Oxen in the nineteenth-century Ottoman Empire

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A dissertation presented to the

Atatürk Institute for Modern Turkish History
at Boğaziçi University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

September 2025

Approvals

"Oxen in the nineteenth-century Ottoman Empire," a dissertation prepared by İbrahim Can Usta in partial fulfillment of the requirements for the degree of Doctor of Philosophy from the Atatürk Institute for Modern Turkish History at Boğaziçi University, has been approved on 19 September 2025 by:

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Declaration of Originality

The intellectual content of this dissertation, which has been written by me and for which I take full responsibility, is my own, original work, and it has not been previously or concurrently submitted elsewhere for any other examination or degree of higher education. The sources of all paraphrased and quoted materials, concepts, and ideas are fully cited, and the admissible contributions and assistance of others with respect to the conception of the work as well as to linguistic expression are explicitly acknowledged herein.

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Abstract

Oxen in the nineteenth-century Ottoman Empire

İbrahim Can Usta, Doctoral Candidate at the Atatürk Institute
for Modern Turkish History at Boğaziçi University, 2025

Professor Cengiz Kırlı, Dissertation Advisor

THE OXEN MADE VITAL CONTRIBUTIONS TO RURAL LIFE IN THE NINEteenth-century Ottoman Empire. These draft animals pulled the plow, threshed the produce, dragged logs, and moved carts in return for a little hay. From the perspective of animal history, they were "non-human workers" who undertook burdensome tasks in accordance with the needs of their human employers.

This dissertation reveals the essential role of oxen in the nineteenth-century Ottoman Empire. It elaborates on the numerical data extracted from the income survey registers of the 1840s. The research reconstructs the geographical setting in three different Ottoman provinces (Konya, Edirne, and Kastamonu) from an environmental history perspective.

Findings from income registers and other archival sources include substantial information about oxen. Oxen had a central place in the economic sectors of agriculture, transportation, and construction. Furthermore, their stressed work agenda was seriously affected by local conflicts involving provincial notables. Moreover, some discussions that the Tanzimat Edict triggered directly concerned oxen. This study rejects the idea that oxen were a trivial subject of human history and offers an original narrative that incorporates oxen as crucial actors in the history of the Ottoman Empire.

119,000 words

Özet

On Dokuzuncu Yüzyıl Osmanlı İmparatorluğu'nda Öküzler

İbrahim Can Usta, Doktora Adayı, 2025
Boğaziçi Üniversitesi Atatürk İlkeleri ve İnkılap Tarihi Enstitüsü

Profesör Cengiz Kırlı, Tez Danışmanı

ÖKÜZLER ON DOKUZUNCU YÜZYIL OSMANLI İMPARATORLUĞU'NUN kırsal hayatına yaşamsal katkılar sundu. Bu çeki hayvanları biraz saman karşılığında sabanı çekiyor, harmanı dövüyor, kütükleri sürütüyor ve kağnıları yürütüyorlardı. Hayvan tarihi perspektifinden bakılırsa onlar, insan işverenlerinin gereksinimleri doğrultusunda en ağır işleri yerine getiren "insan olmayan işçiler"di.

Bu tez öküzlerin 19. yüzyıl Osmanlı İmparatorluğu'ndaki önemli rolünü gözler önüne seriyor. Çalışma 1840'ların temettuat defterlerinden elde edilen sayısal verilere dayanıyor. Bu araştırma üç farklı Osmanlı vilayetindeki (Konya, Edirne ve Kastamonu) coğrafi düzlemi çevre tarihi perspektifiyle yeniden betimliyor.

Temettuat defterlerinden ve diğer arşiv kaynaklarından çıkan bulgular öküzler hakkında önemli bilgiler içeriyor. Öküzler tarım, ulaşım ve inşaat sektörlerinde merkezi bir yere sahipti. Dahası, öküzlerin yoğun iş takvimi ayanların dahil olduğu yerel çatışmalardan ciddi biçimde etkileniyordu. Tanzimat Fermanı'nın tetiklediği bazı tartışmalar öküzleri doğrudan ilgilendiriyordu. Bu çalışma öküzleri beşeri tarihin tali bir konusu olarak gören bakışı reddediyor ve öküzleri Osmanlı İmparatorluğu tarihine önemli aktörler olarak dahil eden özgün bir anlatı sunuyor.

119.000 kelime

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Glossary of Non-English Terms

kuruş	Ottoman piaster including approximately one gram of pure silver
dönüm	Ottoman acreal measure
temettuat defteri	income survey register

Abbreviations

A.}DVN	Sadaret Divan Kalemi Evrakı
A.}DVN.DVE	Bab-ı Asafi Divan-ı Hümayun Düvel-i Ecnebiye Kalemi
A.MKT	Bab-ı Asafi Mektubi Kalemi
A.}MKT	Sadaret Mektubî Kalemi
A.MKT. NZD	Sadaret Mühimme Kalemi Nezaret ve Devâir Evrakı
A.}MKT.NZD	Sadaret Mektubi Kalemi Nezaret ve Deva'ir Evrakı
A.}MKT.UM	Sadaret Mektubi Kalemi Umum Vilayat Evrakı
AE.SMHD.II	Ali Emiri Mahmud II
AE.SSLM.III	Ali Emiri Selim III
BEO.AYN.d	Babıali Evrak Odası Ayniyat Defterleri
C.AS	Cevdet Askeriye
C.BH	Cevdet Bahriye

C.HR	Cevdet Hariciye
C.İKTS	Cevdet İktisad
C.ML	Cevdet Maliye
D.CRD.d	Bab-ı Defteri Ceride Odası Defterleri
DH.HMŞ	Dahiliye Nezareti Hukuk Müşavirliği Belgeleri
DH.MKT	Dahiliye Nezareti Mektubi Kalemi
HAT	Hatt-ı Hümayun
HR.MKT	Hariciye Nezareti Mektubi Kalemi Evrakı
İ.MVL	İrade Meclis-i Vala
ML.EEM	Maliye Nezareti Emlak-i Emiriyye Müdüriyeti
ML.MSF.d	Maliye Masarıfat Defterleri
ML.VRD.d	Maliye Varidat Muhasebesi Defterleri
ML.VRD.CMH.d	Maliye Varidat Muhasebesi Cizye Defterleri
ML.VRD.TMT.d	Maliye Varidat Muhasebesi Temettuat Defterleri
MŞH.ŞSC.d	Meşihat Şer'iyye Sicilleri Defterleri
MVL	Meclis-i Vala Evrakı
NFS	Nüfus Defterleri
OA	Ottoman Archives
TS.MA.e	Topkapı Sarayı Müzesi Arşivi Evrakı

A Note on Transliteration

I translated my findings from archival and contemporary sources into English on my own. While Latinizing Ottoman Turkish phrases and terms, I adopted their predominant usage in modern Turkish orthography. I used the Turkish Historical Society's date translation guide and presented the dates from contemporary sources in accordance with both Rumi and Gregorian calendars.

Acknowledgements

BY THE TIME I ENTERED THE ATATÜRK INSTITUTE'S MA PROGRAM IN 2016, the courses that Ahmet Kuyaş gave at Galatasaray University had excessively deepened my interest in political history. While writing my MA thesis, Aydın Babuna showed a generous patience against my lack of experience in research with primary sources. In the first year of my PhD, while trying to match my interest in political history with my shallow knowledge of Ottoman sources, I heard about environmental history for the first time in Irmak Ertör's course on political ecology. Soon, I started working at Istanbul Bilgi University and met with Cihangir Gündoğdu, from whom I heard about animal history. In the early months of 2020, I did not know that I was going to embrace these historiographic perspectives with ease and develop a camaraderie with Cihangir Hoca in the ranks of *Hayvanât*, an academic network devoted to animal history.

I will always be thankful that Cengiz Kırlı, who surely has a very profound intellectual curiosity about a great variety of subjects, accepted to guide me in research about an uncommon subject of Ottoman history. His great experience saved this work from being a superficial account of cattle plague epidemics or agricultural instruments, as I used to imagine, and transformed it into rich research that touch upon different geographies and different questions simultaneously. Without my advisor's accurate criticism and recommendations, I would never be able to broaden my perspective on Ottoman historiography and develop my research skills.

Nadir Özbek's original judgments regarding Ottoman taxation practices helped me develop a critical understanding of the temettuat surveys of the 1840s, which became the main source of the present research. I am glad that Professor Özbek also motivated me with cheerful conversations about our common hobby, that is, bikes and cycling.

I met with Faisal Husain at the "Animals in Anatolian and Turkish History" conference in May 2024. Since then, various occasions that brought us together in Istanbul have always enriched my intellectual vision and also left me pleasant memories. His detailed feedback about the chapter

drafts I sent him had an evident intellectual depth as well as an intelligent practicality that significantly helped me finalize this work. I look forward to reading Faisal Husain's new publications, with which he will further enhance Ottoman environmental history.

When I read the *Anatolian Livestock* book by Yonca Köksal Özyaşar and Can Nacar, I was amazed by how little I knew about sheep husbandry and the meat market. I hope my research makes a complementary contribution to this literature by treating a different member of Ottoman livestock: the draft ox. I feel so glad that Can Nacar meticulously read an initial draft of my thesis and offered me fertile venture points to develop my research.

I improved my reading skills in Ottoman Turkish thanks to the courses I took from Edhem Eldem and Hasan Karataş at Boğaziçi University, as well as the courses of Hakan Karateke, Helga Anetshofer, and Ali Emre Özyıldırım in the Ottoman Summer School organized at Istanbul Bilgi University in July-August 2023.

Suraiya Faroqhi has always inspired me with her exceptional work discipline, creativity, and productivity. For me, the exclusive chance to know Professor Faroqhi in person has always brought along amusing conversations that expose her delicate sense of humor.

Murat Dağlı kindly invited me to his graduate course this year to present my research. The brainstorm he triggered there highly encouraged me to relate my research subject to the big questions of Ottoman historiography.

At a desperate point where I felt incapable of further improving the text, it was Aysel Yıldız who encouraged me to consult different kinds of archival sources. Had she not shown me a few document examples in a brief lunch break, I would have struggled to find the intersection of different types of nineteenth-century Ottoman registers.

At an initial stage of my research, Başak Tuğ, Gülhan Balsoy, and Nevzat Evrim Önal provided me with crucial feedback. I also had the opportunity to present an early version of my research during a seminar organized by the Faculty of Social Sciences and Humanities at Istanbul Bilgi University in October 2023. At the end of my presentation, Pınar Uyan

Semerci's question, "But, where are the oxen?" was a timely alert for me to think about measures for overcoming the methodological limitations of animal history. I should also add that I did not forget Ali Sipahi's warning about the importance of the venue and socio-geographic setting in a dissertation about the Ottoman Empire.

I would like to thank Burak Çavuşoğlu for introducing me to the world of quantitative data. I will mention (in alphabetical order) my dear colleagues with whom I shared the same office at Bilgi: Ege Akman, Eylem Mercimek, Fikri Buber, H. Işık, Mustafa Akay, and Yiğit Akçin. They have always been so helpful and cheerful to me. I should also express my gratitude to Sarp Buğdacıgil for an almost life-long friendship.

The following people helped me in various ways during this long process: Ahmet Eryüksel, Aylin Aktaş, Ayşe Nur Akdal, Berk Çetin, Berrak Oğuz, Bülent Bilmez, Can Gümüş İspir, Cana Akdal, Cangül Örnek, Cemali Coşkunırmak, Cemre Ünaldı, Deniz İnce, Dilek Tecirli, Dilşat Mis Özkan, Ege Günalp, Ekin Arpacı, Ekrem Yener, Emelnur Ketencioğlu, Emir Küçük, Erdal Bilgiç, Fatma Eda Çelik, Fatma Esen, Fuat Öztürk, Gözde Orhan, Gülay Tsil, Hatice Sönmez, İlayda Fidan, Kadriye Tamtekin, Kiraz Özdoğan, Lütfiye Çetin, Magali Boumaza, Murat Bergi, Neslişah Başaran Lotz, Oğuz Tanındı, Özgür Taylan Çelik, Suna Akbalık, Süha Ertekin, Sylvia La Normande, Veruschka Wagner, Yağmur Nuhrat, Yiğit Özatalay, Zeynep Suda.

More than eighty years ago, a little boy called İbrahim Usta from an isolated village of Görele somehow went to the village institute in Trabzon's Beşikdüzü. One of his sons turned out to be a brilliant student with a deep interest in reading, who is my father. I am proud with the name that I share with both of my grandfathers. I will dedicate this work to my family. My parents always felt the stressful burden of my academic endeavors and the rare pride these efforts occasionally brought. I cannot find words to express my gratitude for the endless support of my mother and father. Last but not least, my dear Şimal has very recently become my beloved wife. I will never have the particular level of communication she has with non-human animals. It is thanks to Şimal's curious and sometimes merciless questions about my work that I could develop a deliberate theoretical position in the present research.

NOTE: The in-house editor of the Atatürk Institute has made detailed recommendations with regard to the format, grammar, spelling, usage, syntax, and style of this dissertation.

Öküzün damını alçacık yapın
Yaş koman altına kuruluk serpin
Koşumdan koşuma gözlerin öpün
İreçberler hoşça tutun öküzü

– Pir Sultan Abdal

1

Introduction

In the arid seasons of the nineteenth century, people from nearby villages would gather in Ottoman town centers for rain prayers. According to the account of people who had participated in these prayers in the final decades of the Ottoman Empire and who were interviewed in Tekirdağ in 1961, a whole region used to mobilize for these collective religious ceremonies.[1] The day before the prayer, school teachers would instruct their students to bring a basket full of little stones. Peasants from nearby villages would be told to do the same, but they had to bring their livestock herds as well. During the ceremony, the imams would pray for each piece of stone to be blessed. They would count the stones to see if people had collected as many as seventy thousand and assemble them in sacks. After the sanctification of stones, all participants would pray together while keeping their palms facing downward. This uncommon hand position for Islamic prayers was indeed a way to imitate the raindrops falling from the sky. Yet, what is more striking about these accounts is the active participation of non-human animals. The rain prayers reached a crescendo when the crowd cried *amin* (amen) in unison. All the interviewees from Tekirdağ affirmed that, "with God's wisdom," the

1 Salim Sami İşçiler, "Tekirdağ'da Yağmur Duası," *Türk Folklor Araştırmaları*, no. 145 (Aug. 1961): 2479. For a comprehensive index of the journal, see Tülay Gündoğan, "Türk Folklor Araştırmaları Dergisi İndeksi" (M.A. Thesis, Erzurum, Atatürk Üniversitesi, 2008).

sheep and cattle assisted the moment of amen with their own words, baa and moo.[2] The service of rice with lamb meat followed the prayer. Then, they would throw the stones into the sea or a nearby river,[3] which was the Mahramlı River for the people of İnecik and Mahramlı. The interviewees from Tekirdağ affirmed that the rain prayer certainly worked, and they would often return home all soaked.

On 10 August 2022, roughly forty kilometers away from Mahramlı and İnecik, I found myself in a fierce race against a flock of dark clouds. With my vintage steel road bike, I tried to keep my distance against this calamitous peloton for a while. Just a few kilometers before the turning to the Tekirdağ city center, I finally lost the race and got caught by a brutal hail shower in the middle of August. I could find refuge anywhere but under a viaduct, where I had the opportunity to make acquaintance with an elderly truck driver who was carrying cement to a nearby factory until the rain started. In a span of more than two hours before the rain got lighter, the driver and I came up with many interesting topics to talk about, such as my uncommon way of traveling, the job opportunities of his children, or our predictions about the next year's elections. Naturally, the first subject we brought up was the weather. I was aware of the possibility of small-scale precipitation, but I did not expect to run into such a long and heavy hailstorm. Though he lacked a canvas to cover the sacks of cement on his truck, my companion was not surprised by this summer rain pattern at all. He was accustomed to this particular precipitation pattern in this region. According to his outstanding example, my companion had even witnessed a scene where it rained on one of the horns of an ox and not the other. I had not told him anything about my academic interest in the oxen, and even tried to hide my fascination while listening to this

2 The author describes the scene in Turkish as follows: *Topluluk "Amin" derken oradaki hayvanlar da -Allah'ın hikmetiyle- meleyip böğürüp kendilerine göre sesler çıkarırlarmış.*

3 Depicting a rain prayer that took place around Istanbul's Kağıthane River in 1892, Can Gümüş İspir interprets the placement of stones into the river as a symbol of the prayers' union with water. See Y. Can Gümüş İspir, "The Politics of Hygiene: Public Health and Urban Transformation in Late Ottoman Istanbul" (PhD Thesis, Boğaziçi University, 2025), 143.

anecdote. I was delighted to hear about the horns of an ox in an explanation of a meteorological phenomenon. Unaware of his contribution, my companion was indirectly underlining the integrity of nature, where the weather was explained in relation to oxen. The environment constitutes a whole with the climate, geographic structures, soil, flora, as well as human and non-human animals. The latter had significant contributions to human understanding of non-human nature. Sheep and cattle species, which fell under human subjugation thousands of years ago, always had an intermediary role between human culture and non-human nature. People in nineteenth-century Anatolia and Rumelia would fill the baskets with stones harnessed on their oxen and take a relatively long walk from their village to the venue of the rain prayer. The oxen, who would have carried a heavy load, had to wait under the sun while humans would pray and eat a meal that would not appeal to bovines at all. One can only guess what kind of feeling an exhausted ox would feel when he heard the loud voices of amen from the human crowd. If the prayer really gave results, the bovines would at least be happy to feel the cool rain on their back. In the morning of such a spectacular event, the sheep and cattle would probably not have a pleasant journey while travelling around dry or already-grazed meadows, but on the way back, they would further shape the human perception of the environment. Humans relied on the physical power of cattle to carry materials and their moral support in the hope of shifting climatic cycles.

§ 1.1 Non-human Nature in Human History

The human idea of modifying the environment should be older than history. The contemporary complications of the Anthropocene, a geologic era marked by human activities, point to the limits of human intervention into the environment rather than the human victory over nature. Whereas some people aspired to modify the environment, others embraced the integrity of human culture with non-human nature. The latter idea should be as old as the former. Long after the prehistoric period, a seventeenth-century English scientific woman affirmed that humans are

"a small part of nature" and their powers can be merely "particular actions of nature."[4] Integrity may trigger fruitful discussions for philosophers; nevertheless, I suppose interaction is a better term for describing relations between human culture and non-human nature in the social sciences and humanities literature. Bruce Campbell acknowledges that nature is a protagonist of historical change as much as society.[5] By the time Margaret Cavendish lived, human edifices in the physical world might still seem minor if compared to nature's sometimes gigantic structures. At the current level of the Anthropocene, I will embrace the understanding of history as an interactive course upon which nature and human culture both have important impacts.

In historiography, works of environmental historians exclusively reflect the integrity and interactions between humans and non-human nature. John McNeill briefly defines environmental history as "the history of the mutual relations between humankind and the rest of nature."[6] The Ottoman Empire's geographic, climatic, and ecological diversity and its vast corpus of source material offer a great source of inspiration for environmental historians to "examine, refine, and rethink environmental processes."[7] Onur İnal and Yavuz Köse describe Ottoman environmental history as a "new subdiscipline with deep roots."[8] I agree entirely to associate the development of Ottoman environmental history from the 2000s on with the framework of neoliberal policies that have been

4 Margaret Cavendish, *Observations upon Experimental Philosophy*, ed. Eileen O'Neill, Cambridge Texts in the History of Philosophy (Cambridge University Press, 2003), 49.

5 Bruce MS Campbell, *The Great Transition: Climate, Disease and Society in the Late-Medieval World* (Cambridge University Press, 2016), 21.

6 John R. McNeill, "Observations on the Nature and Culture of Environmental History," *History and Theory* 42, no. 4 (2003): 6.

7 Alan Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History* (Cambridge University Press, 2011), 18.

8 Onur İnal and Yavuz Köse, "The Ottoman Environments Revisited," in *Seeds of Power: Explorations in Ottoman Environmental History*, ed. Onur İnal and Yavuz Köse (White Horse Press, 2019), 3-4.

destroying the environment in Turkey since then.[9] Strictly connected with the environmental destruction under capitalist policies, the profound consequences of global warming should define another reason for the growing interest in environmental history in the world, as well as in Turkey. Sam White summarizes nature's historical pattern of disasters in the Near East as "recurring ecological crisis and protracted recovery."[10] In summer 2025, the pattern seems to repeat itself in the form of earthquakes, a severe frost in spring, a general drought in summer, a series of forest fires, and cattle diseases around Turkey. Despite tremendous technological advances in today's world, human societies are far from improving their complex relationship with non-human nature. I see substantial benefits in improving at least our knowledge regarding the past forms of the relationship between people and the environment. If the environmental history of the Ottoman Empire resembles "a jigsaw puzzle of thousands of pieces,"[11] the current research can be accepted as another humble piece waiting to fit a missing part of this large puzzle board.

The novelty that environmental history brought primarily lies in the perspective. Historians of the Ottoman Empire have already been giving place to "fragments of information" about environmental conditions for decades.[12] Faisal Husain differentiates historians who document the impact of environmental phenomena on Ottoman society by keeping human actions at the center of their narratives from their colleagues who study the historical process of Ottoman society's relation with the natural environment. While the first category includes historians like Aşıkpaşazade from the fifteenth century or Mustafa Akdağ from the mid-twentieth century, the second category is constituted mainly by twenty-first-century historians who explicitly identify themselves as "environmental

9 Özkan Akpınar, "Reclaiming the Empire: Environment, Marshes, and Hydraulic Engineering in the Late Ottoman Period" (PhD Thesis, Boğaziçi University, 2020), 9.

10 Sam White, *The Climate of Rebellion in the Early Modern Ottoman Empire* (Cambridge University Press, 2011), 9.

11 İnal and Köse, "The Ottoman Environments," 12.

12 Onur İnal, "Environmental History as an Emerging Field in Ottoman Studies: An Historiographical Overview," *The Journal of Ottoman Studies,* no. 38 (2011): 4.

historians" and who consider the environment as a main actor in historical change.[13] An ecological perspective and its reflection in the narrative are key to differentiating environmental history from other types of works. Still, I agree with Husain when considering the vast literature of Ottoman-Turkish economic history and social history as a great source of knowledge and inspiration for future research on environmental history.[14] Likewise, Chris Gratien has the right to deny a fundamental contradiction between environmental history and social history. An ecological perspective can easily be employed in historical narratives "without sacrificing the human component."[15] In fact, the motive can be broadly described as a question of enlarging the list of "acceptable historical actors."[16]

I argue that the inclusion of bovines and other actors from non-human nature in historical narratives will enrich our understanding of Ottoman history. In the same way, Selçuk Dursun considers the adoption of the environmental perspective in historical studies as a way to reach a "more thorough history-writing" in the contemporary context marked by socio-ecological challenges.[17] Moreover, Onur İnal posits that environmental history can bring new approaches to historical events in Ottoman history.[18] Resonating with the historiographic claims of environmental historians, the subfield of animal history also shares the goal to reach "more comprehensive, accurate, and ethical accounts of the past."[19] The acknowledgement of the importance of animals by people in the past is a

13 Faisal H. Husain, "Türkiye'de Çevre Tarihi Yazımının Serüveni," *Toplum ve Bilim*, nos. 169–170 (2024): 114-115.

14 Husain, "Türkiye'de Çevre Tarihi," 116.

15 Chris Gratien, "Ottoman Environmental History: A New Area of Middle East Studies," *The Arab Studies Journal* 20, no. 1 (2012): 254.

16 Mikhail, *Nature and Empire,* 20.

17 Selçuk Dursun, "A Call for an Environmental History of the Ottoman Empire and Turkey: Reflections on the Fourth ESEH Conference," *New Perspectives on Turkey*, no. 37 (2007): 221.

18 İnal, "Environmental History," 25.

19 Dan Vandersommers et al., "Animal History: A Brief Introduction to Its Past and Future," *Animal History* 1, no. 1 (2025): 5.

valid and straightforward argument since the publication of Harriet Ritvo's *The Animal Estate*, as well as other pioneering animal history publications in the 1980s.[20] In the near future, I believe that a growing number of readers will expect to see pieces of information about environmental conditions and non-human actors in any historical narrative.

The historical role of non-human animals deserves particular attention. Underlining the centrality of non-human animals in the lives of people in the past, Erica Fudge calls upon historians to find ways to include them in historical narratives.[21] The perspective in most of the existing studies that give place to non-human animals is limited to their economic dimensions.[22] However, historians need to provide a more central place to these "purposeful, capable, and intentional agents" in their narratives.[23] If it is difficult to "disentangle the animal from the political,"[24] a greater number of writers need to endorse the growing historiographic criticism against the popular assumption to attribute a secondary role to non-human animals in the great transformations in the human world, such as industrialization and urbanization.[25] Alan Mikhail sees in environmental history an opportunity to "revisit and reinterpret historical events and phenomena."[26] An ecological perspective focusing on non-human animals opens surprisingly large and various windows to the popular questions of human history. Since the publication of *Animals and People in the Ottoman Empire,* edited by Suraiya Faroqhi,[27] and Mikhail's *The*

20 David Gary Shaw, "A Way with Animals," *History and Theory* 52, no. 4 (2013): 4-5.

21 Erica Fudge, "Milking Other Men's Beasts," *History and Theory* 52, no. 4 (2013): 27.

22 İnal, "Environmental History," 22.

23 Chris Pearson, "History and Animal Agencies," in *The Oxford Handbook of Animal Studies*, ed. Linda Kalof (Oxford University Press, 2017), 250.

24 Samuel Dolbee, "The Street Dogs of Kurtuluş and Paths to Animal History of the Eastern Mediterranean and North Africa," *Animal History* 1, no. 2 (2024): 18.

25 Mustafa Emir Küçük and Onur İnal, "Antroposentrizmin Ötesinde: Türkiye Modernleşme ve Kent Tarihinde Çalışan Hayvanlar," in *Ekoloji: Bir Arada Yaşamın Geleceği*, ed. Didem Bayındır and Mine Yıldırım (Tellekt Yayınları, 2022), 401, 425.

26 Mikhail, *Nature and Empire,* 22.

27 Suraiya Faroqhi, ed., *Animals and People in the Ottoman Empire* (Eren Yayıncılık, 2010).

Animal in Ottoman Egypt,[28] more and more researchers have been studying subjects related to non-human animals in the Ottoman Empire. Deniz Dölek Sever excellently summarizes how the "animal turn" found its reflection in Ottoman historiography and presents the existing literature by classifying them into different species.[29] For Husain, animal history literature in Turkey has become a relatively advanced subfield of Ottoman-Turkish environmental history with its own academic network and theoretical literature.[30] As ecological concerns pave the ground for the rise of environmental history, I see the urgent concerns for stray animals in the streets of Turkey and the growing activism for animal rights as a fundamental imperative for the development of the animal history perspective in Ottoman historiography.

Efforts to contact several historiographic perspectives at once will come with pitfalls. Oversimplification and involuntary omissions should be the greatest dangers in having a deep interest in a number of fields simultaneously. For instance, the popular questions of the nineteenth-century political history, like modernization, inter-communal relations, or warfare, could not find a big place in the current narrative. Likewise, an experienced economic historian who will show interest in the findings of the current research will surely think of much better ways to exploit and discuss the same data than I did. Meanwhile, the inacceptably limited place devoted to gender can be seen as an inevitable result of my strategy to find out about male bovines in registers that recorded male household representatives. Acknowledging the possible risks of embracing different historiographic approaches at the same time, I will still prefer keeping permissive borders between them. In fact, the interdisciplinary character of this dissertation opens many ventures for further research. Apart from history literature, the consulted secondary sources in this research fall into a great variety of disciplines, including Agricultural Sciences, Animal Studies, Anthropology, Archaeology, Climatology, Economics, Folklore,

28 Alan Mikhail, *The Animal in Ottoman Egypt* (Oxford University Press, 2013).

29 Deniz Dölek Sever, "Hayvan Tarihi: Osmanlı-Türkiye Geçmişine Türlerarası Perspektifle Bakmak," *Reflektif Sosyal Bilimler Dergisi* 5, no. 2 (2024): 241–60.

30 Husain, "Türkiye'de Çevre Tarihi," 129.

Forestry, Geography, Law, Meteorology, and Zoology. With an academic background in social sciences, I must confess the difficulty I had while trying to draw the correct conclusions from the findings of researchers specialized in academic disciplines that are far distant from my academic formation. In return, I hope that at least some of my original findings from the Ottoman Archives catch the attention of scholars from these disciplines and serve them in their future research. Interdisciplinary research may pave the way for fruitful exchanges that broaden our perspective. Historians need to recall not only curiosity but also at least a minimum knowledge of other disciplines to welcome interdisciplinary exchanges in their work.

It is difficult even for me to categorize the current research under a label because I was influenced by a number of historiographic currents at the same time. Some might classify this dissertation as a work of economic history since the main sources are income registers, and there are calculations and tables based on numerical data. It can also be regarded as a work of social history due to the considerable place given to reconstruct the living conditions of ordinary peasant households and the possible concerns of simple peasants in the harsh struggle to provide their subsistence. The detailed descriptions of local topography, flora, and climatic conditions based on sources from the forestry and geography literature should be enough to associate this work with environmental history. At the same time, the employment of the "non-human animal" term and extensive efforts to imagine the possible animal experience should place this work in the domain of animal history. The precious work of numerous researchers from all these diverse approaches shaped my theoretical background. I prefer to see a great richness in the contemporary discussions among historians, yet I would probably side with animal historians if I needed to make a choice between them. Sandra Swart recommends a practical way to incorporate non-human animals into social history, which is to "capture the lived experience of particular creatures in

the past."[31] The present research departs from the photographic information captured in the temettuat registers to reconstruct the experience of mid-nineteenth-century Ottoman oxen.

1.1.1 *Traces of Oxen*

"One who leaves no trace in the field has no say at the harvest."[32] Today, this Turkish proverb is used to underline the need to put the required effort and involvement into a work before sharing the benefit at the end. A literal reading of the proverb will emphasize the strong connection between plowing and harvest. Besides trees, large stones, and the plow itself, the biggest traces in a grain field would be the ones left by the oxen who dragged the instrument. Light steps of human feet would leave incomparably thinner traces than the heavy hooves of the non-human plowers. A mechanical reasoning may deduce from this saying that it was the oxen who deserved the biggest portion of the produce in the harvest. However, such a distribution would be pure fantasy because the oxen were indeed born into captivity under human yoke, and were forced and conditioned to work for the human economic activity called agriculture. Animal historians refuse the understanding that puts "human" in opposition to "animal."[33] Yet, there is no reason to deny the violence inherent in human-animal relations. It was humans who brought oxen into cereal fields, who noted their numbers in tax registers, and who bought or sold them in the market. Since oxen had no opportunity to express themselves in their own documents, historians are obliged to rely on human sources to access the traces that bovines left. Animal historians set forth on the

31 Sandra Swart, "'The World the Horses Made': A South African Case Study of Writing Animals into Social History," *International Review of Social History* 55 (Aug. 2010): 250. I would like to thank Emir Küçük for informing me about this article.

32 The original proverb in Turkish is as follows: *Tarlada izi olmayanın harmanda sözü olmaz.*

33 Erica Fudge, "A Left-Handed Blow: Writing the History of Animals," in *Representing Animals*, ed. Nigel Rothfels (Indiana University Press, 2002), 16.

duty to go beyond the non-human animal traces in human texts and to "forge a real, genuine, authentic, ethical relationship" with them.[34]

Not all historians are as creative as Samuel Dolbee, who describes dog footprints as a "concrete" archive of dogs' traces.[35] This interpretation points out the most important contribution of animal history to Ottoman historiography, which is a new perspective to interpret archival sources. People who wrote about non-human animals, drew their pictures, or photographed them often documented these animals as "peripheral or background objects." So, most of the "traces" non-human animals indirectly left in human documents from the past are not suitable for historical interpretation and are nearly impossible to decipher.[36] If animal history "must be transgressive" like non-human animals themselves,[37] animal historians have little choice but to transgress the boundaries of "human-generated sources"[38] by consulting the sciences and critical animal studies. A big part of the archival findings of the current research were not as vivid as the footprints that Dolbee saw, but simple numbers that nineteenth-century scribes noted down during tax surveys. Even though income registers served me as the main source of this research, I certainly needed to come up with alternative ways to trace down Ottoman oxen. The strategy I adopted was based on reconstructing the relations between human and non-human animals around rural economic operations that they would collectively carry out, such as plowing the field, threshing the harvest, woodcutting, or carrying charcoal.

How can human and non-human relations be defined? On the one hand, "slavery" will perfectly fit to describe the situation of domesticated animals, who are born, kept, and reproduced under human captivity. The

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34 Etienne Benson, "Animal Writes: Historiography, Disciplinarity, and the Animal Trace," in *Making Animal Meaning*, ed. Linda Kalof and Georgina M. Montgomery (Michigan State University Press, 2011), 3-7.

35 Dolbee, "The Street Dogs," 19-20.

36 Jennifer Bonnell and Sean Kheraj, "Introduction: Traces of the Animal Past," in *Traces of the Animal Past: Methodological Challenges in Animal History*, ed. Jennifer Bonnell and Sean Kheraj (University of Calgary Press, 2022), 3.

37 Vandersommers et al., "Animal History," 10.

38 Pearson, "History and Animal," 249.

situation also fits the definition of an "asymmetrical dependency." The relation between domesticated non-human animals and their human owners includes all three of the following traits: the presence of two or more actors, one actor's control over the actions and resources of another actor, and the institutional support, which is animal ownership in this case, which obstructs the dependent actor's arbitrary status change.[39] On the other hand, slavery and dependency, two relevant terms in this case, can expose only a single facet of this relation. I will refuse the reduction of the relation between a domesticated non-human animal and his or her human owner in the nineteenth-century Ottoman Empire to a story of unilateral exploitation. A twenty-first-century bourgeois involved in the meat industry is not obliged to have sympathy for the non-human animals who are temporarily kept in his or her production site before slaughter. Yet, the case of nineteenth-century Ottoman peasant households has no resemblance to the pattern of capitalist mass production. Violence and alienation are inherent to the captivity of non-human animals and their forced work on a nineteenth-century farm. Meanwhile, oxen in an Ottoman peasant household would live longer and in incomparably more comfortable conditions than most male stirks (young cattle) whose processed flesh is today sold in supermarkets. Nineteenth-century oxen would receive respect in the human world since they would represent one of the most expensive assets in a peasant household. They could even have some spare time to enjoy the opportunities of rural life. The annual work tempo of an ox was altered between periods of "frenetic activity" and long periods of "idleness." The time of plowing marked the point with the biggest work demand, the highest stress level, and the smallest body weight in the annual cycle of oxen.[40] Oxen could graze and rest in the time that remained from the stresses of plowing and harvest operations. They could eat the fruits fallen from a tree or wash their large

39 Julia Winnebeck et al., "The Analytical Concept of Asymmetrical Dependency," *Journal of Global Slavery* 8 (2023): 7-8.

40 The article refers to late-twentieth-century research among draft animals in Mali. See R. Trevor Wilson, "The Environmental Ecology of Oxen Used for Draught Power," *Agriculture, Ecosystems & Environment* 97, no. 1–3 (2003): 26.

bodies in a puddle until their human owners would come hours later to take them back to their barns. I cannot deny the implicit or explicit presence of violence that any "domesticated" species who had fallen under human subjugation has been suffering in different forms. Nevertheless, the current research about nineteenth-century Ottoman oxen takes the relation between these non-human workers and the small peasant households who claimed ownership over a pair of oxen as a multifaceted one that cannot be solely reduced to slavery.

Jason Hribal notes the "expropriation, exploitation, and resistance" behind domestication, which is an "active history."[41] Anyone who observes and interacts with cats, for instance, will admit that the success of the domestication process has its obvious limits. Virginia DeJohn Anderson reminds us that domesticated animals are never wholly under human control, sometimes acting in ways that their owners neither predicted nor desired.[42] Therefore, I regard human operations undertaken with non-human labor like plowing, coal transport, or mining as active interactions between human and non-human actors. In the big part of these activities, peasants would work as much as their oxen. Human and non-human laborers had "interwoven fates"[43] in the times of work and rest. In the small peasant households around the nineteenth-century Ottoman Empire, "shared fates," as Semih Çelik puts it, would describe the missing part of the relation between an ox and his human owner that a rough definition of slavery or dependency would neglect. This relation included simultaneously violence, dependency, negotiation, and affection. Hribal posits the necessity of "some degree of negotiation" to obtain an adequate, timely, and profitable amount of labor from non-human

41 Jason Hribal, "'Animals Are Part of the Working Class': A Challenge to Labor History," *Labor History* 44, no. 4 (2003): 436.

42 Virginia DeJohn Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America* (Oxford University Press, 2004), 3-5.

43 Semih Çelik, "'It's a Bad Fate to Be Born Near a Forest': Forest, People and Buffaloes in the Mid-Nineteenth Century North-Western Anatolia," in *Seeds of Power: Explorations in Ottoman Environmental History*, ed. Onur İnal and Yavuz Köse (White Horse Press, 2019), 127.

workers. Otherwise, they would always be ready to resort to the "weapons of the weak" and perform an "everyday form of resistance."[44] The ox, who is known for his docility, is considered less likely to be scared than the mule or the horse. However, once he got startled, the ox would become "virtually uncontrollable."[45] Hence, Ottoman agriculture depended on the success of farmers in convincing their oxen to continue plowing or threshing. As trained and castrated bovines, oxen could be less likely to go on the rampage. Yet, they could always protest excessive fatigue or exposure to extreme heat by simply stopping at unexpected places. If an ox did not want to move, his human owner had so little chance to move him. From this perspective, even the simplest daily works undertaken with oxen will appear as a successful story of negotiation where the human and non-human parties somehow arrived at a certain agreement, of which archival documents ignored the articles.

Plowing is the ox's field of expertise. The nineteenth-century income registers consulted in this research bear vast information regarding Ottoman grain farming. Unfortunately, findings in these documents are limited to numerical data about the acreage under the plow, harvest estimations, and the number of oxen, but they do not provide information about an agricultural operation as vital as plowing. Indeed, no other rural activity than plowing has the power to represent the multifaceted relations between farmers and oxen. No farmer would like to harness the plow to a random non-human worker. The ox himself was a human production, who was physically transformed and trained for the plowing job. The transformation of a bullock into an ox required not only the physical suffering of the chosen male bovine but also the efforts of his human owner. In eighteenth-century New England, little boys would start training a pair of calves to drag light carriages. According to a late-eighteenth-century Englishman called William Strickland, within a few years, the little

44 Jason Hribal, "Animals, Agency, and Class: Writing the History of Animals from Below." *Human Ecology Review* 14, no. 1 (2007): 103.

45 Martin A. Garrett Jr., "Evidence on the Use of Oxen in the Postbellum South," *Social Science History* 22, no. 2 (1998): 246.

bovines would follow their young human trainer "like a dog."[46] The training was both physical and mental. In the end, human and non-human laborers would form a sincere relationship. During plowing, the plowman would encourage "the oxen at their toil with melody and song."[47] A well-trained pair of oxen would obey voice commands and would not need a human in front to guide them.[48]

There is no reason to remind that the human part had the upper hand in the relationship between human and non-human agricultural laborers. Humans not only decided on the work agenda but also resorted to operational arrangements. In land trade, oxen provided a cheap but slow means of transport. They were relatively less costly since they grazed along the routes.[49] Still, this advantage could turn into a disadvantage once tired and thirsty oxen came across a fresh pasture or a muddy puddle and drove away from the way. Worse, the oxen harnessed to a cart had a tendency to pull against each other, and farmers would avoid this by tying their tails together.[50] The ox might usually be a docile worker, but he still needed attention at work. On the threshing floor, while a pair of oxen turned the large threshing wheel to separate grain from the stalks, the non-human worker on the outer side of the cycle would be more tired than his fellow touring on the inner side. That is why their human owner would often change their direction to distribute the workload between the two oxen equally. Another little arrangement for the human farmer on the threshing floor was to protect the grains from the oxen's dung, which required agility and big attention during the operation.[51] With

46 Andrew B. Conroy, "Oxen: Status, Uses and Practices in the U.S.A., Encouraging a Historic Tradition to Thrive," in *Draft Animals in the Past, Present and Future*, ed. Staatliche Schlösser et al. (Propylaeum, 2022), 141.

47 John H. Moore, "The Ox in the Middle Ages," *Agricultural History* 35, no. 2 (1961): 92.

48 J. I. Little, "Harnessing (and Yoking) Ox Power in Canada: A Historical Overview," *Material Culture Review*, no. 85 (Spring 2017): 28.

49 Nazer Aziz Anjum, "Oxen: Mainstay of Land Transport in Mughal India," *Indian History Congress* 78 (2017): 363.

50 Garrett Jr., "Evidence on the Use," 227.

51 Veli Varol, "Çumra'nın Alan Köyünde Düğen Sürme," *Türk Folklor Araştırmaları*, no. 23 (June 1951): 356–57.

their big hooves and strong muscles, the oxen were perfect threshers. Moreover, they were mighty enough to impose their physical characteristics and shape the work even when they were yoked to turn a large stone threshing wheel. In most cases, the biological needs of an ox played a big role in his performance.

The ox became tired and lost weight and condition quickly because his metabolism worked slowly. His digestive system demanded large volumes of food in a single meal. So, he needed a long time to rest and digest.[52] Ottoman rural life's tempo conformed to the slow metabolism of oxen. The long hours of work beginning at dawn would follow long hours of rest until the next morning. The content of the meal was decisive, too. Oxen's food diet served as a socio-economic catalyst in a nineteenth-century village. The oxen in wealthy households would eat oats, hay, and straw throughout the year. In Greek Central Macedonia, peasants who could afford to spare grain for fodder in late winter would plow their fallow fields anytime. Meanwhile, their poorer neighbors had to wait until May so that they could feed their oxen with new grass and begin plowing their fallow land after a months-long delay.[53] Food shortages strictly limited the performance of an ox.[54] The nourishment of oxen and their slow metabolism set the pace of the rural work agenda. Human and non-human laborers performed bits of negotiation and interaction during numerous heavy duties that farmers forced the oxen to carry out.

Some scholars assert that a work of art has an agency stemming from its existence, which is independent of its creator or its interactions with human actors.[55] From a perspective that attributes historical agency to a

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52 E.J.T. Collins, "The Latter-Day History of the Draught Ox in England, 1770-1964," *The Agricultural History Review* 58, no. 2 (2010): 210.

53 Paul Halstead, *Two Oxen Ahead: Pre-Mechanized Farming in the Mediterranean* (Wiley Blackwell, 2014), 16, 20.

54 Collins, "The Latter-Day History," 211.

55 Gustav Roßler, "Do Pictures Have Agency? Reflections on the Agency of Things in the Light of Works of Art and Image Acts," in *Berlin Keys to the Sociology of Technology*, ed. Cornelius Schubert and Ingo Schulz-Schaeffer (Springer VS Wiesbaden, 2023), 238-239. I would like to thank Veruschka Wagner for bringing into my attention this article which, otherwise, I would probably not be aware of.

pictorial work, millions of oxen in the Ottoman Empire will definitely appear as prominent actors on the scene of history. Oxen were undiscussably significant agents in the Ottoman Empire, but the main problem for animal historians is isolating their essential contributions to Ottoman rural life. The findings of the current research, which were mostly derived from numerical sources, encouraged me to focus on the presence of oxen as a strategy to emphasize their historical role.

