Ekonomisi, 1840-1910," *İstanbul Üniversitesi İktisat Fakültesi Türk İktisat Tarihi Yıllığı* 1 (1987): 225-303. For a historiographical study on Ottoman peasantry, see Suraiya Faroqhi, "Ottoman Peasants and Rural Life: The Historiography of the Twentieth Century," *Archivum Ottomanicum* 18 (2000): 154-58.

in the late Ottoman period. In his work, Quataert mainly analyzed the development of the agricultural economy in Anatolia during the Hamidian Era within the context of the European-dominated world economy.²⁰ His study centered on two major themes: the programs of the Ottoman governments to improve and expand Anatolian agriculture, and changes in the production levels of Anatolia's more important crops. Although he did not specifically address the ecological impact of commercial agriculture, Quataert highlighted physical changes in the landscape as a result of the over-exploitation of land. In addition to his dissertation, his articles on the commercialization of agriculture also served as a general introduction to further studies in the history of landscape change in the Ottoman Empire.²¹

Meltem Toksöz, a student of Quataert, has explored the emergence of large-scale cotton agriculture in the Adana-Mersin region. In her study, based on Ottoman and foreign archival documents, Toksöz has examined the role of local and international forces in the integration of the Çukurova Plain into the capitalist world-economy of commercial development. Although Toksöz has explored the emergence of a monoculture and its social, political, and economic implications, especially in the introductory part of her study, there is valuable information about the changes in the alluvial plain of Çukurova and patterns of human habitation there from the 16th to the 19th centuries. In her study, Toksöz has successfully demonstrated how different environmental and climatic factors such as physical geography, climatic variations, sources of water, and soil type affected migration patterns, human habitation, settlement, and stages of agricultural development.²²

The commercialization of agriculture in different parts of the Ottoman Empire has been mainly discussed from the perspective of world-systems theory. There is an edited volume by Faruk Tabak and Çağlar Keyder, *Landholding and Commercial Agriculture in the Middle East*, in which contributors have investigated the question of *çiflik* (big farms) and the role of *ayans* (local notables) in

20 Donald Quataert, "Ottoman Reform and Agriculture in Anatolia, 1876-1908" (Ph.D. Diss., University of California-Los Angeles, 1973).

21 Donald Quataert, "Agricultural Trends and Government Policy in Ottoman Anatolia, 1800-1914," *Asian and African Studies* 15 (1981): 69-84; and Idem., "The Commercialization of Agriculture in Ottoman Turkey, 1800-1914," *International Journal of Turkish Studies* 1/2 (1980): 38-55.

22 Meltem Toksöz, *Nomads, Migrants and Cotton in the Eastern Mediterranean: The Making of the Adana-Mersin Region 1850-1908*; especially pages 19-29. For further studies of the same author on the subject, see "Ottoman Mersin: The Making of an Eastern Mediterranean Port-town," *New Perspectives on Turkey* 31 (Fall 2004): 71-90 and "Bir Coğrafya, Bir Ürün, Bir Bölge: 19. Yüzyılda Çukurova," *Kebikeç* 21 (Spring 2006): 97-110.

the conversion from subsistence to commercial agriculture. Although the articles in this study point out the socio-political and economic implications of the shift from the classical land-tenure (*timar*) system to *çiftlik*s, as well as the consequences of the integration of the Ottoman Empire into the European-dominated capitalist market economy, they may inspire environmental historians to focus more on the ecological effects of commercial agriculture.²³ Because I restrict this essay's discussion to existing studies in Ottoman environmental history, I will not go into detail about agricultural history. However, I shall point out the fact that Ottoman agricultural history provides some clues about how people and their natural environment were interrelated, interdependent, and interacted with each other. Studies focusing on the later periods of the Ottoman Empire demonstrate that there is a direct relationship between the incorporation of the Ottoman Empire into the capitalist world-economy, the transformation of agriculture, and the changes in the physical landscapes in different parts of the empire.

Cities Fed and Watered

People's actions, combined with other environmental and climatic factors, do not only alter rural landscapes or lifestyles. They also have the power and capacity to give urban environments a new shape. This phenomenon makes the changes in urban environments one of the central themes of environmental history. Donald Worster prefers to exclude cities from environmental history; for, according to him, they do not belong to the natural world. However, many researchers have studied urban environments within the framework of environmental history.²⁴ Studies

23 Faruk Tabak and Çağlar Keyder, ed., *Landholding and Commercial Agriculture in the Middle East* (Binghamton, N.Y.: State University of New York Press, 1991). For detailed information on the emergence of *çiftlik*s and the role of *ayans*, see Traian Stoianovich, "Land Tenure and Related Sectors of the Balkan Economy, 1600-1800," *Journal of Economic History* 13 (Fall, 1953): 398-411; Gilles Veinstein, "Ayân de la région d'Izmir et le commerce du Levant (deuxième moitié du XVIIIe siècle)," *Revue de l'Occident musulman et de la Méditerranée* 20 (1975): 131-46; Yûzo Nagata, *Some Documents on the Big Farms (çiftlik) of the Notables in Western Anatolia* (Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa, 1976); Idem., "Notes on the Managerial System of a Big Farm (Çiftlik) in the mid-18th Century Turkey," *Annals of Japan Association for Middle Eastern Studies* 14 (1977): 319-41; Yücel Özkaya, *Osmanlı İmparatorluğu'nda Ayanlık* (Ankara: Türk Tarih Kurumu, 1994); Bruce Masters, "Age of *ayans*," in *An Economic and Social History of the Ottoman Empire, 1300-1914*, eds. Halil İnalcık and Donald Quataert (New York: Cambridge University Press, 1994); Erden Atilla Aytekin, "Land, Rural Classes, and Law: Agrarian Conflict and State Regulation in the Ottoman Empire, 1830s-1860s" (Ph.D. Diss. Binghamton University 2006).