Dölek Sever posits that non-human animals were important historical actors in agrarian settlements and their presence or absence had fatal consequences on the human world.[56] Ottoman agricultural production would largely fail to feed the population without oxen's laborious efforts. Oxen had a big importance and they were everywhere, carrying carts, dragging lumber, or pulling plows. Even though they left rare traces, contemporary people recognized oxen's vital importance and widespread presence. Pairs of oxen distributed to peasant households in the villages might not offer a clear view of the population of bovine workers. The non-human worker population reached a higher visibility in town centers and transit hubs. For example, Michel Tuchscherer describes camels' "permanent presence" in Ottoman Egypt with their cries, smells, and movements that filled every turn in the living spaces they shared with humans.[57] The Ottoman journalist Ahmed Şerif, who visited Adapazarı in November 1913, was amazed by the number of ox carts gathered around the local market. The whole town was "trembling with wheel squeaks" on the market days. The journalist proclaimed water buffaloes, who would tranquilly "chew the cud in the middle of the road" with an indifferent look in their eyes, the "absolute rulers of the streets" (*caddelerin mutlak hakimi mandalardır*).[58] This crowded army of non-human workers, who ruled

56 Deniz Dölek Sever, "Geç Dönem Osmanlı İmparatorluğu'nda Hayvan Hırsızlığı: Kastamonu Vilayeti Örneği," *Cihannüma Tarih ve Coğrafya Araştırmaları Dergisi* 7, no. 2 (2021): 187.

57 Michel Tuchscherer, "Some Reflections on the Place of the Camel in the Economy and Society of Ottoman Egypt," in *Animals and People in the Ottoman Empire*, ed. Suraiya Faroqhi (Eren Yayıncılık, 2010), 184-85.

58 Ahmed Şerif, "Adapazarı'ndan Bolu'ya," *Tanin*, no. 1778 (6 Dec. 1913): 3.

over the streets and fields of the Ottoman Empire until a century ago, left too few traces for historians. Despite the general silence in most official documents, the existing little pieces of information regarding oxen give irrefutable clues about their widespread presence in the Ottoman Empire. In Ancient Rome, enslaved people, who made up the permanent workforce in villa estates, were the victims of a similar historiographic silence, in addition to all kinds of possible mistreatments and abuses in their unfortunate lives. Even though he probably belonged to a rich landowning family, Virgil did not discuss slaves in his *Georgics.* Another Roman writer, Varro, considered enslaved people as a farm's "equipment" (*instrumentum*) and gave them a little place in his works. M.S. Spurr suggests that the reader must take for granted the presence of enslaved people in a Roman estate's workforce. In spite of the authors' silence about a subject as "unpoetic" as agricultural slavery, the enslaved people were "tacitly assumed" in Roman writings about farming.[59] Centuries later, enslaved bovines in the Ottoman Empire shared the same fate as enslaved people who worked in Roman farms. The absence of oxen and the "unpoetic" details regarding their work in most Ottoman documents cannot prove their absence. Instead, I will interpret the underrepresentation of oxen in Ottoman texts as a tacit assumption of their widespread presence.

§ 1.2 What is an Ox?

The *Bovinae* is a subfamily among other cloven-hoofed, ruminant mammals of the *Bovidae* family. The bovines are dispersed into twenty-four species from eight different genera.[60] The genus of domestic taurine cattle (*Bos taurus taurus*) includes the most common breeds typically raised for contemporary meat and milk industries, such as the Scottish beef

59 M.S. Spurr, "Agriculture and the Georgics," *Greece & Rome* 33, no. 2 (1986): 175-177.

60 Whitney Gomez et al., "Bovidae: Antelopes, Cattle, Gazelles, Goats, Sheep, and Relatives," *Animal Diversity Web*, 2011, accessed August 28, 2025, https://animaldiversity.org/accounts/Bovidae/.

cattle Aberdeen Angus or the dairy cattle Holstein Friesian.[61] The following taurine breeds are today considered to be native breeds in Turkey: the Anatolian Black (*Yerli Kara*), the Eastern Anatolian Red (*Doğu Anadolu Kırmızısı*), the Southern Anatolian Red (*Güney Anadolu Kırmızısı*), the Southern Anatolian Yellow (*Yerli Güney Sarısı*), the Turkish Grey (*Boz Irk - Plevne*), and the Zavot.[62] Shorthorned cattle breeds have been kept in Anatolia since the second millennium BCE. The most popular bovine breed has been the Anatolian Black, which is known for its disease resistance and tolerance of poor care. Female adults can attain up to 250 kilograms in weight[63] and male adults weigh 300 kilograms on average. The breed has a relatively small size and a considerably low milk yield.[64]

61 Madelyn Kunzler, "Bos Taurus Taurus vs Bos Indicus Taurus: Meat Quality and Efficacy," *Plant and Agricultural Biosciences Centre (PABC)*, 2022, accessed August 28, 2025, https://www.plantagbiosciences.org/people/madelyn-kunzler/2022/06/29/bos-taurus-taurus-vs-bos-indicus-taurus-meat-quality-and-efficacy/.

62 See Eymen Demir, "Türkiye Yerli Sığır Irklarında Genetik Çeşitlilik ve Seleksiyon İzlerinin Yüksek Yoğunlukta SNP Verilerle Değerlendirilmesi" (PhD Thesis, Akdeniz Üniversitesi, 2023), 3-5; Havva Dinç, "Genotyping of Beta-Casein, Kappa-Casein and Beta-Lactoglobulin Genes in Turkish Native Cattle Breeds and Efforts to Delineate BCM-7 on Human PBMC" (PhD Thesis, Middle East Technical University, 2009), 16; Emel Özkan, "Türkiye'de Yetiştirilen Yerli ve Kültür Sığır Irklarının Genetik Yapılarının Mikrosatelitler Ile İncelenmesi" (PhD Thesis, Trakya Üniversitesi, 2005), 10-13.

63 Zafer Ulutas, "Anatolian Black Cattle," *Breeds of Livestock*, n.d., Oklahoma State University, accessed August 28, 2025, https://breeds.okstate.edu/cattle/anatolian-black-cattle.html.

64 "Yerli Kara," *Et ve Süt Kurumu*, accessed August 28, 2025, https://www.esk.gov.tr/tr/11106/YERLI-KARA.



Figure 1.1 The Anatolian Black Cattle. SOURCE: Et ve Süt Kurumu, https://www.esk.gov.tr/tr/11106/YERLI-KARA.

The water buffalo (*Bubalus bubalis*) is yet another common bovine genus in Turkey. Its members stayed in Anatolia for a considerable time, long enough to adapt to local ecological conditions.[65] Relatively fewer sweat glands make them more sensitive to heat than most bovines; therefore, buffaloes are known for "wallowing in mud." The weight of domesticated buffaloes ranges from 250 to 550 kilograms. Buffalo milk is exceedingly richer in fat, lactose, and protein than taurine milk. Therefore, the butter and cheese made from buffalo milk are of relatively higher quality.[66] The greater muscle mass and richer milk composition of buffaloes give them a greater value in the human economy than domestic taurines.

65 Ermiş Özkan et al., "Morphometric Analysis of the Skulls of Domestic Cattle (Bos Taurus L.) and Water Buffalo (Bubalus Bubalis L.) in Turkey," *Turkish Journal of Veterinary & Animal Sciences* 43, no. 4 (2019): 533.

66 Jason Roth, "Bubalus Bubalis: Water Buffalo," *Animal Diversity Web*, 2004, accessed August 28, 2025, https://animaldiversity.org/accounts/Bubalus_bubalis/.



Figure 1.2 The Anatolian River Buffalo. SOURCE: Bayram Tomakin, ed., "Manda Sayısında Türkiye 1'incisi," *Pusula Gazetesi*, April 28, 2024, https://www.pusulagazetesi.com.tr/manda-sayisinda-turkiye-1incisi.

The current dissertation will follow a simple taxonomic categorization by classifying bovines in question either as members of the Anatolian black cattle breed of the domestic taurine genus (*karasığır* in Turkish) or the Anatolian river buffalo breed of the water buffalo genus (*manda, camuş, kömüş,* or *su sığırı* in Turkish). These two breeds roughly represented the cattle population in the nineteenth-century Ottoman Empire.

The English word "cattle" is today defined as "large farm animals kept for their milk or meat; cows and bulls"[67] or, describing the concerned species in a more specific way, "ruminant mammals of the genus *Bos* that have been domesticated and are often raised for meat and dairy products."[68] It is not a coincidence that both definitions emphasize the products extracted from these non-human animals. One cannot think about cattle without their contribution to the economy. The English word

67 "Cattle," in *Cambridge Academic Content Dictionary* (Cambridge University Press), accessed March 25, 2024, https://dictionary.cambridge.org/dictionary/english/cattle.

68 "Cattle," in *American Heritage® Dictionary of the English Language*, accessed March 25, 2024, https://www.thefreedictionary.com/cattle.

"livestock" and the Turkish word *mal* explicitly expose the economist human perception regarding farm animals. Unsurprisingly, the etymology of "cattle" is also closely related to property[69] and movable possession.[70] Cows, bulls, and steers are considered cattle as long as they have economic value in the human world.

Meat and dairy products stand for only a single aspect of the benefits that humans extract from bovines. A vital service that bovines undertook for their human owners for millennia is their work as draft animals. The ox is a castrated and trained male member of the bovine population, who is known for his competency in plowing. With an affordable cost and maintenance, the Anatolian taurine ox represented the standard non-human worker preference in the Ottoman Empire. Meanwhile, the buffalo ox's bigger strength and his ease of working in muddy terrains like rice paddies gave him a particular role in the rural non-human workforce. Contemporary people were aware of the evident physical differences between the two genera. Taurine and buffalo oxen did not have the same functions, physical capacities, and prices. That is why Ottoman people paid utmost attention while registering oxen with brief information about their species. The ox is the main subject and a prominent actor in this dissertation. Findings concerning oxen from the taurine genus or the buffalo genus constitute the main materials of the current research.

Agriculture is an energy-intensive activity, and the employment of draft animals, wherever possible, increased agricultural output per head.[71] Bovines are not the only non-human animals forced to plow a field. Throughout thousands of years, environmental conditions and evolving agrarian techniques found their translation in different non-human animal preferences in agriculture. For instance, the concurrence

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69 Robert K. Barnhart, ed., "Cattle," in *The Barnhart Dictionary of Etymology* (The H. W. Wilson Company, 1988).

70 T. F. Hoad, ed., "Cattle," in *The Concise Oxford Dictionary of English Etymology* (New York: Oxford University Press, 1996).

71 E. A. Wrigley, "Energy Availability and Agricultural Productivity," in *Land, Labour and Livestock*, ed. Bruce MS Campbell and M. Overton (Manchester University Press, 1991), 338.

between the horse, the camel, and the ox as draft animals has a history longer than three millennia.[72] For some farmers, even donkeys could be an alternative non-human animal to harness their plows to. Still, the ox stayed on the top of the draft animal preference list for the greater part of the ancient world.[73] From the seventeenth century on, more and more horses started to replace oxen in Europe. A writer explains the substitution of oxen by horses with Western agriculture's movement toward market involvement.[74] Another factor was the development of asymmetric plows equipped with iron coulters to cut the soil, a piece to turn over the manure, as well as a shaft and wheels to alleviate the burden on the draft animals.[75] The increased efficiency and speed of these instruments encouraged the usage of horses for quicker plowing work. Jonathan Liebowitz cannot clarify if horses or agricultural prosperity came first. His practical answer is that oxen were replaced by horses "when and where farmers were prosperous enough to afford them." By the 1830s, the draft oxen had already become a "sign of backwardness" in England.[76] Whereas farmers in the northern parts of France, such as Picardy, embraced horses,[77] the preference of most French farmers for oxen had not changed by the nineteenth century.[78] Meanwhile, the ox silently continued to drag the plow in Anatolia.

The physiological differences between the horse and the ox were a hot topic for nineteenth-century farmers. In the eyes of his human owner, the ox had considerable economic advantages over the second most

72 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): 321.

73 George Edwin Fussell, "Ploughs and Ploughing before 1800," *Agricultural History* 40, no. 3 (1966): 177.

74 Jonathan J. Liebowitz, "The Persistence of Draft Oxen in Western Agriculture," *Material Culture Review*, no. 36 (Fall 1992): 30.

75 Emmanuel Le Roy Ladurie. *Les Paysans de Languedoc.* Ecole des Hautes Etudes en Sciences Sociales, 1985: 79-81.

76 Liebowitz, "The Persistence of Draft Oxen," 31-33.

77 Pierre Goubert, "Les techniques agricoles dans les pays picards aux XVIIe et XVIIIe siècles," *Revue d'histoire économique et sociale* 35, no. 1 (1957): 30.

78 Wrigley, "Energy Availability," 329.

popular non-human agricultural worker. As ruminants who can digest leaves and twigs, oxen did not have a strong diet preference like horses.[79] Horses consumed more oats than oxen, whereas the latter would only "eate but straw, and a lyttell hey" according to a sixteenth-century British husbandry book.[80] The oxen also did not have the shoeing maintenance cost as horses did. Last but not least, at the end of their career, unlike horses, the elderly oxen could be "as valuable as ever" after "a few months' rest in a good pasture," according to a nineteenth-century Canadian farmer journal.[81] Besides such economic calculations, environmental conditions and human culture were in play, too. In twentieth-century northern Greece, most farmers used horses since they had to go through distant and steep paths to reach their fields, whereas Thracian communities in the same region preferred the ox, which they considered "the hallmark of a farmer."[82] Horses would lose less time on the road if a farmer's field were distant from his or her village. Yet, their neighbors might prefer a slower trip with their oxen and still find reasons to be proud of the latter. A farmer's choice between alternative draft animals relied on complicated calculations based on geographic, economic, technical, and cultural factors.

The replacement of oxen by horses was a part of a greater series of changes in the European rural economy. In Britain, agricultural output scored a striking increase in the eighteenth century. Growing farm acreages and novelties in farming methods marked the "British agricultural revolution."[83] Asymmetric plows with coulters and wheels harnessed to

79 Little, "Harnessing (and Yoking)," 21.

80 John Langdon, "The Economics of Horses and Oxen in Medieval England," *The Agricultural History Review* 30, no. 1 (1982): 33-34.

81 Little, "Harnessing (and Yoking)," 21.

82 Halstead, *Two Oxen Ahead,* 333.

83 G. E. Mingay hesitates in using the term "agricultural revolution" for this period of transformation which actually showed a slow evolution. See Mingay, "The 'Agricultural Revolution' in English History: A Reconsideration," *Agricultural History* 37, no. 3 (1963): 133. On the other hand, E. L. Jones affirms the "unhurried" pace of the change but adds that its effects were revolutionary. See Jones, "Agriculture and Economic Growth in England, 1660-1750: Agricultural Change," *The Journal of Economic History* 25, no. 1 (1965): 4-5.

horses should have certainly contributed to the amplification of the energy input and its translation into a greater output. Novelties in farming were inseparable from novelties in animal husbandry. British farmers discovered that letting cattle graze in grass leys and feeding them with new fodder crops such as sainfoin, clover, and turnip[84] gave richer bovine manure. Improving fodder meant improving manure, which would eventually improve the quality of the harvest. Higher agricultural productivity would bring additional time and space to experiment with cattle breeds. The division of British bovines into "food producers" and "workers" took a rigid form by the late eighteenth century, as a result of a long process of specialization in farming that took centuries. The search for breeds that would fit human requirements better created results as interesting as athletic and muscular "bovines with equine characteristics."[85] By the nineteenth century, special bovine breeds had taken their place next to sophisticated farm instruments among the triumphs of the extensive agricultural transformation that took place in the northern and northwestern parts of Europe.

Lucien Febvre asserts that techniques often travel around time and space.[86] Still, they will demand suitable conditions to flourish in a new venue. Enclosed big farm estates, which functioned as centers of experimental practices for selective breeding in Britain, had no significant presence in either France or the Ottoman Empire. Ottoman attempts at centralization throughout the nineteenth century occasionally underestimated local notables' hold in rural settlements. The powerful and innovative gentry ideal type in the British example could not find the same socio-political setting in the Ottoman Empire. Despite the presence of wealthy and mighty local landholders in nineteenth-century Anatolia and Rumelia, these distinguished people did not have a vocation to increase the productivity of their farms. Zafer Karademir, who denies defining Ottoman agrarian techniques as "primitive," does not assume a gap

84 Jones, "Agriculture and Economic Growth," 3-5.

85 Collins, "The Latter-Day History," 205, 215.

86 Lucien Febvre, "Réflexions sur l'histoire des techniques," *Annales d'histoire économique et sociale* 7, no. 36 (1935): 531.

as wide as generally imagined between European intensive farming and Ottoman extensive farming in the early modern period.[87] The hegemony of the open-field system in Ottoman farms and the lack of enclosed farms did not mean the inexistence of human control over bovine reproduction. The Turkish proverb "You can tell which bullock will become an ox by its dung,"[88] can be seen as an oral proof of the existence of selective breeding practices or human control over bovine bodies in Anatolia. Ottoman farmers had their own methods for selective breeding, but apparently did not have the capitalist incentive to exert them properly. Poor involvement in market relations and obligatory reliance on subsistence farming prevented most Ottoman peasants from experimenting with breed improvements, which demanded a certain level of economic comfort. Meanwhile, big farm owners, who were far from efficiently using their vast estates, would acknowledge European modern agricultural instruments towards the end of the nineteenth century.

The aforementioned bovine breeds had been preserved in Anatolia and Rumelia over time. Nevertheless, most of their members did not perfectly conform to human aspirations. The need for breed improvement continued to occupy Ottoman farmers' minds well into the twentieth century. By 1912, imperial farms had thirty bulls in Thessaloniki, three bulls in Monastir, thirty-three bulls in Ankara, sixty bulls in Konya, and twenty-nine bulls in Hüdavendigar. If these numbers were seen as sufficient and breed improvement was not a requirement for Anatolian and Rumelian bovine populations, the Minister of Commerce and Agriculture, Aristidi Paşa, would not have complained in the parliament about finding an ample budget and land opportunity for keeping more stud bulls in imperial stables.[89] The hegemony of the Anatolian taurine and the local river buffalo breed persisted in most parts of the Ottoman Empire. They might not be the strongest members of the *Bovinae* for serving human needs, but

87 Zafer Karademir, *Osmanlı Yeni Çağı'nda Tarımsal Gelişim: Ziraat, Hasılat, Ticaret* (İstanbul Bilgi Üniversitesi Yayınları, 2023), 280.

88 The original version in Turkish is as follows: *Öküz olacak tosun bokundan belli olur.*

89 *Meclis-i Mebusan Zabıt Ceridesi* 2, 27. İnikad, 23 Haziran 1328 (1912), 74.

oxen from these breeds worked with devotion for their human owners for centuries.

§ 1.3 Human Perceptions of the Ox

Relations between human and non-human animals are multifaceted. For example, in the last years of the Ottoman Empire, policies towards dogs showed a substantial variety. Cihangir Gündoğdu identifies a parallelism in the late-Ottoman press between campaigns for the removal of street dogs and new productive roles as police dogs or pet animals for select breeds.[90] On the other hand, the upper echelons of the Ottoman society grew an interest in purebred dogs.[91] Apparently, different policies ran at the same time. Mine Yıldırım proposes a bilateral lecture on the late-Ottoman human acts towards street dogs so that actions of violence do not overshadow the precious efforts guided by affection.[92] Resonating with the complexity and dynamism of human-dog relations, the ox's role in the Ottoman Empire had no single definition.

In many cultures, the ox is associated with work, faithfulness, docility, but also stupidity.[93] In Turkish, the word *öküz* may connote strength, stupidity, or rudeness. The linguistic exchange of these behavior attributions or physical characteristics between oxen and people may point out the developed level of their relations. Indeed, these relations were boldly marked by anthropocentrism since the human party was the dominant side. It was human economic expectations that primarily shaped people's perception of bovines. For example, *İlm-i Hayvanat*, a zoology book from 1839, clearly exposed a utilitarian position regarding non-human animals.

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90 Cihangir Gündoğdu, "The State and the Stray Dogs in Late Ottoman Istanbul: From Unruly Subjects to Servile Friends," *Middle Eastern Studies* 54, no. 4 (2018): 565, 569.

91 Cihangir Gündoğdu, "Dogs Feared and Dogs Loved: Human-Dog Relations in the Late Ottoman Empire," *Society & Animals* 31, no. 1 (2023): 36.

92 Mine Yıldırım, "Sürgünden İtlafa, 'Mahallinde Öldürmeden' Ötanaziye: Hayırsızada Vâkâsının Ardından İstanbul'da Sokak Köpekleri," *Reflektif Sosyal Bilimler Dergisi* 5, no. 3 (2024): 906.

93 Moore, "The Ox in the Middle Ages," 92-93.

Mehmed Şükrullah, "disciple of Mehmed Emin Efendi" according to his own presentation, described bovines with the deliciousness of their meat, their suitability for pulling carts and carrying things, and the possible objects that can be made from their fat, skin, hair, horns, and bones. The author concluded, "this blessed animal has nothing to go to waste" (*bu mübarek hayvanın bir şeyi zayi olmaz*). In addition to the general benefits of the bovine population, the cow would also produce milk and calves. No other animal was "more beneficial for human affairs" (*umur-ı insaniyeye bunun kadar yarar bir hayvan yokdur*) than the cow.[94] No one can refuse the various benefits humans have been extracting from bovines for thousands of years. Economic benefits largely shaped human perception of oxen. Different aspects of the bovine contribution in human affairs led to various human interpretations regarding oxen.

1.3.1 *Capital*

Cattle herds entered human societies in the form of capital. According to Frederick Engels, the domestication of non-human animals had resulted in the appearance of a "hitherto unsuspected source of wealth." "Supervision and the rudest care" were enough for the steady growth of this new form of wealth.[95] The etymology of the English word "cattle," which described movable property or wealth during the feudal period, exposes the human perception of bovines. In the eyes of the people in the past, "livestock," above all, was chiefly an economic asset. In the nineteenth century, the main discussion concerning bovines was about refining their subcategory. For instance, Karl Marx saw them as a driving force of primitive accumulation. More precisely, he took the ox as fixed capital but categorized the bovines fattened for slaughter as circulating capital.[96] Meanwhile, some nineteenth-century North American writers considered

94 Mehmed Şükrullah, *İlm-i Hayvânât* (1254 [1839]), 17-19, https://portal.yek.gov.tr/works/detail/568029.

95 Frederick Engels, *The Origin of the Family, Private Property and the State*, ed. Eleanor Burke Leacock (International Publishers, 1975), 117-118.

96 Jason Hribal, "Animals Are Part of the Working Class Reviewed," *Borderlands* 11, no. 2 (2012): 4-5.

oxen "active capital" when they were "not at work," and ox-keeping farmers could "realize their investments" in the nearest butcher whenever they wanted.[97] An anonymous Ottoman writer from 1913 would agree with Marx in this discussion since he also considered "domesticated animals" (*hayvanat-ı ehliye*) in a farm as fixed capital (*daimi sermaye*).[98] There was little hesitation about defining bovines as a form of capital, but their economic benefit altered between use-value and exchange-value according to the form of service they would provide for their human owners.

In the human world, cattle were seen as private property that could be bought and sold for a price. In many peasant households around the Ottoman Empire, a pair of oxen represented one of the most valuable economic assets. For instance, Kör Hafızın Mustafa, a poor mid-nineteenth-century farmer from Konya's Hamid district, owned no farms or gardens but only bovines. The scribes estimated the worth of Mustafa's single pair of oxen as 350 kuruş, almost seventy percent of his whole wealth.[99] Yet, the oxen's real value for Mustafa's household should be priceless. In case they lost one of these laborious bovines, they would hardly be able to replace this valuable economic asset. A notable imperial official called Kapıcıbaşı Mehmed Emin Ağa had a three-hundred-dönüm-large farm in Edirne's Akçakızanlık subdistrict. By 1845, a big portion of the farm's assets was composed of bovines, among which there were eight oxen, two dairy cows, twenty barren cows, as well as numerous calves and stirks.[100] Mehmed Emin Ağa, who owned the farm, was the evident owner of these bovines, too. The birth of calves or the death of old bovines would have a direct impact on the financial value of Mehmed Emin's farm. Ownership

97 Conroy, "Oxen: Status," 141.

98 "Sanayi-i Ziraatte Makinelerin Ehemmiyeti," *Felahat*, no. 17 (Nov. 1913): 259-60.

99 See the second household on the seventh row in the Presidency of the Republic of Türkiye, Directorate of State Archives (documents from the Ottoman archives will be hereafter presented as "OA.") Maliye Varidat Muhasebesi Temettuat Defterleri 10201, 29 Zilhicce 1261 (29 Dec. 1845): 11. Hereafter, temettuat registers will be abbreviated to "ML.VRD.TMT.d" and their standard generic date (29 December 1845) will not be repeated.

100 OA. ML.VRD.TMT.d 5205: 40.

might be the most popular form of human claims over non-human animals, but there is not enough space for the endless number of examples.

People claimed different kinds of ownership over bovines. Some Ottoman bovines were dragged into complicated situations. Seen as a property, a bovine might have multiple human owners if he or she received investments from different people.[101] The Ottoman rural economy was never completely monetized, and peasants were open to transactions that involved the exchange of assets or services. If cows in a household gave birth to an excessive number of calves, their human owner might give some of them to other people to reduce feeding costs and receive long-term benefits from the calves' new owners. The partnership in bovines was so common in the villages around Kastamonu that this form of investment found its reflection in a proverb. Peasants in this part of Anatolia will ask upon someone's frequent visit to a certain place, "Did you give a buffalo cow to your partner?" (*Ortağına inek kömüşü mü verdin?*), implying as if the person has left an asset as valuable as a buffalo cow in the place he or she visits and as if he or she frequently controls it.[102] Many nineteenth-century Ottoman documents from the Province of Kastamonu captured this economic phenomenon. For instance, Küçük oğlu Bekir was a farmer who lived in the Cide subdistrict's Kayadibi village group by 1845. Bekir's livestock included a pair of oxen, a pair of dairy cows, a heifer, and a male calf. Kurt oğlu Ali, a peasant from Cide's Derebucağı village group, must have been frequently visiting Kayadibi to see Bekir since they shared the same water buffalo cow (*sağman camuş*) and split among them the milk and calves she would produce.[103] Abdullah Bilal, a farmer from Cide's Sökü village group, shared the same buffalo

101 Mikhail gives the example of how a number of peasants would buy shares in a single buffalo cow in Ottoman Egypt. See Alan Mikhail, "Animals as Property in Early Modern Ottoman Egypt," *Journal of the Economic and Social History of the Orient* 53, no. 4 (2010): 630.

102 I would like to thank Kemal Yazgan, my parents' neighbor in Gökçeada's Zeytinliköy, who had the time for an interesting conversation about shared cows in the villages of Kastamonu. It is Kemal Hoca who informed me about this uncommon proverb and clearly explained it to me.

103 OA. ML.VRD.TMT.d 3256: 13.

cow with Abdullah Efendi oğlu Ömer from the same village.[104] It should be Ömer who mostly looked after the cow because the scribes noted under Ömer's entry that Bilal had a half share in the non-human animal.[105] There are numerous examples. Deli İbrahim oğlu Süleyman from Cide's Altıntaş village group shared an Anatolian taurine cow with Halil Usta oğlu Mustafa from another village[106] and Abdullah oğlu Abdullah, another farmer from Altıntaş, shared a buffalo cow with someone called Elhac Osman oğlu Ahmed who lived in another village of Cide.[107] All in all, many farmers in mid-nineteenth-century Kastamonu had reasons to visit their neighbors or distant villages to check their investments, that is, dairy cows, and collect their share of profit.

The little note on Ömer's inventory suggests that the "joint-stock" bovines would stay for a long time with one of the partners, but there could also be some cows who would regularly move from a partner's barn to the other's. The consulted registers do not clarify how often human partners resorted to the option of slaughtering their shared stirks and had their shares in the form of carcasses. Archival records do not give all the details about this partnership which seems to be popular in nineteenth-century Kastamonu. For instance, it is a mystery if the "shared" bovines knew the scent and sound of both of their shareholders. Cows were suitable for half shares because they gave material returns like milk and calves; however, peasants rarely resorted to half shares in oxen. A shared oxen appears in the postmortem inventory of Büyük Mustafa oğlu Mustafa bin Mustafa bin Feyzullah, a farmer from Cide's Kayadibi, who passed away in 1870. Among the possessions Mustafa left to his inheritors, there were half shares in a water buffalo ox, four cows, two heifers, and five bullocks.[108] It is impossible to know how the two shareholders from Cide actually benefited from their buffalo ox. It could be a long-term

104 OA. ML.VRD.TMT.d 3266: 29

105 OA. ML.VRD.TMT.d 3266: 32.

106 OA. ML.VRD.TMT.d 3267: 4.

107 OA. ML.VRD.TMT.d 3267: 15.

108 See verdict no. 20 in OA. Meşihat Şer'iyye Sicilleri Defterleri (MŞH.ŞSC.d) 3420, 29 Zilhicce 1289 (27 Feb. 1873): 7.

investment for one party, who would demand an annual rent from his partner for the usufruct of their common economic asset. They might also decide on a time span to use the ox and give him back to the other partner once the period was over. Would the ox follow the schedule and express his joy or resentment at the times of exchange? Such questions will remain without an answer. What these examples show is that bovines in the nineteenth-century Ottoman Empire were considered a form of capital. In the Province of Kastamonu, many peasants saw them as investable economic assets.

Non-human animals in the Ottoman Empire were also subjected to contracts that covered shorter terms than shareholding agreements. Work animals like oxen and horses were rented for certain occasional jobs.[109] The late-nineteenth-century Ottoman civil code, *Mecelle-i Ahkam-ı Adliye*, gave considerable place to animal leases (*icare-i hayvan*). In animal leases for the purpose of carriage, the contract needed to foresee the precise distance so that the non-human carrier would not get injured. Some contracts even defined the kind of load and prohibited carrying another type of goods, even if their weight would remain the same. If the rented non-human worker lost his or her life during a carriage in a way that the contract had not permitted, the renter had to pay the human owner for the deceased worker's whole worth.[110] These articles give an idea about what kind of conflicts happened regarding animal leases in real life. Nineteenth-century Ottoman people rented non-human animals to carry goods or plow their fields whenever they needed non-human assistance. Oxen and horses were leased as economic assets, and their human owners would like to ensure that the renters took care of the non-human properties they used for a short time. It will be too naive to explain the owners' concern about the working conditions of their non-human animals with empathy and affection. The owners certainly worried

109 Cadaster notes from early-sixteenth-century southeastern France indicate that the oxen there, too, were usually hired out. See Thérèse Sclafert, "Sisteron au début du XVIe siècle d'après un cadastre," *Annales de géographie* 37, no. 206 (1928): 172.

110 Aslıhan Akdeniz, "Mecelle-i Ahkâm-ı Adliye'nin Kira Hükümlerinin Nizâmiye Mahkemelerinde Uygulanması" (PhD Thesis, İzmir, Dokuz Eylül Üniversitesi, 2022), 94-96.

about the well-being of their non-human animals, because the latter's injury or death would mean a significant economic loss for them. They would demand an economic recompense from the person responsible to cover their loss. Transactions that involved non-human animals in the nineteenth-century Ottoman Empire point out that people saw them as a form of capital owned by private persons.

1.3.2 *Workers*

"Labor is the source of all wealth," wrote Engels. He also acknowledged nature's role in supplying the material to be converted into wealth.[111] Wealth and capital are designed for the human world. Nevertheless, labor, the precondition of wealth, can be either human or non-human. Throughout history, non-human workers toiled as much as human laborers to create a richness that was unequally distributed among and within species. In the Ottoman Empire, work animals like oxen and horses would leave home early in the morning, head for their workplace, undertake burdensome jobs, and even receive wages in exchange for their services. Their captivity under human yoke and bondage to human work agenda cannot change the fact that these non-human animals were workers who were often even more beneficial than most of their human fellows.

Many animal historians seek to expose the role of non-human labor in human history. Hribal defines milking female mammals as the transformation of reproduction into a form of labor, at the end of which a surplus of milk is extracted. He describes meat, another form of labor for the author, as "hard work."[112] From this perspective, bovine dung will stand for another form of labor. In nineteenth-century Britain, Lincolnshire farmers called cattle "our manufacturers of manure."[113] I acknowledge the violent human exploitation of non-human animal bodies for extracting the milk, flesh, and every other element inside them. The milking

111 Engels, *The Origin of the Family,* 251.

112 Hribal, "Animals are Part of the Working Class Reviewed," 13, 21.

113 R. W. Sturgess, "The Agricultural Revolution on the English Clays," *The Agricultural History Review* 14, no. 2 (1966): 119-20.

operation further needs attention due to the crucial discussions it brings regarding the gender question. However, in this research based on oxen, I prefer a narrow definition of the "non-human worker" category that only covers work animals, who were mostly males and who were exploited primarily for their labor rather than their meat or skin. That is why I do not engage in a discussion to assess the labor and sacrifices of the bovines who were fattened for their meat or the cows who were fattened for their milk. This research focuses on draft animals, who were kept so that they pulled and dragged objects. Unfortunately, archival sources remain silent about the fatal end of an ox, when he would no longer be able to work and would be slaughtered. As I concentrated on the cattle who were actively working by the 1840s, I mostly complied with the archival silence about these non-human workers' probable employment in fattening in the short time span following retirement and prior to slaughter.

People who worked with oxen clearly recognized the non-human workers' role and their status as skillful laborers. In the eighteenth century, the Ottoman bureaucracy saw little difference between the men and oxen who hauled and positioned straw and dirt to repair a dam in the Egyptian countryside. Oxen and men, who ate the same provision of beans and who appeared on the same register, belonged to the same unit of labor.[114] While describing plowing as the work's transfer from the muscle of the peasants to the "beasts" on the yoke, Anthony Bryer mainly refers to oxen and horses but does not exclude humans, who can drag a plow, too.[115] A pair of oxen and a plowman shared the same fate in the middle of the field under the sun. Their dedication and collective effort to move the plow would undermine their anatomic differences. On level ground, a pair of oxen would plow at a steady pace of one to two miles per hour.[116] Both human and non-human plowers needed to keep their

114 Mikhail, *Nature and Empire,* 178.

115 Anthony Bryer, "The Means of Agricultural Production: Muscle and Tools," in *The Economic History of Byzantium: From the Seventh through the Fifteenth Century Volume 1*, by Angeliki Laiou (Dumbarton Oaks, 2002),107.

116 Collins, "The Latter-Day History," 204.

harmony and motivation in such a slow work tempo to plow a considerable size of land before returning home. The Ottoman Empire was not the only state that documented bovine efforts in the agricultural economy. The United States Bureau of the Census listed oxen as "working cattle" until 1890.[117] In France, the "working cattle" category appeared in every agricultural census up to the 1960s.[118] The ox was an officially recognized worker.

Oxen had their place in the labor market. For example, in nineteenth-century southern Italy, hiring a pair of oxen would cost five to ten human laborers.[119] Hired non-human workers did not enjoy the whole sum due to the brokerage fee of their human owners. Still, as long as the oxen continued to work and bring money, their owners would provide them with fodder, the form of payment they preferred. During the construction of the Fatih Mosque in the Ottoman capital, a considerable item in an expenditure list from 1771 was flaxseed pulps for feeding the oxen who carried timber and stones.[120] So, non-human workers received a wage, but in the form of fodder instead of money. These workers' physical traits and necessities differed from those of their human fellows. Indeed, the ox was a costly worker since he would daily eat about 2.5 percent of his body weight.[121] If Ottoman farmers did not see an economic benefit in feeding such a costly non-human worker, most peasant households would not keep a pair of oxen in their barns. Oxen were excellent plowers and threshers. The ease that oxen brought in farming highly encouraged peasant households to fulfill these non-human workers' demand for a large volume of fodder and regular human care. Findings from the nineteenth century suggest that keeping a pair of oxen in Anatolia and Rumelia was not an elite luxury but a common privilege that most farmers

117 Moore, "The Ox in the Middle Ages," 90.

118 Collins, "The Latter-Day History," 194.

119 Halstead, *Two Oxen Ahead,* 42.

120 Verdict no. 193 in İstanbul Kadı Sicilleri, *İstanbul Mahkemesi 33 Numaralı Sicil* 77, 234 [63a-2 in original], https://www.kadisicilleri.org.

121 Jens B. Aune et al., "The Ox Ploughing System in Ethiopia: Can It Be Sustained?" *Outlook on Agriculture* 30, no. 4 (2001): 277.

enjoyed. Whereas wealthy households could afford to keep a larger number of non-human workers, the majority of farmers would have a single pair of oxen to plow their fields and thresh their harvest. In return for their laborious services, oxen would receive their payment as fresh grass in summer and fodder in winter.

A mid-twentieth-century ox producer in the United States defined an ox as "a steer that goes to work."[122] As a non-human worker, the ox had not only a wage but also a workplace and his own work hours. Farmers would take the oxen from their barns early in the morning and head for their workplace. The human would decide on their work and destination. They might sow a field, plow a fallow land, fell trees in the forest, or carry their goods to the market. In field work, the farmer would signal the end of their work by "pulling the oxen's tails twice." According to an account from the mid-twentieth century, the oxen would accurately get the farmer's message.[123] The ox, who headed for work at dawn, who worked and gave pauses together with his human owner, and who returned home from work and rested until the next morning, certainly had a concept of work. The castration of a potential ox and the initial exercises he had with empty carts would not only transform the body of a maturing bullock into an adult ox but would also shape his mind according to the necessities and tempo of rural life. The result of this complicated transformation process would give the strongest and the most docile non-human plowers in the Ottoman Empire.

Columella wrote in the first century that the ox is "man's most hard-working associate in agriculture."[124] Almost two millennia later, after a series of calculations about the contribution of draft animals as a labor force in farming operations, Tony Wrigley concluded, "Perhaps man's best friend was his horse rather than his dog."[125] Although they might have implicitly undermined women's contribution in agriculture, the

122 Moore, "The Ox in the Middle Ages," 90.

123 Veli Varol, "Çumra İlçesinin Alanlı Köyünde Ekime Dair Bazı Tabirler ve Adetler," *Türk Folklor Araştırmaları*, no. 6 (Jan. 1950): 95–96.

124 Moore, "The Ox in the Middle Ages," 90.

125 Wrigley, "Energy Availability," 339.

word choices of "associate" and "best friend" show that both writers acknowledged not only the non-human workers' role in farming but also the deep relation they had with their human employers.

1.3.3 *Means of Production*

Another economic role of oxen was that of a means of production in agriculture. Many people considered non-human animals to be nothing but simple instruments. René Descartes described the body (either human or non-human) as a machine. The French philosopher called animals "*bête-machine*," whose motions originate from a mechanical principle.[126] It is impossible to know if he had read Descartes, but a late-Ottoman writer resonated with this philosophical reasoning in an article about agricultural mechanization. The anonymous author posited that plant, soil, and animal constituted three essential "machines" for farming (*nebat, toprak ve hayvan ziraat için elzem makinelerdir*).[127] The treatment of non-human workers as a means of production was widespread among farmers. Refik Halid Karay depicts a wealthy peasant called Mustafa Ağa, who would buy an old ox as a substitute every summer at the beginning of the harvest. After "using" the spare ox during the harvest and threshing, he would sell the ox in autumn for the same price as his purchase price.[128] Mustafa did not want to cover the substitute ox's expenses through the winter. He would "use" the extra ox in exchange for his fodder cost, just like a seasonal worker or a machine.

Farming was not the only occupation that required the use of non-human animals. In the nineteenth century, timber merchants around the Taurus Mountains would provide forestry laborers with the non-human log carriers they needed. According to the contracts that merchants signed with the members of the peripatetic *Tahtacı* community, the former would demand from the latter payments with interest for these non-

126 John Cottingham, "'A Brute to the Brutes?': Descartes' Treatment of Animals," *Philosophy* 53, no. 206 (1978): 551-552.

127 "Sanayi-i Ziraatte Makinelerin Ehemmiyeti," *Felahat*, no. 17 (Nov. 1913): 258–64.

128 I would like to thank Ekin Arpacı for bringing Karay's short story called "Koca Öküz" to my attention. See Refik Halid Karay, *Memleket Hikayeleri* (İnkılap Kitabevi, 2009), 50.

human animals.[129] The oxen or mules that merchants handed over to the nomadic woodcutters were seen as a simple element of the contract signed for a certain amount of logs. Woodcutters needed them to increase the amount of the logs they collected, and the merchants, who also charged the human workers for these non-human assistants, surely saw a great interest in improving the work efficiency. The non-human forest laborers took part in these timber contracts as a necessary means for the woodcutting job instead of laborers with their own wages and working rights. From a perspective that instrumentalizes non-human animals, they demanded the kind of care that "machines" would require. For instance, the oxen who operated in the transportation sector needed to get shod to drag carts for long distances. Another group of oxen who were more likely to wear shoe nails were the ones who lived in the rocky terrains of Anatolia.[130] Unlike the rest of the ox population, members of these two groups had an extra "maintenance cost" for hoof protection. Moreover, the oxen's transfer resembled a technology transfer. In nineteenth-century England, the interest in draft oxen experienced a short period of "revival" at the expense of workhorses. Farmers in the districts with the draft horse tradition would hire experienced workmen from ox-exporting districts to teach the local workmen how to manage the "new draft species."[131] The ox evidently needed certain technical knowledge to operate correctly in unfamiliar hands.

Associated with plowing and grain farming for thousands of years, the ox had a particular relation with land. For most farmers, ox and land were inseparable from each other. This relation was institutionalized in many ways. In Medieval England, for instance, the Domesday Book indicated land and fiscal obligations in terms of "carucates," which is the land that

129 Başak Akgül, "Being a Forestry Labourer in the Late Ottoman Empire: Debt Bondage, Migration, and Sedentarization," *International Review of Social History*, no. 3 (2022): 473.

130 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): 309.

131 Collins, "The Latter-Day History," 213.

eight oxen would annually till with the heavy plow called *caruca*.[132] Similar fiscal and administrative calculations that associated land and a pair of oxen (*çift*) also existed in the Ottoman Empire and will be treated later. The Ottoman bureaucracy employed direct terms to designate the strong bond between oxen and land. For Ottoman bureaucrats, oxen in a farm were fixtures (*demirbaş*) that belonged to the farm inventory. In the early-nineteenth century, Mahmud Paşa, the governor of Konya's Teke and Hamid districts, handed over the tenure of twelve farms in Kemer-i Hamid and Burdur subdistricts to former grand vizier Mehmed Emin Rauf Paşa. An official document underlined that the oxen in the concerned farms were fixtures that actually belonged to the empire (*çiftlikler derununda mevcud olan öküzler demirbaş olup vakf-ı hümayun malı olarak*) and needed care and attention to survive the handover process.[133] The bureaucrats had reason to emphasize the needs of the concerned oxen. In the 1870s, when Abdullah Ağa did not look after the oxen in the farm he rented near Tekfur Dağı, he was sued by the owner, Emine Şaziye Hanım.[134] The oxen were leased together with the farm, and their death meant the disappearance of the farm's fixtures. Ottoman bureaucrats also employed the term "*tetimme*" (component) while treating oxen as a necessary means of production in certain jobs. The scribes who prepared the income registers of Edirne's Akçakızanlık subdistrict in 1845 associated the oxen with the professions of their human owners. Ottoman tax collectors levied taxes on female farm animals due to the estimated revenues they would bring their human owner with the milk and offspring they produced. Male animals, who did not give birth or milk, were exempted from taxes. The scribes of Akçakızanlık felt the need to further explain male animals' exemption from fiscal duties by emphasizing their services for their human owners. In these registers, each pair of oxen that a farmer had appear with the note, "a component of his

132 H. P. R. Finberg, "The Domesday Plough-Team," *The English Historical Review* 66, no. 258 (Jan. 1951): 67.

133 OA. Topkapı Sarayı Müzesi Arşivi Evrakı (TS.MA.e) 1268/3, 29 Zilhicce 1234 (19 Oct. 1819).

134 Akdeniz, "Mecelle-i Ahkâm-ı Adliye," 266-273.

profession as a farmer" (*çiftçiliği tetimmesinden*).[135] The scribes explained the role of the pair of oxen that Kara Gülle oğlu Osman had with their assistance in Osman's log trade (*hatabçılığı tetimmesinden*).[136] Finally, the same scribes accentuated the significance of Çırak oğlu Mustafa's oxen by their vital role in Mustafa's ox cart transport work (*arabacılığı tetimmesinden*).[137]

The perspective that reduced oxen to fixtures or components had a coherent economic background. Assessing the prevalence of capitalist relations of production in the late-nineteenth-century Russian countryside, Vladimir Ilyich Lenin did not differentiate in his calculations horses from oxen, two popular non-human plowers in the Russian Empire. Lenin saw a strong correlation between the number of draft animals in a farm and the acreage of land under crops. The presence of non-human workers marked the difference between the "group of horseless and cattleless households" and the rural bourgeoisie. The latter, who had a significant number of animals, had the opportunity to fertilize their soil with manure and introduce improvements in their estates.[138] In this economic perspective, non-human animals functioned like instruments, and the economic factor to which they corresponded was the means of production rather than capital or labor.

§ 1.4 Economic Assets or Historical Actors?

The nineteenth-century economic theory appeared in a particular historical context marked by industrial revolutions in Europe. Rural exodus went hand in hand with an evident increase in agricultural productivity. New technologies and capitalist relations of production stemmed from

135 The scribes issued a rare exception when they chose a synonym for the word "farmer" regarding Arnabud İbrahim's oxen, for whom they added the note, "*rençberliği tetimmesinden*". See OA. ML.VRD.TMT.d 5203: 13.

136 OA. ML.VRD.TMT.d 5203: 12.

137 OA. ML.VRD.TMT.d 5203: 5.

138 V. I. Lenin, *The Development of Capitalism in Russia*, vol. 3, Collected Works (Moscow: Progress Publishers, 1977), 103, 116.

urban centers and quickly infiltrated the countryside. The essential elements of the new world order, such as private property, rational investment, and waged labor, found their translation in the theories of nineteenth-century economists.

For Adam Smith, horses and cattle could be fixed capital, circulating capital, instruments of husbandry, or commodities in different contexts.[139] While criticizing Adam Smith's understanding of capital and revenue, Marx asserted that the amount of human labor necessary to take care of the "laboring cattle" determined the latter's value.[140] Although he used a term that pointed out the bovines' active involvement in work, Marx preferred to emphasize the human labor required to feed and guide the laboring bovines. Marx had an evident interest in the non-human world as he underlined the importance of differences between the species of the same genus or described how worker bees killed the drones.[141] However, the Marxist political theory relied on the mobilization of human workers; therefore, neither Marx nor Lenin attributed a particular agency to non-human animals in their economic analyses.

On the one hand, theoretical tools of modern economics perfectly explain different aspects of non-human animals' roles. The economic contribution of non-human animals corresponded to capital, labor, or means of production in different contexts. On the other hand, none of these terms has the explanatory capacity to reflect all aspects of possible non-human economic roles at once. Britain and northern Europe served as the main plot during the birth of modern economics. In the "epoch of the bourgeoisie," this social class would put an end to "all feudal, patriarchal, idyllic relations" wherever possible.[142] By 1842, *le droit du seigneur* (the

139 Hribal, "Animals are Part of the Working Class Reviewed," 5-6.

140 Karl Marx, *Capital: A Critique of Political Economy*, ed. Frederick Engels, II (Progress Publishers, 1956), 235.

141 Karl Marx, "Proceedings of the Sixth Rhine Province Assembly: Third Article," trans. Clemens Dutt, *Rheinische Zeitung*, no. 298 (25 Oct. 1842), www.marxistsfr.org/archive/marx/works/1842/10/25.

142 Karl Marx and Frederick Engels, *Manifesto of the Communist Party* (National Executive Committee of the Socialist Labor Party, 1898), 15-16.

right of the lord) had already appeared to Marx as a reminder of the "barbaric world outlook" that belonged to the "spiritual animal kingdom" of feudalism.[143] The stunning pace of the change in nineteenth-century Europe led contemporary writers to think more about what was coming. The economic terms they employed served them while analyzing factories or enclosed big farm estates run with a capitalist mindset. Non-human animals would appear as replaceable production units or exchangeable commodities in these industrial or agricultural enterprises.

The rarity of large estates and the dominance of small-scale subsistence farming in the Ottoman Empire offered a socio-economic setting that significantly differed from a greater part of nineteenth-century Europe. Modern economic terms worked to a greater degree while analyzing nineteenth-century Ottoman agriculture. Ottoman farmers would keep oxen as a reliable form of capital with substantial benefits. The ox was a profitable investment asset, which could help his owner turn bare terrains into productive land. On the other hand, the ox was the strongest worker in most Ottoman villages. Oxen would wake up early in the morning, follow their human employers to their workplace, and work with their full force and utmost docility. The ox's third role was that of an indispensable agricultural instrument on a farm. If he was pulling a cart, a glance at the goods that an ox carried was enough to tell his owner's job. Without oxen, a few people would be able to earn a living in the Ottoman Empire. They were peasants' vital means of production. I see no conflict between these statements. Oxen in the Ottoman Empire represented a form of capital, means of production, and workers at the same time. However, economic terms cannot explain every aspect of the importance of oxen in the eyes of Ottoman farmers.

1.4.1 *In the Search for Traces*

In the following chapters, the labor factor and the expression of "non-human worker" that reflects it will be the most apparent economic aspect

143 Karl Marx, "Proceedings of the Sixth Rhine Province Assembly: Third Article," trans. Clemens Dutt, *Rheinische Zeitung*, no. 305 (1 Nov. 1842).

of bovine presence in the Ottoman Empire. Nevertheless, it does not exclude the other aspects of the relationship between oxen and humans. An important constituent of human-bovine relations is fellowship. In fact, a romantic sympathy for non-human animals can hardly be assumed as an integral element of rural life. The Ottoman animal rights movement developed in the twentieth century[144] and the social consciousness about non-human animals still has a long way to go in the twenty-first century. It will be pure anachronism to expect from nineteenth-century peasants to embrace a concept that developed much later and express it in full detail. Unfortunately, tax documents do not give any clues about the possible affection between these two laborious species. Still, the long hours farmers spent together with their oxen and the same work conditions they shared must have somehow turned into empathic feelings. The particular names humans gave to their oxen and the songs they sang to soothe these non-human workers in difficult times could not find their place in bureaucratic documents. The main sources used in this work to seize the contemporary human perception of oxen will be mechanical terms and numbers that anonymous scribes have noted. The traces that oxen left in these documents give an economic and utilitarian human understanding of them. They certainly do not tell us the whole story.

The discussion above about probable human perceptions of oxen will help develop what Edward Hallett Carr calls an "imaginative understanding" of the nineteenth-century Ottoman countryside.[145] In the following chapters, I will apply bigger doses of imagination grounded in archival traces to reconstruct the particular jobs that a specific pair of oxen did and the possible meanings of these non-human workers in the eyes of the people living in a specific peasant household. Reconstructing the lives of the silenced is a common methodological question in gender history, slavery studies, and subaltern studies. Swart draws striking parallels between horses and women in history as they were both "socially integral

144 Cihangir Gündoğdu, "The Animal Rights Movement in the Late Ottoman Empire and the Early Republic: The Society for the Protection of Animals," in *Animals and People in the Ottoman Empire*, ed. Suraiya Faroqhi (Eren Yayıncılık, 2010), 373-374.

145 Edward Hallett Carr, *What Is History?* (Alfred A. Knopf, 1969), 26-27.

but subordinated groups," who left only little convenient traces behind.[146] Therefore, animal historians have much to borrow from the existing methodological repertoire of historians who had been working on various silenced groups for a long time.

Saidiya Hartman examines the death of an enslaved woman during the Middle Passage in 1792. Departing from an emblematic figure of the enslaved women, Hartman writes a "history of an unrecoverable past," which is also a counter-history written "with and against the archive," standing at the intersection of the fictive and the historical.[147] The aim of the current research is to reveal the indispensable role of oxen in the nineteenth-century Ottoman Empire. Despite my interest in capturing non-human actors, I would not like to fall into the error of "pushing human characters background."[148] So, by resorting to my imagination, I tried to decorate the bovine traces in archival findings with unverifiable stories to illustrate the possible relations between nineteenth-century oxen and their human owners.

The second chapter begins with an introductory brainstorm about archival research in Ottoman history that departs from three selected photographs. The chapter continues with the presentation of the temettuat registers, the main primary source of the current work. These registers show considerable meticulousness when referring to each type of bovine by implicitly noting their economic roles and differences within the bovine population. The chapter ends with a discussion on Ottoman historiography regarding the role of oxen, an essential element of the family farm unit and a crucial actor in the Tanzimat Period.

The following three chapters elaborate on the results of my findings in the temettuat registers from three mid-nineteenth-century Ottoman provinces. These core chapters include information about the topography and climatic conditions of the chosen regions, oxen's role in the

146 Swart, "'The World the Horses Made,'" 249.

147 Saidiya Hartman, "Venus in Two Acts," *Small Axe: A Caribbean Journal of Criticism* 12, no. 2 (2008): 12. I would like to thank Ebru Aykut for bringing this article to my attention.

148 Dilara Avcı, "Interview: On Environmental History with Faisal Husain," *Uluslararası Tarih Araştırmaları Dergisi (UTAD)* 7, no. 1 (2023): 99.

estimated yields, and their participation in peasants' secondary occupations. Each province has its own characteristics that shaped the geographic conditions in which non-human workers toiled. People expected different kinds of performance from oxen in Konya's plain, vast, and semiarid terrains, Edirne's fertile fields, or Kastamonu's humid and hilly topography. Moreover, the socio-economic conflicts between human actors such as the poor segments of the peasantry, local notables, merchants, and Ottoman state agents had a direct impact on the oxen's stressed work agenda. The third chapter is reserved for two subdistricts from Konya's Lakes Region, an area that could survive the central Anatolian drought of the 1840s thanks to its indirect contact with the Mediterranean humidity. The fourth chapter begins with the corvée work of firewood and charcoal transfer in Midye, one of Edirne's subdistricts with a coast to the Black Sea. Then, it continues with the subdistrict called Akçakızanlık, which was settled in a fertile valley in the north of the Rhodopes. The fifth chapter is about Kastamonu's Cide subdistrict, where an influential local family largely dominated the timber trade and maritime economy on the Black Sea coast. In the last chapter, findings about three Ottoman provinces will be summarized and compared with a special focus on the role of oxen in regions with different average acreage and yield levels.

Oxen in the nineteenth-century Ottoman Empire made vital contributions to rural life. These non-human workers undertook burdensome tasks while serving their human employers. Different geographic settings and various local conflicts between peasants, state agents, and provincial notables had an immediate impact on the oxen's stressed work agenda. The ox was not a mute witness but a prominent actor in the history of the Ottoman Empire.

2

Oxen in the Ottoman Empire

The present chapter begins with free reckonings about three photographs that depict different aspects of Ottoman rural life. The temettuat registers, the primary sources of the current research, do not visualize but still provide quasi-photographic information about the settlements they have recorded. Despite their epistemological limits, these sources offer valuable data and clues about the mid-nineteenth-century Ottoman countryside. Bovines were popular non-human animals in the rural settlements of the Ottoman Empire, who would serve their human owners with a considerably strict division of labor. The ox had a particular position both in the bovine population and the human world. Oxen were the most crucial non-human workers in the Ottoman Empire, who plowed the land, threshed the harvest, and hauled logs from the forest. Despite direct references to oxen in the academic literature about the Ottoman family farm unit, historians still fail to underline oxen's indispensable role in historiography. I will argue that these hardworking non-human workers need a visible place in Ottoman historiography. For instance, the mid-nineteenth-century process of politico-legal transformations called the *Tanzimat* directly concerned oxen in multiple matters. To recollect oxen's presence and emphasize their role, I consulted the temettuat registers of three provinces from nineteenth-century Ottoman Anatolia and Rumelia. The chapter ends with acknowledgements about methodological preferences and discussions regarding my research.

§ 2.1 Photographic Sources of the Nineteenth Century

Sources pose the primary problem in any research on rural history. Documents produced by Ottoman agents from financial or military bodies, surveyors, or scribes captured an incomplete and problematic panorama of rural life. The panorama would solely depict the moment of the visit. The majority of the local people who contributed to the preparation of bureaucratic documents about the countryside belonged to the wealthier segments of the peasantry. The local elite did not represent the interests and worries of the poorer strata. As to the content, the bureaucrats' depiction of the countryside would exclusively focus on the issues the imperial center devoted attention to. There is no way to ensure both the accuracy and clarity of the blurry panorama that such a problematic depiction offered.

Though imperfect, the numerous representations Ottoman scribes recorded include many clues that may be translated into substantial information about rural life. The translation process mobilizes knowledge, logic, and imagination at the same time. After all, each historical survey provides a "window" that opens to the past.[1] From the late-nineteenth century on, photographs stand for exceptional sources that perfectly suit the window analogy. Most photographs captured in the Ottoman Empire carry the signature of a private photographer, some of whom showed an effort to capture the countryside. However, most of these images share the historiographical limits of Ottoman archival sources. They were produced by someone who occasionally visited a particular village, in which they often contacted and depicted the local elite. Yet, the look of ordinary peasants and their non-human companions must have caught the attention of some photographers, who captured them and produced unique sources with substantial information about Ottoman rural life. I chose

1 Hribal, "Animals Are Part of the Working Class Reviewed," 2.

three photographs as sources of an initial inquiry about the role of oxen in the nineteenth-century Ottoman Empire.



Figure 2.1 Plowers in Halep. SOURCE: Photograph from Istanbul Metropolitan Municipality's (İBB) Atatürk Library archive, Kartpostal Arşivi 25255.

The first photograph is printed on a postcard. The French script "*les labours*" refers to the already-apparent plowing scene. The hand-written little note in Arabic letters clarifies the profession of the human figure, *çiftçi* (farmer), and indicates the place, *Haleb* (Aleppo), in today's northwestern Syria.[2] The postcard does not give a date, but it can be broadly

2 Here I took Aleppo as the actual place where the photograph was taken. However, it may also simply refer to the location of the studio which printed the image. The postcard has the note, "*Ed. K. Missirlian. Phot.*" According to the information on other pieces produced in the same studio, Kirkor Mısırlıyan's studio was situated in Aleppo. See the following pieces sold at auctions:
Phebus Müzayede, "Şam Mısırlıyan Fotoğrafhanesi Kabin Fotoğraf," accessed April 30, 2025, https://phebusmuzayede.com/119859-sam-misirliyan-fotografhanesi-16x11-cm-olculerinde-kabin-fotograf.html; Moda Müzayede, "Mısırlıyan-Halep-Osmanlı Kabin Foto," accessed April 30, 2025,

assumed that the card was printed in the late-nineteenth- or early-twentieth-century Ottoman Empire.[3]

The plowman, standing still, gives a firm look to the camera. A pair of oxen are harnessed to the plow the farmer is holding. The plow team is standing in the middle of an agricultural field that they have already tilled at least once. The large stones or pieces of earth announce the necessity of repeating the same work multiple times until the field is entirely cleaned and the soil is completely prepared for seeding. The long grasses in the background must correspond to the plot's border.

The parallel stance of the cattle's front legs points to a moment of halt, a little pause to pose for the photographer. The plowman does not press down the handle of the plow with full force but simply holds it in his right hand. There is a thin stick in his left hand, with which he would maneuver the oxen while plowing. The tip of the stick is stuck in the ground at the moment. The non-human workers with horns and tails are catching their breath for a short moment until the shooting ends, and then, they will continue dragging the plow under the sun.

The plowman does not wear any special garment that stands out from the daily outfits most contemporary peasants would wear. He did not belong to a notable segment of the peasantry. A further guess about his socio-economic status will assume that he was a landless agricultural worker (*ırgat* in Turkish) who cultivated someone else's field with someone else's oxen and tools in return for a wage. The second pair of oxen waiting behind supports this suggestion. Although the photographer did not capture it, the perfectly parallel position of the pair points out the presence of a probable harness between them, as well as another

https://www.modamuzayede.com/en/product/1097586/kabin-fotograf-k-misirliyan-halep-osmanli-kabin-foto; Müzayede APP, "Efemera Fotoğraf Filateli Müzayedesi Lot 14," accessed April 30, 2025, https://www.muzayedeapp.com/urun/halep-ermeni-kirkor-misirliyan-fotografhanesi-kaseli-halep-maras-ermeni-mallari-MjA0LTI2NTQ5LTkxMDAzMTM=.

3 Since sending postcards is a modern European concept, the appearance of a French word is typical. However, the employment of the Turkish word *çiftçi* encourages me to suppose that this postcard belongs to a period when Halep was an Ottoman province, that is prior to the end of the Great War.

plowman behind them. The field must be large enough to demand the work of (at least) two pairs of worker bovines at the same time. So, the two plowmen and the four non-human workers were presumably fellows who toiled together for the same landlord. It must be the intensive collective labor on a vast plot that caught the photographer's attention.

The oxen were indispensable for the tilling work in Ottoman agriculture. In the early decades of the twentieth century, only a few farms would spend their resources on mechanization attempts, often with unpromising results. The oxen kept their vital role in Ottoman agriculture, either in the small plots of ordinary farmer households or the vast fields of wealthy landlords.



Figure 2.2 Women collecting wood with oxen in Siirt. SOURCE: Photograph from İBB Atatürk Library archive, Müteferrik Evrak 25901 in Fahreddin Türkkan Paşa Collection.

The second photograph was taken in a mountainous landscape in Siirt, in today's southeastern Turkey. The image bears the date 1900, when Siirt belonged to the Ottoman province of Bitlis. The Turkish note, inscribed in hand-written Arabic letters on the first copy and then printed in Latin

letters on another copy, explains that the women seen are collecting wood around Siirt (*Siirt taraflarında oduncular*). The photograph depicts five women at different ages and a child posing behind the branches they harvested. They have two oxen with them. A seventh person behind the ox on the right is barely visible but partially obscured because he or she was not posing but moving at the moment of capture.

The peasants are standing in the middle of a bushy point, whereas the valley seen in the background looks like a barren terrain with only sparse vegetation. The peasant group certainly arrived at this particular point for gathering branches and apparently tried to pile them with the chopped parts of the branches standing in one way and the leafed parts in the other. The striped blankets covering the oxen announce that the women will load the branches on the back of their non-human companions. The two ropes tied on the horns of the ox on the left are clearly visible and lie on the ground until the women use them to haul the branches on the worker bovine.

There are no big trees or heavy logs in the image. The little branches the women harvested could not be a lucrative business. If there were a lucrative business, men would likely be engaged in this occupation. However, the usage of women and probably child labor in this activity signals the inferior socio-economic status of this occupation in the eyes of contemporary people. Collecting branches in that particular valley of Siirt might bring no money at all to the peasants posing for the camera. They would harvest these branches not to sell them in the market but to burn them in their houses as firewood, an indispensable energy source in the countryside. Ottoman peasants relied on the strong muscles of their

humble oxen not only in the spectacular work of plowing but also in the simplest activities of rural life.



Figure 2.3 Two peasants and an ox cart in Ankara. SOURCE: Photograph from İBB Atatürk Library archive, Kartpostal Arşivi 26201.

The last photograph, printed on a postcard, depicts two peasants with an ox cart in Ankara.[4] The existing biographic information about Jean Weinberg makes it possible to state that the famous photographer captured the scene either during the War of Independence or in the early years of the Republic of Turkey.[5]

There is a young peasant man on the left and a peasant woman on the right side of the photograph. The man is waiting in front of the ox cart and holding a stick, with which he would maneuver the two oxen who pulled the cart. The woman is waiting behind the cart, controlling a third bovine, who looks younger than his two brothers due to his relatively

4 The postcard has the following note in French: *Angora… Type de paysan.*

5 Weinberg stayed in Turkey between 1921-1935. See Savaş Arslan, "Fotoğrafçı Jean Weinberg Hakkında Yeni Bulgular," *Sinecine: Sinema Araştırmaları Dergisi* 11, no. 1 (2020): 153-54.

smaller size. In fact, all three of these black bovines look young, and it is nearly impossible to guess their gender from the photograph. However, the established rural (and economic) custom to continue feeding female stirks as producers of calves and milk suggests that the three members of the Anatolian taurine cattle (*karasığır*) species were not fully grown oxen but yet uncastrated bullocks. Peasants would train and castrate male stirks so that they became oxen or fatten and sell them in the market.

The neatly-paved cobblestones on the ground and the fresh look of the buildings seen behind support that Weinberg took the photograph in the henceforth capital of the Republic of Turkey. The stressed face impressions of both peasants, who did not stare at the camera, may be a marker of their distance from their village. They had come to an urban center to sell their products. The leather cover of the carriage hides the load, but it can be guessed that the two peasants brought agricultural products, such as hay, grains, fruits, or vegetables, to sell in the town market. The company of a third bullock, who was not harnessed to the cart, arouses suspicion. If the third bullock did not help drag the cart, he could be one of the products that the peasants wanted to sell. Ottoman peasants used oxen to carry their produce from villages to nearby markets. Sometimes the bovines themselves appeared among the list of commodities peasants brought to sell. Bovine animals were indispensable for the Ottoman rural economy. They contributed to the subsistence of most Ottoman households with their labor, milk, and meat.

The panorama of late-Ottoman (or early-Republican) rural life that the photographs above represent certainly has incomplete and problematic aspects. These images will always be open to further inquiry regarding the human-centered perspective, gender inequalities, contemporary ethnic tensions, or the rapid and radical changes that eventually put an end to the Ottoman Empire. Meanwhile, these images share a noticeable historical importance because they depict ordinary people with their non-human companions. They open three unique windows to Ottoman rural life with the minimal mediation of the local elite and bureaucracy. I suppose that the temettuat registers belong to the "scattered archival

documentation" which discouraged Donald Quataert from further research on Ottoman peasantry.[6] These registers have strong historiographical parallelism with the photographs above. They were all captured by people who visited a particular Ottoman village at a specific moment. They depicted a single moment without a similar repetition in the past or future. Both temettuat registers and the photographic evidence represent unique sources with substantial information about nineteenth-century Ottoman rural life, in which the oxen played a decisive role.

§ 2.2 The Temettuat Registers

Among various sources in the archives of the Ottoman Empire, income tax registers (*temettuat defterleri*) stand out as exceptional sources for imagining rural life in mid-nineteenth-century Anatolia. The registers were born into the Ottoman period of reforms known as *Tanzimat* (literally "reorganization"). More specifically, these records made part of a financial reform program named *Tensikat-ı mülkiye,* which aimed at ensuring justice in taxation.[7] An essential prerequisite of this project obliged the Ottoman administration to have better information about peasants and their productive potential.[8] Therefore, the temettuat registers were prepared to provide the imperial center with accurate knowledge about the economic capacities of various regions. Introducing a new tax on incomes required the overall count of taxpayers (as well as their movable property and real estate) in certain provinces in the Balkans and Anatolia.[9] The surveys were mainly held by bureaucrats, village headmen, and

6 Cengiz Kırlı, "In Memory of Donald Quataert (1941-2011)," *New Perspectives on Turkey*, no. 44 (2011): 5–10.

7 Sinan Kaya, "Tanzimat'ın Bursa'da Uygulanması (1839-1863)" (PhD Thesis, Istanbul, İstanbul 29 Mayıs Üniversitesi, 2022): 23-29.

8 Mehmet Yavuz Erler, "Animals during disasters," in *Animals and People in the Ottoman Empire*, ed. Suraiya Faroqhi (Istanbul: Eren Yayıncılık, 2010), 345.

9 Suraiya Faroqhi, *Osmanlı Tarihi Nasıl İncelenir?*, trans. Zeynep Altok (İstanbul: Kronik Kitap, 2024), 94.

local ethno-religious leaders in 1840 and 1845 and led to thousands of temettuat registers (almost twenty thousand copies) that note income-yielding assets of households in thousands of settlements.[10] The surveys of 1845 constituted a "partially successful second attempt" and "the most systematic effort" to record labor potential, leaving more numerous and consistent documents than the first attempt.[11] In June 1845, the Ministry of Finance charged four hundred scribes for preparing clean copies of the temettuat registers arriving from all around the empire and enumerating them.[12] Most temettuat registers have a standard format and show relatively fine handwriting, implying that they were clean copies finalized after the survey. On the other hand, most registers also have the original seals of village headmen and religious leaders at the end of the documents, which are official marks that scribes in Istanbul would hardly be able to collect. The appearance of seals suggests that most of these extant copies were prepared by the scribes who directly held the survey. If the scribes had not asked for the local representatives to put their seal on a blank page before leaving the village surveyed, at least one of the members of the survey team must have been preparing a final copy in the village while other members continued collecting data around the settlement and issuing their initial drafts. Considering historical registers that bear voluminous and complicated data, each new copy would certainly bring the risk of the original content's modification. However, since temettuat surveys were not repeated throughout the century, these registers have greater epistemological problems than modified versions. The lack of an equally extensive contemporary survey leaves no chance to confirm the veracity of the information with a cross-check. Therefore, historians stipulate the need for "the closest attention" while using data

10 Mübahat S. Kütükoğlu, "Osmanlı Sosyal ve Iktisadi Tarihi Kaynaklarından Temettü Defterleri," *Belleten* 59, no. 225 (Aug. 1995): 395–98.

11 Semih Çelik, "'No Work for Anyone in This Country of Misery': Famine and Labour Relations in Mid-Nineteenth-Century Anatolia," in *Working in Greece and Turkey: A Comparative Labour History from Empires to Nation-States, 1840–1940*, ed. Leda Papastefanaki and M. Erdem Kabadayı (Berghahn Books, 2020), 152-54.

12 Kaya, "Tanzimat'ın Bursa'da Uygulanması," 41.

from temettuat registers.[13] Alp Yücel Kaya rejects the possibility that the temettuat registers give a mirror image of a regional economic structure. Instead, the image reflected on the registers was the product of conflicts and negotiations among different socio-political groups who were willing or not to have themselves represented in different degrees. Therefore, the author argues that the image recorded is "some representation" of reality.[14]

Temettuat registers include essential information about households in a mid-nineteenth-century Ottoman settlement: The household representative's name (usually a male person and most probably a widow if it is a woman) and occupation, the household's recent tithe payments, and its possessions in terms of land, garden, tree, shop, and non-human animals, with the estimated income that each of them annually generated. Cautious eyes may always extract outstanding information from the numbers, names, scribbles, and little vertical or diagonal notes that scribes had marked. However, archival sources exist with their limitations. Temettuat registers, like other Ottoman survey registers, reflect the "priorities of the taxman."[15] From a critical point of view, the Ottoman administration's aim in producing these documents was to tax the peasant population engaged in small-scale subsistence farming, who were considered as taxpayers and financers of a bigger part of the imperial budget, even if their profits did not always cover their own consumption or seed costs.[16] From a theoretical point of view, all statistical historical materials come with their problems. Paying attention to gaps, omissions, incompleteness, and the fragmentary character of the extant records, Henry Eaton

13 Yoichi Takamatsu, "Ottoman Income Survey (1840-1846)," in *The Ottoman State and Societies in Change: A Study of the Nineteenth Century Temettuat Registers*, ed. Kayoko Hayashi and Mahir Aydın (Routledge, 2010).

14 Alp Yücel Kaya, "In the Hinterland of Izmir: Mid-Nineteenth-Century Traders Facing a New Type of Fiscal Practice," in *Merchants in the Ottoman Empire*, ed. Suraiya Faroqhi and Gilles Veinstein, Collection Turcica (Leuven: Peeters, 2008), 263.

15 Faisal H. Husain, *Rivers of the Sultan: The Tigris and Euphrates in the Ottoman Empire* (Oxford University Press, 2021), 19.

16 Nadir Özbek, *İmparatorluğun Bedeli: Osmanlı'da Vergi, Siyaset ve Toplumsal Adalet (1839-1908)* (Boğaziçi Üniversitesi Yayınevi, 2015), 39.

considers the problem of reliability as a major difficulty in working with statistical historical sources.[17] The same difficulty and more profound epistemological questions about the preparation process and veracity of temettuat registers preoccupy Ottoman historians as well. Erdem Kabadayı and Murat Güvenç consider the "huge shadow" of under- or non-registration in the temettuat records, which were based on self-claims[18] of local headsmen or religious leaders. The "distributive" (*tevzii*) character of temettuat registers remained similar to sixteenth-century *tahrir* registers because they both distributed the fiscal burden collectively among neighbors living in a single village.[19] Moreover, the excessive attention of the surveys on income-yielding assets resulted in a "silent" stance on other components of wealth, as well as female and household labor.[20] Regarding income-yielding assets, the same sources evidently avoided any cost prediction or any exemption based on production costs such as seeds, rents, or maintenance,[21] giving another reason to question the representative power of the data. Overall, the picture that these records captured had many misleading aspects.

Another essential problem about using tax books like temettuat registers as historical research material is the underrepresentation of non-human animals. The temettuat registers show a complete silence regarding cats or birds that people kept for their "adorability"[22] but did not have financial importance in the eyes of contemporary people. Unlike the

17 Henry L. Eaton, "Cadasters and Censuses of Muscovy," *Slavic Review* 26, no. 1 (1967): 68. I would like to thank Faisal Husain for informing me about this interesting article.

18 M. Erdem Kabadayı and Murat Güvenç, "Ethno-Religious Division of Labour in Urban Economies of the Ottoman Empire in the Nineteenth Century," in *Working in Greece and Turkey: A Comparative Labour History from Empires to Nation-States, 1840–1940*, ed. Leda Papastefanaki and M. Erdem Kabadayı (Berghahn Books, 2020), 209-10.

19 Özbek, *İmparatorluğun Bedeli*, 124.

20 Efe Erünal, "The Economic and Population Geography of the Bursa Region, 1820-1870" (PhD Thesis, İstanbul, Koç University, 2023): 222.

21 Nuri Adıyeke, "Temettuat Sayımları ve Bu Sayımları Düzenleyen Nizamname Örnekleri," *Ankara Üniversitesi Osmanlı Tarihi Araştırma ve Uygulama Merkezi Dergisi*, no. 11 (2000): 773.

22 Faroqhi, *Osmanlı Tarihi,* 163.

supposedly "violent" or "noxious" animals that humans could not capture and domesticate, farm animals enjoyed a remarkable visibility in historical sources. Yet, statistical information on farm animals noted in tax records avoided giving clues about the living conditions in the barns.[23] The livestock had a secondary place in most financial records compared to land plots. In the United States, the country registers kept permanent records of the land mortgages in the nineteenth century, but state legislators did not see a benefit in keeping a similar permanent record of chattel debt, which was indeed a common form of short-term credit in the Middle West.[24] In cases where farm animals found their place in human records, their representation remained only partial. For instance, twentieth-century national accounting statistics in Africa and India neglected the contribution of draft animals. Commodities such as meat, milk, eggs, wool, hides, and skins, but not draft power, defined the share of livestock in agricultural output according to these statistics.[25] Bureaucrats who prepare the extant records are not the only ones responsible for missing information in fiscal documents. Many taxpayers saw an advantage in evading cadastral and census surveys. In seventeenth-century Russia, some peasant families would double up in neighboring homes during the census to avoid full assessment.[26] There is reason to suppose that the peasants who tried to hide their family members or neighbors also concealed their non-human animals during a tax survey. Studying the cadastre records of early-sixteenth-century Sisteron in southeastern France, Thérèse Sclafert suggests that livestock was "a big richness to hide" for peasants.[27] The efforts for tax evasion could be another reason for the underrepresentation of non-human animals in historical surveys.

The neglect of women and any kind of domestic labor, tax evasion attempts, socio-economic conflicts, technical carelessness, and numerous

23 Erler, "Animals during disasters," 334.

24 Allan G. Bogue, Brian Q. Cannon, and Kenneth J. Winkle, "Oxen to Organs: Chattel Credit in Springdale Town, 1849–1900," *Agricultural History* 77, no. 3 (Summer 2003): 420-23.

25 Wilson, "The Environmental Ecology," 30.

26 Eaton, "Cadasters and Censuses," 63-66.

27 Sclafert, "Sisteron au début," 168.

other reasons certainly led to minor or major problems regarding the misleading and incomplete data that the temettuat registers include. Furthermore, all the information temettuat registers bear is merely captured in names, numbers, and scribbles. However, they are still highly descriptive. The temettuat surveys remained limited to the two attempts in the 1840s and never extended their scope to the whole empire. Yet, the eventual failure of the project does not nullify the "significance of the result" at all.[28] The vast regional span and the rich content of temettuat registers relied on "the most comprehensive surveys" that the Ottoman Empire carried out throughout the nineteenth century.[29] These registers depict the nineteenth-century Ottoman countryside with a broad perspective.[30] Each register lays the foundations of a possible historiographic project of reconstructing a small-scale community. On a bigger scale, the massive number of these records allows historians to seize tendencies and make multi-level comparisons. Although many historians consider these records as a means of producing "numerical data" for the first half of the nineteenth century,[31] the information they include passes beyond economics and finance because they also bear many traces about human and non-human animals. The Ottoman administration took a "lively interest" in farm animals. Scribes meticulously recorded the presence of livestock due to their significant economic value.[32] Non-human animals occupied an incomplete but noticeable place in temettuat registers.

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28 Kayoko Hayashi, "The Ottoman Temettuat Registers: Significant Results from a Failed Venture," in *The Ottoman State and Societies in Change: A Study of the Nineteenth Century Temettuat Registers*, ed. Kayoko Hayashi and Mahir Aydın (Routledge, 2010).

29 Adıyeke, "Temettuat Sayımları," 784-85.

30 Said Öztürk, "Türkiye'de Temettuat Çalışmaları," *Türkiye Araştırmaları Literatür Dergisi* 1, no. 1 (2003): 288.

31 Ayla Efe, "1845 Temettuat Sayım Sonuçları Ne Oldu?," *History Studies*, no. 1 (Mar. 2016): 33.

32 Erler, "Animals during disasters," 334, 351.

Registers can be "brought to life" with an engagement in contemporary historiographic discussions.[33] The registers bear considerable information pointing out different land usage patterns and benefits that humans expected from non-human animals. The records call for an original elaboration with an industrious perspective based on the presence of cattle. Even the latter's absence gives an idea about what kind of services the peasants in consideration expected (or not) from bovines. These brief and imprecise records may lead to fruitful reflections on the availability and role of cattle in the Ottoman Empire.

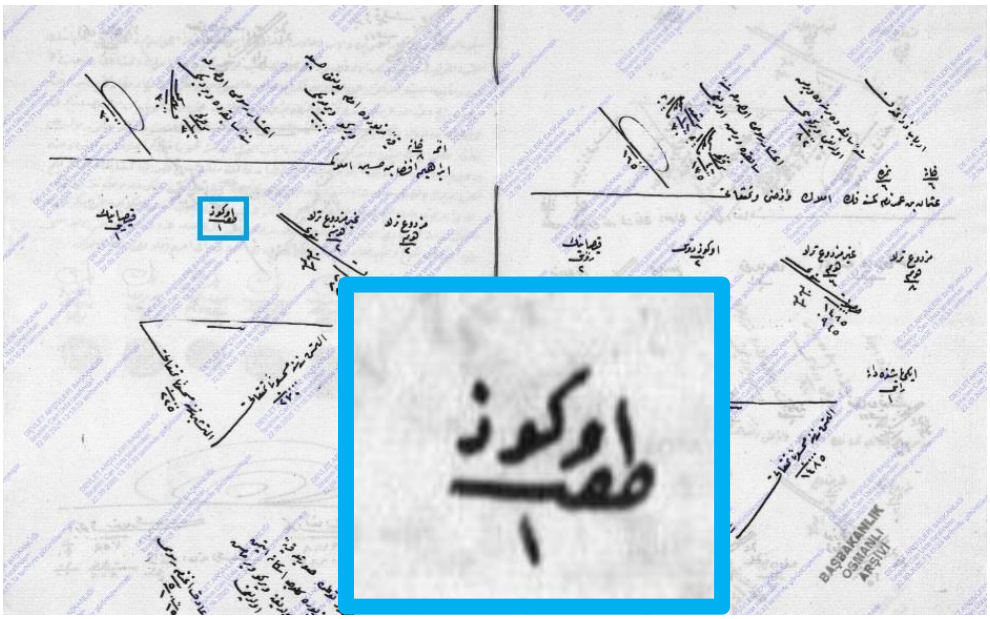

Figure 2.4 Example from a temettuat register. The information about oxen in these registers is as brief as in the following example. The script in the blue box reads: *öküz çift 1* (ox pair 1). SOURCE: OA. ML.VRD.TMT.d 12222: 5.

The present research aims to trace a pattern for oxen keeping in nineteenth-century Anatolia and Rumelia. The consulted registers indicate a strong correlation between grain production and oxen keeping. The oxen were strong enough to drag the plow in vast grain fields. They played the

33 Suraiya Faroqhi, "Agriculture and Rural Life in the Ottoman Empire (ca 1500-1878)," *New Perspectives on Turkey* 1 (1987): 8.

most significant role in creating richness for peasant households. It was this indispensable role that exempted the oxen from taxation. A pair of oxen represented, at the same time, a means of production, capital, workers, and maybe companions in the eyes of a farmer. For his human owner, an ox was surely more than "a single head of karasığır öküzü" as the temettuat records inscribe. He would have a "personalized" identity and a personal name. The farmer who fed him would remember his birth, his castration, or his purchase. The household members would all know how to call him. They would know the particular way he worked, suffered, got excited, or felt relieved. No one can find such statements in the temettuat registers. But no one can deny they are indeed there, concealed somewhere between the scribblings around household entries. These scribblings may lead to vivid scenes about rural life and give clues about human-animal relations.

§ 2.3 Ottoman Cattle

The word *sığır* is probably the best equivalent for translating the word "cattle" into Turkish. A clear distinction between the two subcategories of farm animals in the Turkish language deserves a closer look: *küçükbaş* (literally the "little head") and *büyükbaş* (the "big head"). Whereas the latter covers approximately the same species as *sığır*, the former mentions the sheep and goats. If these "little cattle" also have an economic value, what can be the initial reason to exclude them from a broader category of cattle? This sophisticated conceptual meticulousness undoubtedly originated from a precise categorization in real life. I assert that there was a clear division of labor among non-human animals in the Ottoman Empire.

In Ottoman terminology, domestic ungulates were comprised of three main categories. *Hayvanat-ı ganemiye,* headed by the sheep and goats, constituted the most crowded livestock group. The members of this category actually correspond to the "little cattle" (*küçükbaş*). The sheep held a reserved place in this category since mutton was the main meat

consumed[34] and the sheep generated a considerable tax revenue volume. *Ağnam*, (the plural form of the word *ganem,* which means sheep), the specific tax collected for each head of *ganem*, was named after the sheep. The statistics from the Ministry of Finance (*Maliye Nezareti*) exposed the significant contribution of the small cattle to the Ottoman treasury. In the financial year of 1279 (1862-63), *ağnam* or *koyun vergisi* touched 85 million kuruş, representing 5.13 percent of total state revenues. In 1291 (1875-76), the direct contribution of the sheep to the Ottoman treasury was estimated to be more than 200 million kuruş, constituting 8.46 percent of total revenues. In 1303 (1887-88), while the collected sheep tax remained less than 189 million kuruş, it still represented 10.75 percent of total state revenues.[35] The fluctuation of numbers and percentages should not overshadow the great economic significance of *hayvanat-ı ganemiye* for the Ottomans. More sheep meant greater wealth for peasants and bigger tax revenue for the imperial center.

Horses and mules represented *hayvanat-ı feresiye.* Among their members were luxurious and sophisticated horse breeds, along with humble donkeys. They did not respond to the Ottoman taste for meat and mainly served as vehicles that carried human animals and other things. While some worked to operate little mills to grind wheat, the most prestigious ones occasionally fought on battlefields.

Hayvanat-ı bakariye have a central place in this research. Broadly classified as "big cattle" (*büyükbaş*), they also covered all sorts of bovines and camels. Not as much as sheep meat, their meat was also consumed. For example, the Ottoman army resorted to bovine meat only if a sufficient number of sheep could not be provided.[36] The source of bovine meat was mostly the males who could no longer serve as breeders or workers. Yet, the big cattle made their certainly biggest contribution to

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34 Yonca Köksal Özyaşar and Can Nacar, *Anatolian Livestock Trade in the Late Ottoman Empire* (Leiden University Press, 2024), 17.

35 Tevfik Güran, *Resmi İstatistiklere Göre Osmanlı Toplum ve Ekonomisi* (Türkiye İş Bankası Kültür Yayınları, 2016), 402-7.

36 Ahmet Uzun, *İstanbul'un İaşesinde Devletin Rolü: Ondalık Ağnam Uygulaması 1783-1875* (Ankara: Türk Tarih Kurumu, 2006), 179.

the Ottoman economy in their roles as producers and workers. While dairy products were extracted from cows, breeding cattle were responsible for producing new members with expected qualities, and the oxen served as carriers and drafters. All in all, labor was the most demanded contribution of this category of non-human animals.