24 According to Worster, cities are built environments and "[t]he built environment is wholly expressive of culture; its study is already well advanced in the history of architecture, technology,

in the history of urban environments have made great strides in the last couple of decades especially in the United States and Western Europe. Numerous books and articles have been written on topics such as public works and infrastructure, environmental services, management of green spaces, environmental engineering, public health, air, water, and land pollution, waste disposal, and so forth.²⁵ The possible contribution of ecological issues to the development of urban environmental history has probably been best pronounced by Martin Melosi, who has argued that “just as ecological science has influenced the study of environmental history in general, urban ecology can more deeply influence the study of the city.”²⁶

The history of environmental developments, issues, and problems in Ottoman cities has not been explored as thoroughly as other issues in urban history. Instead, Ottoman cities have been mostly examined from an urban or architectural historical point-of-view. There are many books and articles about urban planning and administration, especially focusing on the later period of the empire. Only a few of them refer to issues such as the creation of public parks, gardens, and waterfront promenades. Zeynep Çelik, a Turkish architectural historian, has examined the transformations in the urban form of Istanbul, the creation of green public spaces during the Tanzimat Era, and made her contribution to the “history of the fabric of cities.”²⁷ Another architectural historian, Maurice Cerasi, has

and the city. [...] when we step beyond the self-reflecting world of humankind to encounter the nonhuman sphere, environmental history finds its main theme of study.” Donald Worster, *The Ends of the Earth* (Cambridge; New York: Cambridge University Press, 1988): 292-93. Martin V. Melosi, however, makes a simple modification of Worster’s definition and states that “Environmental history is about the role and place of the *physical environment* in human life” and argues that “[t]he city has a place in such a definition, and as such reflects more accurately, the essence of the field.” Martin V. Melosi, “The Place of the City in Environmental History,” *Environmental History Review* 17, no. 1 (Spring 1993): 5.

25 For some examples of works on urban environmental history in the US and Western Europe, see Bill Luckin, *Pollution and Control: A Social History of the Thames in the Nineteenth Century* (Bristol: Hilger, 1986); David Schuyler, *The New Urban Landscape: The Redefinition of City Form in Nineteenth-Century America* (Baltimore, Md.: John Hopkins University Press, 1986); Martin Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore, Md.; London: John Hopkins University Press, 2000); John Sheail, *An Environmental History of Twentieth-Century Britain* (New York: Palgrave, 2002); Martin Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment* (Pittsburgh, Pa.: University of Pittsburgh Press, 2004); Peter Clark, ed., *The European City and Green Space: London, Stockholm, Helsinki and St. Petersburg, 1850-2000* (Aldershot [England]; Burlington, Vt.: Ashgate, 2006); Dorcetta E. Taylor, *The Environment and the People in American Cities, 1600s-1900s* (Durham and London: Duke University Press, 2009).

26 Melosi, “The Place of the City,” 5.

27 Zeynep Çelik has published books and articles on architecture, urban engineering, public works, and city planning in the Ottoman Empire. For her contribution to Ottoman urban

discussed the management and design of open spaces in Ottoman cities, with a particular emphasis on green areas, parks, gardens, and waterways in Istanbul.²⁸ Despite such purposeful attempts, there is still a lack of information about the environmental history of Ottoman cities and towns. Themes such as urban environmental politics, development and management of green spaces, public parks, and gardens, air, water, and land pollution, disease regulations, sanitation and health, and waste management in Ottoman cities have not been researched in-depth. There is need for urban histories that approach issues from an environmental viewpoint in order to better understand the interplay between city and environment.

Another territory that awaits exploration by Ottoman environmental historians is the use of resources to provide food and water to the populations throughout Ottoman history. There are studies on the provisioning of and consumption in Ottoman cities. Such studies give valuable information, yet they do not approach the issue of food and water supply from the perspective of environmental history.²⁹ Existing studies on the supply, control, distribution, and efficient use of water and food in the Ottoman Empire are mostly in the field of socio-economic history. Such studies have concentrated on later centuries, and particularly on Istanbul.³⁰ Although Istanbul was surrounded by water, its water-supply, due to its large population, has always been a priority for the authorities. Kâzım Çeçen, a professor of hydraulic engineering, has been considered a pioneer in the field. He published many books and articles, both in English and Turkish, on the water supply and sewer systems in Istanbul.³¹ In addition to the valuable work done by Çeçen, a number of Turkish scholars have studied water supply and management

environmental history in particular, see Zeynep Çelik, *The Remaking of Istanbul: Portrait of an Ottoman City in the Nineteenth Century* (Seattle: University of Washington Press, 1986).