Even though canines, cats, birds, and other species also deserve to be listed among farm animals who worked, produced, and wandered around the Ottoman Empire, the mentioned three categories of ungulates left the biggest number of traces that can still be retrieved from the archives. The names given to domestic animals certainly bear significant clues about the relationship between humans and non-human animals. In a period when vaccination cards and personalized collars were exceptionally scarce, these names disappeared along with the referred animals and their owners without any trace. Though not with the names given by their owners, these animals were still referred to in historical documents. Each head of cattle had a specific identity. As they implicitly denoted a status and a relative privilege within the bovine population, these identities were all "constructed around humanness."[37] The identity of Ottoman bovines bore an undeniable "denaturalized"[38] character since the animals in question were appropriated and domesticated members of their genus. They did not have freedom, but had identities that described their roles and status in human culture. Archival evidence from the Ottoman Empire suggests that people paid great attention to noting non-human animals with specific information that defined their biological and socio-economic traits.

In the Ottoman Empire, the identity of a head of cattle included two types of information. The first information was about the species of the mentioned animal. In Ottoman Anatolia, two bovine genera reigned: *Bos primigenius taurus* (the domestic taurine cattle) and *Bubalus bubalis* (the domestic water buffalo).[39] While the Anatolian taurine cattle were

37 Hribal, "Animals are Part of the Working Class Reviewed," 23.

38 Jennifer Wolch, "Zoöpolis," in *Historical Animal Geographies*, ed. Sharon Wilcox and Stephanie Rutherford (Routledge, 2018), 56.

39 Ali Demirsoy, *Genel ve Türkiye Zoocoğrafyası: "Hayvan Coğrafyası"* (Ankara, 1996), 581.

referred to as *karasığır* (literally the "black cattle") or simply *sığır,* members of the water buffalo species were called *su sığırı* (literally the "water cattle"), *manda, camuş,* or *kömüş*. A Turkish dictionary defines the *karasığır* by its resistant character to harsh and arid climates and by its relatively small size.[40] Also known as the "river buffalo," the second species is considerably bigger and stronger than the latter. The large hooves of water buffaloes distribute their weight evenly, facilitating their movement in swampy fields.[41] In return for the labor and yields buffaloes would provide, farmers needed to give them special care by regularly washing them with salt and water and rubbing their massive bodies with flaxseed oil.[42] While referring to a head of cattle, the Ottomans paid great attention to indicate whether his or her species was the Anatolian taurine (*karasığır*) or water buffalo (*manda*). They hence gave the first type of information that constituted the mentioned animal's identity.

The second type of information that the identity of a head of cattle contained was about the animal's socio-economic status. It covered, at the same time, the animal's gender, maturity, and way of contributing to human activities. Therefore, this status generally represented an intersection of non-human animals' biological conditions, such as sex, productivity, and maturity, as well as the decisions of their human owners. The biological life span of cattle under human captivity could lead to different trajectories according to their biological traits and their owners' expectations. The new members of the cattle population began their lives as *buzağı*, that is, sucking calves. According to their gender, six-month-old calves were to become stirks, either *dana* (heifer) or *tosun* (bullock), until they were put to breeding. The breeding of cattle was more than a natural phase of reproduction, but a delicate operation where human involvement in non-human animals' life cycles became more apparent than ever, especially when it came to male stirks. The bullocks selected to be kept

40 "Karasığır," in *Güncel Türkçe Sözlük* (Türk Dil Kurumu), accessed March 25, 2024, https://sozluk.gov.tr/.

41 Little, "Harnessing (and Yoking)," 23.

42 Mürsel Köse, "Kars'ta, Sığır Yaş ve Dişleri Üzerine," *Türk Folklor Araştırmaları* 9, no. 182 (Sep. 1964): 3522.

for breeding (*damızlık*) were henceforth called *boğa* (bull). The ones found unsuitable for *damızlık* reserve were to join the ranks of non-human workforce as an *öküz* (ox). After a special training, they were castrated and started serving as draft animals. Meanwhile, the period of sexual excitement of a heifer marked her new status as a *düve* (or *düğe*). Soon, she would become a fully-grown *inek* (cow) and serve her human owners as a producer of milk and calves.

The intrinsic value of the cattle as sources of meat further complicated their dull life under human captivity. The owner always kept in reserve the option of slaughtering any cattle older than six months. In case of an urgent need for meat or money, or in case of an economic decision to reduce the costs of a farm, the owner could resort to this fatal option.[43] Otherwise, these animals decorated with hundreds of kilograms of fresh meat could feel safe as long as their biological traits were considered suitable to fulfill the services expected from them. As to female bovines, a cow's fertility determined her years of service to a greater degree. The draft ox was expected to serve for a couple of years[44] and left his owner no other rational economic choice than slaughter if he could no longer pull a plow or cart. The bull might have a more comfortable job than the ox, but they would both share the same tragic end. After passing the job to younger males, the bull would lose his raison d'être in the human world. Besides, an old bull would never turn into a docile ox.

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43 The owner was not absolutely free when making the decision to slaughter livestock. Apart from established customs, policies could adjust the recommended timing of the slaughter. In 1918, a law prohibited the slaughter of the following cattle in the Ottoman Empire: Any bovines (*hayvanat-ı bakariye*) younger than thirty months, cows suitable for breeding (*damızlığa elverişli*) until ten years of age, oxen and buffaloes suitable to serve as draft animals (*çifte elverişli*) until the age of twelve, ox, and buffalo bulls until the age of five. See OA. Dahiliye Nezâreti Hukuk Müşavirliği Belgeleri (DH.HMŞ) 19/97, 10 Recep 1336 (21 Apr. 1918).

44 Elaborating on his findings on the Domesday records, a British historian concluded that most oxen in Medieval England worked in the fields from the age of four to ten. See Moore, "The Ox in the Middle Ages," 90-91. In the nineteenth century, farmers in Norfolk would usually take their oxen from the plow work for their fattening and sale at the age of seven or eight. See Collins, "The Latter-Day History," 209.

Heavy and dull tasks as well as marks of multi-faceted human exploitation shaped cattle's lives. Most people supposed them to be slaves, workers, commodities, or mere instruments. Born into captivity, they worked, produced, and eventually became a meal for humans with few exceptions. However, the notorious end should not overshadow life. In each stage of their lives, bovines existed with their own identities. The species and status information that shaped the identity of a head of cattle also determined the role he or she would play in human society. Only a few people would call a bovine by a name, but everyone would recognize his or her social identity.

§ 2.4 Bovines in the Temettuat Registers

Bovine animals do not speak any human language. It was people who gave them identities. Humans associated each bovine category with different values in the livestock market and different qualities of service. The information about the gender, service, and species of cattle was apparent to all people and represented a bovine animal's economic value and social role. The Ottoman society and bureaucracy tended to identify cattle with their species and socio-economic status. Despite frequent exceptions where one of the categories was missing, contemporary documents generally endorsed the practice of inscribing all constituents of cattle's identity, that is, the species and status. In most examples, these two sets of information perfectly accompanied each other.

Mid-nineteenth-century temettuat registers include much information about farm animals in the Ottoman Empire. Ottoman bureaucrats considered non-human animals as sources of income for their owners. Therefore, the preparers of temettuat registers paid utmost attention to note down each head of livestock that households kept in their barns. Most bovine animals appeared in temettuat registers with full identity labels, including the information concerning both their species and status. The Anatolian domestic taurine (*karasığır*) was the norm, and the buffalo (*manda*) was the exception among the bovine population throughout Anatolia. Hence, if the information about a bovine animal's

species were missing, he or she would probably turn out to be an Anatolian taurine. However, most people still felt the need to refer to cattle by indicating their species along with their socio-economic role and biological status. Temettuat registers include an infinite number of combinations to describe the identity of bovines who once lived in the Ottoman Empire.

2.4.1 *The Ox*

The complicated division of labor within an Ottoman farm had simple and bold boundaries for the oxen. As castrated males, they could not give milk or offspring. They had to devote all their energy to pulling things humans could not. They chiefly specialized in pulling and carrying things. The ox was at the same time a strong worker, a functional means of production, and a valuable commodity to his owner.

The contribution of oxen was indispensable for most rural activities. Once attached with suitable equipment, oxen could draft carts, plows, logs, and anything. A considerable part of nineteenth-century Ottoman trade relied on carts that oxen pulled.[45] Yet, their main work and field of expertise was plowing. Champion at plowing, the ox was the dominant draft animal in the Ottoman Empire. In the Anatolian peasant economy, the oxen were the "main asset for production in field agriculture" as they represented the "ploughing potential."[46] While recording a household's sources of income, most temettuat registers reserved the first place after the information about the land for the oxen. Even though the Ottoman bureaucracy did not consider the latter to generate any profit per se, people who prepared the temettuat registers paid great attention to note

45 The competition between oxen and camels in land transport balanced in favor of the former from the eighteenth century on. See Suraiya Faroqhi, "Camels, Wagons, and the Ottoman State in the Sixteenth and Seventeenth Centuries." *International Journal of Middle East Studies* 14, no. 4 (Nov. 1982): 523–39.

46 Halil İnalcık, "A Case Study of the Village Microeconomy: Villages in the Bursa Sancak, 1520–1593," in *The Middle East and the Balkans Under the Ottoman Empire: Essays on Economy and Society*, ed. İlhan Başgöz, 9 (Indiana University Turkish Studies and turkish Ministry of Culture Joint Series, 1993), 175.

down the number of these non-human workers, just after the information about cultivated plots and fallow lands. In the eyes of the Ottoman financial bureaucracy, they made part of the "untaxed potential" or "fixed assets" of a household.[47]

The ox is a category humans invented and shaped according to human necessities. Male stirks underwent a peculiar process before becoming oxen. The immature bodies of potential oxen were trained with the threshing board, which was lighter than the plow. In Kars, two-and-a-half-year-old stirks were called *gemlik* because they would be harnessed to the threshing board called *gem* during the threshing time. At the age of three or four, farmers would pair the bullocks who looked alike and train them from time to time by harnessing them to empty carts and nailing their hooves for the first time.[48] Henceforth called "bullocks," these male stirks would have attained the physical maturity required for their transformation into oxen.[49] Once farmers decided a bullock to become an ox, they would geld him and give him special training, usually in teams under the supervision of experienced oxen,[50] so that he became used to working with a yoke. Some temettuat registers gave clues about this demanding transformation process. For example, Yofço, a servant from the Maksi village of Edirne's Akçakızanlık subdistrict, had a pair of Anatolian taurine stirks (*karasığır danası*). The scribes added the note that the stirks were three years old and "were going to become oxen next year" (*üç yaşında olup sene-i atide öküz olacakları*).[51] The register's scribes put the exact

47 Adıyeke, "Temettuat Sayımları," 774. Similarly, in Mughal India under the reign of Akbar, keeping two cows and four bullocks per plow was tax-free. See Anjum, "Oxen: Mainstay of Land," 364.

48 Köse, "Kars'ta, Sığır," 3521–22.

49 Writers from the ancient Roman and Greek world had different views on the age of "breaking to the yoke." Mago the Carthaginian recommends the age of three to five, whereas Hesiod prefers nine-year old oxen. For the operation, Columella suggests choosing the morning of a day without storms or any religious ceremony. He recommends pouring wine mixed with leek or garlic into the bovine's nostrils for alleviating the nausea or lassitude of the operated ox. See Moore, "The Ox," 90.

50 Collins, "The Latter-Day," 208.

51 OA. ML.VRD.TMT.d 5207: 39.

same note above a pair of male buffaloes (*erkek camuş*) who belonged to a neighbor of Yofço's, a farmer called Todor.[52] In Edirne's Midye subdistrict, a coal carrier and farmer named Todori had four- and five-year-old bullocks, who had not become oxen,[53] which exposes that farmers waited until bullocks grew to maturity before castrating them. Meanwhile, the scribes who prepared the registers of Kastamonu were not as informative as Edirne's scribes about the process that young oxen went through. A temettuat register recorded that a farmer in Cide called Köse oğlu Ali plowed his five-dönüm grain field with a pair of "oxen bullocks" (*tosun öküz*), his only draft animals according to the register entry.[54] How could these non-human workers be bullocks and oxen at the same time? Maybe Ali trained and used them to till the soil and carry logs, but had not castrated them yet. Maybe they were castrated and had already become oxen, but looked younger than their fellows who worked in the same village. It is impossible to clearly track down the stages of an ox's making from numerical records such as temettuat registers. Nevertheless, little notes about the age of potential oxen and expectations of their human owners point out the importance of the process. Most temettuat scribes probably made little effort to inscribe non-human animals with their ages. Yet, the rarity of notes about potential oxen in registers also marks the relatively big age of the oxen in work. For most farmers, there would be little benefit in raising young oxen if they already had a healthy and experienced pair in work. From an economic perspective, extra oxen would make an unnecessarily bigger non-human workforce and increase the cost of feeding for their owners. Meanwhile, they could always fatten and sell the bullocks for their meat. The making of an ox depended on the decision of his human owners, and the latter only occasionally decided to castrate and train a bullock to turn him into an ox.

In most records, an ox would appear with his full identity: *karasığır öküzü*, which expressed enough information about his species, gender, maturity, and job at the same time. For instance, the records from a

52 OA. ML.VRD.TMT.d 5207: 126.

53 OA. ML.VRD.TMT.d 6171: 4.

54 OA. ML.VRD.TMT.d 3264: 14.

village in western Thrace inscribed the oxen with their full identities, although there were no buffalo oxen to distinguish from the latter.[55] There is no way to know why a scribe would continue marking *karasığır öküzü* for oxen if no oxen of the alternative species existed in the same list. The preparers of a temettuat register from the Hüdavendigar province showed the practicality to refer to oxen as simply *öküz*,[56] leaving the reader the chance to guess that they belonged to the species of Anatolian taurine cattle. In a little village of Amasya, the existence of oxen of the buffalo species obliged scribes to distinguish the five heads of *karasığır öküzü* from a pair of *camuş öküzü*.[57] Likewise, temettuat registers of Kastamonu's Cide recurred to the full identity of oxen and helped to differentiate them from *manda öküzü* that appeared in the list of the Dere village.[58] In Burdur's Tefenni, the scribes of a temettuat register normally marked simply "oxen" for Anatolian taurine oxen but emphasized the species only in cases where buffalo oxen (*camuş öküzü*) appeared. The existence of oxen of two different species in the barn of a single household forced them to note the full identity of these non-human workers. According to the register, Çelik Paşazade Elhac Ahmed Bey, the owner of the Kuvat farm, kept a pair of *karasığır öküzü* and a pair of *camuş öküzü*.[59] Ahmed Bey's Anatolian taurine oxen had the privilege of bearing the name of their species in a register that recorded Anatolian taurine oxen simply as "oxen."

Oxen of the two genera represented different categories in the eyes of contemporary people because they had different economic values and functions. The Anatolian taurine ox was more affordable to buy and feed. The buffalo ox was more expensive but much stronger and also responded to particular labor requirements like plowing in muddy lands.

55 OA. ML.VRD.TMT.d 5425.

56 OA. ML.VRD.TMT.d 7233.

57 OA. ML.VRD.TMT.d 12912.

58 OA. ML.VRD.TMT.d 3257.

59 OA. ML.VRD.TMT.d 10572: 67.

In two villages of Boyabad[60] in northern Anatolia, in Kastamonu's Sinop district, buffaloes constituted more than forty percent of the total ox population of 132, an outstanding ratio for Anatolia, where buffalo oxen generally showed a marginal existence. Engaged in rice production, each farmer household in the villages of Ömerli and Bektaş had at least four dönüm of paddies (*çeltik tarlası*) as well as at least a pair of oxen. Thirty-two *karasığır* oxen and twenty-four *camuş* oxen plowed 342 dönüm of paddy fields in the Ömerli village. In the neighboring village of Bektaş, forty-two *karasığır* oxen and thirty-four *camuş* oxen plowed 484 dönüm of paddies.[61] The ease and even joy that water buffaloes had in marshy lands made them more efficient in cultivating paddies. The scribes who investigated the rice-growing villages of Boyabad were careful enough to note the non-human workers of paddies with their full identities, including the information about their species.

In some cases, the species information prevailed over the information about a bovine's status and job as an ox. Temettuat registers from Kastamonu's Cide include such confusing cases. Registers simply inscribed "male water buffalo" (*erkek manda*) for recording the pairs of buffalo oxen that belonged to Emir İbrahim oğlu Süleyman,[62] a farmer called Musa,[63] Musa Kethüda oğlu İsmail,[64] Kapudan oğlu Osman,[65] and Kara Abdullah oğlu İsmail.[66] The absence of financial revenue estimation for these buffaloes, their position in the initial lines of the entries, and their existence in pairs strongly endorsed that these bovines were indeed oxen. The situation was more intriguing for the buffalo oxen who were registered with two synonyms of the water buffalo species, *camuş manda*. This is how registers recorded the buffalo oxen of Kurt oğlu İbrahim,[67]

60 For further information about the subdistrict, see Bedirhan Kale, "19. Yüzyılda Boyabat Kazasının Sosyoekonomik Yapısı" (M.A. Thesis, İstanbul, İstanbul Üniversitesi, 2022).

61 OA. ML.VRD.TMT.d 16404.

62 OA. ML.VRD.TMT.d 3257: 5.

63 OA. ML.VRD.TMT.d 3259: 5.

64 OA. ML.VRD.TMT.d 3259: 24.

65 OA. ML.VRD.TMT.d 3260: 15.

66 OA. ML.VRD.TMT.d 3263: 19.

67 OA. ML.VRD.TMT.d 3260: 9.

Molla Ahmed oğlu Sabit,[68] and Söylemez oğlu Mustafa.[69] İbrahim and Sabit kept their buffaloes in pairs, whereas Mustafa apparently had a single buffalo ox alongside his pair of Anatolian taurine oxen. Although this time even the gender information was absent in the naming of these bovines, the absence of revenue estimations still suggests that these water buffaloes were indeed oxen.

The absence of status and job information for oxen was not a particularity of the registers from Kastamonu. The register no. 10200 from Konya's Kemer subdistrict joined the aforementioned examples since it recorded water buffalo oxen simply with the name of their species, *camuş*. For instance, this is how the register noted the buffalo oxen of Halil oğlu Hacı İsmail, Koca Bekir oğlu Ahmed, Koca Adem oğlu Yusuf, and Abdülhalim Efendi in the village of Elmacık.[70] The scribes did not estimate that these water buffaloes would bring any immediate financial income to their human owners. The scribes paid more attention to the species of these non-human workers instead of their jobs for an unspecified reason. These bovines were certainly buffalo oxen. The scribes who prepared the latter register marked another intriguing detail about water buffaloes. They noted two "barren buffaloes" (*yoz camuş*): one in the barn of Ahmed oğlu İsmail from the Böbekler village and the other in Usta Osman oğlu Muhammed's barn from the Kozluca village.[71] Did these buffaloes have any difference with the remaining buffalo oxen that the scribes simply wrote as *camuş*? Since oxen were castrated males, they were all infertile. Yet, the common usage of the adjective *yoz* for unproductive female animals increases the chance that these two "barren buffaloes" were actually barren buffalo cows that farmers kept for exploiting their muscles. If they did not generate any apparent financial income, as the register noted, they probably worked as non-human laborers. It is not possible to be sure about the gender and the actual identity of these last

68 OA. ML.VRD.TMT.d 3262: 5.

69 OA. ML.VRD.TMT.d 3266: 11.

70 Households no. 2, 3, 20, and 27 in OA. ML.VRD.TMT.d 10200: 45-52.

71 OA. ML.VRD.TMT.d 10200: 11, 59.

two buffaloes. However, the scribes' laconic wording still gives clues to guess that the remaining "buffaloes" in the register were buffalo oxen.

Some scribes chose to underline the oxen's harsh occupation of pulling a plow or cart. Two temettuat registers from Amasya[72] and Sivas[73] recorded the oxen as "draft oxen" (*koşu öküzü*). There is only a poor chance that the writers aimed at emphasizing the brutal aspect of yoking oxen and forcing them to work on plots. On the other hand, they might have made an effort to clarify that they did not intend to extract taxes for oxen, which would be completely in line with the temettuat procedure. By exempting the oxen and most male animals from income tax, the temettuat registers strengthened the contemporary view that oxen made part of the minimum means of production that agricultural activities called for. Another naming apparently reflected the same logic. Some temettuat registers from the Province of Edirne[74] and at least one from Erzurum[75] recorded oxen in pairs. These registers recorded each pair of Anatolian taurine oxen as a single *öküz çift,* and each pair of buffalo oxen appeared as a single *manda çift*. The Turkish word *çift* means not only "a pair" but also a team of two oxen and a plow or the plowing operation itself. In accordance with this conception, the *çift* word in these records describes both the number and the job of these worker bovines. The scribes who marked the number of oxen by pairs instead of heads exposed the effort to point out the essential role of these laborious beasts for the economy. In this logic, the ox was unthinkable outside a pair and without a plow.[76]

The ox, as a socio-economic bovine identity, was a human product created for human affairs. The oxen were trained to specialize in plowing and therefore occupied a central place in agricultural activities. They could also carry carts and drag logs. The last benefit a human would extract from an ox was his sale or slaughter for the large amount of meat he

72 OA. ML.VRD.TMT.d 13000.

73 OA. ML.VRD.TMT.d 13587.

74 OA. ML.VRD.TMT.d 6170, 6171, and 6172.

75 OA. ML.VRD.TMT.d 7000.

76 Finberg, "The Domesday Plough-Team," 67.

developed and carried in his heavy body. The countryside in Ottoman Anatolia was unimaginable without oxen. Little details in the temettuat registers indicate the remarkable level of meticulousness the scribes showed while describing these humble non-human workers.

2.4.2 *The Cow*

The cow was a "basic means of subsistence" in an Ottoman village.[77] As producers of milk and calves, cows had immediate financial benefits for their owners according to the logic of the temettuat registers. Records precisely noted down the number of dairy cows (*sağman* or *sağmal inek)* and added an estimated annual income that each cow would generate. The revenues that cows would bring yearly differed from place to place. It was nine kuruş in a village of central Anatolia[78] and fifteen in a town on the Mediterranean coast[79] and a subdistrict on the Black Sea coast.[80] It rose up to twenty-five kuruş in the mountainous parts of the Mediterranean coast,[81] raising questions about the species and unexpectedly high quality of the cows in the semi-nomadic community called Günbeli Obası, or a steady calculation error. The estimated milk yield from cows attained fifty kuruş, and even the double for water buffaloes in Edirne's Akçakızanlık subdistrict.[82]

Similar to the case of oxen, scribes showed different levels of sensitivity while indicating cows' species. For cows, as for oxen, *karasığır* posed the standard. In most cases, the missing information about species would lead to an Anatolian taurine cow with lower estimated revenues than a buffalo cow. The cows of Günbeli Obası formed an exception with their remarkably high output, which one would expect to match with the wording "buffalo cow" instead of the simple "dairy cow". Temettuat records estimated significantly bigger revenues for buffalo cows than Anatolian

77 İnalcık, "A Case Study," 168.

78 OA. ML.VRD.TMT.d 17584.

79 OA. ML.VRD.TMT.d 9652.

80 OA. ML.VRD.TMT.d 3258.

81 OA. ML.VRD.TMT.d 17580.

82 OA. ML.VRD.TMT.d 5203.

cattle cows. According to the register of Erzurum's Köşk[83] and Taşağıl[84] villages, a "dairy buffalo" (*sağman manda* or *sağman medek*) brought her owner an additional income of sixty kuruş. In contrast, an Anatolian taurine cow brought only thirty. The scribes of registers from Edirne's Midye subdistrict were meticulous while indicating the full species and status information of dairy buffalo cows (*sağmal manda ineği*). They noted that each of these non-human animals recorded an annual milk yield of seventy kuruş for their human owners, while their Anatolian taurine sisters recorded twenty-five kuruş.[85] In Cide, the gap between the milk revenue from the cows of the two genera appeared smaller. According to the calculation, a dairy buffalo (*sağman camuş*) would annually generate an income of twenty-five kuruş for her owner, while an Anatolian taurine cow would bring fifteen kuruş. Still, the gap was not negligible, which should explain why the preparers of the register showed an effort to indicate the species of at least some cows. While some Anatolian taurine cows appeared as "dairy cow" (*sağman inek*), some appeared as "*karasığır inek*".[86] An exceptional naming appeared in the register of the village of Sıraböceklik in Amasya, where the household no. 9 had three dairy "black" buffalo cows (*sağman kara camuş ineği*). It could be a reference to the cows' color or an error of the scribe who was maybe tired of indicating cows in the long formulation of "*sağman karasığır inek*" throughout the document. The register recorded that the milk each Anatolian taurine cow in Sıraböceklik produced would be thirty-six kuruş annually, and each buffalo cow would give twice as much.[87] The gap between the milk productivity of the two species seemed narrower in a little village in the inner parts of north Anatolia. The register of the village of Adakınık in the Province of Bolu calculated that each dairy Anatolian cattle would bring thirty kuruş annually, while each dairy buffalo would bring forty

83 OA. ML.VRD.TMT.d 6901.

84 OA. ML.VRD.TMT.d 7000.

85 OA. ML.VRD.TMT.d 6170.

86 OA. ML.VRD.TMT.d 3256.

87 OA. ML.VRD.TMT.d 12912.

kuruş.[88] The gap between the estimated milk yields of the two species remained the same in Konya's Kemer subdistrict, where dairy taurine cows annually brought twenty, and their buffalo sisters brought thirty kuruş.[89]

Registers do not explain why their estimation of milk production per cow differed from place to place. There are only limited details about breeds. The Anatolian taurine was the most abundant cow species, and water buffalo cows had a remarkably higher milk productivity than the latter. Serious fluctuations among estimations create unexpected situations in which a dairy buffalo cow in Kastamonu would produce less milk than an Anatolian taurine cow in the neighboring province of Bolu. Did taurine cows in Edirne's Midye produce half the amount of milk their sisters of the same species produced in Edirne's Kızanlık? How could cows' estimated annual milk production from a single province, Konya, vary from nine kuruş to twenty-five kuruş? It appears that milk yield estimations in temettuat registers cannot lead to reliable calculations about the productivity of nineteenth-century Ottoman cows. However, inconsistencies cannot overshadow the nearly perfect coherence within each register. Scribes paid great attention to estimating the same milk yield value for cows of the same genus in a single document. Although these estimations showed radical differences from district to district, they were notably coherent within each register. In the eyes of the scribes who prepared the temettuat registers, reaching a standard among the residents of the same settlement might be more crucial than assuring the actual reliability of their calculations. A nearly excellent coherence of milk yield estimations on the village level was accompanied by unexplained inconsistencies on the district level. All in all, the data confirm that cows in the same village produced approximately the same amount of milk, and buffalo cows produced noticeably more milk than their Anatolian taurine sisters.

88 OA. ML.VRD.TMT.d 3423.

89 OA. ML.VRD.TMT.d 10200.

TABLE 2.1 The inscription of cows in different temettuat registers

register no.	province	non-human animal	original naming in Turkish	estimated annual milk yield (in kuruş)
3256	Kastamonu	dairy Anatolian taurine cow	*sağman* or *karasığır inek*	15
3256	Kastamonu	dairy buffalo cow	*sağman camuş*	25
3423	Bolu	dairy Anatolian taurine cow	*sağman karasığır*	30
3423	Bolu	dairy buffalo cow	*sağman camuş*	40
5203	Edirne	dairy Anatolian taurine cow	*sağmal karasığır ineği*	50
5203	Edirne	dairy buffalo cow	*sağmal camuş*	100
6170	Edirne	dairy Anatolian taurine cow	*sağmal karasığır ineği*	25
6170	Edirne	dairy buffalo cow	*sağmal manda ineği*	70
6901	Erzurum	dairy Anatolian taurine cow	*inek*	30
6901	Erzurum	dairy buffalo cow	*sağman manda*	60
7000	Erzurum	dairy Anatolian taurine cow	*inek*	30
7000	Erzurum	dairy buffalo cow	*sağman medek*	60
9652	Konya	dairy Anatolian taurine cow	*inek*	15
10200	Konya	dairy Anatolian taurine cow	*sağman inek*	20
10200	Konya	dairy buffalo cow	*sağman camuş*	30
12912	Sivas	dairy Anatolian taurine cow	*sağman inek*	36
12912	Sivas	dairy buffalo cow	*sağman kara camuş ineği*	72
17580	Konya	dairy Anatolian taurine cow	*sağmal inek*	25
17584	Konya	dairy Anatolian taurine cow	*sağmal inek*	9

A cow had a financial value as long as she produced milk.[90] Anatolian farmers would express their resentment against four-year-old heifers

[90] The gender question regarding cows can be enhanced with İnalcık's suggestion that cows remained in the wife's possession in an Anatolian peasant household. In case of the husband's death, the cows were "expressly set aside for the widow." Therefore, almost every widow in İnalcık's research had at least one cow. Further research in this regard may test the assumed sisterhood relation between peasant women and cows in

who had not still given birth by calling them "summer wanderer" (*yaz gezeri*). In the eyes of a farmer, these heifers would be "grazing in vain" the whole summer (*bütün yaz sürünün içinde boşuna yiyip içip dolaşır*) without bringing any economic yields.[91] Cows were mothers to calves, for whom they produced milk. Hence, a dairy cow always came with her offspring. In line with their human owners' demand for milk, cows had to give birth annually.[92] Some temettuat registers recorded cows together with their calves. The register no. 10201 from Konya's Kemer-i Hamid subdistrict noted "cow with calves" (*buzaklı inek*), "barren cow with stirks" (*kısır inek mağ dana*), or "cow with stirks" (*danalı inek*). The price of each cow with stirks, either barren or productive, was 140 kuruş, while the price of their sisters with calves was only 110 kuruş. The scribes showed the same economic preference of inscribing the offspring with their mothers while noting "donkey with colt" (*sıpalı merkeb*), "sheep with lamb" (*kuzulu koyun*), and "goat with yeanling" (*oğlaklı keçi*).[93] The scribes' preference may point to an alternative way of indicating the productivity (in terms of milk and offspring) of these non-human animals. If the term "barren cow with stirks" did not repeat, it could be taken as an error. Still, these barren cows left their bold shadow on the possibility of a correlation between productivity and the collective inscription of cows with their calves in the chosen temettuat register.

If a cow had not given birth, temettuat records would not estimate any additional income for her, but would still count her as a part of a household's economic potential.[94] Registers referred to "unproductive" cows with the adjectives *kısır* (barren), *dölsüz* (without offspring), or *yoz* (virgin). If their owners could not extract their milk, these cows had to

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rural Anatolia. See İnalcık, "A Case Study," 168. Cow milking was a work generally associated with women and plowing the field was associated with men. A ballad from 1629 gives a crystallized description of the gender roles regarding cattle husbandry in Britain. When the husband tried to milk the cow, she kicked him in the face because he had approached her on the wrong side. See Fudge, "Milking Other Men's Beasts," 25.

91 Köse, "Kars'ta, Sığır," 3521–22.

92 Little, "Harnessing (and Yoking)," 21.

93 OA. ML.VRD.TMT.d 10201.

94 Adıyeke, "Temettuat Sayımları," 774.

join the bovine workforce alongside oxen.[95] In central Anatolia, in a little village of Yozgat called Çanakçı, a pair of barren cows appeared as the only recorded possessions in households no. 9 and 12. The register noted that Kara Veli oğlu Hasan and Sağır Ahmed oğlu Kel Hüseyin were both apprentices (*çırak*) and had no other source of income than their professional occupation, which yearly brought each no more than 150 kuruş. Their sixteen farmer neighbors all had at least a pair of oxen as well as many other farm animals, while the two apprentices kept each a barren cow.[96] If the cows did not produce milk (the register did not estimate any financial benefit from them), the apprentices should have kept these two non-human animals as work animals. Smaller than oxen, these infertile cows probably demanded less fodder and served as a relatively cheaper workforce alternative for the households of Hasan and Hüseyin. In western Thrace, households no. 9 and 12 in Çirmen's subdistrict called Kavak kept three barren Anatolian taurine cows (*kısır karasığır inek*) in their barns. The households of Salih bin Feyzullah and Ahmed bin Ali both had a pair of oxen that worked on their eighteen- and fourteen-dönüm plots for cultivating grains and tobacco. These farmers with annual revenues of 1442 and 1235 kuruş were not in a financial situation as miserable as the aforementioned apprentices in Yozgat. They probably used the barren cows to enlarge their team of bovine workers serving for their numerous agricultural and domestic tasks, including carrying wheat and flour to Salih's watermill (*dere değirmeni*).[97] The twenty-five households in the Şeyh Cui community in Amasya kept at least fifty-two work animals, of which twenty-seven were oxen, seven were barren cows, and the remaining eighteen were either horses or donkeys. The household of İmam Ahmed Efendi (no. 1) raised a variety of agricultural products,

95 In nineteenth-century Britain, cows and heifers were "only very occasionally" employed for draft, whereas they "spent time in the yoke" in mainland Europe. See Collins, "The Latter-Day," 194. Referring to two early-twentieth-century French novels, Liebowitz reports that cows were used for plowing in south-central regions of France. See Liebowitz, "The Persistence of Draft Oxen," 31-32.

96 OA. ML.VRD.TMT.d 13386: 4-5.

97 OA. ML.VRD.TMT.d 5425: 4-5.

including wheat, grapes, and raw silk. However, the only work animals they kept were an Anatolian taurine ox, a donkey, and a barren cow (*yoz karasığır ineği*). Only a little imagination is required to picture that the imam paired the two bovines in the same plow when he wanted to till the soil. One can imagine a similar picture on the plots of the gardener called Halil (no. 7). In the barn of Halil's household, there were only a donkey, a bullock, and a pair of barren cows. It would not be surprising if the two female bovines pulled a plow together. By the way, as Halil rented out his agricultural field, the remaining vineyard and mulberry orchard probably would not call for a deep plowing that would exhaust the female bovines.[98] The twelve households that the village called Sıraböceklik (still from Amasya) covered kept more barren cows than oxen. As mulberry orchards did not require the hard and deep plowing work that grain crops required, only three households felt the need to feed a total of seven oxen in their barns. The only other work animal in the village was the barren cow. Thirteen female bovine workers probably carried things for seven gardener households in Sıraböceklik.[99] As registers recorded no revenues on behalf of any of these cows, these infertile female members of the Anatolian taurine population eventually joined their oxen brothers in carrying and dragging stuff for their human owners.[100]

Errors in the preparation of the registers led to bizarre situations involving non-human animals. For example, a "dairy ox" (*sağman öküz*) appeared among the possessions of Sarı Abdi oğlu Osman, a farmer from Kastamonu.[101] This rare oxymoron creature was evidently the result of an error. As it did not generate an income like cows in the village did, the creature was probably a simple ox, who did not produce any milk or offspring. The temettuat registers of Edirne's Midye subdistrict created

98 OA. ML.VRD.TMT.d 13000.

99 OA. ML.VRD.TMT.d 12912.

100 Robert Trow-Smith arrived into a similar conclusion after treating the Domesday records. He saw the cow at the time of the Domesday Survey as "essentially a draft animal." Cows would take "their place in the plow team" if pregnancy was not too advanced. See Moore, "The Ox," 91.

101 OA. ML.VRD.TMT.d 3256: 12.

another exceptional situation by estimating that barren cows generated immediate financial revenues as their productive sisters did. According to the scribes who prepared the registers of Midye,[102] barren cows (marked as *kısır karasığır ineği* or *kısır manda ineği* depending on their species) in the subdistrict brought the same amount of economic benefits to their human owners as their dairy sisters did. So, each Anatolian taurine cow, either dairy or barren, generated an annual income of twenty-five kuruş, whereas each buffalo cow, either dairy or barren, generated seventy kuruş. It is an obvious error. The erratic calculation of Midye's registers did not repeat itself in other registers from the same province. For instance, scribes did not estimate revenues from barren cows in Edirne's Akçakızanlık.[103] The error in Midye's registers remained as an exception. It not only underestimated the significance of dairy cows in the food diet and financial revenues of nineteenth-century households, but also defied the established habit of exempting draft animals from taxation.

The cow held a privilege that exempted her from the dull tasks of a draft animal as long as she carried out the expected reproductive activities of her gender. In the eyes of an Ottoman bureaucrat, a cow meant a source of income that would feed the concerned household with fresh milk, the precious ingredient of dairy products. The number of cows was a marker of richness. Yet, if a cow could not produce the milk her human owner waited to extract, she would not enjoy the status that saved her from hard labor. She would not be able to work in the dairying, but might join her brothers in field work. Or, her owner might always end up selling or slaughtering her.

2.4.3 *The Offspring*

There is nothing particular about cows giving birth to calves. The latter, born into captivity, needed a couple of years to grow to maturity before they took an active role in the functioning of an Ottoman farm. According

102 OA. ML.VRD.TMT.d 6170, 6171, and 6172.

103 OA. ML.VRD.TMT.d 5203.

to the logic of temettuat, little bovines brought no financial income to their human owners. Reminding of the case of the oxen and other draft animals, calves and young bovines were not subject to taxation but still appeared in the temettuat registers. Moreover, temettuat registers showed traces of a special meticulousness in noting down the gender of these little ones. Most temettuat scribes paid great attention to make precise the gender of calves.

Temettuat registers noted calves as separate categories, not in additional notes written under or around the information about their mothers. The economism in the records' logic usually placed calves towards the end of the livestock list. Meanwhile, their mothers with noticeable financial values usually appeared towards the beginning, just after the oxen. Most scribes noted calves by specifying their gender. For example, in a small village of Erzurum, Dursun'un oğlu Hüseyin (household no. 3) kept at the same time a male calf and a female calf, both recorded separately.[104] Meanwhile, some registers[105] neglected the gender of calves and recorded them simply as *buzağı*. It should also be added that some registers[106] employed the Armenian term *mozik (մոզիկ)* instead of the Turkish equivalent *buzağı* while referring to calves. *Malak* was the most common way to describe a little water buffalo, either a calf or a stirk. In the registers from the Edirne province, they usually appeared with information about their gender. The scribes noted female (*dişi malak*)[107] and male (*erkek malak*)[108] water buffalo calves separately. On the other hand, registers from Konya's Kemer employed the word *botak,*[109] and a register

104 OA. ML.VRD.TMT.d 6901.

105 OA. ML.VRD.TMT.d 7233 and 13587.

106 That is the case in the following temettuat registers from Erzurum Ovası: OA. ML.VRD.TMT.d 6900, 6901, and 6930.

107 For example, see OA. ML.VRD.TMT.d 5205.

108 For example, see OA. ML.VRD.TMT.d 6171.

109 OA. ML.VRD.TMT.d 10200 and 10201.

from Edirne's Akçakızanlık employed the word *kot*[110] for water buffalo calves. There were a variety of ways to refer to cattle offspring.[111]

While sucking calves were attached to their mothers, their elderly sisters and brothers enjoyed greater mobility and represented a different category in the eyes of the people. Stirks had left behind the dependent and fragile status of calves, but most of their owners would still consider them too young for the hard tasks expected from adult bovines as workers in the field or as producers of milk. Meanwhile, some human owners might prefer forcing them to work so that they "put on flesh"[112] and gain weight before the approaching time of their sale or slaughter. Ottoman people used the category of *dana* (stirk) for any weaning bovine older than six months of age, be it a heifer (again *dana* or *düve* if she had sexual excitement) or a bullock (*tosun*). The scribes of a temettuat register from Kastamonu[113] paid special attention to indicating the stirks' gender. They noted each stirk either as a "male stirk" (*erkek dana*) or a "female stirk" (*dişi dana*) separately. The scribes not only indicated the gender but also the sexual maturity of heifers with the term *düve dana*. These potential cows represented a different category than simple female stirks. The farmer called Ömer oğlu Osman had a pair of female stirks (*dişi dana*), a sexually active heifer (*düve dana*), and a bullock (*tosun*). The scribes inscribed each of these bovine categories separately.[114] If the sexually active heifer belonged to the water buffalo species, the scribes noted them particularly. In Kastamonu's Cide subdistrict, the farmer called Yakub oğlu İbrahim had a *düve malak* (alongside her brother noted as *erkek malak*)[115] and İshak oğlu İshak had a *düve manda*.[116] In Edirne, the coal carrier and farmer called Mehmed Sadık bin Ebu Bekir had a pair of *manda*

110 OA. ML.VRD.TMT.d 5207.

111 For a long list of alternative words for calling cattle offspring, see Gülseren Tor, "Anadolu Ağızlarında Yavru Adları," in *ICANAS*, 2011, 1749–1830.

112 Liebowitz, "The Persistence of Draft," 34.

113 OA. ML.VRD.TMT.d 3258.

114 OA. ML.VRD.TMT.d 3258: 28.

115 OA. ML.VRD.TMT.d 3258: 26.

116 OA. ML.VRD.TMT.d 3262: 12.

düvesi,[117] and the latter's fellow Tanaş veled-i Yorgaki had a pair of *dişi malak düvesi.*[118] The scribes' excessively descriptive attitude was translated into the appearance of multiple "male bullocks" (*erkek tosun*) in other registers from Cide.[119] It is the same excessive sensitivity that led the same scribes to note a male stirk (*erkek dana*) along with a bullock (*tosun*) for Şaban oğlu Osman.[120] The difference certainly lay in the status of sexual maturity between the two categories of young male bovines.

Some temettuat registers recorded stirks by indicating their ages. In Gürün's Cemal village within the Province of Sivas, the temettuat register noted six two-year-old bullocks (*iki yaşında tosun*) and a pair of two-year-old heifers (*iki yaşında düve*) among the possessions of the recorded twenty-nine households. Forty-six oxen, twenty-six cows, a single sucking calf, and three other bullocks appeared in the same list without any information about their age.[121] The temettuat register of Çirmen's Kavak neighborhood was even more illustrative than the latter because it paid attention not only to the age but also to the species of bovine animals. Species still mattered while referring to calves and stirks. In Kavak's register, the recorded sixteen households kept four one-year-old stirks (three males and a female), five two-year-old Anatolian taurine heifers (*iki yaşında karasığır düvesi*), seven two-year-old Anatolian taurine bullocks (*iki yaşında karasığır tosunu*), a three-year-old Anatolian taurine bullock, and a pair of two-year-old buffalo stirks. The scribe recorded the last two stirks as *camuş düvesi* (buffalo heifer) and *erkek malak* (male buffalo stirk).[122] Sometimes, the age information helped the reader to guess the missing elements of a bovine's identity. The scribes who prepared the registers of Edirne's Kızanlık occasionally found it enough to simply indicate the species and the gender of some bovines that they noted as "female buffalo" (*dişi camuş*). The information about the

117 OA. ML.VRD.TMT.d 6170: 8.

118 OA. ML.VRD.TMT.d 6172: 14.

119 See OA. ML.VRD.TMT.d 3258, 3259, 3262, 3263, 3264, 3265.

120 OA. ML.VRD.TMT.d 3260: 19.

121 OA. ML.VRD.TMT.d 13587.

122 OA. ML.VRD.TMT.d 5425.

concerned buffaloes' age (they were either one and a half or two years old) provided the precious clue to understand that the female buffaloes that Çakır oğlu Hüseyin,[123] Abdulbaki oğlu Molla Hüdaverdi,[124] and Kula oğlu Babas Görgi[125] kept were heifers, who still had a couple of years before becoming mature cows and giving milk. The inscription of bovines with their ages provided valuable information about the cattle population in the settlements that the temettuat registers recorded.

The most explicit reflection of economism in temettuat registers about young bovines involved heifers. Some registers added a little note about certain female stirks, which read: "returns will be collected in '62" (*altmış ikide hasılat alınacağı*). Eight heifers appeared with the exact same note among the possessions of the fifty-eight households that a temettuat register from Kastamonu's Cide covered. These eight heifers also had other sisters in the same settlement, and the register simply marked them as "female calf" or "female stirk" without such a note.[126] The concerned heifers were all *düve*, which pointed out that they were sexually active. Thus, the note, written in the Hijri year 1261, implied that these heifers would become mature cows by the following year. In fact, it was a note to the surveyors of 1262, who would encounter more cows in the concerned eight households and who would then calculate higher revenues for these households. A regulation addressing temettuat surveyors clearly instructed them to inscribe only the number of bovine offspring and leave them untaxed until next year's survey.[127] The scribes who prepared the temettuat registers of the Edirne province paid great attention to the age of the calves and stirks they noted. Apparently, their scope of estimation was wider than a single year. Registers of Akçakızanlık captured little bovines with their ages and even recorded the estimated time span before they fully grew in maturity and started generating revenues for their human owners. The scribes carefully noted

123 OA. ML.VRD.TMT.d 5203: 4.

124 OA. ML.VRD.TMT.d 5205: 3.

125 OA. ML.VRD.TMT.d 5207: 4.

126 OA. ML.VRD.TMT.d 3263.

127 Adıyeke, "Temettuat Sayımları," 802.

the age of sucking calves but excluded them from yield estimations. Some calves were recently born, like Dimitri's one-month-old female calf,[128] and most of them had barely spent their first year in the world. Calves at the age of two or three only appeared rarely in the registers and were the result of apparent errors made during the inscription.[129] The Ottoman bureaucracy did not expect sucking calves to generate revenues for their human owners. However, by the age of two, responsibilities on the shoulders of bovines started to gain weight. The scribes of Kızanlık's temettuat registers meticulously calculated the remaining years until stirks reached the age of five. For each stirk, they indicated his or her age and the remaining years until he or she became suitable for taxation in little notes like the following: *üç yaşında olup iki seneden sonra temettu vereceği*. The waiting span was two years for a three-year-old bovine or a single year for a four-year-old. In most cases, the age of five marked the time for a bovine to bring a financial income to his or her household. In Cide, only the heifers were supposed to generate revenue, that is, producing milk. In Kızanlık, the scribes attentively sought future dairy cows and expected a financial yield also from male stirks and bullocks. Intriguingly, the temettuat scribes calculated the age of bullocks, too. One can only guess how these five-year-old male bovines brought financial yields to their owners. People would castrate these young adults and exploit their labor or slaughter them for their meat.

Was there a third option for male bovines besides turning into oxen or fresh meat? Who impregnated heifers and cows? Temettuat registers bear a very striking piece of information about bovine populations in Anatolia, which is the absence of bulls. It is extremely rare to come across a bull (*boğa*) specially preserved for the purpose of reproduction (*damızlık*) in a temettuat register. For example, Mustafa bin Ali, a twenty-five-year-old member of a Yörükan community in Balya, district of the Hüdavendigar province, kept a single bull along with six cows, three stirks, two heifers, two bullocks, and other farm animals.[130] An Anatolian

128 OA. ML.VRD.TMT.d 5207: 103.

129 You can find numerous two- or three-year-old "calves" in OA. ML.VRD.TMT.d 5207.

130 OA. ML.VRD.TMT.d 7233: 5.

taurine bull (*karasığır boğası*) appeared among the possessions of Kosta veled-i Dimitri, a coal carrier and farmer from Edirne.[131] The two bulls that Mustafa and Kosta owned did not have a single rival either in their own villages or nearby settlements. The absence of bulls in most temettuat registers points to the lack of a deliberate policy of reproduction that cattle-owners would pursue. Presumably, random bullocks would impregnate most heifers and cows in Ottoman Anatolia and Rumelia. The quasi-absence of enclosed fields in Anatolia led to greater freedom for bovines to mate with each other and limited control of their human owners on their reproduction practices. The immediate result, which was smaller, lighter, and less productive bovine generations, was certainly not favorable for the human affairs called economy and agriculture.[132]

Calves born into an Ottoman barn would grow into heifers and bullocks and turn into grown-up oxen and cows in a few years. They would pass through different stages and arrive at the same point where they worked or produced for their human owners. The scribes who prepared the temettuat registers carefully noted the stages that showed the growth of a little bovine and the point of arrival where he or she became perfectly functional in the subsistence of an Ottoman household.

2.4.4 *Their Worth*

Non-human animals appeared in temettuat registers either as generators of income or means of production. The dairy cow represented the first category because she brought an additional income to her household by producing milk. The ox represented the second category because he had vital roles in agricultural production. According to the hierarchy of bovines in the eyes of Ottoman people, the economic value of an ox was

131 OA. ML.VRD.TMT.d 6171: 2.

132 The little size of Anatolian livestock and the quasi-lack of practices of selective breeding was not a nineteenth-century phenomenon. Bryer claims that one could probably lift a Byzantine calf in one hand. See Bryer, "The Means of Agricultural Production," 103. The need for species improvement marked the Anatolian bovine population well into the twentieth century.

generally greater than that of a cow. For example, in the sixteenth-century Bursa villages that Halil İnalcık studied, the worth of an ox could be twice that of a cow.[133] In eighteenth-century Egypt, a pair of oxen was worth as much as three cows.[134] Human categorizations of bovines were translated into different estimations regarding the financial values of an ox, a cow, or their offspring in temettuat registers.

Several temettuat registers diverted from the standard format based on annual revenues and gave place to the estimated worth of each possession that nineteenth-century Ottoman people had. This derivation brought valuable information about the prices of livestock. One of the irregular registers is from the Balya subdistrict of the Karesi district in the Hüdavendigar province. A nomadic community called "Kubaş" in Balya had bovines alongside sheep and goats, the favorite livestock preference of transhumant groups. The register[135] estimated the worth of bovine categories as follows (in descending order): 450 kuruş for an ox, 200 kuruş for a cow, 150 kuruş for a bullock, 100 kuruş for a heifer, 50 kuruş for a stirk, and 25 kuruş for a calf. The prices showed considerable variety in different registers, but the financial hierarchy would remain the same between different bovine categories. In the Lakes Region in the southern part of the Province of Konya, the cattle were much cheaper than in Balya. Meanwhile, the order of prices and bovine categories remained the same. The register from Kemer-i Hamid subdistrict[136] estimated the following worth for bovines: 150-200 kuruş for an ox, 120 kuruş for a cow with a stirk, 110 kuruş for a cow with a calf, 80-100 kuruş for a barren cow, 80-100 kuruş for a bullock, 50 kuruş for a heifer, 30-50 kuruş for a stirk. Not all bovines belonged to the Anatolian taurine species in this register. There were also water buffalo oxen (350-400 kuruş), buffalo bullocks (150-300 kuruş), buffalo heifers (200-250 kuruş), and buffalo calves (150 kuruş) in the same record.

133 İnalcık, "A Case Study", 167-68.

134 Tuchscherer, "Some Reflections," 182.

135 OA. ML.VRD.TMT.d 7233: 5-7.

136 OA. ML.VRD.TMT.d 10201.

The given prices could vary, probably according to the condition of a bovine. In Kemer, there were oxen as cheap as 150 kuruş or as expensive as 200 kuruş. The scribes noted most oxen in pairs with an estimated price of 350 kuruş, which posed the average of 175 kuruş per head. Likewise, the price of bullocks and heifers varied between eighty and a hundred kuruş. Unfortunately, the scribes did not provide clues about how they estimated these prices. They probably assessed the condition of the non-human animal. A 150-kuruş-worth water buffalo bullock must bear apparently weaker physical traits in a register where most of his fellows in the same category had an estimated price of 300 kuruş. A little clue about this valorization appeared in the entry for Topal Ömer, an agricultural laborer (*ırgad*). Whereas dairy cows were estimated to cost more than a hundred kuruş in the village, the worth of Ömer's old cow (*koca inek*) was only eighty kuruş.[137] If the temettuat survey took place at a time when Ömer's cow was younger and healthier, the scribes would estimate a higher price for her. Varying prices reflected differences in non-human animals' physical condition, status, and function. For example, there was a consistent logic behind the price of a "cow with stirk," 120 kuruş. It was equal to the sum of a barren cow's price (ninety kuruş for most of them) and the price of a stirk (thirty kuruş for most of them). By giving birth to calves and raising her stirks, a cow not only produced milk and offspring but increased her own value, too. The scribes of register no. 10201 noted most of the little bovines together with their mothers. As they grew up from calves to heifers and bullocks, these young bovines would gain weight, acquire new statuses, and increase their financial value at the same time. The value estimation in both registers shows a substantial coherence in the evident financial hierarchy between bovine categories. In both registers, a calf was cheaper than a stirk, and a full-grown ox was more expensive than a young bullock. Similarly, a young heifer mature enough to mate was more expensive than a younger female stirk but cheaper than a grown-up dairy cow. At the same time, each bovine species had the same price hierarchy among its members from different

137 See the first household on the fourth line in OA. ML.VRD.TMT.d 10201: 22.

bovine categories. A water buffalo calf could be as expensive as a mature male or female member of the Anatolian taurine species, but the same buffalo calf would always have a cheaper price than older buffaloes. Factors such as productivity, condition, species, and status shaped the cattle prices in the nineteenth-century Ottoman Empire.

TABLE 2.2 The worth of bovines

register no.	province	non-human animal	original naming in Turkish	estimated worth (in kuruş)
7233	Hüdavendigar	ox	*öküz*	450
7233	Hüdavendigar	cow	*inek*	200
7233	Hüdavendigar	bullock	*tosun*	150
7233	Hüdavendigar	heifer	*düğe*	100
7233	Hüdavendigar	stirk	*dana*	50
7233	Hüdavendigar	sucking calf	*buzağı*	25
10201	Konya	ox	*öküz*	150-200
10201	Konya	cow with stirk	*danalı inek*	120
10201	Konya	cow with calf	*buzaklı inek*	110
10201	Konya	barren cow	*kısır inek*	80-100
10201	Konya	bullock	*tosun*	80-100
10201	Konya	heifer	*düğe*	50
10201	Konya	stirk	*dana*	30-50
10201	Konya	buffalo ox	*öküz camuş*	350-400
10201	Konya	buffalo cow	*camuş inek*	350-400
10201	Konya	buffalo bullock	*camuş tosunu*	150-300
10201	Konya	buffalo heifer	*camuş düğesi*	200-250
10201	Konya	buffalo calf	*buzak camuş*	150

Bovine species had millions of members in the Ottoman Empire. The Ottoman society acknowledged their crucial roles as workers and producers. People translated their expectations from these large and strong non-human animals into labels. For each head of bovine, the labels that humans gave them were markers of a denaturalized identity based on a mixture of animal biology and the human affair called the economy. Their

species, gender, age, and physical traits, as well as the immediate needs and arbitrary decisions of their owners, determined how cattle would devote their lives to serving humans. Some bovines focused on producing milk for humans, some fattened to become a larger carcass one day, some specialized in reproducing their enslaved population, and some undertook the heaviest works for human affairs of agriculture and transportation. Bovines found a considerably large place in the temettuat registers with numerous details about their work and condition. These registers enfold the key for reconstructing the presence of oxen in the nineteenth-century Ottoman Empire.

§ 2.5 Discussion on Ottoman Historiography

Most economic historians will admit the importance of oxen in the Ottoman Empire, but only a few, if any, will reserve a particular place for oxen in their narratives. Oxen in economic history are just a means of production. In that sense, if something differentiates the oxen from the plow they pulled, it is the intrinsic value of their carcass. Historians of veterinary medicine may also mention oxen, but they will take the bovine population as a whole and consider the worker members of this species simply as male adults, either healthy or infected. I do not consider research focusing on oxen as a trivial subject in history. I will deny the isolation of oxen in rural nostalgia. On the contrary, I believe that oxen were central to fundamental topics of Ottoman history. Moreover, I will assert that the key to enhancing big questions in Ottoman historiography is tied to the oxen's neck. Without these industrious non-human workers, it is impossible to have a profound understanding of agriculture, transportation, social life, administrative functioning, or war mobilization in the Ottoman Empire.

2.5.1 *The Family Farm Unit*

For long centuries, the ox stood at the core of Anatolian farming. A peasant family household, a pair of oxen, and an adequate size of land constituted the three fundamental elements of the main production unit (*çift-*

hane) in the Anatolian countryside.[138] The word *çift,* which corresponded to *cuft* (جفت) in Persian, *iugum* in Latin, and *zeugarion* (ζευγάριον) in Greek, could describe at the same time the yoke, a yoked pair of oxen, or the land.[139] In Byzantine Anatolia, the nuclear family of four to six people with a plot of five to eight hectares posed the standard.[140] According to İnalcık, the family farm unit that free peasant households cultivated and managed constituted the "dominant form of agrarian production" in Anatolia since the late Roman Empire.[141] The Ottoman bureaucracy considered peasant labor as a taxable asset. The tax depended on the size of the productive workforce, that is whether the household leader was married. The system, in an indirect and silent way, hence included women and children in the calculation of the rural workforce.[142] The taxable adult male peasant had a full economic labor capacity only if he had a wife, children, fields, and oxen. The çift tax would take the entire household as a single work team.[143] Although historians do not emphasize it enough, the oxen were an indispensable member of this team. The ox, who was the "kingpin of the manorial system" in medieval Europe,[144] had an equally important role in the Ottoman Empire. The family farm unit held its domination in rural Anatolia under Ottoman rule and formed the backbone of the whole administrative, financial, and military structure of the Ottoman Empire.[145]

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138 Halil İnalcık, "The Çift-Hane System: The Organization of Ottoman Rural Society," in *An Economic and Social History of the Ottoman Empire Volume I: 1300-1600*, ed. Halil İnalcık and Donald Quataert (Cambridge University Press, 1994), 146.

139 Halil İnalcık, "Çift-Hane Sistemi ve Köylünün Vergilendirilmesi," in *Doğu Batı Makaleler - II* (Doğu Batı Yayınları, 2008), 97-99.

140 Pierre Toubert, "Byzantium and the Mediterranean Agrarian Civilization," in *The Economic History of Byzantium: From the Seventh through the Fifteenth Century Volume 1*, by Angeliki Laiou (Dumbarton Oaks, 2002), 381.

141 İnalcık, "The Çift-Hane System," 143.

142 İnalcık, "Çift-Hane Sistemi," 107.

143 İnalcık, "Çift-Hane Sistemi," 103, 110.

144 Moore, "The Ox," 91-92.

145 İnalcık, "Çift-Hane Sistemi," 101.

The çift-hane unit was an indispensable part of the *tımar* system, which was based on land grants in exchange for raising mounted soldiers. The tımar system gradually disappeared with its timariots called *sipahi* after the sixteenth century.[146] The *tahrir* registers, the outcome of numerous surveys to determine the income sources of newly conquered territories and the tax amount to be allocated from there, were "indispensable elements of the tımar system"[147] and disappeared along with timariots after the sixteenth century. In the following centuries, the çift-hane unit outlived the institutions and the tax system it was associated with. Despite the seventeenth- and eighteenth-century challenges regarding Istanbul's control over the provinces, the çift-hane system survived as a unit of agricultural production into the nineteenth century.[148] In the nineteenth century, Ottoman agriculture continued to rely largely on family farms, which annually cultivated between four and six hectares with the labor of the household members and a pair of oxen.[149] Small peasantry was still "the most prevalent form of production"[150] throughout the Ottoman Empire.

İnalcık suggests that it is impossible to explain the family labor farm system without reference to the team of plow oxen.[151] A farmer household, a simple Anatolian plow called *kara saban,* and a pair of oxen who dragged it formed a single team. Many historians classify the pair of oxen as "means of production" along with the plow; however, the non-human agricultural workers represented the economic factors of capital, labor,

146 Huricihan İslamoğlu and Çağlar Keyder, "Agenda for Ottoman History," *Review (Fernand Braudel Center)* 1, no. 1 (Summer 1977): 38-39.

147 Osman Gümüşçü, "The Ottoman Tahrir Defters as a Source for Historical Geography," *Belleten* 72, no. 265 (2008): 912-13.

148 Semih Çelik, "Scarcity and Misery at the Time of 'Abundance beyond Imagination' Climate Change, Famines and Empire-Building in Ottoman Anatolia (c. 1800-1850)" (PhD Thesis, European University Institute, 2017), 103.

149 Şevket Pamuk, *Uneven Centuries: Economic Development of Turkey since 1820* (Princeton University Press, 2018), 121-122.

150 Reşat Kasaba, *The Ottoman Empire and the World Economy: The Nineteenth Century* (State University of New York, 1988), 27.

151 İnalcık, "The Çift-Hane System," 145.

and means of production at the same time. In Ottoman farming, human labor was inseparable from non-human labor. Plowing required the coordinated effort of the plowman and the draft animals. The plowman would press down the plow's handles so that it tilled the soil, and the non-human workers would drag the instrument forward through the field. I argue that the labor of oxen and people remained the most decisive economic factors regarding rural production in nineteenth-century Anatolia and Rumelia.

Land was another indispensable economic factor in Ottoman agriculture, which was as crucial as the other two factors, labor and means of production. Settlements on the Anatolian peninsula enjoyed a relative abundance of land. Modest households in the interiors of the Anatolian plateau might have dozens of dönüm of land, a privilege that only the wealthiest segment of the society could have in the other corners of the empire, where population made a bigger pressure on arable land acreages. In the Balkans, the population pressure was remarkably higher than in most parts of Anatolia. In the coastal parts of Anatolia, mountain ranges generally put strict limits on the available arable land. Still, even in the regions with a more stressed ratio between population and arable acreage, the question of access to land was not the most urgent problem for most farmers. Even the poorest strata in nineteenth-century Ottoman Anatolia and Rumelia might have a few acres of grain fields or at least a certain portion of vegetable gardens or orchards. On the other hand, some landless peasants might resort to leasing a field or engaging in sharecropping contracts. Once accessed, the land would not bring the harvest per se. The scarcity of labor for crop cultivation was a deeper problem than access to the land, especially in the Anatolian plateau. The number of oxen was more efficient than the acreage of available fields in tracing the upper limit of Ottoman agricultural production.[152] Labor deficit prevailed over land deficit in most parts of the nineteenth-century Ottoman Empire.

152 Çağlar Keyder and Şevket Pamuk, "1945 Çiftçiyi Topraklandırma Kanunu Üzerine Tezler," *Yapıt Toplumsal Araştırmalar Dergisi*, no. 8 (1984-85): 60-61.

Mikhail illustrates a striking counterexample from Egypt, where the supremacy of labor was overwhelmed.[153] The cattle population in Egypt underwent a huge shock due to a series of epidemics, food shortages, and climatic events that happened towards the end of the eighteenth century. The author suggests that the massive reduction in the number of domesticated animals triggered a realignment of wealth in the countryside. Land gained primacy as the "foundation of wealth and prestige" at the expense of livestock. As a result, rural Egyptian elites began to concentrate land in their hands in the final decades of the eighteenth century.[154] So, the land factor prevailed over labor in the eyes of agricultural producers in Egypt by the nineteenth century. Did the striking transformation that a great grain-producing province such as Egypt, the Ottoman "breadbasket,"[155] went through resonate in the other parts of the Ottoman Empire?

Unlike in Egypt, the main scale of agricultural production in the core provinces of the Ottoman Empire persisted at the level of a subsistence economy practiced on small portions of land that pairs of oxen tilled. The big farm units called *çiftlik* had become a prevalent form of production in the Balkans and western Anatolia in the eighteenth century, but the tendency was interrupted by the Ottoman government from the first decade of the nineteenth century on.[156] Rumelian and Anatolian big estates were not intensively engaged in market-oriented mono-crop production as in the case of nineteenth-century Egyptian cotton plantations. The inefficient usage of vast estates is a solid marker of the relatively secondary importance of land availability in the Anatolian and Rumelian countryside. Apparently, landholders in the empire's core provinces were not stressed about the efficient usage of their vast agricultural lands. Ottoman big estates were built on wasteland called *mevat,* and animal

153 Alan Mikhail, "Unleashing the Beast: Animals, Energy, and the Economy of Labor in Ottoman Egypt," *The American Historical Review* 118, no. 2 (Apr. 1, 2013): 317–48.

154 Mikhail, "Unleashing the Beast," 322, 339.

155 Faisal H. Husain, "In the Bellies of the Marshes: Water and Power in the Countryside of Ottoman Baghdad," *Environmental History* 19 (Oct. 2014): 644.

156 Kasaba, *The Ottoman Empire,* 27.

husbandry activities in these farms were "as significant as" grain farming.[157] Since they were castrated, animal husbandry was only seldom concerned with oxen. In the competition between husbandry and farming, the ox belonged to the second party. İrfan Kokdaş asserts that many landholders in eighteenth-century Manisa had turned their estates into dairy farms or cattle ranches at the expense of crop cultivation. A shift from animal husbandry towards agricultural production in big farms became visible only in the mid-nineteenth century.[158] Quataert assumes that large estates in the nineteenth-century Ottoman Empire contained high proportions of unused lands. Great landholders might resort to lease arrangements, sharecropping agreements, wage laborer employment, or stock-raising to exploit their holdings in a labor-scarce economy. When small landholders rented acreage from large estates, these portions would often be otherwise unused lands.[159]

The main agricultural question in the core provinces of the Ottoman Empire was about the deficit of labor and means of production rather than access to the land. The labor required was not only human labor. On the contrary, the potential to put a greater acreage under the plow depended more on the heavy hooves of oxen than human hands. Ekin Mahmuzlu considers bovines as "the Achilles' heel of wheat cultivation" because cereal production could better tolerate shortages of human labor and rainfall than a shortage of oxen.[160] I will argue that the main

157 Faruk Tabak, *The Waning of the Mediterranean, 1550-1870: A Geohistorical Approach* (Baltimore: The Johns Hopkins University Press, 2008), 227-28.

158 İrfan Kokdaş, "Manisa'da Çiftlik, Ağıl ve Mandıralardaki Tarımsal İşgücü Profili: Emek Hareketliliği ve Sosyo-Hukuki Dönüşümler, 1690-1870," *Meltem: İzmir Akdeniz Akademisi Dergisi*, no. 3 (Summer 2018): 47 & 52. Faruk Tabak also detects the same nineteenth-century tendency that relatively increased the share of cereal cultivation at the expense of stock raising in Ottoman big estates. See Tabak, *The Waning*, 291.

159 Donald Quataert, "Agricultural Trends and Government Policy in Ottoman Anatolia: 1800-1914," in *Workers, Peasants and Economic Change in the Ottoman Empire, 1730-1914* (The Isis Press, Istanbul & Gorgias Press, 2010), 22.

160 Ekin Mahmuzlu, "Agrarian and Commercial Change in The Southeastern Black Sea Region: Production, Ecology, and Institutions (1850s-1910s)" (PhD Thesis, Istanbul, Boğaziçi University, 2019), 208.

question in nineteenth-century Ottoman agriculture was not access to land but a deficit of oxen. The number of oxen fell short in Anatolia and Rumelia, where great acreages were not tilled but left for fallow.

2.5.2 *Oxen During the Tanzimat*

Oxen represented a minor part of the whole bovine population in the Ottoman Empire. Humans charged little bovines and their mothers with the tasks of keeping up with their growth, fattening, and remaining docile if their owners approached them to extract their milk or carcass. They would graze more often and more freely than oxen, the professional workers of the cattle population. As oxen tilled the grain fields, hauled logs from forests, and pulled carts to markets, they would cover longer distances and make incomparably bigger physical efforts than their other bovine fellows. Almost 1.4 million oxen, representing forty percent of the whole bovine population, toiled in the Ottoman Empire according to official statistics from 1897. If cereal fields covered slightly more than fifty-three million dönüm all around the empire,[161] each pair of oxen needed to till more than seventy-five dönüm per year. Leaving aside the reliability of Ottoman statistics, this simple calculation boldly underlines the heavy workload of nineteenth-century Ottoman oxen. If a pair of oxen could till around three dönüm with the Anatolian wooden plow in a single work day,[162] they had to spend weeks plowing a field just for once. Tilling the field multiple times would increase the success of the operation and eventually lead to a better harvest. Until seeding, Ottoman oxen would spend several months before winter and several months, if not only weeks, after snowmelt by plowing. Non-human plowers unceasingly worked for human purposes. Could the "new style" (*usul-i cedide*)[163] launched with the Gülhane Rescript in November 1839 and implemented in the following months alleviate the oxen's heavy workload?

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161 Güran, *Resmi İstatistiklere Göre,* 173 & 178.

162 Tevfik Güran, *19. Yüzyılda Osmanlı Ekonomisi Üzerine Araştırmalar* (Türkiye İş Bankası Kültür Yayınları, 2014), 96.

163 Cengiz Kırlı, *Yolsuzluğun İcadı: 1840 Ceza Kanunu, İktidar ve Bürokrasi* (İstanbul: Verita, 2015), 29.

The Gülhane Rescript, or the Tanzimat Edict, led to thorough transformations in the following thirty years, a process that Çağdaş Sümer defines as a "passive revolution."[164] It is debatable whether the Tanzimat meant a profound regime change, but the rescript certainly had a revolutionary tone regarding fiscal issues. There was a strong criticism against tax farming, which was defined as a "detrimental method" that had never given a productive result" (*hiçbir vakitte semere-i nafiası görülmeyen iltizamat usul-i muzırrası*). The solution the rescript offered was individual taxation upon wealth and economic power (*her ferdin emlak ve kudretine göre*), and no one should take anything more beyond that (*kimseden ziyade bir şey alınamaması*). Once Ottoman subjects were secured from excessive fiscal duties, they would be safely taking care of improving their own livelihood (*kendi işi ile tevsi-i daire-i taayyüşüyle uğraşıp*).[165] The prohibition of levying excessive taxes from Ottoman subjects was another way of abolishing corvée. Soon after the Tanzimat Edict, Sultan Abdülmecid I felt the necessity to send clearer instructions to state representatives in the provinces, which forbade them from charging people with corvée work.[166] The abolition of forced labor was one of the prominent clauses of the Tanzimat. However, there were significant limits both in theory and practice that would postpone Ottoman oxen's emancipation from intensive work tempo.

In the eyes of the Tanzimat bureaucrats, corvée work belonged to a particular context. While discussing the Tanzimat's promise to abolish all corvée, most historians[167] accurately focus on the forced labor that

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164 Çağdaş Sümer, "Eski Rejimden II. Meşrutiyet'e Osmanlı İmparatorluğu'nda Modern Devlet Oluşumu ve Siyasal Çatışma Dinamikleri" (PhD Thesis, Ankara, Ankara Üniversitesi, 2020), 225.

165 Muharrem Kaya, ed., "Tanzimat Fermanı," in *Modern Türkiye'de Siyasi Düşünce - Cumhuriyet'e Devreden Düşünce Mirası: Tanzimat ve Meşrutiyet'in Birikimi*, by Tanıl Bora and Murat Gültekingil, vol. 1 (İstanbul: İletişim, 2009), 449-51.

166 Ali Akyıldız, "Tanzimat," in *TDV İslâm Ansiklopedisi* (İstanbul: TDV İslâm Araştırmaları Merkezi, 2011).

167 For example, see Halil İnalcık, "Tanzimat'ın Uygulanması ve Sosyal Tepkileri," Belleten 28, no. 112 (1964): 623–90. Likewise, some writers define corvée as a traditional surplus

provincial notables demanded to enrich themselves upon the unpaid exploitation of peasants in their domain. The evident criticism of tax farming and the prohibition of levying extra taxes made part of the Tanzimat Edict's strategy against local notables. However, the Tanzimat would fail to bring a completely free labor market in the countryside. First, the Tanzimat's anti-corvée stance mainly concerned the forced labor imposed by local notables and did not question the physical tasks that the central government imposed on peasants. Second, the Ottoman government remained silent about the continuation of the corvée work imposed by provincial notables and local state representatives despite serious grievances from local people.[168] The Tanzimat's legal ban on corvée did not put a decisive end to forced labor. On the contrary, the Ottoman government even created a new type of forced labor for road constructions, called *mükellefiyet*.[169] Discussions about corvée work directly concerned millions of oxen who worked under human yoke all around the empire. For oxen, the Tanzimat's shortcomings were translated into the lack of change in their tight work schedule that the nature's cycle traced, their human owners decided, and local or central authorities overcharged.

There is reason to admit that nineteenth-century legal reforms had no chance to put a decisive end to cattle's subjugation to humans, which had a history of at least ten thousand years.[170] Not only oxen but all their

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extraction method (*geleneksel artık çekme yöntemi*) like rents and tithes. See Sümer, "Eski Rejimden II. Meşrutiyet'e," 244.

168 In 1840, the Ottoman government eventually sided with the district governor Hüseyin Paşa despite a series of petitions from the people of Vranje regarding the free work he imposed on them. See Cengiz Kırlı, "Tyranny Illustrated: From Petition to Rebellion in Ottoman Vranje," New Perspectives on Turkey, no. 53 (2015): 3–36.

169 Deniz Yüce, "Implementing Obligatory Labor in Road Construction during the Tanzimat Period" (M.A. Thesis, Istanbul, Boğaziçi University, 2024), 2.

170 Anatolia is one of the possible areas where people domesticated taurine cattle during the Neolithic Age, more than ten thousand years ago. See Daniel Pitt et al., "Domestication of Cattle: Two or Three Events?," *Evolutionary Applications* 12 (2019): 124. Plow marks, models or drawings, and paired ox burials make part of the evidence for the usage of draft oxen in pairs since the fourth millennium BCE on. See Andrew Sherratt, "The Secondary Exploitation of Animals in the Old World," *World Archaeology* 15, no. 1 (June 1983): 92.

non-worker siblings were also enslaved by humans. The ox, as a trained and castrated non-human animal, was physically and mentally shaped by humans. So, even the most radical revolution in the nineteenth-century human world would have limited effects on oxen's slavery in the hands of humans. One may assert that rural life was always the same for oxen since they did not exactly know for which human lord they worked. They simply pulled and hauled things. Yet, Ottoman oxen would still wag their tails with joy if they could understand the term "abolition of all corvée" in their own language. While authorities imposed endless duties on them, oxen suffered as their human owners suffered. The corvée work did not mean an arithmetic increase in a peasant's work days. Nature's schedule would not wait for imperial orders. Environmental cycles like the ripening of crops and weather changes would charge some periods as short as a few weeks, if not days, in rural life with a relentless tempo. As examples from my research show, an untimely corvée demand might increase a peasant's working schedule drastically. For instance, harvest would be an unsuitable time for an imperial task since most peasants would be hurrying to collect and thresh their produce. If the order came in the middle of the threshing time, both peasants and their oxen would work to fulfill the corvée work of carrying coal or logs and would return to their threshing floors on the first occasion to separate the wheat from the chaff as soon as possible. The chance of coinciding with a suitable wind would put additional stress on their threshing agenda. Peasants would show a similar hurry if the order came in a rainy month, at a time when peasants looked for a dry day to go plowing. Not only would work days increase, but the oxen would also feel the uncontrollable stress levels of their human owners. The more frequently the oxen continued to contribute to corvée log or charcoal collection for a provincial notable or an imperial institution, the more limited time span they would have to plow their human owners' grain fields. If one of the Tanzimat's aims was to ensure that Ottoman subjects safely took care of their occupations, the oxen's working tempo was a clear marker of the Tanzimat's success.

Many Ottoman villages were mobilized under harsh conditions to meet the central government's demands. Certain villages in proximity to

Istanbul were charged with firewood collection for the needs of the imperial capital or timber collection for the Imperial Dockyard. In exchange for their services, they would demand exemption from certain taxes[171] or receive a certain payment. Şevket Pamuk states that one of the aims of the Tanzimat reforms was to increase the reliance on markets instead of state interventions for the provisioning of the urban areas.[172] However, corvée work in the villages that were charged with imperial tasks for Istanbul's provision continued long after the Tanzimat Edict. The fact that the mobilized peasants received payments cannot conceal the work's corvée character. Likewise, the existence of intermediary traders cannot prove that they organized the transfer of Istanbul's demands under free market rules. The peasants who were charged with imperial tasks did not perceive the corvée work as a lucrative trade. Even if they were paid, these people considered themselves workers of the imperial institution to whom they collected the demanded materials. A petition from the little settlement called Akkaya on the Black Sea coast in Kastamonu's Sinop district left behind remarkable marks about a peasant's possible perception of the imperial corvée work.[173] Halil oğlu Mehmed used to carry logs in the forests around Sinop for the Imperial Dockyard until he had a terrible accident in 1848. While transporting logs for the Imperial Dockyard, a tree accidently slipped and broke the feet of both Mehmed and his buffalo ox (*kazaen ağaç kayup kömüşün ayağı ile bu kullarının ayağı kırılup*). The poor man had to sell whatever he had to survive with his injured leg. Two years later, he wrote a petition to request aid of oxen and seeds or

171 Ahmet Uzun, "İstanbul'un İaşesi," in *Antik Çağ'dan XXI. Yüzyıla Büyük İstanbul Tarihi* (TDV İslam Araştırmaları Merkezi, 2015), https://istanbultarihi.ist/191-istanbulun-iasesi. In the early eighteenth century, villagers from Gebze demanded their exemption from the *imdadiye* tax in exchange for the firewood and timber they had collected for Istanbul and the Imperial Dockyard. See OA. Cevdet Maliye (C.ML) 698/28568, 28 Safer 1117 (21 June 1705). In Üsküdar, certain villages had collected timber and firewood in exchange for the tax called *avarız*. See OA. C.ML 619/25528, 29 Rabiulevvel 1119 (30 June 1707).

172 Pamuk, *Uneven Centuries,* 99.

173 I became aware of the following archival document thanks to a footnote in Çelik's book chapter. See Çelik, "'It's a Bad Fate,'" 120.

the remission of his six-hundred-kuruş tax debts from the previous two years. Mehmed described his situation with strong expressions such as wretched (*perişan*) or deserving mercy (*merhamete şayan*). The evident respectful and kind tone in Mehmed's petition[174] could not prevent the cold-blooded note that the Imperial Navy authorities added next to Mehmed's letter. The navy bureaucrats did not see Mehmed in a position to request a favor. "Even if the latter was injured while carrying the Imperial Navy's timbers," (*merkum eğerce Tersane-i Amire kerestesi nakleder iken mecruh olmuş ise de*) they justified, the log carrier people had been paid money for each piece of timber they had cut "with their own good consent" (*kendi hüsn-i rızalarıyla kat olunan*).[175] In this logic, it was Halil oğlu Mehmed who had taken an individual risk by carrying timber for the Imperial Navy for money, and the navy did not have a responsibility for the occured injury. While Mehmed considered himself a navy worker, the imperial institution did not share the same perception. For the unfortunate peasant who demanded aid in return for his labor, questioning his working status might not be a reasonable strategy. On the other hand, the navy did not question Mehmed's status, who used to provide corvée work ten years after the abolition of corvée. The definition of obligatory labor does not exclude remuneration. The cases of corvée laborers, conscripted soldiers, and sailors all fit the same definition of "those who have to work for the polity and are remunerated mainly in kind."[176] In that sense, the uncertain amount of money Mehmed received for the timbers that he had carried could not change the nature of his efforts. After his injury, Mehmed was no longer capable of serving as a corvée log carrier. After leaving behind the fatal risks of log trade, he henceforth aspired to live the life of a simple farmer. That is why he asked for oxen and seeds. Had the Tanzimat put an end to all kinds of forced labor, Mehmed's buffalo might never have got injured. In that case, Mehmed would be collecting

174 He would rub his face on the sultan's feet: "*hak-i pa-yi mülukanelerine yüzüm sürerek*"

175 OA. Sadâret Mühimme Kalemi Nezaret ve Devâir Evrakı (A.MKT. NZD) 15/14, 10 Zilkade 1266 (17 Sep. 1850).

176 Yüce, "Implementing Obligatory Labor," 8.

firewood only for his own consumption and would never try to haul a huge tree with his dear buffalo in 1848.

Interpreting the motive of the government officials of the Tanzimat era, Pamuk does not see a long-term economic program but a concern to ensure British support for the territorial integrity of the Ottoman Empire after the series of wars and uprisings that marked the reign of Mahmud II. Hence, the reforms remained "selective" and were shaped by the "interests and priorities of the state elites"[177] rather than the interests of the poor peasantry. The short-term needs of the Ottoman government and the selective character of the Tanzimat policies may explain the inconsistencies in their enforcement. However, discontinuities should not lead to the underestimation of the ideological transformation that the Tanzimat represented regarding fiscal policies. If state agents inscribed peasants' possessions during the temettuat surveys, the motive was to extend the central state's tax extraction with new instruments. The temettuat survey logic had adopted the modern political economy of nineteenth-century centralized states that differentiated tax and income, which was an effort to rationalize tax collection.[178] The surveys relied on a new approach to property relations. These records turned individuals, their incomes, and properties into statistical data that can be used to increase agricultural productivity and, eventually, taxation.[179] If the Tanzimat bureaucrats aimed at encouraging agrarian surplus production and enlarging their tax revenues, their success depended on the extensive presence and arduous performance of oxen.

Of course, the Tanzimat was not crafted with oxen in mind. Still, this process of politico-legal transformation directly concerned them. Oxen held the key to the Tanzimat's fiscal policies. Either for the sake of fulfilling the promise of fair taxation for Ottoman subjects or increasing the state's tax revenues, the success of the Tanzimat's fiscal policies depended on oxen. Ottoman bureaucrats had to launch comprehensive

177 Pamuk, *Uneven Centuries,* 132, 308.

178 Kaya, "In the Hinterland," 261.

179 Murat Dağlı, "Kütahya in the Eighteenth Century: Transformation or the Persistence of the Old Order?" (PhD Thesis, University of California, Berkeley, 2012), 136.

surveys to count the number of oxen and the acreage of fields they tilled. The main objective of the temettuat surveys was to grasp the economic potential of each household recorded. The number of oxen was a direct marker of the agricultural productive capacity of a peasant household. As a result, reliable information about the ox population working in the empire was the first step in enforcing the Tanzimat's fiscal policies. That is why the scribes of the temettuat surveys meticulously noted down their number, even though they did not estimate any immediate income in the form of milk or offspring from keeping oxen. The oxen stood at the center of the Tanzimat. Their numbers were decisive in assessing the economic potential in the Ottoman countryside. Their exploitation for enforced tasks, which could be as risky as log transport, directly indicated the continuation of corvée work. If Sultan Abdülmecid and his bureaucrats sincerely wanted to protect the goods, life, and honor of Ottoman subjects, they needed to begin by protecting their oxen from additional tasks that further stressed their tight work schedule.

§ 2.6 Methodology

In nineteenth-century Anatolia, there was a strong correlation between grain cultivation and oxen keeping. It was the oxen who tilled the soil in wheat and barley fields. Oxen were crucial during plowing, seeding, harvesting, and threshing operations. In the nineteenth century, it was unthinkable for farmers in Anatolia and Rumelia to produce cereals without the arduous help of a pair of oxen. Most oxen lived and worked in pairs. "Grains" and "pairs" defined nineteenth-century Ottoman agriculture to a greater degree. In Anatolia, the pattern was as simple as farmers raising grains and keeping their oxen in pairs. The photographic information that temettuat registers bear endorses the pattern of grains and pairs. The data exposes that by 1845, most farmers in Anatolian and Rumelian villages practiced subsistence farming by cultivating cereals and keeping pairs of oxen.

The "ox" is one of the most frequent words that appear in temettuat registers. Quantitative information about the size of the land households

cultivated or the number of oxen they kept may not be enough to recreate the contemporary relationship between humans and non-human animals. Yet, it may serve to describe the oxen's role in the eyes of the humans living in the concerned settlement. Grain production, land usage, yields, and non-farming occupations are critical to assessing a household's reliance on ox power. Simple calculations prove enough to translate the numerical data that the temettuat registers offer into socio-economic assumptions about concerned settlements. It is impossible to neglect that these calculations always come with two pitfalls, one stemming from the nature of the treated documents and one deriving from the methodology adopted by the writer. As treated above, the epistemological problems of temettuat registers include writing errors, underrepresentation of women, as well as efforts for tax evasion or over-taxing specific communities or people. As to the writer, who is also a reader of the consulted manuscripts, the margin of error always includes probable misreading of words and numbers, and also the tiny calculations that he carried out to simplify the analysis of the existing numerical data.

By the time the temettuat surveys started, the land had become "a thing, measurable, controllable, and alienable."[180] The scribes were instructed to use a standard acreal measure called *dönüm*. For measuring a *dönüm*, the measurer needed to make forty wide steps from the vertical and horizontal sides of a field.[181] The standard unit could still not prevent quarrels during surveys over the measuring of fields.[182] Despite considerable doubts about whether it actually represented a standard and was meticulously noted, the adoption of a single unit gives a favorable ground for calculations of field acreage between different villages and regions. Another standard unit that temettuat registers used is the *kuruş* currency. By 1844, *kuruş* included approximately one gram of pure silver, and

180 Huri İslamoğlu, "Property as a Contested Domain: A Re-Evaluation of the Ottoman Land Code of 1858," in *Ottoman History as World History* (Istanbul: The Isis Press, Istanbul & Gorgias Press, 2010), 193.

181 Feridun Emecen, "Dönüm," in *TDV İslâm Ansiklopedisi* (İstanbul: TDV İslâm Araştırmaları Merkezi, 1994).

182 Kırlı, *Yolsuzluğun İcadı*, 32.

a hundred silver *kuruş* was equal to one gold *lira*.[183] The usage of a standard monetary unit in all registers is another opportunity that allows comparisons and calculations between different regions and assets that generated income. The scribes' estimations regarding revenues from assets point out a potential. However, a fifteen-kuruş estimated annual income from a dairy cow did not mean that her human owner had turned all drops of milk into cash money. As long as farmers exchanged their goods and labor among themselves without visiting the market, many nineteenth-century Anatolian villages stood on a thin line between barter economy and monetary economy. The *kuruş* posed a standard in fiscal issues. Though it may not represent all the economic activities and transactions in a nineteenth-century village, this standard currency noticeably simplified calculations for scribes and tax collectors. By adopting a standard monetary unit, the temettuat registers also left a valuable data set for historians.