- 28 Maurice Cerasi, "Open Space, Water, and Trees in Ottoman Urban Culture in the XVIIIth-XIXth Centuries," *Environmental Design* 2 (1985): 36-49.
- 29 I shall note the two historians who have discussed these issues extensively in their works: Alan Mikhail, *Nature and Empire in Ottoman Egypt. An Environmental History* (New York: Cambridge University Press, 2011) and Sam White, *The Climate of Rebellion*.
- 30 Perhaps one exception is Nicolas Trépanier's dissertation, in which he has also investigated the provisioning of food and water in Central Anatolia in the 14th century: Nicolas Trépanier, "Food as a Window into Daily Life in Fourteenth Century Central Anatolia," (Ph.D. Diss. Harvard University 2008), especially 64-127.
- 31 Just to name a few of the many: Kâzım Çeçen, *Sinan's Water Supply System in Istanbul* (İstanbul: İSKİ Genel Müdürlüğü, 1992); Idem., *II. Bayezid Suyolu Haritaları* (İstanbul: İSKİ Genel Müdürlüğü, 1997); Kâzım Çeçen and Celâl Kolay, *Topkapı Sarayı'na Su Sağlayan İsale Hatları* (İstanbul: İSKİ Genel Müdürlüğü, 1997); Idem., *İstanbul'un Osmanlı Dönemi Suyolları* (İstanbul: İSKİ Genel Müdürlüğü, 2000).

in Istanbul and the provinces.³² These studies are very useful to the understanding of water supply, management, and use in Ottoman cities. Yet, significant issues and problems related to every aspect of water in the Ottoman Empire, such as drought, flood, soil erosion, the rise or fall of river beds, and the increase of silt in the water remain understudied. The investigation of these issues is crucial, not only because they allow us to understand the effects that water had on the quality of life in the past, but also they help us to trace the critical concerns related to water that have influenced humanity throughout the world. In short, the history of water supply, transportation, control and utilization in the Ottoman Empire is a rich field which deserves further study.

Food provisioning, like the water supply, posed serious problem, especially for large cities that gorged themselves [expanded at the expense of] on the ever-receding countryside. Big cities such as Izmir, Salonika, Bursa, and Cairo were fortunate because they had large agricultural areas behind them. Meats, grains, fruits, and vegetables flowed to these cities from their immediate hinterlands. The largest city of the empire, Istanbul, however, lacked an agricultural hinterland. The city produced little but consumed a great deal; it was known, therefore, as the *ville ventre*. The provisioning of the imperial capital was of vital importance and the issue has long aroused the interest of historians. For example, providing meat to the masses in Istanbul has been studied by Ahmet Uzun, who has examined the meat provisioning of Istanbul in the 19th century through the *ağnam* (annual tax on sheep and goats) registers, and Antony Greenwood, who has focused on the *celebkeşan* (butchers) system in the early modern Ottoman Empire.³³ Also, some

32 Oral Onur, *Edirne Su Kültürü: "Kadim Su" (Haseki Suyu): Mimar Sinan'ın Su Yolları, Su Kemeri, Teraziler, Maksim Yerleri, Çesme ve Sebiller* (Edirne, 1978); *Tarih Boyunca İstanbul Suları ve İstanbul Su ve Kanalizasyon Sorunu* (İstanbul: İSKİ Genel Müdürlüğü, 1983); Burhan Oğuz, *Bizans'tan Günümüze İstanbul Suları* (İstanbul: Simurg, 1998); Heinz Gaube, "The Traditional Water and Sewer System in the Old City of Aleppo and Its Changes in the Mandatory Period," in *The Syrian Land: Processes of Integration and Fragmentation*, eds. Thomas Philipp and Birgit Schäbler (Stuttgart: Franz Steiner, 1998): 157-64; Haydar Kazgan and Sami Önal, *İstanbul'da Suyun Tarihi: İstanbul'un Su Sorununun Tarihsel Kökenleri ve Osmanlı'da Yabancı Su Şirketleri* (İstanbul: İletişim, 1999); Neriman Meriç Köyllüoğlu, *Edirne'de Osmanlıdan Günümüze Su Yapıları* (Edirne: Türk Kütüphaneciler Derneği Edirne Şubesi, 2001); M. Sabri Doğan, *Konya Su Tarihi* (Konya: Koski Genel Müdürlüğü, 2003); Noyan Dinçkal, *Istanbul und das Wasser: Zur Geschichte der Wasserversorgung und Abwasserentsorgung von der Mitte des 19. Jahrhunderts bis 1966* (München: R. Oldenbourg, 2004); In addition to these studies, there is an ongoing dissertation project by Deniz Karakaş at Binghamton University, entitled "Marble Surfaces: The Topographies of Water Supply and Waste Disposal in the Outskirts of the Ottoman Capital, 1715-1732."

33 Ahmet Uzun, "İstanbul'un Et İhtiyacının Karşılanması: Ondalık Ağnam Uygulaması (1782-1858)" (Ph.D. Diss. Istanbul University 1997); Greenwood, Antony, "Istanbul's Meat Provisioning: A

have investigated the control of the central government over the provision of grain to the imperial capital through Ottoman documents,³⁴ whereas others have examined the provisioning of Istanbul from the perspective of the periphery by looking at the role of the provinces in the processes of supplying food.³⁵

Of epidemics, earthquakes, and fires...

The change in population distribution, density, fertility, birth-rate, and mortality is closely related to the environment. In the past two centuries, environmental degradation has had an overall impact on ecosystems and human well-being in different geographies throughout the world. It has made the conditions for living organisms more severe, exacerbated inequalities in societal welfare on a global scale, and precipitated involuntary human migrations.

A number of scholars have investigated population change and its socio-economic, political, and cultural implications in the early modern Ottoman Empire. They have explained a period of overpopulation in the mid-16th century, and the population decline in the following three centuries, in different ways.³⁶

Study of the Celebbeşan System” (Ph.D. Diss. University of Chicago, 1988).

- 34 Lütü Güçer, “XVIII. Yüzyıl Ortalarında İstanbul’un İlaşesi İçin Lüzumlu Hububatın Temini Meselesi”, *İstanbul Üniversitesi İktisat Fakültesi Dergisi* 11, no. 1-4 (1949): 397-416; Idem., “Osmanlı İmparatorluğu Dahilinde Hububat Ticaretinin Tabi Olduğu Kayıtlar”, *İktisat Fakültesi Mecmuası*, 13 (1951/52): 76-98; Idem., *XVI-XVII. Asırlarda Osmanlı İmparatorluğunda Hububat Meselesi ve Hububattan Alınan Vergiler* (İstanbul: İstanbul Üniversitesi İktisat Fakültesi Yayınları, 1964); Marie-Mathilde Alexandrescu, “Contribution a l’étude de l’approvisionnement en blé de Constantinople au XVIIIe siècle,” *Studia et Acta Orientalia*, 1 (1957): 13-57; Bruce McGowan, “Food Supply and Taxation on the Middle Danube (1568-1579),” *Archivum Ottomanicum*, 1 (1969): 139-96; Rhoads Murphey, “Provisioning Istanbul: The State and Subsistence in the Early Modern Middle East.” *Food and Foodways* 2 (1988): 217-63; and Tefik Güran, “İstanbul’un İlaşesinde Devletin Rolü, 1793-1839,” in *19. Yüzyılda Osmanlı Tarımı Üzerine Araştırmalar*, ed. Tefik Güran (İstanbul: Eren Yayıncılık, 1998): 15-42.
- 35 Suraiya Faroqhi, “İstanbul’un İlaşesi ve Tekirdağ-Rodosçuk Limanı,” *ODTÜ Gelişme Dergisi* 2 (1981): 139-54; Feridun Emecen, “XVI. Asrın İkinci Yarısında İstanbul ve Sarayın İlaşesi İçin Batı Anadolu’dan Yapılan Sevkiyat,” in *Tarih Boyunca İstanbul Semineri* (İstanbul: İstanbul Üniversitesi Edebiyat Fakültesi Basımevi, 1988): 197-230; Kate Fleet, “Ottoman Grain Exports from Western Anatolia at the End of the Fourteenth Century,” *Journal of the Economic and Social History of the Orient* 40, no. 3 (1997): 283-93; and Cafer Çiftçi, “Osmanlı Döneminde İstanbul’un İlaşesinde Bursa’nın Rolü” *Osmanlı Tarihi Araştırma ve Uygulama Merkezi (OTAM) Dergisi* 16 (2004): 51-171.
- 36 In earlier studies, researchers investigated the *tahrirs* (tax registers) to understand population change in the empire. Ömer Lütfi Barkan, a leading economic historian, was one of the first to use the *tahrirs* for demographic inquiry: “Türkiye’de İmparatorluk Devirlerinin Büyük Nüfus ve Arazi Tahrirleri ve Hakana Mahsus İstatistik Defterleri,” *İktisat Fakültesi Mecmuası* 2,

Nevertheless, few of them have explored the interplay between climate, natural disasters, pandemics, and food supply and population change. Oktay Özel, a Turkish economic historian, is one of them. In his article about the “demographic crisis” of the 16th and 17th centuries in the Ottoman Empire, he has particularly emphasized the relationship between population and environment. He has mainly studied the *defters* (cadastral surveys) and registers and argued that famine, droughts, epidemics, and natural disasters were possible causes of the “population crisis” in the 16th and 17th centuries.³⁷ Huri İslamoğlu-İnan has also explored the interrelation between agricultural production, population growth, and urban development in the 16th century North-Central Anatolia. One of the many issues İslamoğlu-İnan has pointed out is the deforestation and opening of new farmlands as a result of the increase in population in the Ottoman Empire in the pre-industrial period.³⁸ In a similar vein, Michael Cook has attempted to explore the consequences of scarcity in land due to growing population in the 16th-century Anatolia. The work of Cook is useful for environmental historians in the sense he