The analysis of the consulted temettuat registers does not cover all the entries that the records include. First, the households that had left their settlement years ago and the ones that did not actually live there are absolutely omitted and are even absent in the category of "total households." The "total households" category refers to the number of households appearing in the concerned tax register once the formerly mentioned absentees and deserters are excluded. The most important category of the calculations is called "grain-producing households." These households had paid any amount of tithe (*öşr*) for any cereal crop after the harvest of 1844. Any household that had paid tithe for any variety of grains, appears as a "grain-producer" (or sometimes simply "farmer") in the following analysis, even if the register indicated another occupation for it. The consulted registers noted that most households in the concerned villages made part of the class of farmers (*erbab-ı ziraatten*).[184] Whereas the case of officially recognized farmers who did not raise grains is extremely rare, the same records pointed out that most

183 Şevket Pamuk, "Kuruş," in *TDV İslâm Ansiklopedisi* (Ankara: TDV İslâm Araştırmaları Merkezi, 2002).

184 A literal translation for *erbab-ı ziraat* will be "professionals of agriculture."

households associated with different occupations had also paid tithes for cereals as their farmer neighbors did. Less critical if their revenues from wheat, barley, or corn harvest remained secondary compared with their income from other occupations, these officially non-farmer households with evident grain production appear as "grain-producing" or "farmer" households in the following chapters.

Pieces of information like a household's estimated annual revenue, tithes for different varieties of cereals paid in 1844 and estimated to be paid in 1845, or estimated yields of a cultivated plot in the harvests of 1844 and 1845 directly appear in the temettuat registers. The annual revenue refers to the total yearly revenue of a household from any source of income, such as cultivated plots, gardens, dairy animals, trade activities, rents, or professional occupations. For revenues that the land and non-human animals generated, most temettuat records calculated an average based on the revenues of 1844 and estimated revenues of 1845, and then added this average to the household's total annual income. If the register only recorded the tax payment or yield information for 1844, I doubled the available number to conform with the calculation in other registers.

A last small but crucial calculation regards the tithe payments. The Tanzimat Edict fixed the tithe at ten percent of gross output all around the empire.[185] So, the average estimated tithe payment of a household in the harvests of 1844 and 1845 for grain varieties should give ten percent of the economic value of their yield from grain cultivation. Hence, the estimated annual grain production (in kuruş) is the recorded tithe amount households paid for cultivating varieties of grains, such as wheat, barley, or corn, multiplied by ten. A similar small calculation is required to estimate the percentage of fallow fields, which refers to the percentage of uncultivated fields in proportion to the total acreage of cultivated and uncultivated fields that the concerned households kept. Another calculation brings together land size and yields. Under each entry that includes a "cultivated plot" (*mezru tarla*), there is an estimated average gross product (in kuruş) obtained from a household's grain fields under cultivation

185 Pamuk, *Uneven Centuries,* 122.

in the harvests of 1844 and to be obtained in 1845. The product is divided by the size of the cultivated lands that the households kept to get the average annual harvest per dönüm. Given the strong relation between the land, oxen, and yields, I felt the necessity to make another calculation to isolate the oxen's contribution to grain farming. So, I divided the information for yields by the number of oxen and multiplied the result by two, which produced the "yield per pair of oxen" value in kuruş. I repeated the same calculation with total acreage under cultivation to get the "acreage per pair of oxen" value. Hence, I was able to seize the average acreage that a pair of oxen needed to till and the average gross grain yield their operation would generate at harvest.

The following chapters pass beyond a mechanical analysis of some numerical archival records. Still, resorting to the quantitative and standardized data from registers is a prerequisite for achieving a profound understanding of an Ottoman settlement. Nineteenth-century population surveys give brief but vital information about settlement names, population, and even the profession, age, and appearance of people who lived there. Until the 1880s, Ottoman population surveys counted only male residents (more precisely, the household representatives and their male children) to seize the potential of military conscription in Ottoman villages. To approximate the total population, I multiplied the male-only population numbers issued in the surveys of the mid-nineteenth century by two to retrieve women, the missing half of the population. To address further gaps, I adopted Kemal Karpat's method and added an eight percent "margin of error" for the people whom the scribes possibly did not register for several reasons.[186]

Underlining the impossibility of cross-checking from a similar material, Yoichi Takamatsu doubts the validity of "individual numerical values" in temettuat registers.[187] It is certain that treating individual cases

186 Kemal Karpat suggests that the unregistered persons might be exempt from taxes or conscription. A last possibility is that the scribes simply might not have reached them. See Kemal H. Karpat, *Ottoman Population 1830-1914: Demographic and Social Characteristics* (The University of Wisconsin Press, 1985), 10.

187 Takamatsu, "Ottoman Income Survey."

in a temettuat register requires excessive attention. Overemphasizing marginal particular cases from temettuat registers may lead to incorrect conclusions. That is why a more reliable methodology would be based on seizing tendencies, repetitions, and clusters from numerous household entries. Moreover, the numerical data in temettuat registers encourages gathering collective information about different households in a single calculation. Meanwhile, in spite of these methodological concerns, I used every opportunity in my research to highlight individual cases. The data in temettuat registers are not just numbers and scribbles. Even the smallest illegible pieces of data in these records are actually traces of human and non-human animals, and bringing them back to life from the nineteenth century is the greatest challenge of a historian who works with a source as repetitive and quantitative as the temettuat registers.

The Ottoman government did not repeat an income survey as extensive as the temettuat surveys. Nevertheless, there is still a great chance to find complementary information from population surveys and sharia court registers. Indeed, population surveys left behind the valuable opportunity to cross-check the village names, the number of households, and the names of their representatives that also appeared in temettuat registers. In addition, population registers also give interesting information about the age and appearance of male residents. As to the records of local sharia courts, the postmortem inventories (*tereke*) make these registers unique sources for grasping family ties, economic transactions, and detailed information about possessions and wealth in a settlement. Focused on income calculation, the temettuat scribes totally neglected these important pieces of information. Research in sharia court registers demands considerable time and luck, and the findings will be about particular cases. The temettuat registers might have a compact and simple structure that covers an entire settlement. On the other hand, the inheritance records in court registers offer a smaller but more detailed photograph from a nineteenth-century settlement that should have appeared also in the survey registers.

I tried to revitalize a number of people from the samples I chose. As soon as I found an interesting postmortem inventory in a sharia court

register, I sought the same person's name in the population and temettuat registers which recorded the village where the deceased person used to live. It turned out that some documents had a "happy marriage" after all.[188] It is always exciting to see how ordinary peasants from the nineteenth century left brief but substantial information about themselves in at least these three different types of archival documents. Unfortunately, it is almost impossible to detect women in the same three types of documents since women's considerable visibility in the sharia courts almost completely disappears in the temettuat and population registers. Meanwhile, it can still be demanding to detect all the men whose names appear in the court register inheritances in other registers. Some are absolutely absent in the consulted registers, and some of these men, although they were personally absent, had relatives with the same family name in the villages where they were supposed to live. I used every archival means to recapture information about a number of selected people from the research sample and reconstruct their living conditions. Not all selected people left traces in multiple sources. I am also aware that archival sources cannot tell us everything about nineteenth-century rural life. So, I did not abstain from adding a little imagination wherever needed and possible.

Digital tools save today's historians from the necessity of acquiring technical knowledge and applying it accurately to reach a little piece of information, which would consume considerable time at the expense of the limited time for archival research and writing. Digital databases, applications, and programs, such as OpenStreetMap, ArcGIS Online, or Nişanyan Yeradları, not only remarkably shortened my efforts to find and process data and materials, but also broadened my perception regarding a particular phenomenon or place. Online map services provide numerous facilities to calculate distances and routes between selected locations. I do not regard distance, changes of altitude, and estimated walking duration between chosen destinations as mere technical data. I resorted

188 Dağlı, "Kütahya in the Eighteenth Century," 139 referring to Amy Singer, "Tapu Tahrir Defterleri and Kadı Sicilleri: A Happy Marriage of Sources," *Tarih Araştırmaları Dergisi* 1 (1990).

to these pieces of information to imagine the experience that the people and non-human animals who appear in the temettuat registers might have had. Despite the multifaceted profound transformations of the Anthropocene, human modifications on the physical geography had limits. A walk of an hour between two villages in the nineteenth century is still an hour's walk today. Even though I did not have the opportunity to physically visit the settlements I studied, I used digital opportunities to visualize the possible conditions under which human and non-human animals used to live there in the nineteenth century.

2.6.1 *Three Provinces*

The pattern of grain production with pairs of oxen prevailed over immeasurable tracts of land and extensive periods of time. Millions of oxen tilled the land and hauled heavy loads all around the nineteenth-century Ottoman Empire. Temettuat scribes acknowledged the efforts of these non-human workers by attentively noting them one by one. It is hard to find a temettuat register from a rural settlement without oxen. However, oxen's presence in temettuat registers is generally reduced to two or three words (like *karasığır öküzü çift*) and a single number marked below. The oversimplicity of the available information may easily turn oxen's abundance into invisibility. A way to revitalize the numbers standing for oxen is to have a closer look at the registers to seize fine details and consistent patterns, which are not visible at first glance.

Temettuat registers are reliable sources for capturing a photographic panorama of the mid-nineteenth-century Ottoman Empire. Each register captured a single pixel of a wider image. Each individual researcher can only consult a small part of the massive image that tens of thousands of registers depict. The borders of the nineteenth-century Ottoman Empire covered regions that showed profound differences. The temettuat surveys did not take place in all provinces of the empire, posing a natural limit to the current research based on the investigation of these registers. A few preliminary explorations signalled the standard points and divergent elements that temettuat registers from different provinces could bear. Deepening in chosen samples could be a reliable method for testing

the pattern of grain farming with pairs of oxen. Records from the provinces of Edirne, Kastamonu, and Konya showed numerous diversities, but all essentially supported the validity of the pattern.

While deciding on the pilot regions, I gave priority to environmental conditions. The considerable differences between hilly and plain topographies, as well as between arid and humid climates, needed to be examined in terms of oxen usage in agricultural activities. Therefore, I chose a hilly region with a humid climate on the Black Sea coast, Kastamonu, and an arid zone from the plains of the Anatolian plateau, Konya. Despite the 600-kilometer-long distance between them, the two provinces fell in similar meridians, Kastamonu on 33° and Konya on 32° East longitude. For the sake of locational variety, the next choice had to avoid the same vertical axis. Since the temettuat surveys were held in a limited geography, choices were not abundant in the provinces of eastern Anatolia. The Province of Erzurum, where livestock trade and dry meat had a central role in the local economy,[189] was indeed a viable alternative for this research. However, as a castrated male bovine, the ox had a more central role in agriculture than in animal husbandry. Given Konya's aridity and Kastamonu's harsh topography, selecting a third province with more favorable agricultural conditions and a richer economy would highly diversify the research sample. In that regard, the Adana and Hüdavendigar provinces were more reliable alternatives than Sivas or Harput, but they were not distant enough from the two chosen provinces. The Province of Aydın, already subject to a considerably rich literature,[190] stood for another alternative, but I decided to move further west and make a choice from the Balkans. In terms of economy, the Province of Edirne was a

189 Yasar Tolga Cora, "Transforming Erzurum/Karin: The Social and Economic History of a Multi-Ethnic Ottoman City in the Nineteenth Century" (PhD Thesis, The University of Chicago, 2016), 233.

190 For a remarkable research using temettuat registers from western Anatolia, see Alp Yücel Kaya, "Çiftlik Holdings in Western Anatolia: The Karaosmanoğlu Family and the Baltazzi Family in the 18th-19th Centuries," in *Wealth Accumulation and Entrepreneurship in the Ottoman Empire, 18th to 20th Centuries*, ed. Maria Christina Chatziioannou and Sophia Laiou (Taylor & Francis, 2024).

crucial province that had formerly hosted the Ottoman palace. Moreover, it had an apparent ethno-religious diversity as well as numerous economic activities. Regarding the environment, it had both coastal humid areas and inner continental areas. Further research on the temettuat registers of the Adana or Aydın provinces may always bear noticeable data for treating the important questions of nineteenth-century Ottoman economic history, such as the concentration of land in favor of big farm estates or the spread of capitalist relations of production in the countryside. However, due to the limited time span of the current research, I studied only three provinces and initially prioritized environmental conditions over socio-economic conditions while selecting them. At the subdistrict level, the choice became more difficult due to the appearance of another criterion. The temettuat registers offer popular and practical primary sources for history students in Turkey. As I aspired to contribute to the existing literature with original findings, I tried to avoid registers that had been formerly studied in transliteration projects.

Temettuat registers of five subdistricts provided the necessary samples for understanding oxen's role in the nineteenth-century rural life from the three provinces selected. The Province of Konya is the first research venue. The central parts of the Anatolian plateau are known for their plain terrain and vast grain fields. The 1840s, the period of temettuat surveys, was also a period of fatal droughts that devastated rural life in central Anatolia. To capture a photograph free of the damages of the famine, I preferred consulting the temettuat registers from the Lakes Region. The abundance of water sources and the mild Mediterranean weather infiltrating from the Taurus Mountains isolated the Hamid district from the ravages of the mid-nineteenth-century Anatolian drought. Hence, I decided to contemplate the registers of Hamid's Tefenni and Kemer-i Hamid subdistricts. Although the particular geographic traits of the Lakes Regions partially restrained Konya's general continental climate, the plain topography, vast fields, and considerable cereal production still gave it the distinctive characteristics of the province. Oxen in Konya would work with full devotion to plow vast acreages and harvest the voluminous wheat produce.

The mid-nineteenth-century Province of Edirne included various areas with different geographical traits. The subdistrict of Akçakızanlık was located in the inner part of the Thracian peninsula. The Rose Valley and present water sources saved the villages of Kızanlık from a continental climate. Farmers of Kızanlık would combine their grain production with alternative products such as rose oil. To enlarge and diversify the sample of Edirne, I added a second subdistrict with dissimilar geographical characteristics. The subdistrict of Midye was on Edirne's coast to the Black Sea. The few villages around Midye were surrounded by dense forests and had a humid climate. Oxen in the villages of Midye not only plowed grain fields but also carried out the burdensome task of firewood and charcoal carriage throughout the year.

Kastamonu is the third and last province that the current research has treated. Coasts around the Black Sea share the general rainy, humid, but mild climatic conditions. I preferred to sharpen the environmental factors by selecting Kastamonu's most isolated subdistrict. Cide is situated on a hilly terrain with discouraging land route access from the neighboring settlements. The valleys and mountains around Cide are covered with thick forests. In the nineteenth century, oxen in Cide had only a few acres of land to plow. However, they needed to haul huge timbers from the forest, which was a fatally risky but frequent occupation for human and nonhuman workers.

In the nineteenth century, the ox was the strongest and the most popular non-human worker in rural Anatolia and Rumelia. Findings from the temettuat registers of five subdistricts from Konya, Edirne, and Kastamonu provinces suggest that cereal production was the primary source of income for peasants, and oxen played the chief role in harvesting cereal yields. Oxen numbers that the temettuat scribes recorded are indeed substantial traces that give an idea about oxen's multifaceted and indispensable contribution to nineteenth-century Ottoman rural life.

3

Traces of Oxen in the Province of Konya

Today, Konya is known as Turkey's "grain hub" (*tahıl ambarı*). In the nineteenth century, the Province of Konya spread over a vast region starting from the central parts of the Anatolian plateau and reaching the Mediterranean coast with the Teke district. Konya was one of the prominent grain-producing provinces of the Ottoman Empire. Most farmers in different subdistricts of Konya would raise cereals with the assistance of pairs of oxen, who prepared the soil and carried the harvest. Farmer households fed a pair of oxen, but in fact, it was the oxen who fed people with cereals.

Ottoman grain farming had an extensive character and was directly affected by fluctuating environmental conditions, such as floods and droughts. The water resources and the mild climate of the Mediterranean Sea could isolate the Lakes Region from the mid-nineteenth-century drought that devastated the rest of central Anatolia. Accordingly, the favorable climatic conditions of the region protected the temettuat registers of Hamid's Kemer and Tefenni subdistricts from giving a distorted photograph in 1845. Four scribes were appointed to handle the second temettuat survey in these two subdistricts. They walked from one village to another and recorded anything they estimated to have financial significance. This chapter is mainly based on the findings of an archival research that includes data for 777 households from temettuat registers of Konya's Hamid district.

An average farmer in mid-nineteenth-century Konya would raise cereals on forty dönüm. At the harvest, the farmer would obtain a wheat yield of approximately twenty-one kuruş per dönüm. Throughout the year, some peasants would chop trees and sell firewood, some would cultivate alternative crops, or some would collect herbal materials from the steppes to diversify their sources of income. Nevertheless, none of these occupations could financially substitute for grain farming. The wheat and barley yield defined the economic condition of a farmer household until the next harvest. The ox, who might occasionally take part in the secondary occupations of his human owner, showed his biggest performance in the grain field. The quality of the harvest, as well as the economic lot of their whole household, depended on the oxen's plowing operation. Meanwhile, the number of oxen, the acreage of cultivated lands, and the wealth of a peasant household were strongly correlated. Though indirectly and briefly, oxen left their traces in the temettuat registers. The simple numbers and scribbles in these documents allow assessing different aspects of oxen's vital role in mid-nineteenth-century rural Konya.

§ 3.1 A Semiarid Microclimate



FIGURE 3.1 Map of the Province of Konya. The two red spots in the southwest mark the location of the subdistricts of Kemer-i Hamid and Tefenni. SOURCE: Postcard from İBB Atatürk Library archive, Kartpostal Arşivi 28235.

The nineteenth-century Ottoman province of Konya remained in the central part of the Anatolian plateau. The vast administrative unit reached the sea via the Teke district on the coast of the Mediterranean. However, the bigger portion of the province remained in the inner part of the plateau with its districts called Konya, Niğde, Isparta, Burdur, and Hamid. The Taurus mountain range posed a "barrier" between the districts of Hamid and Teke.[1] With the topography isolating the plateau from the sea, low humidity and an extensive temperature range marked the region's

[1] Başak Akgül Kovankaya, "Negotiating Nature: Ecology, Politics, and Nomadism in the Forests of Mediterranean Anatolia, 1870-1920" (PhD Thesis, Boğaziçi University & Leiden University, 2019), 41.

continental climate.[2] Central Anatolia received less precipitation than the coastline. Still, it would usually rain enough to obtain pleasing grain yields. Crops such as cereals and cotton that did not want excessive humidity prior to ripening favored central Anatolia's dry weather.

The dry steppes of central Anatolia are usually associated with sheep and goats. However, an important missing element of the scene is the oxen, an indispensable actor in Anatolian agriculture. If the field did not receive enough precipitation in autumn, the oxen would have a heavier work for breaking the soil that sunlights baked and hardened since last summer. Farmers of arid lands needed to ensure that the seeds they sowed retained enough moisture and survived extreme temperature variations. The most common way to meet these requirements was to plow deeper. As the plowing operation became more difficult, the farmers' reliance on oxen would equally increase. Each pair of oxen had a vital importance for farmers in the nineteenth-century Konya province. Human arms and short tools were not enough for preparing the soil hardened by the harsh conditions of central Anatolia's continental climate. Only oxen could generate the power needed to plow the vast fields of Konya.

The northern slopes of the Taurus Mountains meet with the Anatolian plateau on a tectonic-karstic area. The less humid inner parts of the plateau receive an annual precipitation of fewer than four hundred millimeters. The arid scene that reminds one of a desert occasionally overflows with water. The spectacular karstic formations of the region have witnessed days with more than twenty-five millimeters of rain falling in a few hours. The data covering the years 1983-2013 expose the potency of convectional summer rainfalls. The upward movement of the warm and moist air in summer months can bring surprising precipitations that quadruple monthly averages. The large polje and doline depressions that

2 Catherine Kuzucuoğlu, "The Physical Geography of Turkey: An Outline," in *Landscapes and Landforms of Turkey*, ed. Catherine Kuzucuoğlu, Attila Çiner, and Nizamettin Kazancı (Springer, 2019), 9.

adorn the karstic topography cannot drain the unexpectedly great volumes of rain that fall in a day or two.[3]

This volatile climatic pattern set the stage for the flood that struck Elmalı in the summer of 1888. The rain and hail that "fell with plenitude" caused a flood (*kesretle nüzul eden baran ve doludan hasıl olan seylabdan*), which damaged forty dönüm of vineyards and thirty dönüm of cultivated fields (*mezruat*). Unfortunately, the damages were not limited to agricultural lands. According to a telegram sent from the Province of Konya, a woman, fifteen goat yeanlings, and five oxen lost their lives because of the catastrophe. The absence of any information about the poor woman, including her name, is a tragedy in itself. Another tragic detail concerns the oxen's way of death. Whereas three oxen probably drowned in the flood, it was a lightning strike (*saika isabetinden*) that killed two of the five bovine victims.[4]

From a distant economic perspective, these casualties may appear to be of minor importance. The exclusion of thirty dönüm from the region's total grain harvest would be easily negligible. The ruined vineyards would not devastate the local economy since most farmers considered viniculture a secondary source of income. The loss of the ten non-human animals could also be somehow compensated because yeanlings and oxen did not bring any immediate financial profit as substantial as milk to their human owners. The anonymous woman's economic contribution to her community was unspecified. She had already received the scribe's credit (!), who mentioned her in the first place before stating the non-human victims. The woman shared the same destiny with the non-human victims, who had all "perished" (*telef olduğuna*) as the scribe summarized in a single verb. A flood in a little subdistrict of Konya might result in worse casualties and profound socio-economic consequences. The disaster that happened in Elmalı in the summer of 1888 presumably did not alarm the Ottoman bureaucracy.

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3 Taner Aydın and Mehmet Ali Çelik, "6-7 Ağustos 2018'de Elmalı İlçesinde Meydana Gelen Sel Afetinin Tarım Alanları Üzerine Etkisi," *Doğu Coğrafya Dergisi* 24, no. 42 (Dec. 2019): 93-101.

4 OA. Dahiliye Nezareti Mektubi Kalemi (DH.MKT) 1525/12, 16 Zilkade 1305 (25 July 1888).

The telegram from Konya could not deliver all the misery that the flood triggered in Elmalı in the summer of 1888. The epistemological limits of the document are so narrow that it failed even to deliver the name of the deceased woman. The telegram neither indicates whether there is a connection between the victims. Did they drown in the same puddle? What was the woman's story? Did she go out into the rain alone to keep someone or something safe from the storm? Was she looking for her goats? Did the storm catch the oxen in their barns or on plain fields? Did they feel a moment of guilty pleasure when the rain refreshed the air and made some mud? How did they try to hide their massive bodies from the storm?

The acreages of the ruined lands and the number of non-human victims suggest that the storm affected multiple households in Elmalı. The excessive water must have damaged a considerable amount of crops in the whole subdistrict. The consequences would still be catastrophic if the storm broke out before the wheat harvest, but it was equally undesirable for farmers to watch their grains getting ruined on the threshing floor. If the telegram's information was accurate, five oxen died during the catastrophe. As most farmers kept a single pair of oxen, these non-human agricultural workers should belong to at least three different households. The two oxen that the thunderstrike killed probably shared the same yoke in their relatively short lives and eventually experienced the same tragic end together. It is possible to imagine that at least two of the three oxen who drowned in the flood were also close friends who shared the same hardships in their lives. The loss of the five oxen must have ruined their human owners' lives as well. Farmers would not easily recover from the economic damage of the ruined harvest of a crop. Moreover, the loss of their oxen would automatically bring a "contingent" cycle of debt[5] as soon as they started to borrow oxen from their wealthier neighbors. If floods were an exception to Konya's dry weather, another exception was

5 Aytekin asserts that indebtedness was a contingent feature of Ottoman rural life. See E. Attila Aytekin, "Cultivators, Creditors and the State: Rural Indebtedness in the Nineteenth Century Ottoman Empire," *The Journal of Peasant Studies* 35, no. 2 (Apr. 2008): 296.

years-long droughts. The damages of a drought might not show themselves as immediately as during a flood. However, the long-term consequences were comparable since both resulted in the loss of human and non-human lives, yields, and economic power. Half a century before the flood in Elmalı, many farmer households in Konya had suffered from these damages, this time because of a drought.

The plowing work became more demanding than ever for many Anatolian farmers in the 1840s. The lack of humidity developed into a serious drought in central Anatolia. Konya's fields must have turned into layers of unbreakable stones. In 1845, the drought reached its climax with a poor harvest and famine.[6] The governor of the Konya province, Hamdi Paşa, and the head of the military staff in the Aydın province, Müşir Yakub Paşa, reported the loss of agricultural products due to drought in October 1845.[7] The bureaucrats complained about the lack of prosperity and abundance in the yields of local farmers (*bu sene-i mübarekede havali-i merkume mezruatında feyz ü bereket olmadığı*).[8] The drought of 1845 was going to turn into a famine in the following years, with human and non-human losses in Ankara and Konya.[9] A brief poem by Silleli Aşık Zehri describes the hardships of the year 1845 in Konya. The people who were struck by poverty and famine would give their children to wealthier families, sell their belongings in the market, and eventually leave the province.[10] The famine incited many peasants to start looking for alternative occupations in town centers. By the end of the 1840s, the scarcity of agricultural labor was further deepened in many parts of Anatolia.[11] The

6 Köksal Özyaşar and Nacar, *Anatolian Livestock,* 39.

7 Mehmet Yavuz Erler, *Osmanlı Devleti'nde Kuraklık ve Kıtlık Olayları (1800-1880)* (Libra Kitap, 2012), 141-42.

8 OA. Bab-ı Asafi Mektubi Kalemi (A.}MKT) 29/30, 15 Şevval 1261 (17 Oct. 1845).

9 Erler, *Osmanlı Devleti'nde*, 154-55.

10 The poem has verses as striking as the following ones: *Bin iki yüz altmış birdeki kıtlık / Nice can evladın kıldı satılık / Kimseler görmemiş böyle bir sene / Çok metalar çıktı mutlak pazara.* See Afif Evren, "Konya'ya Ait İki Kıtlık Destanı," *Türk Folklor Araştırmaları* 13, no. 266 (Sep. 1971): 6091.

11 Çelik, "'No Work,'" 158.

famine also caused a decrease in population and agricultural yields around Anatolia.[12]

The most profound socio-economic consequences of the poor harvest of 1845 appeared in the following year. The photograph temettuat registers of Konya captured in 1845 marked a moment when farmers had been observing the lack of precipitation for a certain time, but had not experienced it yet in the form of a famine. If the same survey were held in the same places the following year, harvest and population numbers would probably show a sharp decrease. The survey of 1845 did not capture the fatal consequences of a crucial famine that was about to begin. Still, peasants had been experiencing the drought for years, and some of them had already found another place or another job for their whole family. As a survey recording the full economic potential of settlements in detail, the photograph temettuat registers captured is a distorted one. It did not represent the full potential of human or non-human labor in rural Anatolia. The drought in central Anatolia deepens the existing epistemological questions about the reliability of the temettuat registers from the Province of Konya.

Did the drought turn into famine in every district of Konya in 1845? Despite the relatively low level of precipitation it received, the region had considerable water sources. The districts of Hamid, Burdur, and Isparta remained in the western part of the province. The abundance of lakes brought the name "Lakes Region" (*Göller Yöresi*) to this particular area. Thornthwaite's moisture index[13] would classify a greater portion of the Hamid district as "dry subhumid," whereas the vicinity of Burdur would

12 Erler, *Osmanlı Devleti'nde*, 363.

13 Thornthwaite Moisture Index consults precipitation, evapotranspiration, soil water storage, moisture deficit and run off for describing the aridity or humidity of the soil and climate of a region. See Michael A. P. Taylor and Michelle L. Philp, "Beyond Agriculture: A Review of the Thornthwaite Moisture Index with Respect to Road Pavements and Other Infrastructure Application," *International Journal of Sustainable Transportation* 10, no. 6 (2016): 528.

fall in a "semiarid" area.[14] Tectonic and karstic sedimentary basins,[15] as well as valleys and plains, shaped the region's complex topography that included the Eşler Mountain (2254 meters) in Tefenni.[16] The latter was a large plain that hung at 1150 meters in the middle of various limestone formations.[17] The Western Taurus mountain range (mountains Sandıklı and Akdağ in the north and Katrancı in the south) surrounded the region.[18] The Lakes Region received rain from the west and south in early spring and autumn.[19] The tender coastal climate of the Mediterranean penetrated northwards into the region via rivers Aksu (Kestros), Köprüçay (Eurymedon), and Manavgat (Melas).[20] Contact with the coastal climate and the abundance of alternative water sources separated the Lakes Region from the provincial center. Farmers of Tefenni and Kemer had the chance to avoid the mid-nineteenth-century drought that devastated the rest of central Anatolia.

The seeds would not grow into wheat and the wheat would not develop enough without water. In the summer of 1845, farmers in Konya did

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14 See the map in Kuzucuoğlu, "The Physical Geography," 11 from the unpublished yearly report S. Şensoy, "Climate of Turkey," *Turkish State Meteorological Service* (Ankara, 2016). From another perspective, it was a "cold and sub-humid Mediterranean climate" that prevailed over the region. Whereas long summer drought characterized the microclimate in the south, it became more continental and less Mediterranean in the northern side of the region. See Kürsad Ozkan et al., "Site Properties for Crimean Juniper (Juniperus Excelsa) in Semi-Natural Forests of South Western Anatolia, Turkey," *Journal of Environmental Biology*, no. 31 (Mar. 2010): 98.

15 Cengiz Yücedağ, Bora Bingöl, and Latif Gürkan Kaya, "Forest Genetic Resources in Burdur, Turkey," *Journal of Mehmet Akif Ersoy University Economics and Administrative Sciences Faculty* 3, no. 2 (Autumn 2016): 7.

16 Ahmet Doğan, "Burdur İli Tahıl Yetiştirilen Toprakların Verimlilik Durumlarının Belirlenmesi" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2018), 16.

17 Ziya Çağrı Yazgan, "XIX. Yüzyılın Ilk Yarısında Tefenni Kazasında Yerleşme ve Nüfus" (M.A. Thesis, Burdur, Mehmet Akif Ersoy Üniversitesi, 2021), 21.

18 Akgül Kovankaya, "Negotiating Nature," 6.

19 Sami Sinav, "1844-1845 (H. 1260-1261) Tarihli Temettuat Defterine Göre Uluborlu Kazası'nın Sosyal ve Ekonomik Yapısı" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2007), 3.

20 Kamile Gül Faydalı, "10597 Numaralı Temettuat Defterine Göre Yalvaç Kazası'nın Sosyal ve Ekonomik Yapısı" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2008), 4.

not see the bright golden color of the grain in their fields. Unfortunately, their vast lands looked barren, and the farmers had little to do to change the result. Before anyone else, peasants must have worried about the poor condition of Konya's harvest in 1845. On the other hand, some people saw an opportunity in Konya's arid terrain. A German trader, to whom Ottoman bureaucrats referred as "Markoç," received the news in Antalya.[21] Presumably, he had been benefiting from a special commercial network connecting Konya's provincial center to its subdistricts and reaching out to the Mediterranean market.[22] Markoç would coordinate his trade from Antalya, which was close to the port. Boats anchored at the ports of Konya's Teke district would bring not only goods but also information about Mediterranean markets. State agents, transporters, and other merchants from Konya's districts would provide Markoç the information he needed about prices, deficits, and opportunities in the hinterland. The Mediterranean ports of the Teke district were not developed enough, and the land route to the provincial center was long and unsafe.[23] So, the transfer of each piece of information was the subtle output of a complex network that operated on the shoulders of thousands of non-human carriers who travelled between the plains of Konya, the slopes of the Taurus mountain range, and the Mediterranean coasts of the Teke district. In the last months of 1845, camels and ox carts coming from the provincial center brought the news that "the scarcity of grain" (*zehairin nedreti*) marked Konya and its vicinity. Meanwhile, human and non-

21 The document presented him as follows: "*Nemçe Devleti tebaasından Antalya'da mukim Markoç nam tacir*" See OA. Sadaret Mektubî Kalemi (A.}MKT.) 31/66, 24 Zilhicce 1261 (24 Dec. 1845).

22 Keyder, Özveren, and Quataert emphasize merchants' role in nineteenth-century trade networks that linked port-cities to the interior. See Çağlar Keyder, Y. Eyüp Özveren, and Donald Quataert, "Port-Cities in the Ottoman Empire: Some Theoretical and Historical Perspectives," *Review (Fernand Braudel Center)* 16, no. 4 (Fall 1993): 542.

23 Erler interprets the preference of the land route to Konya instead of the sea route via Teke during the famine of 1874 as a marker of the unfavorable condition of this destination. Grain transfer from Cyprus to Konya was carried out via the ports of Adana instead of Alaiye (today, Alanya), a coastal subdistrict of Konya not far away from the provincial distance. See Erler, *Osmanlı Devleti'nde*, 244-48.

human actors of the same commercial network had already informed Markoç that Burdur, Isparta, and Hamid still had "many grains" (*oldukça zehair bulunup*). He purchased fifteen thousand *keyl istanbuli* of wheat[24] from Tefenni, where the last harvest had brought "prosperity and abundance" (*feyz ü bereket*). The German merchant planned to sell the abundant produce of Tefenni in the provincial center of Konya, where it was lacking.[25] In the midst of the drought of 1845, private and state actors made efforts to feed Konya with cereals produced in Tefenni. If the Hamid district had a rich wheat harvest in the same season in which Konya's yields remained poor, it was the microclimate and various streams flowing in the Lakes Region that marked the difference.

The temettuat surveys of 1845 took place at a time when farmers of Konya were witnessing the initial signs of an unusual drought's new stage. Therefore, it is highly questionable how the registers of Konya's central district reflected the human and non-human presence and their full economic potential. While the mid-nineteenth-century drought ravaged central Anatolia, the tender climate blowing from the Mediterranean coast and multiple water sources protected the Lakes Region. The photographic images that quantitative tax surveys like the temettuat registers offer can never reflect the reality with complete accuracy. However, the registers from Konya's subdistricts of Kemer-i Hamid and Tefenni provide a less distorted photograph because the Hamid district had an advantageous geographic location that protected its human and non-human[26] residents from the fatal consequences of the drought of 1845.

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24 It made approximately 550 thousand litres if 1 *keyl* was 37 litres. For the calculation, see Cengiz Kallek, "Kile," in *TDV İslâm Ansiklopedisi* (Ankara: TDV İslâm Araştırmaları Merkezi, 2022).

25 Markoç's plan did not work when Celaleddin Paşa, the governor of the Hamid district, blocked the grain transfer in return for the tax debts (*aşar bedelatına olan deyni*) of Mesud Bey, the governor of the Tefenni subdistrict. A series of correspondences discuss ensuring the grain transfer to Konya by purchasing new cereals from the subdistricts of Tefenni and Elmalı. OA. A.MKT. 31/66, 24 Zilhicce 1261 (24 Dec. 1845).

26 Had Burdur suffered from the deadly consequences of an efficient drought, butchers would not decide to decrease, though slightly, meat prices in 1845. See Hasan Kür, "210

§ 3.2 Surveying Konya

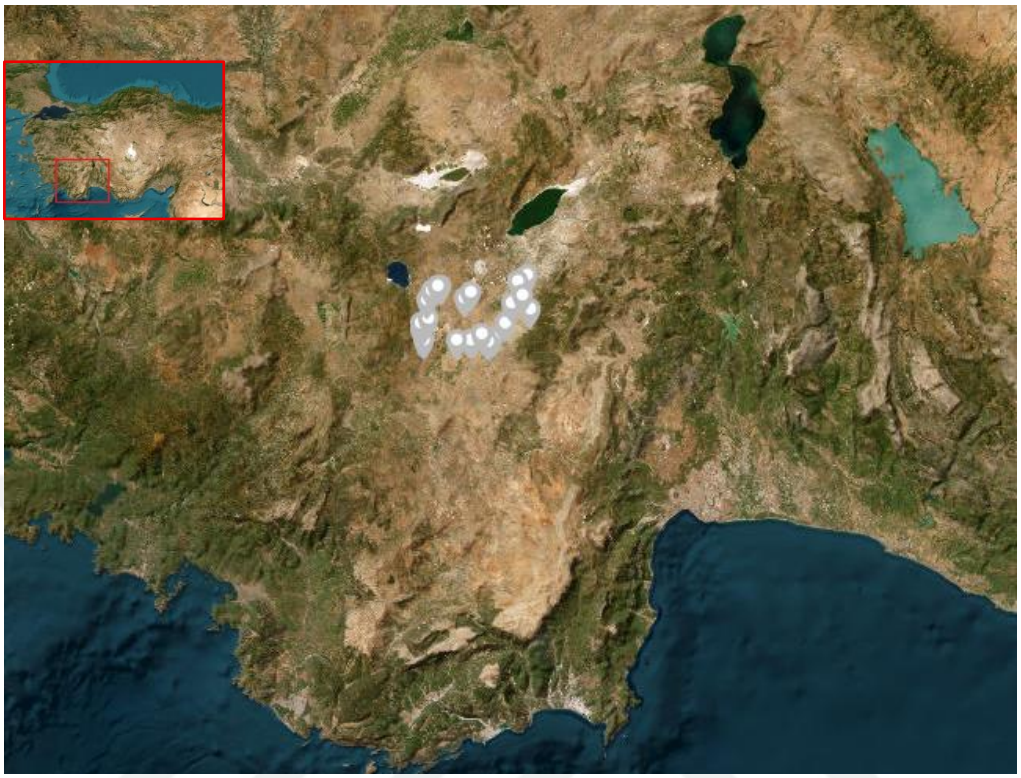

FIGURE 3.2 Satellite view of the Lakes Region. The pointers mark the location of the twenty-one nineteenth-century Ottoman villages covered in this chapter. SOURCE: Prepared on ArcGIS Online, Esri's web-based mapping software.

Mid-nineteenth-century Kemer-i Hamid was a subdistrict of Konya's Hamid district.[27] Its neighbor, Tefenni, belonged to either the district of

Numaralı Şer'iyye Siciline Göre Burdur Kazası'nın İdari, Sosyal ve Ekonomik Yapısı (H.1255-1261/M.1839-1845)" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2008), 59-60.

27 The temettuat registers of this region have served as research materials for numerous academic works. Apart from the ones cited below, the following are among the works that contributed to the concerned literature: Azize Akalın, "XIX. Yüzyıl Ortalarında Gölhisar Kazasının Sosyal ve Ekonomik Durumu (10047 Nolu Temettuat Defterine Göre)" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2015), Fatih Ekmekci, "9580 Numaralı Temettuat Defterine Göre XIX. Yüzyıl Ortalarında Ağlasun Kazası'nın Sosyal ve

Burdur or Hamid, passing from one administrative unit to the other at least three times in the nineteenth century.[28] The population survey of 1834 recorded fewer than 1400 male residents in Kemer and approximately 1700 in Tefenni.[29] A researcher applied Karpat's method of doubling the male population and adding an eight percent for possible absence on the existing data and estimated that 2920 people lived in Kemer and 3674 in Tefenni.[30] Temettuat surveys must have recorded most of the people that the population survey of 1834 noted ten years ago. As numbers from 1834 indicated, the chosen two subdistricts had a modest population level.[31] During the temettuat surveys, some districts required the work of a dozen scribes (*katip*), while little teams of only three members ended up enough for the survey of Tefenni and Kemer.[32] A few scribes who visited Hamid for the temettuat survey in 1845 left crucial records for imagining the role of oxen in mid-nineteenth-century villages in the Lakes Region of the Konya province.[33] The modest population level only emphasizes the dependence of local farmers on oxen for cultivating

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Ekonomik Yapısı" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2019), Ramazan Aldemir, "19. Yüzyıl Ortalarında Karaağac-ı Yalvaç Kazası" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2021), Muhammet Sadık Akdemir, *XIX. Yüzyıl Ortalarında Kemer (Hamid) Kazası ve Köyleri* (Isparta: Dilara Yayıncılık, 2018).

28 Kazım Kartal, "1845 Tarihli Temettuat Defterine Göre Tefenni Kazasına Bağlı Alakır Çiftliğinin Demografik Yapısı," vol. 5 (4. Uluslararası Akdeniz Sempozyumu, Mersin: Mer Ak Yayınları, 2020), 217.

29 Behset Karaca and Kadir Karacan, "Nüfus Defterlerine Göre Ağlasun Kazası (1831-1847)," *History Studies* 12, no. 5 (n.d.): 2499.

30 İlker Yiğit, "Burdur ve Çevre Kazalarda Nüfus (1834)," *Doğu Coğrafya Dergisi* 25, no. 44 (Dec. 2020): 27.

31 Sixty years later, the provincial yearbook of Konya indicated that only 4542 people lived in Kemer and 6128 in Tefenni. *Konya Vilayeti Salnamesi 1312* (Konya, 1895), 234-35.

32 Kurtuluş Demirkol, "Hamid Sancağı Temettuat Tahriri Masarifat Defteri Üzerine Bir Değerlendirme (1845-1848)," *Tarihin Peşinde - Uluslararası Tarih ve Sosyal Araştırmalar Dergisi*, no. 11 (2014): 144.

33 This chapter is the product of research largely based on the following temettuat registers: OA. Maliye Varidat Muhasebesi Temettuat Defterleri (ML.VRD.TMT.d) 10200, 10201, and 10572, 29 Zilhicce 1261 (29 Dec. 1845). Although it is archived with this generic date of most temettuat registers, the register no. 10201 bears the Hijri date of 1256 inside and is the result of the first survey from 1840-41.

cereals on the vast plains of the Lakes Region. Both Kemer and Tefenni had plain fields with considerable water sources but a limited human workforce. Oxen, the strongest non-human plowers, represented the only way for overcoming the scarcity of labor and plowing as much land as possible.

"Katib Mustafa Efendi sakin-i Kastamonu" was one of the temettuat survey scribes that the Ottoman government selected to work in Konya's Hamid district.[34] He must have jumped on an ox cart or a camel wherever possible, and walked the rest of his long route. Arid dry plains would replace Kastamonu's thick forests and stressed topography as the scribe approached Ankara. The journey was long enough to speculate on the next harvest. Empty fields and the cracks in the soil would inform the travellers about upcoming famine. Dull scenes of aridity must have accompanied the scribe while he left behind the Province of Ankara and entered the lands of the Province of Konya. If the scribe had the chance to find an ox cart, he would have quarrelled with the driver about the performance of his non-human workers. Because the terrain was so arid, there would be no fresh pasture for the oxen to graze on the route. In that case, the driver had to feed them with fodder. The scribe would be dragged into a difficult choice between covering the additional fodder expenses or continuing on foot. Towards Isparta, the slight change of the weather must have alleviated Mustafa Efendi's exhaustion at least for a while. Lakes of different sizes would announce that only a day or two remained for the final destination. The six-hundred-kilometer-long journey with considerable altitude changes must have taken at least two weeks. Non-human transporters must have carried the scribe on carts or on their back in a considerable part of the exhausting journey from Kastamonu to the Lakes Region.