no.1 (1940): 20-59; “Osmanlı’da Bir İskan ve Kolonizasyon Metodu Olarak Sürgünler,” *İktisat Fakültesi Mecmuası*, 11 (1949-50): 56-78; “Research on the Ottoman Fiscal Surveys” in *Studies in the Economic History of the Middle East*, ed. Michael Cook (London: Oxford University Press, 1970). A number of historians followed Barkan in the 1970s and 1980s and published on Ottoman demography: Leila Erder, “Measurement of Pre-Industrial Population Changes: The Ottoman Empire from the 15th to the 17th Century,” *Middle Eastern Studies* 11, no.3 (Oct. 1975): 284-301; Ronald C. Jennings, “Urban Population in Anatolia in the Sixteenth Century: A Study of Kayseri, Karaman, Amasya, Trabzon, and Erzurum,” *International Journal of Middle East Studies*, 7, no.1 (1976): 21-57. For some recent studies that deal with population, migration, and migration patterns in the 16th and 17th century Ottoman Empire, see İbrahim Güler “XVIII. Yüzyılda Osmanlı Devleti’nde Nüfus Hareketleri Olarak İç Göçler,” *İstanbul Üniversitesi Edebiyat Fakültesi Tarih Dergisi* 36 (2000): 179-92; Hüseyin Arslan, *16. Yüzyıl Osmanlı Toplumunda Yönetim, Nüfus, İskan, Göç ve Sürgün* (İstanbul: Kaknüs, 2001); Heath W. Lowry, *Fifteenth Century Ottoman Realities: Christian Peasant Life on the Aegean Island of Limnos* (İstanbul: Eren Yayıncılık, 2002); Osman Gümüşçü, “Internal Migrations in Sixteenth Century Anatolia,” *Journal of Historical Geography* 30 (2004): 231-48; Heath W. Lowry, *Trabzon Şehrinin İslamlaşma ve Türkleşmesi, 1481-1583* [The Islamization and Turkification of the City of Trabzon, 1461-1583]. 4th Edition (İstanbul: Bosphorus University Press, 2010). For a bibliography of works on population in the Ottoman Empire; Daniel Panzac, “La Population de l’empire Ottoman et de ses Marges du XVe au XIXe Siècle: Bibliographie (1941-1980),” *Revue de l’Occident musulman et de la Méditerranée* 31 (1981): 119-37.

- 37 Oktay Özel, “Population Changes in Ottoman Anatolia during the 16th and 17th Centuries: The Demographic ‘Crisis’ Reconsidered,” *International Journal of Middle East Studies* 36, no. 2 (2004): 183-205.
- 38 Huri İslamoğlu-İnan, *State and Peasant in the Ottoman Empire: Agrarian Power Relations and Regional Economic Development in Ottoman Anatolia during the Sixteenth Century* (Leiden: Brill, 1994), 152-54.

has showed that relatively infertile land was brought under cultivation as a result of ‘population pressure’.³⁹

The interplay between disease and political, economic, and social issues in the early modern Ottoman Empire is very important. Until the last century of the empire, plague epidemics were a major occurrence that afflicted populations throughout the empire. The ‘Black Death’ was a historical actor behind political, social, and economic changes in the early modern Ottoman Empire. For a long time the influence of bubonic plague and other infections on Ottoman people was a mystery. However, in the past two or three decades historians have researched epidemics in the Ottoman Empire in depth.⁴⁰ Nükhet Varlık has examined the expansion of the Ottoman Empire and its impact on plague from a medical historical perspective. In her study, she has shown that the rise and expansion of the Ottoman Empire contributed to the spread of the Black Death in the Mediterranean because the empire consolidated the intersecting trade networks connecting Asia, Africa, and Europe and opened new avenues through which the epidemics could spread.⁴¹ Birsen Bulmuş, on the other hand,

39 Michael Cook, *Population Pressure*.

40 For a comprehensive study on the impact of plague on populations in the late-Ottoman Empire, see Daniel Panzac, *La Peste dans l’Empire Ottoman 1700-1850* (Leuven [Belgium]: Éditions Peeters, 1985). Some other works on the plague epidemics include: Micheal W. Dols, “The Second Plague Pandemic and its Recurrences in the Middle East, 1347-1894,” *Journal of the Economic and Social History of the Orient*, 22, no.2 (1979): 162-89; Daniel Panzac, “Alexandrie: Peste et croissance urbaine (XVIIe-XIXe siècles),” *Revue de l’Occident Musulman et de la Méditerranée*, 46, no. 1 (1987): 81-90; Rhoads Murphey, “Ottoman Medicine and Transculturalism from the Sixteenth through the Eighteenth Century,” *Bulletin of the History of Medicine* 66 (1992): 376-403; R. J. Jennings, “Plague in Trabzon and Reactions to it according to Local Judicial Registers,” in *Humanist and Scholar*, 27-35; Amy Singer, “Ottoman Palestine (1516-1800): Health, Disease, and Historical Sources,” in *Health and Disease in the Holy Land*, ed. Manfred Wasserman and Samuel Kottek (Lewiston, N.Y.: Edwin Mellen Press, 1996); Heath Lowry, “Pushing the Stone Uphill: The Impact of Bubonic Plague on Ottoman Urban Society in the Fifteenth and Sixteenth Centuries,” *Osmanlı Araştırmaları* 23 (2003): 93-132; Orhan Kılıç, *Genel Hatlarıyla Dünyada ve Osmanlı Devleti’nde Salgın Hastalıklar* (Elazığ: Fırat Üniversitesi Basımevi, 2004); Uli Schamiloglu, “The Rise of the Ottoman Empire: The Black Death in Medieval Anatolia and Its Impact on Turkish Civilization,” in *Views from the Edge: Essays in Honor of Richard Bulliet*, ed. Nequin Yavari et al. (New York: Columbia University Press, 2004): 255-79; Alan Mikhail, “The Nature of Plague in Late-Eighteenth Century Egypt,” *Bulletin of the History of Medicine* 82 (2008): 249-75; Oya Dağlar, *War, Epidemics, and Medicine in the Late Ottoman Empire (1912-1918)* (Haarlem [The Netherlands]: SOTA, 2008); and Miri Shefer-Mossensohn, *Ottoman Medicine: Healing and Medical Institutions, 1500-1700* (Binghamton, N.Y.: State University of New York Press, 2009).

41 Nükhet Varlık, “Disease and Empire: A History of Plague Epidemics in the Early Modern Ottoman Empire (1453-1600),” (Ph.D. Diss. University of Chicago, 2008).

has examined the Ottoman response to plague within a broader chronological timeframe and suggested that the Ottoman response to plague was not essentially religious and the government took medical measures to prevent the spread of disease.⁴² Finally, in a recent article, Sam White revisited the usual paradigm of disease in Ottoman history from the perspective of environmental history. Focusing on the period from circa 1500 to 1800, White has demonstrated that in the Ottoman Empire there were a variety of other infections that were just as severe as bubonic plague. He has also argued that environmental and climatic conditions during the Little Ice Age played a major role in the spread of diseases, hence the changes in population.⁴³

Like the history of epidemics, the study of natural disasters in a historical framework is relatively new in Ottoman studies. Earthquakes, fires, extreme weather, blizzards, and floods that occurred in the Ottoman Empire have only recently raised the interest of historians. They have started to use historical records to draw conclusions on the implications of natural disasters. Earthquakes and fires were the most common disasters in the empire. Caroline Finkel and Nicolas Ambraseys have done the most detailed study on the chronology and destructive effects of earthquakes in the empire.⁴⁴ Another volume, edited by the Greek historian Elizabeth Zachariadou on natural disasters in the Ottoman Empire, contains articles exploring earthquakes, floods, and droughts.⁴⁵ Heath Lowry, on the other hand, has examined the early period of Ottoman Bursa in European travelers' accounts and discussed the impact of plague, fires, and earthquakes on the first Ottoman capital.⁴⁶ Yet, there is a need for further study and clarification of certain issues relating to population growth, disease, and large scale migrations as a result of environmental changes in the empire, particularly after the ebbing of the Little Ice Age in the 19th century.

42 Birsen Bulmuş, "The Plague in the Ottoman Empire, 1300-1838," (Ph.D. Diss. Georgetown University 2008).

43 Sam White, "Rethinking Disease in Ottoman History," *International Journal of Middle East Studies* 42 (2010): 549-67.

44 Caroline Finkel, *The Seismicity of Turkey and Adjacent Areas: A Historical Review, 1500-1800* (İstanbul: Eren Yayını, 1995).

45 Elizabeth Zachariadou, *Natural Disasters in the Ottoman Empire* (Rethymnon [Greece]: Crete University Press, 1999).

46 Heath W. Lowry, *Ottoman Bursa in Travel Accounts* (Bloomington, IN: Indiana University, Ottoman & Modern Turkish Studies Publications, 2003). Lowry has also explored the impact of waterborne disease on the population of İznik: "Ottoman İznik (Nicaea): Through the Eyes of Travelers and as Recorded in Administrative Documents, 1331-1923," in *İznik Throughout History*, ed. İ. Akbaygil, H. İnalçık, & O. Aslanapa (İstanbul: Türkiye İş Bankası, 2003): 135-74.

Nature's Bounty: Forests, Pastures, Animal and Plant Kingdoms

Natural resources, such as forests, pastures, salterns, mines, rivers, and lakes, are sources of energy and subsistence for people, as well as a source of wealth for governments. In the 19th and 20th centuries, the governments in Western Europe and the United States developed national policies for the exploitation and protection of natural resources and adopted new sets of laws related to forests, mining, water resources, hunting, fisheries, and so on. There is a widespread assumption that the idea of conservation and administration of natural resources in the Ottoman Empire flourished very late. However, even before the launch of Tanzimat reforms, the Ottoman government had already undertaken the responsibility of the utilization and protection of natural resources.