While departing from Kastamonu, did Mustafa Efendi know that his service as a temettuat survey scribe in Konya's Hamid district was going to take nearly six months? He was going to participate in the temettuat

34 It is a great chance that the expenditure book for the Hamid district's temettuat records noted down the names of the scribes. OA. Masârifât Muhasebeciliği Defterleri (ML.MSF.d.) 6954, 26 Muharrem 1264 (3 Jan. 1848): 7-9.

surveys in the subdistricts of Alasun, İrle, İncirpazarı, Keçiborlu, Kemer, Tefenni, and Uluborlu. Two other scribes, Hayri Efendi and another Mustafa Efendi, should have arrived in Hamid much earlier than the scribe from Kastamonu. Hayri and the latter Mustafa were originally from Burdur and had a certain acquaintance with the Lakes Region that Mustafa from Kastamonu probably lacked. It is not possible to know exactly where and how the three scribes met before heading for the villages of the Kemer-i Hamid subdistrict. In eighteenth-century Russia, census clerks used to carry an official letter, a public announcement text, and notes from earlier registers.[35] In 1845, the temettuat scribes in Konya's Hamid should have brought at least a copy of the last population register with them.

The first village the modest team of temettuat scribes visited was Böbekler, a relatively large village with more than a hundred households and a population of more than half a thousand. Wandering around houses and gardens, if the visitors came across a young man carrying a heavy sack of hay, it could be Odabaşı oğlu Musa's sixteen-year-old son, İbrahim. Maybe, the young peasant was as long as his sixty-year-old father.[36] If İbrahim were not busy rushing the sack to the haymow in their barn, he would take a few minutes to lead the scribes to a large mansion at the center of the village. The mansion's owner, Katırcızade Salih oğlu Ali, represented a community larger than his neighbors in the village. He was the head of the subdistrict (*kaza müdürü*).[37] With an annual revenue of 3442 kuruş, the Katırcızade family was the wealthiest household in Böbekler. The subdistrict governor cultivated wheat, barley, and corn on plots that measured sixty dönüm and granted him around 1200 kuruş. He also had a hundred dönüm of fallow lands awaiting another season for cultivation. In addition, sharecroppers brought him almost 1500 kuruş. In the first temettuat survey, when another team of scribes had visited the same

35 Eaton, "Cadasters and Censuses," 67.

36 By 1840, Musa bin Odabaşı oğlu İbrahim was a fifty-five-year-old long man with a grey beard and his son was only eleven years old. See people no. 166-67 in OA. Nüfus Defterleri (NFS) 3265, 25 Cemazeyilahir 1256 (24 Aug. 1840): 15.

37 OA. ML.VRD.TMT.d 10200: 2.

village five years ago, they recorded that "Katırcı oğlu Ali Bey" had an annual income of four thousand kuruş and calculated his total wealth as 42,875 kuruş.[38] The Katırcızades were the most notable family in Kemer with a long history tracing back to sixteenth-century tımar holder ancestors. The administrative experience of family members reached far beyond the village of Böbekler. For instance, in the mid-seventeenth century, Sultan Mehmed IV had appointed Katırcıoğlu Mehmed as the governor of the Beyşehir district.[39] By the nineteenth century, the family owned mansions, baths, and even dungeons in Kemer.[40] Unfortunately, the mid-nineteenth-century temettuat registers do not indicate any of these buildings. Still, the size of their livestock exposes the household's wealth. The Katırcızade family kept pairs of water buffalo oxen and buffalo cows, dozens of sheep and goats, as well as horses and donkeys, leaving aside the numerous offspring of all these non-human animals. The scribe team of the second temettuat survey started their work in Kemer-i Hamid by noting down the vast fields and the crowded barn of the subdistrict's most prominent family. By 1845, Ali Bey was a fifty-seven-year-old long man with a grey beard and probably sufficient experience of bureaucratic visits.[41] The notable family must have hosted the three scribes for a day or two until they surveyed the whole village.

The Katırcıoğlus apparently owed their name to the caravan trade of their ancestors. Yet, in mid-nineteenth-century Kemer, farming prevailed

38 See the third household on the third row in OA. ML.VRD.TMT.d 10201: 12.

39 Emine Foat Tugay, *Three Centuries: Family Chronicles of Turkey and Egypt* (Oxford University Press, 1963), 5.

40 A few decades after the temettuat surveys, another family, the Alamans, put an end to the Katırcıoğlu family's hold in Kemer. Family members were forced to leave Kemer and emigrated, leaving no descendants in their ancient fief by the twentieth century. See Hayati Kuzucu, "Şekavetten Şehadete Kemerli Katırcıoğlu Mehmet Paşa," Burdur Tarih ve Kültür Araştırmaları, accessed May 23, 2025, http://www.burdur-tarihi.com/KATIRCIOGLU.pdf.

41 "*Uzun boylu kır sakallı Ali bin Katırcızade Salih Bey*" was fifty-two years old at the time of the population survey in 1840. Ali's twenty-year-old elder son was named after his grandfather, Salih. Salih had two younger brothers: İbrahim (13) and Mustafa (3). See the people no. 220-23 in OA. NFS 3265, 25 Cemazeyilahir 1256 (24 Aug. 1840): 16.

over land trade; therefore, oxen constituted the most crowded non-human worker group. Oxen outnumbered mules and any other non-human work animal in Kemer's temettuat registers. The scribes would not necessarily need a carriage between their destinations since they could walk from one village to another in an hour or two. Villages in Kemer were separated by only six or seven kilometers from their closest neighbors. After completing the survey in Böbekler, the temettuat team visited consecutively the villages of Manca, Akviran, Akçaviran, and Kayı. The surveys of all these four villages would take less than a week since they each had only a dozen households or two and a maximum of a hundred residents. With only thirteen households and fifty residents, the Manca village's survey would take no more than a few hours. The next village, Elmacık, was slightly more crowded than the last four villages. Thirty-five households and more than 150 people lived in Elmacık. At least eleven households in Elmacık were represented by pious men decorated with the religious adjectives *hacı, hatib, imam,* or *molla*. İmam Muhammed Ali Efendi was the religious representative[42] and the village headman's name was Hacı İsmail.[43] When the scribes entered the village, maybe the imam and the headman were in the middle of a conversation with their neighbor Molla Yusuf. This long man with a black beard was in his mid-forties. He had gained the adjective molla from his father, Osman, after whom he had named two of his three sons.[44] All three men were indeed farmers cultivating a variety of crops, from grains to opium, and raising livestock. They all had donkeys and cows, but they would not be able to have sufficient yields without their oxen. Hacı İsmail was Elmacık's wealthiest person. The acreage of his fields under cultivation was as much as 350 dönüm, and a land of the same size meanwhile remained fallow. The temettuat scribes of the former survey had calculated the imam's wealth as 43 thousand kuruş. His two neighbors, Muhammed Ali and Yusuf, were moderate farmers with consecutively thirty and forty dönüm of grain fields under the plow. Their wealth was estimated to be more than three

42 OA. ML.VRD.TMT.d 10200: 45.

43 See the first households on the fifth and sixth rows in OA. ML.VRD.TMT.d 10201: 14.

44 See the people no. 28-31 in OA. NFS 3265, 25 Cemazeyilahir 1256 (24 Aug. 1840): 18.

thousand and less than four thousand kuruş.[45] Oxen, with their presence, made visible the socio-economic difference between the imam and his two neighbors. Whereas the imam and the molla each kept a single pair of oxen, the number of Hacı İsmail's non-human plowers were noted as four and eight in two temettuat registers. In fact, Yusuf was a devoted farmer who had an iron plowshare to till the dry soil and an ox cart to carry the produce.[46] Yusuf's two oxen played an indispensable role in his agricultural activities, and the temettuat scribes would affirm it.

The scribes' next step was a big one: the village of Kozluca, where as many as 127 households and almost seven hundred people lived. On the ninth day of Kemer's temettuat survey, Mustafa Efendi from Kastamonu decided to leave his service there.[47] If the scribe left in a hurry, he might have borrowed a mare or a workhorse from Hasan in the village of Kozluca. Hasan earned his living by renting out his non-human carriers, and according to the temettuat registers, he was the only "renter" (*kiracı*) in the whole of the seven villages stated above.[48] The relatively short

45 For the estimated wealth of Monla Osman'ın Yusuf, see the second household on the fifth row in OA. ML.VRD.TMT.d 10201: 13.

46 Yusuf died five years after the second temettuat survey, leaving behind three adolescent sons, and probably a wife and daughters as well. The consulted registers do not give information regarding the wife and daughters. For his inheritance, see OA. Meşihat Şer'iyye Sicilleri Defterleri (MŞH.ŞSC.d) 5212, 29 Zilhicce 1268 (14 Oct. 1852): 13.

47 The expenditure book noted that Mustafa Efendi from Kastamonu worked for eight days, whereas Hayri Efendi worked for sixteen days and the other Mustafa Efendi worked for fifteen days in Kemer-i Hamid. See OA. ML.MSF.d 6954, 26 Muharrem 1264 (3 Jan. 1848): 7-9.

48 Kemer's register from 1840 gave place to an extraordinary case by recording Kolgal (?) oğlu Hasan, the renter, twice in the same list. Whereas the register recorded the first Hasan as a pure renter with an annual income of 300 kuruş, the second Hasan had cultivated fields and an additional income of 450 kuruş from his agricultural activities. Both entries had a few oxen, cows, stirks, mares, workhorses, and donkeys, but their numbers varied in two cases. I interprete this case as an error, and the incoherences in livestock information as another error. I give little chance that the two Kolgal (?) oğlu Hasans were two different people in a single village who shared the same distinctive name and unpopular profession. If they were brothers and the scribes simply confused their names, the position of the two entries would probably be consecutive and not appear in

distances between destinations may explain the rarity of professional non-human porters in Kemer's villages. On the other hand, the low population density in the villages supports the absence of a delicate division of labor or specialization among peasants. The main activity of most households was farming and the best non-human worker for this profession was the ox. For instance, Cirid oğlu İsmail and Uğurlu oğlu Osman would rely on their oxen for preparing the soil and threshing the harvest. If they needed to carry a heavy load, they would put it on their ox carts. If they were intended to carry water or simple sacks, they would load them on their donkeys. İsmail and Osman were average farmers with estimated annual revenues around 1000-1200 kuruş.[49] So, they were unlikely to rent a non-human carrier from their renter neighbor, Hasan.

The temettuat scribes Hayri Efendi and Mustafa Efendi should have passed a night or two in Kozluca. As early as 1840, at least six households from Kozluca had left for Burdur.[50] So, peasants must have asked the two scribes curious questions about their former neighbors and maybe some generic questions about life in Burdur. Once Kozluca surveyed, the temettuat team accomplished the eastern part of the subdistrict and were ready to head westward. The temettuat scribes of the first survey in 1840-41 had started from the village of Kozluca and continued via Böbekler, Elmacık, and Akçaviran. Then, they must have spent almost an entire day on the twenty-five-kilometer-long way from Akçaviran to Kuzca. While approaching Kuzca, the scribes might have discussed among themselves whether the village headman, Hacı Süleyman, would offer them a comfortable accommodation. After Kuzca, the scribes surveyed the nearby villages of Çavdır, Belenli, and Kulağuzlar. Then, they had to walk sixteen kilometers northward, seeing the Karataş Lake on their right, to the villages of Bademli and Mürseller. Less than two hundred people lived in each of these villages. So, the temettuat survey of the western part of nineteenth-century Kemer-i Hamid probably required

different pages. See the second household on the fourth row in OA. ML.VRD.TMT.d 10201: 4 and the second household on the second row in OA. ML.VRD.TMT.d 10201: 5.

49 See the households no. 72 and 104 in OA. ML.VRD.TMT.d 10200: 69, 76.

50 OA. ML.VRD.TMT.d 10201: 5-8.

around a week's work, as long as the scribes did not walk into a serious problem. The reasonable work day numbers of the three temettuat scribes who surveyed Kemer in 1845 and the proper register they prepared suggest that they did not encounter a crucial resistance in the villages they visited. Everyone knew that there was a thin but visible line between surveys and taxation. Therefore, it would be misleading to imagine that peasants cheerfully welcomed the scribes with great enthusiasm. Nevertheless, two members of the temettuat team were from Burdur, so their acquaintance with the local culture probably helped them absorb tensions to a certain point. Moreover, they must have also benefited from the experience of the former temettuat survey, which did not give immediate results (or harm) for peasants except for accommodating a few scribes for a few days. At the end of the two-week-long survey in 1845, Hayri Efendi stayed in Kemer a day longer than his remaining colleague. He was among the most experienced temettuat surveyors in the whole district of Hamid,[51] so it was probably Hayri Efendi who took with him the final copies of Kemer's registers and headed back to the Böbekler village to submit the documents to Katırcızade Salih oğlu Ali.[52]

If the division of labor noted in the aforementioned expenditure book was accurate, each scribe worked in multiple subdistricts of Hamid. The same temettuat scribes came across each other for different missions around the district of Hamid. The temettuat survey of Hamid's Tefenni subdistrict brought Mustafa Efendi from Kastamonu together with Hayri Efendi from Burdur once again. Mehmed Ali Efendi, another scribe from Burdur, joined the two experienced scribes as the third and last member of the team. They started from the subdistrict's center. With over a hundred grain producers, it was a large village where almost eight hundred people lived in 143 households. The survey in the first destination must

51 According to the expenditure book, Hayri Efendi worked for the temettuat survey of the Hamid district in 1845 for almost eleven months. See OA. ML.MSF.d. 6954, 26 Muharrem 1264 (3 Jan. 1848).

52 Once having collected the signs and seals of village representatives, the temettuat scribes needed to submit the registers to the head of the subdistrict. See Takamatsu, "Ottoman Income Survey."

have taken more than a single day. Then, the temettuat scribes moved north to record the possessions of people in the villages of Ece, Sazak, and Kılcanlı. Less than three hundred people in total lived in these three villages. The scribes had to walk for an hour and pass through little tributaries of the Bozçay River to reach the next village. After Kılcanlı, the scribes continued their progression towards the north to reach the Dere farm, located next to another branch of Bozçay, as its name implied. The farm was owned by Süleyman Bey oğlu Hacı Abdullah Bey, an absentee landlord living in Burdur. They raised wheat and barley in a land that measured almost three hundred dönüm. The estate's workforce included twelve oxen, six donkeys, two barren cows, and seven men.[53] After visiting the Dere farm, they walked northward for another hour to reach Gebrem, a village with less than two hundred people in forty-two households. The survey in Gebrem should have lasted more than a day. Then, the scribe team headed east for the farm called Kuvat. The latter farm must have reminded the scribes of the Dere farm they had previously visited. Kuvat's owner was also a notable person from Burdur, Çelik Paşazade Elhac Ahmed Bey. Mustafa, Kel Süleyman oğlu Halil, Hacı Hasan, Mustafa oğlu Halil, İbrahim, Abdurrahman, and Ali worked for Ahmed Bey. The farm's cultivated lands were larger than a hundred dönüm and produced wheat and barley, the most popular grains in Anatolia. Apart from the aforementioned men, their probable non-mentioned family members,[54] and a dependent person called Çömez oğlu Hüseyin, sixteen oxen, six donkeys, three barren cows, a mule, and a mare also worked in

53 The scribes recorded Hacı Mahmud, Ali, İbrahim, Hasan, Halil, Mustafa, and Yusuf as representatives of separate households in Çiftlik-i Dere. At least some of them should have wives and children, but the latter could not find their place in the temettuat register. See OA. ML.VRD.TMT.d 10572: 54-55. Four years before the temettuat survey, the population survey had recorded twenty male residents in the same farm. A rough calculation will suggest that there were also twenty female residents. See OA. NFS 3268, 29 Zilhicce 1256 (21 Feb. 1841): 43.

54 Adding five male children and a brother to the aforementioned names, the population register of 1840 noted that the Kuvat farm had fourteen male residents. Nevertheless, the record does not include any information about women living in the farm. See OA. NFS 3268, 29 Zilhicce 1256 (21 Feb. 1841): 47.

Ahmed Bey's farm.[55] After a short visit to the farm, they arrived at the nearby village of Bedirli, a settlement with roughly more than a hundred people living in twenty-two households. They must have accomplished the survey of Tefenni's western part in a time span of slightly more than a week. From Bedirli, they moved to the south. The remaining part of the survey was going to take two more weeks. At the end of the twenty-third day, Hayri and Mehmed Ali, the scribes from Burdur, left the final copies of the register to the scribe from Kastamonu. This time, it was Mustafa Efendi who remained in the subdistrict for another two days before taking the copies to the subdistrict governor.

At the end of the survey, the temettuat scribes earned ten kuruş per day of service. The amounts that experienced scribes deserved were remarkably higher than most peasants' total annual revenues. Indeed, it should be demanding work to travel for weeks from one village to another and bear the responsibility of preparing official documents as important as income registers. At a moment when they did not find the energy and will to continue to the next destination, some scribes might have felt envy for pursuing a settled life in one of these villages. Maybe the scribes already had agricultural fields and livestock in their own villages. Sometimes, they would compare the villages they visited with their own homelands. In such a comparison, the eyes of the scribe from Kastamonu would probably detect greater differences than the scribes from Burdur. Yet, common points in socio-economic life would be greater than differences. All along the long weeks around the villages of Hamid, the temettuat scribes witnessed and carefully noted the traces of the same farming pattern that prevailed over Konya and a greater part of Anatolia. The majority of peasants in Hamid's villages were cultivating cereals to earn a living. The most preferred crops were wheat and barley. Most farmers had enough land to cultivate on and saved a portion of their land for fallow. Oxen stood for another essential factor for raising grains. They pulled the plow and carried the harvest. These non-human agricultural workers could even help their human owners in secondary occupations

55 OA. ML.VRD.TMT.d 10572: 66-67.

such as log trade or horticulture. The following analysis is harvested from the temettuat registers that the aforementioned scribes prepared in mid-nineteenth-century while travelling around the villages and farms of Kemer and Tefenni.

A sample from three temettuat registers brought together almost four thousand people from 777 households who lived in twenty-one villages from either Kemer or Tefenni (thirteen villages from the former and eight from the latter). Register no. 10201 deserves particular attention because it was prepared during the first temettuat survey of 1840-41. The document deviated from the standard formalities of most temettuat registers. A glance at the minimalist structure of notes is enough to grasp the record's originality. The final scribe wrote tiny enough to fit the notes for thirty households on a single page. Another great originality of the document concerned the data content. The scribe preferred to note the price of each asset rather than the annual income it brought. The result was an excessively original temettuat register that inscribed not only revenues but also prices and wealth. This noticeable drift from the standard seemingly called for another survey to reissue the data from the same villages. Despite the general parallelism between the data in registers no. 10200 and 10201 (most household representative names and a considerable part of their assets seemed to overlap), remarkable differences point out that the two registers resulted from two different surveys. Because the standard register form included consistent details about agricultural plots (register no. 10201 noted their estimated value but skipped the annual harvest revenue and neglected tithe payments as well), I preferred relying on the standard form in questions related to land and yield at the expense of a temettuat register as rare as no. 10201. This is why I excluded from my sample the information about the villages of Kozluca, Böbekler, Elmacık, and Akçaviran (which included 325 households in total) that register no. 10201 noted but relied on the data in register no. 10200. Let aside general epistemological problems of every tax book, the information in the latter register from the second temettuat survey must have outdated the results of the first survey. All three registers clearly expose the popularity of grain farming in the concerned villages. The majority of the

recorded peasants were indeed farmers, and they plowed grain fields with pairs of oxen. The selected sample thoroughly depicts the pattern of oxen-powered cereal production in mid-nineteenth-century Konya. The particularities of the Lakes Region support the sample's representation of the Province of Konya as long as they protected the area from the extreme climatic conditions that had devastating consequences in the provincial center at the time of the temettuat surveys.

TABLE 3.1 The sample for the Province of Konya

register no.	subdistrict	village name	number of households in 1845	estimated population in 1840[56]
10200	Kemer	Böbekler	117	583
10200	Kemer	Manca	13	50
10200	Kemer	Akviran	20	112
10200	Kemer	Akçaviran	21	108
10200	Kemer	Çiftlik-i Kayı	23	97
10200	Kemer	Elmacık	35	156
10200	Kemer	Kozluca	127	683
10201	Kemer	Kuzca	16	89
10201	Kemer	Çavdır	11	35
10201	Kemer	Belenli	31	156
10201	Kemer	Kulağuzlar	26	125
10201	Kemer	Bademli	27	140
10201	Kemer	Mürseller	33	166
10572	Tefenni	Tefenni	143	775
10572	Tefenni	Ece	21	93
10572	Tefenni	Sazak	22	114
10572	Tefenni	Kılcanlı	10	65
10572	Tefenni	Çiftlik-i Dere	8	43
10572	Tefenni	Gebrem	42	197
10572	Tefenni	Çiftlik-i Kuvat	9	30
10572	Tefenni	Bedirli	22	119
TOTAL		21 villages	777 households	3935

56 In line with Karpat's population estimation method, I multiplied the male population that the survey of 1840 registered by two and also added an eight percent for covering the probable "margin of error." See Karpat, *Ottoman Population*, 10. For Kemer-i Hamid, I consulted OA. NFS 3265, 25 Cemazeyilahir 1256 (24 Aug. 1840). For Tefenni, I consulted OA. NFS 3268, 29 Zilhicce 1256 (21 Feb. 1841). For a dissertation prepared about Tefenni's population survey, see Rojda Yakut, "3268 Numaralı Karaman Konya Eyaleti Hamidili Sancağı Tefenni Müslim Nüfus Defterinin Transkripsiyon ve Değerlendirmesi" (M.A. Thesis, Batman, Batman Üniversitesi, 2021).

§ 3.3 Yields

While the temettuat scribes were departing from Kemer's Manca village to the neighboring village of Elmacık, Elmacık's headman Hacı İsmail, İmam Muhammed Ali Efendi, and their neighbor Molla Osman oğlu Yusuf could have been exchanging their felicity regarding the last harvest. Last winter, the rumours of drought stemming from the vicinity of Konya had worried the villagers. Yet, after a remarkably prosperous harvest in summer 1845, the three pious men must have felt an infinite gratitude that God spared their village from the calamities of drought and famine. Halil oğlu Hacı İsmail's gratitude was immeasurable. His grain yield of 1785 kuruş in the harvest of 1844 turned into 2529 kuruş in 1845.[57] Even if probable costs of seed, wages, and taxes were reduced, the yield would still mean a fortune for İsmail's neighbors. The headman's last two harvests equaled more than Muhammed Ali's or Yusuf's whole wealth. One cannot know if the latter farmers interpreted their economic divergence with Hacı İsmail as God's will. Still, it is certain that they shared a similar gratitude after the harvest of 1845. In a single year, the imam's cereal harvest on a plot measuring thirty dönüm increased from 468 to 683 kuruş. The profit Muhammed Ali Efendi earned from his alternative sources of income, such as a vegetable garden, an opium field, and log trade, could not compete with his revenue from grain production.[58] Molla Yusuf's felicity could have passed beyond the imam's. Yusuf had sown wheat and barley on forty dönüm. His cereal harvest of 540 kuruş in 1844 became as much as 891 kuruş in the following year.[59] The sixty-five percent increase was considerably bigger than the increase in his neighbors' fields. Had Yusuf ever witnessed better harvests in his whole life? The haymow in his barn was large enough to keep hay bales at least as much as two hundred liters

57 OA. ML.VRD.TMT.d 10200: 45.

58 OA. ML.VRD.TMT.d 10200: 45.

59 OA. ML.VRD.TMT.d 10200: 49.

in volume.[60] Maybe he left some of the bales on the field for a certain time. Perhaps he passed a few nights on the field guarding his harvest from theft. How many times did he load his ox cart for taking the produce to the market? His two sons, both named Osman, were thirteen and eleven years old. Yusuf might consider them old enough to help him in his trade. Yusuf's wife probably would not permit him to take seven-year-old Ahmed with him on the way to the hay market in Böbekler. The two brothers would be amazed by the views they witnessed on the fifteen-kilometer-long route guided by the rivers called Eren Çayı and Akpınar Deresi. The pair of oxen who dragged the cart were surely more experienced in grain trade than Yusuf's children. The oxen knew each detail of the whole process, from plowing to threshing and transporting to selling. Their contribution to the yield was immeasurable. After the harvest of 1845, Yusuf's oxen must have shared the felicity of their human neighbors in Elmacık once they started enjoying a larger amount of fodder than the previous year.

Crop raising was the prominent economic activity in nineteenth-century Kemer and Tefenni. Peasants of the Lakes Region joined farmers in the rest of Anatolia as they harvested grains and paid tithes (*aşar*). A tax record from 1840 noted the tithe payments that the Ottoman government received from Konya's districts. Peasants of Kemer paid 56,824 kuruş of tithe, and peasants of Tefenni paid 69,752.5 kuruş.[61] Three years later, the amount of the tithe peasants of Kemer paid was 63,852 kuruş, and their neighbors in Tefenni paid 114,662 kuruş (still higher than their neighbors and much higher than their former payment in 1840).[62] In June 1846, a year after the second temettuat survey, government officials managed to collect 15,193 kuruş of tithe in Kemer and 3468 in Tefenni in a time span

60 Among Yusuf's possessions in his inheritance, there were three sacks, an ox cart, a barn with a haymow (*ahır mağ samanhane*), eight *mut* of wheat and four *mut* of barley. See OA. MŞH.ŞSC.d 5212, 29 Zilhicce 1268 (14 Oct. 1852): 13. For the measure of *mut*, see Cengiz Kallek, "Müd," in *TDV İslâm Ansiklopedisi* (Ankara: TDV İslâm Araştırmaları Merkezi, 2020).

61 OA. Maliye Varidat Muhasebesi Defterleri (ML.VRD.d) 366, 29 Zilhicce 1256 (21 Feb. 1841).

62 OA. ML.VRD.d 866, 14 Cemazeyilevvel 1259 (12 June 1843).

limited to a single month.[63] The provincial yearbook of 1869 noted that the Hamid district's wheat production attained 808 thousand keyl. Hamid's contribution represented nearly twenty percent of the whole province's harvest, which passed beyond four million keyl.[64] Towards the end of the century, farmers of Kemer and Tefenni would alone produce more than a million *keyl istanbuli* of wheat.[65] Peasants in the Lakes Region concentrated on extensive grain cultivation and raised their crops as peasants in the rest of the province did. In fact, statistics remain silent about the real actors behind the yields. If they did not have plows and oxen, the bare arms of the farmers of the whole province would fall short of producing cereals in considerable volumes.

The temettuat registers of the Lakes Region build on the macro data about the vital economic importance of cereal production in the area. Among 777 households in the sample of Konya, 620 were farmers. There are 281 households in register no. 10200 and 287 in no. 10572 which had paid tithes for grains in 1844. For register no. 10201, the "farmer" category describes the 110 households for which the scribe added acreage information about cultivated lands. The 510 farmer households in registers no. 10200 and 10572 paid 36,915 kuruş as tithes for the cereals they had produced in the harvest season of 1844. A rough calculation of multiplying the tithe payment by ten would give a clue about the gross cereal harvest. The bi-annual output data that registers recorded under cultivated plots broadly verify the calculation. The gross cereal production of farmers in register no. 10200 was 237,555 kuruş according to the tithe payments and 245,654 kuruş according to the data about yields per plot. In Tefenni, farmers produced cereals worth 131,595 kuruş according to tithe payments in their plots that brought 149,098.5 kuruş. Errors about the existing data and my calculations or the cultivation of different crops other than cereals in the plots under taxation might explain the gap of three percent in Kemer and twelve percent in Tefenni. Yet, such inconveniences would not put a shadow on the significance of grain production in the

63 OA. ML.VRD.d 1353, 4 Şaban 1262 (28 July 1846).

64 *Salname-i Vilayet-i Konya 1286* (Konya, 1869), 130.

65 *Konya Vilayeti Salnamesi 1312* (Konya, 1895), 262-63.

economy of the chosen villages. Cereal return of 845.4 kuruş per farmer in Kemer and 574.7 kuruş in Tefenni (based on cereal tithes) represented a remarkable positive contribution to the economic survival of these settlements if average annual income per household was 1187 kuruş in the concerned villages of Kemer and 1097 kuruş in Tefenni. The 510 farmer households in the sample earned more than half of their income from producing grains.

The sample had an adequate yearly agricultural output average, around twenty-one kuruş per dönüm. Productivity is the result of a complicated process in which soil, water, and fertilizers play their particular roles. Temettuat registers remain silent about the specific karstic or clayey character of the soil in the recorded terrains. The temettuat scribes also totally neglected how farmers collected and applied manure to their crops. Still, the physical geography of the region gives enough clues to suppose that tributaries of the Bozçay generously watered Tefenni, whereas in the neighboring subdistrict, various rivers flowed through Kemer, feeding the terrain with the humidity it desired, before eventually pouring into the Burdur or Karataş lakes. Despite the discouraging context of the central Anatolian drought, temettuat registers recorded that farmers in the Lakes Region scored adequate yields in the harvest of 1845. Although the data does not show any consistency regarding the fluctuations between the last two harvests, some farmers, such as the three farmers in Kemer's Elmacık village, even witnessed a considerable increase in their yields in 1845 if compared with the previous harvest.

How did farmers in Tefenni and Kemer plow their vast fields? How did they collect the harvest? To generate a yield of twenty kuruş from a single dönüm of land, thousands of farmers toiled on the fields along with oxen and other non-human agricultural laborers. Temettuat registers did not calculate any costs or profits. In reality, a remarkable portion of the yield would wither away after reducing the expenses. Feeding workers as huge as oxen constituted a noticeable cost for their human owners. However, the labor they performed during plowing and even the dung they dropped on the field would bring a return incomparably bigger than their fodder and upkeep costs. The devoted efforts of oxen made an

immeasurably crucial contribution in the generation of twenty-one kuruş on each dönüm of land in the Lakes Region.

TABLE 3.2 Tithes, yields, and income (in kuruş)

	total annual tithe payment for cereals	yearly output per plot	yearly output per dönüm	gross cereal product per farmer	average annual household income (non-farmer residents included)
281 farmers in register no. 10200	23,755.5	245,654.25	23.38	845.39	1187.31
287 farmers in register no. 10572	13,159.5	149,098.5	19.35	574.65	1097.2
sum	36,915				
average		197,376	21.36	710.02	1142.25

§ 3.4 Land

In mid-nineteenth-century Kemer-i Hamid, no one could compete with the Katırcızade family regarding the acreage of cultivated lands. Still, the land was plenty and fertile enough for accommodating the remaining residents of the Böbekler village. Odabaşı oğlu Musa's share was sixty dönüm. With a single pair of oxen, he could not cultivate more than forty dönüm and would leave the remaining twenty dönüm under fallow. Musa's only son bore his grandfather's name, İbrahim. The sixteen-year-old farmer would help his ageing father plow vast plots and collect the cereal harvest, always under the supervision of a pair of experienced oxen. If they had spare time from grain cultivation, Musa and İbrahim would take care of their little vineyard. In 1840, the Odabaşı family's wealth was estimated at 4450 kuruş and their annual income at 350

kuruş.[66] Five years later, the household's yearly income had increased to 1125 kuruş.[67] When Musa passed away at the age of sixty-four in summer 1849, the kadı estimated his wealth as low as 1024 kuruş.[68] Inheritances might leave a relatively small ground for tax evasion efforts in the midst of a tragic event like death. On the other hand, some taxpayers might take advantage of daily life's high tempo and its complexities during a temettuat survey for evasion. So, the obvious decrease of Musa's financial assets from 1840 to 1849 signals a sharp impoverishment. There is no indication that Musa lost the usufruct for the sixty dönüm of agricultural plots or the vineyard. Moreover, his young son would inherit a house, a barn, and a haymow. However, in a time span of four years, Musa had lost one of his two oxen and a dairy cow, who both appeared in the temettuat register from 1845. Furthermore, no plows or plowshares appear in Musa's inheritance. Historical findings do not clarify how Odabaşı oğlu Musa lost his ox and plowing team. Yet, his household experienced the result of a full plow team's lack as a sharp impoverishment. If the inheritance list was accurate, in his last years, Musa had been borrowing a plow and an ox from his neighbors during the plowing season in exchange for a daily rent or maybe a portion of his next harvest. The loss of an ox was more than the loss of a source of power and manure. Worst of all, the lack of an ox would bring an additional financial burden via the rent paid for a substitute ox to complete the plowing team. Access to land was only a secondary problem in nineteenth-century Konya, where land was abundant and the workforce was scarce. Even ordinary peasants had dozens of dönüm under their usufruct. On the other hand, the abundance of land in Konya only increased farmers' reliance on oxen. The available land gained an economic potential as long as non-human plowers prepared it for cultivation.

The complex morphology of the Anatolian plateau reserved some great plains suitable for grain cultivation in the Lakes Region. The topography had saved people in Kemer and Tefenni from the problem of

66 See the first household on the fifth row in OA. ML.VRD.TMT.d 10201: 11.

67 OA. ML.VRD.TMT.d 10200: 16.

68 OA. MŞH.ŞSC.d 5212, 29 Zilhicce 1268 (14 Oct. 1852): 23.

finding enough portions of arable land.[69] Moreover, the population was far from stressing the available lands. There were fewer than ten thousand people in the whole of mid-nineteenth-century Kemer-i Hamid and Tefenni. The Bozçay River, the main stream (along with Suludere) that fed the Burdur Lake,[70] had traced the settlement trajectory in Kemer and Tefenni. Almost all of the villages in the sample stood around the Bozçay's distributaries.[71] The availability of watering options and the absence of population pressure in the Lakes Region were translated into an abundance of arable land. An economist perspective will interpret greater land acreages as the need for a bigger labor force. In this sense, a crowded household, without exempting women and children from arduous tasks, meant a great human workforce in nineteenth-century rural life. Still, even the most crowded farmer households would fall short of sufficiently hoeing a plot greater than a few dönüm. Short tools and human arms had deliberate limits, only enough for cultivating vegetable gardens or little vineyards. Consequently, greater fields increased the dependence on the power of oxen. The abundance of land brought a bigger stress on the shoulders of non-human plowers. Only a pair of oxen could plow a grain

69 An ecological study underlines that the region's forests have a "long history of high livestock grazing pressure." See Ozkan et al., "Site properties," 99. The semiarid climate of the region could not alleviate the stress on pasturelands. In the summer of 1864, a dispute occurred between peasants of Kemer and Isparta's Ağlasun and İncirpazarı subdistricts about the usufruct of summer pastures (*yaylak*) that remained on the borderline between the two districts. Representing the residents of Kemer's Kozluca, Elmacık, Kayı, and Akçaviran villages, a certain Osman submitted a petition claiming that the residents of these villages and their animals had been "benefitting from the grass and water" (*ot ve suyundan hayvanatları idare ve kendileri intifa edegeldikleri cihetle*) of five meadows with the permission of an imperial decree (*ber ferman-ı ali*). The continuation of bureaucratic correspondences suggests that the dispute continued at least for another two years. See OA. Sadaret Mektubi Kalemi Umum Vilayat Evrakı (A.}MKT.UM) 788/39, 6 Safer 1281 (11 July 1864), OA. Meclis-i Vala Evrakı (MVL) 711/128, 16 Recep 1282 (5 Dec. 1865), and OA. MVL 725/78, 29 Cemazeyilahir 1283 (8 Nov. 1866).

70 Murat Ataol, "Burdur Gölü'nde Seviye Değişimleri," *Coğrafi Bilimler Dergisi* 8, no. 1 (2010): 78.

71 For Tefenni, see the contour map that Yazgan prepared. Yazgan, "XIX. Yüzyılın Ilk Yarısında Tefenni," 76. For Kemer, see Yiğit, "Burdur ve Çevre," 18-19.

field larger than a dozen dönüm. In each season, the oxen in Konya needed to put their whole effort for plowing the arid soil of vast fields multiple times until the terrain was finally ready for seeding.

The 777 households in the sample had more than twenty-four thousand dönüm of plots under cultivation. The average acreage of cultivated lands per farmer household altered from 35.5 to 45 dönüm, with a sample average of 39.86 dönüm per farmer.[72] If the calculation included gardens and vineyards, it would turn out that farmers in Tefenni and Kemer had far more than forty dönüm under their usufruct. Meanwhile, nearly forty percent of arable lands in register no. 10200 and fifty-seven percent in no. 10572 remained under fallow. The general fallow period in Anatolia might be a year or two,[73] but fallow fields in Konya would wait for multiple seasons before being seeded since farmers would not have a hurry amid land abundance. Sheep and goats might help the oxen to manure lands under fallow, but they could not plow it. The oxen still had to plow these plots from time to time once they finished with the lands under the plow.

TABLE 3.3 Land and acreage (in dönüm)

	register no. 10200	register no. 10201	register no. 10572	the whole sample
acreage of plots under the plow	10,980	4949	8131	24,060
acreage of plots under fallow	6990	-	10,714	17,704
cultivated plot acreage per farmer household	39.07	44.99	35.51	39.86

As the Hamid district did not have a land deficit, renting was an exception, and the several landless peasants had substantial reasons for their lack. In the chosen villages of Tefenni, only eleven households had rented

72 The average acreage of fields under the plow per farmer in Hamid's Keçiborlu subdistrict was around thirty dönüm, slightly smaller than the average in Kemer and Tefenni. See Ayşe Özdemir, "10199 Numaralı Temettuat Defterlerine Göre Keçiborlu Kazasının Sosyal ve Ekonomik Durumu (1844-1845)" (M.A. Thesis, Isparta, Süleyman Demirel Üniversitesi, 2005), 76.

73 Tabak, *The Waning,* 266.

plots from someone else to cultivate crops. In the selected villages of Kemer, there were no tenants, but Kara oğlan oğlu Ahmed in Kemer's Kozluca village and Hatib oğlu İshak in Elmacık earned modest revenues from the plots they had rented out.[74] The rarity of land leases is an indirect marker of easy access to land. Meanwhile, not all residents of the concerned villages had land. There were 153 households (19.7 percent of the whole sample) with no lands under cultivation. Forty-nine households were definitely landless as they had neither uncultivated lands nor small plots like gardens and vineyards. Some were extremely poor and dependent. Women, children, or men without the physical condition to work represented nine of these households. Seven of them had no income at all and depended on the aid of their neighbors.

On the other hand, most landless peasants in the sample either practiced particular professions or worked in the service of wealthier peasants. There were fourteen servants, eleven shepherds, four log traders, three workers, two agricultural laborers, two traders, and four households practicing other particular professions. The average yearly revenues of this category amounted to 467.5 kuruş, less than half of the sample average (1014 kuruş). There were 104 households with at least a garden, a vineyard, or an uncultivated plot. Dependent people represented fourteen of them. Eighty-nine households with no cultivated grain fields but with some gardens or uncultivated lands practiced different occupations. These professional households, which included thirty-five servants, thirteen traders of forest products, eleven shepherds, eleven peddlers, and five agricultural laborers, yearly earned 542.66 kuruş on average. The category also included one farmer (*ziraatçi*) called İsmail oğlu Mustafa, who had not paid any tithe in 1844 and did not cultivate any crops for unspecified reasons.[75] All in all, the data in the sample did not

74 In 1845, İshak (no. 24 in Elmacık) received 38 kuruş from the cultivated field he rented out whereas Ahmed (household no. 92 in Kozluca) received 32 kuruş in 1844 and 60 kuruş in 1845 from the rent of his 25-dönüm-large field. OA. ML.VRD.TMT.d 10200: 51, 74.

75 Recorded as a farmer, Mustafa did not fulfill the requisites of his professional identity. He only had a donkey and did not work on his twenty-five-dönüm fields lying fallow. Household no. 4 in OA. ML.VRD.TMT.d 10200: 34.

bring up a "land question" that would preoccupy most people's minds in Tefenni and Kemer. Households without lands did not resort to leasing plots but practiced different occupations or worked in other people's fields as servants (*hizmetkar*) or agricultural laborers (*ırgad*). A farmer would need not only the land but also a plow and a pair of non-human workers to raise crops. There was no land scarcity in Konya. So, why would household members continue working in someone else's service if they possessed a pair of oxen? In this regard, there were only three exceptions among the 153 households (that only had twenty-eight oxen in total). A servant from Mürseller[76] and an agricultural laborer from Kulağuzlar[77] both had a pair of oxen. However, they did not have a single plot and apparently worked in fields they did not own. Their low annual income (250 kuruş for the former and 300 kuruş for the latter) signaled that they would not easily afford the costs of seed and maintenance of the plow. Could it be more likely for a laborer in the village of Belenli to reach economic independence? The register recorded a single dönüm of cultivated land under Tireli oğlu Osman's name but neglected it by avoiding indicating any acreage of cultivated field for him.[78] Four oxen worked for Osman, but the register still considered the latter as an agricultural laborer.[79] He might be a laborer who worked in his neighbors' fields with his oxen and earned a daily wage for the work he and his non-human

76 For Koca İbrahim oğlu Osman, see the first household on the fifth row in OA. ML.VRD.TMT.d 10201: 22.

77 For Bekir, see the first household at the top of the page in OA. ML.VRD.TMT.d 10201: 19.

78 Regarding the data from register no. 10201, I respected the acreage indication and ignored the existence of cultivated lands among their possessions in case the acreage was missing. There were totally five households with some cultivated fields in their inventories but without acreage information. I suppose that the scribes intentionally omitted this information and treated these households simply as landless peasants because they were poor and did not record a significant production. The average income of these five households was only 260 kuruş.

79 There was an obvious incoherence between this household's relatively crowded livestock and poor level of annual income, which was only 250 kuruş. One can only speculate if the register's additional note that Osman had returned to his village recently (*bu sene karyesine gelmiş*) could explain the incoherence. See the third entry on the fourth row in OA. ML.VRD.TMT.d 10201: 17.

workers performed. So, Osman and his team of bovine workers might be a professional team of plowers that worked in the fields of wealthier residents of Belenli, such as Mahmud oğlu Hüseyin, Kapusuz oğulları Osman and Süleyman, and Tıraş oğlu Musa, who each owned at least eighty dönüm of cultivated lands. Osman had thirty neighbor households in Belenli. Apart from his wealthier neighbors, Hacı oğlu Kara Osman, Çelik oğlu Hüseyin, Balcı oğlu Ömer, Akça oğlu Hasan, and Akça oğlu İsmail might also be renting Osman's extra pair of oxen since none of these peasants had any oxen to plow their own fields. Some farmers might lack a pair of oxen. However, it was highly exceptional for a household without cultivated fields to keep oxen. Indeed, some peasants with extra pairs of oxen, such as Tireli oğlu Osman in the village of Belenli, might be profiting from Konya's abundance of land and high dependence on oxen.

If access to land were easy, barriers posed by other factors of production (such as means of production and labor) would play a more critical role. The extreme rarity of the exceptional cases of oxen-keeping landless households is a significant indication of the strong bond between oxen ownership and grain cultivation. Poor peasants might be unable to afford to cultivate land, and tradespeople did not need it. If they were willing and had the economic power, the landscape of the Lakes Region would be large enough to host more cultivated fields. However, access to land was not the only factor that ensured economic independence in Konya. A farmer household would be able to survive economically as long as they had both land and oxen. If a farmer lacked enough number of oxen, a considerable portion of his fields would desperately wait under fallow. Worst of all, reminding of Odabaşı oğlu Musa's case, the poor farmer would become poorer each day as he continued to rent oxen from other peasants.