Forests were one of the major sources of wealth in the Ottoman Empire. Possibly because forest lands were not strictly controlled by the state in the pre-industrial period, the historiography on the Ottoman Empire overlooks the socio-economic and cultural importance of forests. In this respect, Selçuk Dursun's dissertation is the first work of its kind, in which he has argued that scientific forestry began back in the 19th century. In his thorough study of the Ottoman forestry, Dursun has analyzed the history of forestry and forest administration in the Ottoman Empire from the 15th to the early-20th century, with a major focus on the 19th century. In addition to his emphasis on economic, social, political, legal and administrative aspects, Dursun has also discussed the environmental dimensions of the development of rational forestry in the Ottoman Empire. Dursun's study is promising for the history of conservation and protection of natural resources.⁴⁷

Water was an important part of the life in the empire. Unlike the Austro-Hungarian, Russian, or German empires, which had a limited access to open seas, the Ottoman Empire was surrounded by a number of seas. In addition to the seas, the empire had navigable rivers, such as the Nile, Tigris, Euphrates, and Danube, and lakes and reservoirs, such as Lake Van and Lake Tuz, which were used for transportation and irrigation. Furthermore, in many cities and towns along the coasts of seas, rivers, and lakes, people made their living from the water, by fishing or farming. At the same time, the bodies of waters in and around the Ottoman Empire, by channeling the movement of diseases, imperiled the lives of peoples and their livestock. Dwellers in port towns searched for ways to mitigate hazards related to water while to utilizing them to the best of their ability.

47 Selçuk Dursun, "Forest and the State: History of Forestry and Forest Administration in the Ottoman Empire," (Ph.D. Diss. Sabancı Univ., 2007).

Except for a handful of promising studies recently completed, historians have so far underestimated the vital importance of water for human survival, as well as the ways people controlled, managed, and used water resources in the Ottoman Empire. Alan Mikhail, through a study of irrigation and water usage, examines the Ottoman imperial system of natural resource use, coordination, and transport in Ottoman Egypt between 1650 and 1820. Mikhail argues that it was not imperial Ottoman bureaucrats, but local people, i.e., Egyptian peasants, who decided the management of water resources and irrigation in the Egyptian countryside. Furthermore, Mikhail demonstrates that the issue of water management and use was an imperial concern due to the fact that impediment of water flow in the Egyptian countryside empire could cause serious political and socio-economic problems in Istanbul, Cairo, and elsewhere in the empire.⁴⁸

Animals were one of the key historical actors in the Ottoman Empire even after the construction of paved roads and railways. Camels, oxen, horses, mules, and other pack animals served to transport goods over long distances, to turn waterwheels, and to cultivate lands. Furthermore, cattle, sheep, goats, poultry, and game were sources of food and clothing, as well as symbols of wealth. As yet the use of animals has remained one of the more under-investigated topics in Ottoman history. There is mention of animals in Ottoman history texts, but these texts have not been interpreted or analyzed from an environmental point of view. Most of the existing studies, which deal with camels and other animals used for long-distance transport, are limited to their economic dimensions.⁴⁹

Botanical history is closely related to environmental history, and there is a certain need to explore the evolution of fauna and flora throughout the Ottoman Empire, since it can reveal how the landscapes and climates have changed over time. The revisiting of primary sources such as chronicles, travelers' accounts, and archival documents helps historians investigate the animal and plant kingdoms in the Ottoman Empire. There are accounts of European botanists who traveled

48 Alan Mikhail, *Nature and Empire*. See also Idem., "An Irrigated Empire: From Ottoman Fayyum," *International Journal of Middle East Studies* 42 (2010): 569-90.

49 For example, see İlber Ortaylı, "Devenin Taşıma Maliyeti Eğrisi Üzerine Bir Deneme," *Siyasal Bilgiler Fakültesi Dergisi* 28, 1-2 (1973): 181-190; Suraiya Faroqhi, "Camels, Wagons, and the Ottoman State," *International Journal of Middle East Studies* 14 (1982): 523-39; and Halil İnalçık, "Arab Camel Drivers in Western Anatolia in the Fifteenth Century," *Revue d'Histoire Maghrébine* 10, no. 31-32 (1983): 247-70. The French geographer Xavier de Planhol dealt with the use of oxen as pack animals: Xavier de Planhol, "Le boeuf porteur dans le Proche-Orient et l'Afrique du Nord," *Journal of the Economic and Social History of the Orient* 12, no.3 (1969): 298-321.

widely to study rare plants, of which the tulip is the most famous.⁵⁰ There are only a small number of studies in Ottoman botanical history. Asuman Baytop seems to be the first scholar to use such accounts as a source for botanical history. Furthermore, she investigated heretofore unexplored subjects, such as vegetation in the Ottoman Empire, the history of species in the Eastern Mediterranean region, and the history of botanical education in the Ottoman Empire and Turkey.⁵¹

As the small number of studies indicates, the history of the conservation and management of natural resources, as well as botanical history and the history of species are poorly studied topics in Ottoman environmental history. Future studies related to the histories of natural resources in the Ottoman Empire, such as pastures, salterns, mines, and fisheries, especially those investigating the probable shift in Ottoman governments' approaches to natural resources throughout history, are expected to fill in the gap in the field.

Conclusion: The Future of Ottoman Environmental History

Environmental history can be understood, as James O'Connor suggests, as "the history of the planet and its people and other species of life and inorganic matter insofar as these have been modified by, and have enabled and constrained, the material and mental productions of human beings."⁵² The scope of environmental history is exceedingly broad. Everything that shapes humans' lives and everything that is shaped by humans can be a subject of environmental history. The Ottoman Empire, due to the sheer size of its geographical space between Europe, Asia, and Africa, and its large diversity of ecological zones, climatic conditions, and environmental features, has a great deal to offer to environmental historians.

Ottoman environmental historians can study a variety of subjects from an environmental viewpoint, including the history of energy use and depletion; the use, management, and conservation of natural resources such as water reserves, lakes,

⁵⁰ One of the most famous descriptions of landscapes, species, and plants in the Levant belongs to the French botanist Joseph Pitton de Tournefort. Joseph Pitton de Tournefort, *Relation d'une Voyage* (Amsterdam: Aux dépens de La Compagnie, 1718).

⁵¹ Asuman Baytop, *Türkiye'de Botanik Tarihi Araştırmaları* (İstanbul: TÜBİTAK, 2004). She has also used the accounts of Belon and Tournefort as a source for botanical history. See Idem., "P. Belon ve J. P. de Tournefort'un Seyahatnamelerindeki Türkiye Bitkileri," *Kebikeç* 17 (2004): 205-23. This issue of the journal *Kebikeç* is devoted to the flora and fauna of Anatolia.

⁵² James O'Connor, "What is *Environmental History*? Why Environmental History?," *Capitalism, Nature, Socialism*, 8, no. 2 (June 1997): 1-27.

rivers, forests, and pastures; human-related environmental changes; climatic and atmospheric events; natural disasters and catastrophes, such as earthquakes, fires, floods, and droughts; and plants and animals. Also, they can approach themes and issues of political, economic, social, cultural, demographic, and urban history, such as wars, economic crises, revolts, famines, migrations, population movements, and urbanization patterns, from their unique environmental perspective.

If environmental history is such a promising field, one wonders why historians of the Ottoman Empire were not interested before in finding out how people interacted with their surrounding environment. Although they have touched upon environmental aspects of the Ottoman Empire, why has it taken so long for them to embrace environmental history? I would argue that there are two reasons for this: First, the majority of historians of the Ottoman Empire work in isolation from one another and from their colleagues in other fields, and lack interdisciplinarity. They adhere to their own agendas, chronologies, and regions, and they have been slow to embrace new perspectives, paradigms, and approaches. In other words, Ottoman historians so far have been limited to their own particular fields and have continued to be conservative regarding studies in other geographies and fields. The reason for this may be that post-Ottoman history writing is inclined to take the “nation” as the basic framework of inquiry and historians have preferred to be confined within national perspectives. Second, Ottoman historians have mostly followed European styles of history-writing, which focused on internecine wars, power struggles, political disturbances, vivid personalities, and the accumulation of events, and have long regarded them as important. The environmental dimensions of political, military, economic, and cultural history of the Ottoman Empire have escaped the attention of historians. This is logical because, as James O’Connor points out, “modern Western history writing begins with political, legal, and constitutional history; moves to economic history in the mid-to-late 19th century; shifts to social and cultural history in the mid-20th century; and culminates in environmental history in the late-20th century.”⁵³

At this point, environmental history needs to play a central role and encourage Ottoman history to come out of its shell, to establish comparisons with other related environmental history studies, and develop linkages with other disciplines, most importantly geography, economics, sociology, demography, ecology, and climatology. It can help the historians of the states that once constituted the Ottoman Empire to think beyond the confines of nations, governments, institutions, and borders. In other words, it can push them to create new discussions

53 Ibid., 5.

and new conceptualizations of history that transcend rigid geographical, political, and national boundaries.

To conclude, environmental history is a fledgling subfield of Ottoman history. It has taken root only recently and researchers of the Ottoman Empire have only begun to investigate the complex and delicate interrelations between people and their natural environment. The theoretical development of environmental history might broaden the scope of Ottoman historical studies as a whole and enrich our understanding of the Ottoman past. Most importantly, it can challenge traditional historiography, which places political and military events and prominent individuals at its center, and can provide new perspectives and approaches to historical events in Ottoman history that have been overlooked before.

Environmental History as an Emerging Field in Ottoman Studies: An Historiographical Overview

Abstract ■ Environmental history is a discipline that studies the mutual relationship between humans and their natural environment over time. It was born out of a strong moral concern in the 1970s, when global environmental problems such as climate change rose to prominence. It explores the impact of environmental change on people's lives, as well as people's use, perception, management, and conservation of their surrounding environment. Environmental history introduces a new perspective to our understanding of historical change. Only recently have Ottoman specialists begun looking through the lens of environmental history and begun to exhibit an interest in the environmental dimensions of the political, economic, and social history of the Ottoman Empire. The goal of this article is to bring environmental history to the attention of the community of specialists on Ottoman history and discuss how environmental history can push Ottomanists to create new dialogues and new ways of thinking about history. Approaches that transcend the rigid geographical, political, and national boundaries which have heretofore dominated the field.

Key words: Environmental History, Ottoman Empire, Historiography, Eco-History