TABLE 3.4 Households with no cultivated grain fields

households	number of households	people with particular occupations	servants and agricultural laborers	dependent people	average yearly income (kuruş)
with no land at all	49	40	16	9	397.35
with uncultivated land, a garden, or a vineyard	104	89	40	14	471.48
TOTAL	153	139	56	23	447.74

§ 3.5 Oxen

Cirid oğlu İsmail was a farmer in the village of Kozluca. Like most of his neighbors, İsmail relied on the labor of a pair of oxen for cultivating cereals. Apart from a fallow land of twenty dönüm under his usufruct, İsmail raised cereals on thirty dönüm. The worth of his total grain harvest was more than seven hundred kuruş in 1844. Wheat and barley stood for the primary source of income for this farmer household with an annual income of around 1100 kuruş. In 1845, the worth of their grain harvest decreased to 549 kuruş for an unspecified reason.[80] When Cirid oğlu İsmail lost his life in the summer of 1849, the volume of the cereals he left to his inheritors was bigger than 600 liters, and their worth was almost 1500 kuruş.[81] In nine years, İsmail's wealth had increased from 2095 kuruş[82] to 3537 kuruş. The two temettuat registers of 1840 and 1845 had noted a pair of oxen, a cow, a workhorse, a donkey, and some goats for İsmail. The coherence strengthens the reliability of the survey data. The ox cart and the plow that the inheritance includes can be seen as the basic means of farming and cannot explain the significant increase in İsmail's prosperity. Still, a little detail in the same document may point to the reason behind

80 OA. ML.VRD.TMT.d 10200: 69.

81 OA. MŞH.ŞSC.d 5212, 29 Zilhicce 1268 (14 Oct. 1852): 13.

82 See the third household on the ninth row in OA. ML.VRD.TMT.d 10201: 6.

İsmail's enrichment. Though the number of oxen İsmail kept remained two in the temettuat surveys, in 1849, he left three oxen to his inheritors. In the last years of his life, Cirid oğlu İsmail should have added an extra ox to his experienced team of non-human plowers. It is unclear if he bought or raised the ox and the three oxen's equal estimated values suggest no crucial difference between their physical conditions. If İsmail rented another ox to form a second plow team and cultivate a greater acreage, he would require another plow, which does not appear in the inheritance. Instead, he probably rented out the extra ox in exchange for cash or a portion of the renter's harvest. Eventually, the additional non-human plower would turn into a viable source of income. Even the manure of a third ox could be a source of richness in the eyes of a nineteenth-century farmer who sought agricultural productivity. The worth of an ox was around 150 kuruş in mid-nineteenth-century Konya. The considerable cost of accommodating a non-human worker as huge as an ox would further question his intrinsic value on a farm. In fact, people in rural Anatolia barely regarded oxen as a source of meat. They were excellent plowers and patient carriers. The oxen's role in the subsistence of farmer households was priceless. The oxen clearly represented the economic capacity of a rural household. The number of oxen was a direct marker of wealth in the villages of Konya, where land was abundant but labor was scarce.

The ox was the most popular draft animal in the villages of Konya. These non-human workers pulled the plow and carried anything between barns and fields throughout the year. Peasants in Konya's Hamid kept pairs of oxen for cultivating cereals. There were 1273 oxen in the whole sample. Divided by the number of farmers, it made 2.05 oxen per farmer household. Though it did not appear in temettuat registers, some simple calculations help imagine the oxen's economic contribution. According to the data from the chosen sample, each pair of oxen had around thirty-eight dönüm to plow. If the number is close to the sample average of forty dönüm of cultivated lands per farmer household, it only endorses the pattern of grain farming with pairs of oxen. Farmers would till their fields with simple plows dragged by pairs of oxen more than once for

different purposes in different seasons. The stressful duties of the threshing season would be followed by the burdensome plowing period. A simple reasoning will suggest that a pair of oxen in a household with thirty dönüm of cultivated fields had a less stressful work life than their non-human fellows in a household with forty dönüm of grain fields. However, if the first household plowed their fields twice while their neighbors plowed their fields once, the equation would be totally reversed. One cannot guess which farmers in nineteenth-century Konya demanded more work from their oxen. Since the registers do not describe the quality of the land or the plowing operation, it is not possible to exactly define the work schedule of each non-human plower. What oxen earned in return for their efforts was nothing but fodder. The gross product that farmers received per pair of oxen they kept was 877 kuruş in register no. 10200 and almost 560 kuruş in register no. 10572. If expenses of tax payments, seed costs, and the economic burden of keeping non-human workers were included, the yield per pair of oxen would strikingly shrink. In a region where peasants' main activity was grain farming, the 780 kuruş on average brought by each pair of oxen would make up more than half of most households' total annual revenues. Despite technical inconsistencies, such calculations mark a way to unveil the invisible role of oxen in grain production.

TABLE 3.5 Oxen, land, and yields

	register no. 10200	register no. 10201	register no. 10572	the whole sample
total number of oxen	542	260	471	1273
number of oxen per farmer	1.93	2.36	2.06	2.05
cultivated land acreage per pair of oxen (in dönüm)	40.52	38.07	34.53	37.80
annual yield per pair of oxen (in kuruş)	876.59	-	558.79	779.37

The sample included 485 households that kept a pair of oxen. This crowded category represented 62.4 percent of the whole sample. In

temettuat registers, pairs of oxen typically followed the information about grain fields and gardens, and oxen-keeping without lands was significantly exceptional. Registers did not record any information about the acreage of cultivated land for only seventeen households that kept a pair of oxen. In Tefenni, ten peasants in the big farms of Dere[83] and Kuvat[84] cultivated the plot they rented from the farm owner with their own oxen. A certain Kara Ali in the Bedirli village[85] was also a tenant farmer with a pair of oxen. Register no. 10572 did not inscribe the acreage of these leased terrains. Apart from these eleven renters in Tefenni, register no. 10201 noted a pair of oxen but no cultivated land for six other households in Kemer. There was a woman,[86] an agricultural laborer, a shepherd, a servant, and two peasants who earned income from vineyards and tragacanth trade. The remaining 468 households in the sample had both a pair of oxen and cultivated fields of at least nine dönüm in size. A categorization based on the size of cultivated lands highlights the strong correlation between acreage, tithes, yields, and revenues. Unsurprisingly, as the land size grew between different segments in the table, yields, tithe payments,[87] and revenues increased, too. The average yield per acreage broadly varied around twenty-two kuruş for all segments except the

83 OA. ML.VRD.TMT.d 10572: 54-55.

84 OA. ML.VRD.TMT.d 10572: 66-67.

85 Household no. 19 in OA. ML.VRD.TMT.d 10572: 74.

86 It was nearly impossible for a woman to represent her household in these registers as long as she had her husband or father alive. In this case, it was probably a widow to whom the scribes gave the very last place in Çavdır village's list. Moreover, the scribes preferred indicating her husband's name instead of her own name: *Toklu oğlu Halil zevcesi.* See the entry on the left at the top of the page in OA. ML.VRD.TMT.d 10201: 17.

87 A technical but significant note regarding the calculation is the absence of tithe payment and yield information in the entries from register no. 10201. Although Kemer's aforementioned register did not provide these crucial data for forty-four households with a pair of oxen and cultivated lands, they still appeared in the calculation with their existing information. Yet, I neglected them while calculating average levels of tithes and yields so that the lacking data did not affect the general tendencies the existing numbers showed.

wealthiest one.[88] Regarding productivity, the categorization did not show a clear tendency between different segments. Did two oxen that tilled a humble peasant family's plot work in similar conditions with their co-workers that tilled the endless fields of a big farm? Did these two teams of non-human workers work for the same number of days? Did they get any assistance or incentive? Unfortunately, the existing data and my calculations do not respond to these questions. Even if the calculation fixed the number of oxen at two, plenty of variables still blur the actual economic contribution of these non-human agricultural laborers. The livestock information in the registers silently points out that equines and infertile female bovines often assisted oxen. Most oxen in the sample had fellows other than their companions on the same yoke. However, the presence of non-human workers from different categories and species cannot conceal farmers' evident preference for oxen in Konya.

88 The data would not permit further analysis. Seven of these households with more than sixty dönüm of cultivated lands appeared in register no. 10201, which did not indicate any information about yields. Data regarding tithes and yields for this segment came from the remaining five households.

TABLE 3.6 Households that kept a pair of oxen

the size of their land under cultivation (dönüm)	number of households	total number of oxen	number of other non-human workers	average land size under cultivation (dönüm)	tithe payment for grains in 1844 (kuruş)	average yields in the previous two years (kuruş)	average yield per dönüm (in kuruş)	average yearly income (kuruş)
60 and more	12	24	48	70.83	137.60	3406.20	20.48	1687.17
45-55	73	146	167	49.78	102.56	2181.58	21.84	1486.44
35-40	130	260	337	39.36	81.98	1697.55	21.43	1427.77
30-33	156	312	345	30.02	63.02	1355.71	22.60	1204.98
9-27	97	194	190	20.16	40.94	896.89	21.84	853.07
TOTAL	468	936	1087					
AVERAGE				34.70	70.48	1501.30	21.98	1250.19
sample average				30.97	72.38	1539	21.36	1014.16

In the Lakes Region, as elsewhere, the number of oxen was a marker of wealth among farmer households. The sample had only ten households that kept more than two pairs of oxen. This exceptionally wealthy strata cultivated fields larger than 164 dönüm and yearly earned more than three thousand kuruş on average. Fifty-seven households kept three or four oxen. According to the data for this category, the average size of the cultivated lands these households had was more than sixty-seven dönüm, and their average annual income was 1527.26 kuruş. Unsurprisingly, farmers with a pair of oxen constituted the largest category of oxen-keeping households within the sample. These 485 households practiced agriculture on an average terrain of 33.5 dönüm (slightly bigger than the sample average, 30.97 dönüm) and annually received 1225 kuruş (slightly higher than the sample average, 1014.16 kuruş). The twenty-one households with a single ox represented the poorest category of ox-keepers in the sample. Their plots were smaller than twenty-five dönüm, and their average yearly income was no more than 630 kuruş. Greater lands would bring

greater yields, and greater yields would bring more oxen. Vice versa, fewer oxen would till smaller lands, and smaller lands would bring smaller yields. Data on average land possession and average revenues from the sample showed almost perfect[89] consistency regarding the correlation between the number of oxen in a barn and the wealth of a household.

TABLE 3.7 The distribution of oxen among households

households that kept	number of households	total number of oxen	average land size under cultivation (dönüm)	average yearly income (kuruş)
more than two pairs of oxen	10	77	164.60	3171.20
two pairs of oxen	34	136	78.79	1793.62
three oxen	23	69	49.87	1133.52
a pair of oxen	485	970	33.48	1225.26
sample average			30.97	1014.16
a single ox	21	21	24.86	627.38
no oxen	204	0	8.95	537.08
TOTAL	777	1273		

There were 204 households in the sample that did not keep any oxen. Sixty-three did not have a single dönüm of plots under the plow. Only thirty-seven of them had paid tithes for cereals in 1844. Most of these thirty-seven households practiced other occupations and worked as servants, shepherds, coal carriers, shoemakers, traders, log carriers, or imams. Their average yearly income was nearly 875 kuruş, which was below the sample average but still higher than the average income of households with a single ox. The relatively decent income of households

89 The only exception in the table below is the modest economic superiority of households with a pair of oxen over their neighbors with three oxen. If the former's average revenue is ninety-two kuruş higher than the latter, the inconsistency should be about the insufficient data about households with three oxen. As oxen worked in pairs, the number of households with a single ox or three oxen remained only marginal. Such limited data could make it difficult to form reliable patterns and easy to create inconsistencies.

without oxen indirectly suggested that they did not keep oxen because they did not need their assistance. Registers recorded only seven of these households as "farmers" (*ziraatçi*). Two workhorses, three barren cows, two mares, and eight donkeys lived in the barns of these seven farmer households. Though not as strong as their fellow oxen, these non-human workers still constituted an adequate team to till the land and carry out agricultural duties for their human owners. Six of these farmer households earned at least thirty-three percent of their yearly revenues from trade or other occupations. The only exception was Hasan oğlu Abdurrahman,[90] who did not have an additional income but earned a living from the agricultural activities he somehow managed to carry out without a single ox or any other draft animal. According to the register, Abdurrahman's household was wealthy enough to afford to keep oxen since they had cultivated lands of fifty dönüm, farrow lands of 150 dönüm, and an annual income of 1784 kuruş. Moreover, they already kept livestock. The non-human members of the household were crowded enough to include a pair of dairy buffalo cows, a dairy taurine cow with their calves, six sheep, and five goats. Members of Abdurrahman's household would not be able to hoe an acreage as vast as fifty dönüm by hand. In conclusion, it is likely that the single exception of a full-time farmer entry without oxen in the whole sample resulted from an error in the claim or script of the concerned temettuat survey in the village of Kozluca. Most of the 204 households without oxen did not grow grains, so they did not engage in the economically costly endeavor of feeding oxen. Registers suggest that the ones that actually raised cereals among these households probably resorted to the forced labor of horses, donkeys, or cows.

With 1273 members, the oxen formed the most crowded category of non-human workers in the sample. The donkeys came second with their 976 members living with the households that three tax registers recorded. Registers exempted donkeys from taxation, as they did for other non-human workers. Households mobilized the humble labor of donkeys

90 Household no. 68 in the village of Kozluca. OA. ML.VRD.TMT.d 10200: 69. I could not detect the same household in the list of Kozluca that register no. 10201 included.

for numerous reasons, from specific occupations to daily domestic duties. The registers did not estimate that the 347 barren cows (*yoz inek* or *kısır inek*) would bring any financial income to their households, which signaled their exploitation as work animals. Workhorses (*bargir*), mares (*kısrak*), and mules (*katır*) constituted the last category of non-human workers, which had 356 members. Why would some peasants prefer oxen over donkeys? Why would some peasants prefer feeding donkeys instead of horses? Despite their silence on details, data from temettuat registers indirectly pointed out how peasants exploited non-human workers in different occupations.

TABLE 3.8 Non-human workers in Konya

temettuat register no	taurine oxen	buffalo oxen	donkeys	barren cows	horses and mules	oxen per farmer
10200	516	26	356	147	139	1.93
10201	221	39	238	45	82	2.36
10572	441	30	382	155	135	2.06
TOTAL	1178	95	976	347	356	2.05

§ 3.6 Log Trade

Uğurlu oğlu Osman from the Kozluca village would often take his donkeys and go chopping wood. Donkeys could easily carry thin logs and bundles of dry branches once Osman put them in a pair of sacks upon their saddles or attached them around the humble bodies of his non-human assistants with ropes. Firewood was a constant need in rural life. Peasants consumed firewood throughout the year, not only for heating their houses but also for cooking food or washing clothes. Sometimes, Osman would leave his donkeys at home and take his oxen instead for a more extended trip into the forest. The non-human loggers would slowly drag a simple cart. On the way, Osman's axe would drift from one side of the

empty ox cart to the other.[91] If Osman had human assistants, maybe a neighbor or his own children, they could take care of the axe and any other tools they carried. Children might even find joy in their uncomfortable ride on the cart. When they arrived in the forest, Osman and his human assistants would spend hours chopping down trees or collecting the branches that had already fallen. In the afternoon, they would be loading on the ox cart all the logs they had gathered. At home, they would stock the household's consumption in their barn and leave the remaining firewood on the cart. The next day, or maybe after a few days of rest, Osman and his oxen would travel through Kozluca to sell the logs. Among the six hundred residents of this large village, some people did not have the means, energy, or time to go collecting firewood. If their wood stock were alarming, they would be more than happy to hear the squeaky wheels of Osman's approaching ox cart. If there were a good-looking piece of cedar on the cart, Osman would reserve it for Kürt oğlu Yusuf.[92] The latter was the village's only *dülger*, construction carpenter. Yusuf's experienced eyes would easily recognize the timber of quality necessary for woodworks, and maybe he would even order Osman some special pieces of wood he needed. In fact, not everyone in Kozluca would know Osman as a woodcutter. In the first place, Osman was a farmer and his oxen were perfect plowers. As Osman's primary source of income was grain cultivation, the most important duty of his oxen was plowing and threshing. However, the occasional logging job was a considerable complementary source of income. In 1845, log trade had brought Osman as much as 350 kuruş.[93] Consequently, dragging a cart loaded with logs and branches had become a secondary job for Osman's oxen. Meanwhile, some peasants in the same village would prefer carrying firewood with their donkeys.

Forests of the Lakes Region include a variety of tree species such as the Brutian pine (*Pinus brutia*), Anatolian Black pine (*Pinus nigra*), Cilician fir (*Abies cilicica*), Taurus cedar (*Cedrus libani*), Juniper (*Juniperus*

91 Osman passed away in 1849. His inheritance verifies that he had a pair of sacks, an axe, and a cart. See OA. MŞH.ŞSC.d 5212, 29 Zilhicce 1268 (14 Oct. 1852): 16.

92 See the third household on the fifth row in OA. ML.VRD.TMT.d 10201: 5.

93 OA. ML.VRD.TMT.d 10200: 76.

sp.), Oak (*Quercus sp*.), Sweetgum (*Liquidambar orientalis*), and Locust (*Acacia sp*.).[94] Timber made from the Taurus cedar, juniper, and pine trees of Lycia was a valuable commodity at least since the first century.[95] Timber from the Taurus Mountains preserved its importance in the Mediterranean trade into the nineteenth century.[96] In the nineteenth century, cedar, pine, and juniper trees of the Lakes Region brought a substantial income to the peasants who chopped them to sell their logs. Temettuat registers noted many households in this region as "log traders" (*hatabçı* or *oduncu*). The current research sample had 112 households that earned revenues from trading logs. Only twelve did not have a field under the plow. The remaining hundred households cultivated crops and cut trees at the same time. In total, log trade brought 60,860 kuruş to the villages within the sample, which comprised more than seven percent of the total gross product. On average, each household earned 543.4 kuruş from cutting trees and selling firewood, more than half of the average annual income per household.[97] How did peasants generate a source of living from pieces of dead trees? A French forest expert observed in 1855 that Ottoman woodcutters used axes instead of saws. Chopping trees with axes consumed more time and energy than cutting them with saws.[98] Logging

94 Yücedağ et al., "Forest genetic," 8.

95 Harrison considers the "timber forests" of Lycia, as a great economic asset for the region. See R. M. Harrison, "Churches and Chapels of Central Lycia," *Anatolian Studies* 13 (1963): 118. For a map showing ancient Mediterranean trade routes for timber, see Selçuk Dursun, "Forest and the State: History of Forestry and Forest Administration in the Ottoman Empire" (PhD Thesis, Istanbul, Sabancı University, 2007), 32.

96 Tabak, *The Waning*, 290.

97 Register no. 10201 did not clearly classify the source of annual revenues but only named them without indicating the numerical contribution of each. So, I made a practical choice by accepting the whole annual income of an household as log trade income (even though there were cultivated fields and dairy animals in the inventory) if the register classified its source of income simply "from log" (*odundan*). If the register showed another source of income, such as "from agricultural produce and log" (*mezruattan ve odundan*) or "from vineyard and log" (*bağ ve odundan*), then I simply divided the revenue by two.

98 Alaaddin Tok, "From Wood to Coal: The Energy Economy in Ottoman Anatolia and the Balkans (1750-1914)" (PhD Thesis, Istanbul, Boğaziçi University, 2017), 28-29.

was an exhausting work that most peasants had to practice throughout the year to collect their own firewood. It is impossible to know every detail about how they selected the trees, how far they carried them, or to whom exactly they sold their goods. However, one can suppose that peasants certainly did not carry all the logs on their shoulders. They needed the muscles of non-human workers to travel with them from the forest to the village to carry sacks or drag carts loaded with logs.

All 112 households that traded logs kept non-human workers without exception. On average, each log trader had 4.37 non-human assistants. Most households kept different non-human workers in the same barns. Ninety-two households had both oxen and donkeys. Since a significant portion of the log traders were also farmers, it is difficult to isolate the marginal role of different non-human animals in agriculture, domestic tasks, and the burdensome occupation of trading logs. Nevertheless, statistics from such a heterogeneous sample point out the indispensable role that members of a particular species played in log trade. The horse, mule, and barren cow appear in minor numbers that cannot compete with the two other non-human workers: the ox and the donkey. Among the two, the former mastered agricultural tasks, and the latter was more helpful in log trade. The 108 households that traded logs and kept donkeys annually earned nearly 553 kuruş on average from their exhausting occupation, whereas their average overall income per year remained at 1207 kuruş. The 96 households that traded logs and kept oxen, receiving an average overall annual revenue of 1310 kuruş, earned 546 kuruş from this occupation. Log traders with donkeys profited more from their trade, even though they were less wealthy than log traders with oxen. The sample villages from the three registers classified eleven households as pure "log traders"[99] but not farmers, and all of them kept donkeys. The only pure log trader who fed oxen was Sağır oğlu Hasan from the village of Kemer's Belenli. He had recently returned to his village from Teke that year, which could be the reason why he did not cultivate crops although

99 *Hatabçı* in registers no. 10200 and 10572 and *oduncu* in no. 10201.

he had three oxen and some non-cultivated fields.[100] Apart from the last exception, carrying firewood and timber seemed to be a job for donkeys rather than oxen in Kemer and Tefenni.

TABLE 3.9 Log trading households and their non-human workers

household	number of households	oxen	donkeys	barren cows	horses and mules	total revenue from log trade (kuruş)	average revenue from log trade (kuruş)	average annual revenue (kuruş)
with oxen	96	199 (including 9 buffalo oxen)	170	51	39	52,410	545.94	1310.14
with donkeys	108	190 (8 buffaloes)	193	52	40	59,710	552.87	1207.07
with barren cows	49	95 (5 buffaloes)	86	55	16	24,140	492.65	1234.45
with horses and mules	38	72 (2 buffaloes)	55	16	42	27,100	713.16	1609.63[101]
overall	112	199 (9 buffaloes)	193	55	42	60,860	543.39	1216.88

Today, it is mainly the Taurus cedar and Anatolian Black pine that dominate forests around Tefenni.[102] *Cedrus libani* can reach a height of twenty-

100 The note indicated, *Teke'den karyesine bu sene gelmiş.* Hasan also kept a pair of donkeys, a pair of cows, as well as some sheep and goats. See the third household on the third row in OA. ML.VRD.TMT.d 10201: 17.

101 The limited data that less than forty households offered and relatively higher costs of keeping horses may explain the exceptionally high average annual revenue of log traders with workhorses and mules. Not all peasants would afford to keep these non-human animals with selective diet. Taking the scale to the whole sample, the average annual revenue of 238 households with horses and mules was 1461.41 kuruş, much higher than the sample average of 1014.16 kuruş. Keeping horses signaled favorable socio-economic conditions in nineteenth-century Anatolia.

102 Şükran Oğuzoğlu and Mustafa Avcı, "Natural Enemies of *Cinara Cedri* Mimeur 1936 (Hemiptera: Aphididae) in Cedar Forests in Isparta Regional Forest Directorate," *Kastamonu University Journal of Forestry Faculty* 19, no. 2 (2019): 175.

six meters and a diameter at breast height of forty-two centimeters.[103] Tree samples that scholars took from the region show an average diameter of thirty-five centimeters for *Juniperus*[104] and around forty centimeters for both the Brutian pine and Black pine.[105] These findings from forestry literature suggest that most trees within the nineteenth-century Hamid district would rarely have trunks as thick as oaks and chestnuts have.

According to the temettuat registers of Tefenni and Kemer, donkeys played the chief role in carrying firewood from the forest to the village and elsewhere. The relatively smaller bodies of donkeys gave them the advantage of maneuverability.[106] In the forest, peasants would carry logs on their shoulders and gather them in a particular place where donkeys awaited.[107] The size of the logs in the Lakes Region was presumably enough to be carried in sacks or baskets. In different parts of the Ottoman Empire, peasants involved in the log trade commonly preferred to work with oxen and make them drag huge and heavy logs.[108] If the forests of the Hamid district had bigger and thicker trees, peasants would look for carriers stronger than donkeys. Yet, the data suggest that donkeys took the oxen's log-carrying job in Konya's Kemer and Tefenni in the nineteenth century. A folktale narrated by a twentieth-century peasant from Elmalı's Yalnızdam village, Mehmed Ertuğrul, verifies the finding. The main character in the tale is an old logger (*ihtiyar oduncu*), who collects

103 Nikola Zsolnay, Anna Walentowitz, and Gregor Aas, "Impact of Climatic Conditions on Radial Growth of Non-Native Cedrus Libani Compared to Native Conifers in Central Europe," *PLoS ONE* 18, no. 5 (May 12, 2023): 4.

104 Ayse Betül Avci and Nebi Bilir, "Variation in Essential Oil Content and Composition of Crimean Juniper (Juniperus Excelsa) Berries during the Growth Periods," *Journal of Essential Oil Bearing Plants* 17, no. 3 (2014): 479.

105 Ramazan Özçelik et al., "Development of Ecoregion-Based Merchantable Volume Systems for Pinus Brutia Ten. and Pinus Nigra Arnold. in Southern Turkey," *Journal of Forestry Research* 27 (2016): 105.

106 Tok, "From Wood to Coal," 45.

107 Akgül Kovankaya, "Negotiating Nature," 161.

108 In Kocaeli, peasants needed water buffaloes, a stronger cattle species than the Anatolian taurus, to undertake their log trade. See Çelik, "'It's a Bad Fate,'" 111–33.

firewood in the forest every day, loads it on his donkey, and sells it in the market to earn his living.[109] Apparently, the donkey's role in log trade had left its mark around the Taurus Mountains. Peasants like Uğurlu oğlu Osman might still think about taking their ox carts to the forest, but everyone would know that it was only an occasional task for oxen to carry firewood in Konya. Woodcutting was a complementary occupation for most farmers in Konya, and the oxen presumably shared their human owners' perception regarding log trade.

§ 3.7 Opium

The nineteenth-century village of Elmacık stood out from other villages in Kemer-i Hamid in many ways. Most residents of Elmacık must have been proud of the significant presence of pious people in their village. İmam Muhammed Ali Efendi, Halil oğlu Hacı İsmail, Molla Süleyman oğlu Abdülcelil, Hacı Bekir oğlu Muhammed and Osman, Hacı oğlu Osman and Mustafa, Hatib oğlu İshak and Yusuf should have been deepening the religious knowledge and faith of their neighbors on every occasion. Apart from the religious titles in their names, another common point of these nine households was opium cultivation. If the abundance of pious people was a distinctive trait of the Elmacık village, another marker was the great volume of opium production, and the intersection of these two distinctive properties in the same households was not rare. Indeed, Molla Osman oğlu Yusuf was the only household representative in the village who bore a religious title but did not have an opium field. It is impossible to know why Molla Yusuf distanced himself from this agricultural product. Apparently, most of his neighbors did not share Yusuf's position. Meanwhile, it is equally impossible to know exactly how opium cultivators in Elmacık made use of their non-human workers for raising this specific product used for medical or maybe recreational purposes.

The opium poppy was a popular crop in nineteenth-century Konya. Opium poppies favor light and clayey soil. They do not want humidity

109 Hüsnü Yıldız, "İhtiyar Oduncu," *Türk Folklor Araştırmaları* 8, no. 174 (Jan. 1964): 3268.

during the later phases of their growth. The karstic terrain and semiarid climate in the Lakes Region perfectly meet the requirements for beneficial opium harvests. Opium poppies give flowers in late spring. In June or July, poppies lose their petals and turn into bare capsules (called *topalak, topak*,[110] *kelle,* or *kobalak*). Once a white-colored dust covers the capsule, the harvest takes off.[111] Weather conditions have a significant impact on opium cultivation not only during the growing of poppies but also during the harvest. In the nineteenth century, many farmers would avoid rainy, windy, foggy, and even cloudy weather[112] because they regarded quality and could not bear a single drop going in vain. Peasants would use particular blades to cut slashes on the capsules. During the incision, capsules would give their "milk" (*süt*) in little drops, which was raw opium indeed.[113] The operation could take about two weeks because capsules in the same field did not ripen at the same time. A competent laborer could gather nearly half a kilogram of raw opium latex in a single workday. The average yield would remain at ten to twenty-five kilograms per hectare.[114] Along with the products from Afyonkarahisar, Burdur's opium occupied the second place in the Ottoman market in terms of quality. Morphine constituted 11.5 to 12 percent of the opium raised in Burdur.[115] Many farmers in Kemer-i Hamid carried out the laborious but lucrative tasks of opium production. The temettuat scribes recorded each opium plot (*afyon tarlası*) as a separate unit with its own acreage and yield information different than the cultivated field (*mezru tarla*) reserved for

110 Burak Çıtır, "Osmanlı'dan Cumhuriyet'e Türkiye'de Afyon Ziraati ve Ticareti (1900-1939)" (M.A. Thesis, Sakarya, Sakarya Üniversitesi, 2015), 23.

111 Filiz Çolak, "Anadolu'da Afyon Ziraatı ve Ticaretine Dair İzlenimler," *The Journal of Academic Social Science Studies* 6, no. 1 (Jan. 2013): 516.

112 Çıtır, "Osmanlı'dan Cumhuriyet'e," 24.

113 Çolak, "Anadolu'da Afyon," 516.

114 "The Cultivation of the Opium Poppy in Turkey," *Bulletin on Narcotics*, Jan. 1950, United Nations Office on Drugs and Crime.

115 Harvests from Isparta, Uşak, Zile, Tokat, and Gümüşhacıköy represented first quality because their morphine level could attain 15 percent. See Çıtır, "Osmanlı'dan Cumhuriyet'e," 32.

cereals. Alongside the terrains that farmers reserved for growing poppies, registers also noted farmers' tithe payments for producing raw opium.[116]

In the sample from Kemer, register no. 10200 recorded that some households[117] in the villages of Elmacık and Kozluca, as well as the farm called Kayı, had plots for opium poppies and paid tithe for opium harvest. This micro-sample of opium cultivators had fifty-six households with opium plots. The latter represented more than thirty percent of the 185 households in the mentioned settlements. Twelve among the twenty-three households in Kayı cultivated opium, whereas opium cultivators represented only thirteen percent of the peasants living in Kozluca. The example of the Elmacık village stood out from the other two examples because the farmers of this village apparently specialized in opium production. The ratio between household numbers and cereal tithes in Elmacık and Kozluca remained constant at around 3.6. A broad comparison reveals that Kozluca was 2.6 times more crowded than Elmacık, and farmers of Kozluca produced 2.6 times more grains than their neighbors in Elmacık. Yet, proportions completely reversed when it came to opium production. Farmers of Elmacık reserved twenty-four dönüm of land for raising opium poppies, while the total acreage of opium plots was only 13.5 dönüm in Kozluca. As a marker of yields, farmers of Elmacık had paid 245 kuruş of tithe for opium in 1844, whereas opium cultivators in Kozluca had paid only 133 kuruş. Twenty-seven households that grew opium poppies in Elmacık had turned their village into a hub of opium harvest.

116 By 1837, two years before the Tanzimat Edict and three years before the first temettuat survey, the Ottoman government had renewed its intention to register the amount, location, and payers of the collected opium tithes, reserving a kuruş for each *çeki* (probably around 760 grams) for the nominated collector. See OA. MŞH.ŞSC.d 5211, 29 Zilhicce 1265 (15 Nov. 1849): 47. For the measure unit *çeki*, see Cengiz Kallek, "Çeki," in *TDV İslâm Ansiklopedisi* (İstanbul: TDV İslâm Araştırmaları Merkezi, 1993).

117 In the village of Akviran, İbrahim oğlu Ahmed represented the only household that cultivated opium. See household no. 3 in OA. ML.VRD.TMT.d 10200: 28.

TABLE 3.10 Opium cultivators in Elmacık, Kozluca, and Çiftlik-i Kayı

village	number of households	number of opium cultivators	total annual tithes for cereals (kuruş)	total annual tithes for opium (kuruş)	total acreage of opium fields (dönüm)	average annual income (kuruş)
Çiftlik-i Kayı	23	12	1412	99	11.5	1174.35
Elmacık	35	27	2672	245	24	1220.66
Kozluca	127	17	9585	133	13.5	1351.89
TOTAL	185	56	13,669	477	49	

The temettuat scribes supposed that each dönüm of opium poppies brought ninety kuruş in the harvest time (and half a dönüm would accordingly bring forty-five kuruş). The sum of 2160 kuruş that the register estimated to contribute to the annual budget of opium cultivators in Elmacık remained incomparable with scores from cereal production. The gross harvest of the village's farmers from grain fields was nearly twenty-seven thousand kuruş. Though relatively more specialized than other villages, opium production in Elmacık could only be a source of additional income for cultivators. They earned most of their revenues from cereal production, as farmers in the neighboring villages did. All opium cultivators were farmers, including the religious leaders of the Elmacık village and the Kayı farm, who both cultivated grains and opium at the same time.[118] Opium poppy cultivation was a secondary occupation for farmers in Konya.

118 Molla Muhammed oğlu Yusuf Efendi in OA. ML.VRD.TMT.d 10200: 38 and İmam Muhammed Ali Efendi in OA. ML.VRD.TMT.d 10200: 45.

TABLE 3.11 Opium cultivators in the village of Elmacık

	opium cultivators	village total
number of households	27	35
total annual tithes for cereals (kuruş)	2368	2672
total annual tithes for opium (kuruş)	245	245
total acreage of opium fields (dönüm)	24	24
total acreage of grain fields (dönüm)	1290	1485
total annual output from grain fields (kuruş)	24,276	27,715.5
total annual output from opium fields (kuruş)	2160	2160
total annual income from trade (kuruş)	6988	10,838

Among fifty-six households with opium fields in the whole sample, forty-two received revenues from trade. The total annual trade income of forty-two opium-cultivating households was more than 18 thousand kuruş. This sum made a substantial part of their total revenues of 61 thousand kuruş. On average, trade revenues made 30.81 percent of the total yearly earnings of each household. The register did not detail the commodity they exchanged further but simply marked "income from his commerce" (*ticareti temettuatı*) at the bottom of each household's entry. One can only guess that at least a portion of this commercial activity concerned their opium harvest.

TABLE 3.12 Opium cultivators with trade revenues

number of households	115
total annual tithes for cereals (kuruş)	3439
total annual tithes for opium (kuruş)	375
total trade revenues (kuruş)	18,635
total annual output from grain fields (kuruş)	37,223.5
total annual income (kuruş)	61,342

Wheat roots grow down into the soil deeper than 150 centimeters[119] whereas opium poppy roots cannot reach deeper than thirty centimeters.[120] Opium poppies certainly did not demand a deep plowing as the wheat demanded. Furthermore, the size of the opium plots was only a few dönüm. Therefore, cultivators would simply hoe the soil of their opium plots in a day or two, without using a plow or oxen. Did opium cultivators need non-human assistants to raise this extraordinary plant that underwent operations as delicate as the incision? It is nearly impossible to grasp the marginal contribution of each type of non-human worker in opium cultivation. However, there should be no coincidence in the presence of 4.05 non-human workers on average per opium-cultivating household. Sometimes, they kept a single pair of oxen (like Molla Hüseyin oğlu Gebeş Ahmed)[121] or a barren cow, a donkey, and a barren mare (like Kula oğlu Muhammed),[122] but they all indeed kept work animals. Except for the latter peasant, Muhammed, all opium-cultivating households kept oxen. Fifty households kept donkeys. Meanwhile, forty-nine households kept both donkeys and oxen in the same barn. There might be a division of labor between these two types of non-human workers. The ox was better at plowing and producing manure, and the donkey was faster at carrying light stuff. They would not undertake the same work, yet at least some of these non-human laborers probably contributed to opium cultivation in the villages of Kemer-i Hamid. Even if the oxen participated in the preparation of the opium plots in Konya, everyone would know that it was a secondary occupation for them. As their human owners' first profession was grain farming, the main field of experience of these oxen was plowing grain fields.

119 "Buğday Yetiştiriciliği," *Agrowy*, accessed June 5, 2025, https://agrowy.com/bitki-yetistiriciligi/bugday-yetistiriciligi.

120 "Haşhaş Üretimi," *Organic Group*, accessed June 5, 2025, https://organicgroup.eu/?336/detay/hashas-uretimi.

121 Household no. 21 in OA. ML.VRD.TMT.d 10200: 50.

122 Household no. 6 in OA. ML.VRD.TMT.d 10200: 56.

TABLE 3.13 Opium-cultivating households and their non-human workers

households	number of house-holds	oxen	don-keys	barren cows	horses and mules	total opium tithes (ku-ruş)	average opium tithe (ku-ruş)	average annual revenue (kuruş)
with oxen	55	117 (including 9 buffalo oxen)	58	22	27	466	8.79	1429.53
with donkeys	50	102 (6 buffaloes)	59	21	23	430	8.96	1408.02
with barren cows	23	22 (2 buffaloes)	21	23	13	195	8.48	1474.26
with horses and mules	25	52 (6 buffaloes)	22	13	28	198	8.25	1541.64
overall	56	117 (9 buffaloes)	59	23	28	477	8.83	1435.96

§ 3.8 Tragacanth Gum

In late spring, Odabaşı oğlu Musa's son İbrahim would set out for the hills and valleys around the village of Böbekler in search of a particular spiky plant. If he ran into shepherds, he would ask them if they had seen any astragali. If there were a cluster nearby, they would watch İbrahim taking out a knife and scratching the plants. Before leaving, maybe he would warn the shepherds not to burn the bushes around the astragali he scratched. Then, he would leave and return there only weeks later. Tragacanth gum trade had contributed to Musa's household economy in 1840.[123] After Musa died in 1849,[124] his twenty-year-old son might have continued practicing this authentic trade he presumably learned from his father.

Temettuat register no. 10201 shows exceptional characteristics in terms of form and content. The scribes of the first temettuat survey in Kemer-i Hamid issued a register that bore no resemblance to the registers of the second survey. The lack of a strictly standardized form in 1840

123 See the first household on the fifth row in OA. ML.VRD.TMT.d 10201: 11.

124 OA. MŞH.ŞSC.d 5212, 29 Zilhicce 1268 (14 Oct. 1852): 23.

allowed the scribes to note interesting details that were going to disappear in 1845. The scribes of the 1845 survey turned most peasants' occupational revenues into simple "trade" revenues. Meanwhile, the register of the first survey gave place to an uncommon source of income that the scribes of the second survey completely neglected. Register no. 10201 inscribed that 118 households earned income from tragacanth gum in the villages of Kozluca, Böbekler, Elmacık, Akçaviran, Kozca, Çavdır, Belenli, Kulağuzlar, Bademli, and Mürseller. On the other side, register no. 10201 did not clarify how much each source of income contributed to a household's total revenues. More than a quarter of the 469 households in these villages register no. 10201 recorded earned revenues from tragacanth gum; nevertheless, it is not possible to calculate the actual sum that this specific product brought to the peasants who collected and sold it.

The astragalus plant (*geven* in Turkish) grows in highlands with arid climates. Its leaves are in the form of spines, minimizing water consumption. People would burn this plant to start a fire or pound its stem to enrich cattle fodder.[125] They also extracted from astragali the gum that the Ottomans called *kitre*. In late spring, peasants would scratch the plant's stem with a special blade and wait for more than a week before collecting the solidified sap.[126] In a document from 1910, the Minister of Finance explained that the astragalus sprouted either in forests or agricultural fields.[127] The inexistence of specific plots reserved for this plant in the registers indicates that there were no particular places for villagers in nineteenth-century Kemer-i Hamid to extract tragacanth. Besides,

125 M. Sıtkı Kıvçak, "Astragalus - Geven," *İstanbul Üniversitesi Orman Fakültesi Dergisi* VI, no. 1 (1956): 76–77.

126 Banu Kadıoğlu, Sibel Kadıoğlu, and Yasemin Turan, "Gevenlerin (Astragalus Sp.) Farklı Kullanım Alanları ve Önemi," *Alinteri Journal of Agriculture Science* 14, no. 1 (2008): 20.

127 The document is about tax impositions on tragacanth. The Minister's motive in stating details about the growing place of the astragalus plant was to underline the difficulty of imposing tithes for tragacanth during collection. Moreover, the existence of a tithe for forest products posed additional confusion. An alternative way for the ministry would be collecting the tragacanth tithe during the product's transfer in towns and cities. See OA. Maliye Nezareti Emlak-i Emiriyye Müdüriyeti (ML.EEM) 781/72, 25 Kanunusani 1325 (7 Feb. 1910).

farmers would not consider devoting their land to this eccentric herb instead of popular cash crops. Tragacanth gum traders probably collected it either from forests or barren steppe lands. A twentieth-century tragacanth gum collector from Burdur, Kemal Pala, stated in an interview from 1974 that their work started in June, but July and August defined the most productive period to collect the material that he called "astragalus honey" (*geven balı*). If an area with dense astragali clusters remained inside a neighboring village's meadow, the collectors would rent the field. Pala added that he had left a part of his family in the village, who would take care of their wheat and barley harvest.[128] Apparently, the twentieth-century peasant's household had both the time and workforce needed to pursue their grain production and tragacanth gum collection at the same time. Nevertheless, the gum collection's overlap with the grain harvest and threshing period would pose a serious problem for a peasant household with fewer members.

The register classified the tragacanth gum trade as the only source of income for thirteen households. Even though nine of them had either fields under cultivation or dairy cows, which would certainly bring them a certain financial profit, the scribes preferred to mark that their sole source of income was the tragacanth gum (*kitreden*). The total yearly revenues of these thirteen households were 4300 kuruş, with an average of 330.77 kuruş per household. According to the records in register no. 10201, people in the villages mentioned above earned 635.5 kuruş on average. The annual income average falls to 530 kuruş among the 118 households with revenues from tragacanth. An average yearly income as low as 330 kuruş for supposedly full-time tragacanth collectors points to a socio-economic reality behind this occupation. The same tendency shows itself in terms of field acreage. Whereas the sample average for cultivated land per household was thirty-two dönüm, the acreage falls below twenty-one dönüm for households with tragacanth income, and it becomes as low as twelve dönüm for the thirteen households with only revenues coming

128 Mustafa Kuttaş, "Gevenciler ve Geven Otu," *Türk Folklor Araştırmaları* 16, no. 309 (Apr. 1975): 7292–93.

from tragacanth. Collecting and trading tragacanth gum was not the most prestigious work in nineteenth-century Konya. The exceptional information that the register offers endorses this assumption. Register no. 10201 gives details about the wealth of each household by indicating each asset with its estimated value. According to this information, the average wealth in the villages above was almost 3800 kuruş. The possessions of households involved in the tragacanth trade were valued at 2889 kuruş, while the thirteen households with only tragacanth revenue had an average wealth of 1625 kuruş. If peasants did not have vast fields to plow or a crowded cattle herd to take care of, only then they would have the time and motivation to look for astragalus plants in the forests and on the hills.

TABLE 3.14 Tragacanth-trading households and their non-human workers

households	number of households	average wealth (kuruş)	average annual revenue (kuruş)	cultivated land size (dönüm)	oxen	donkeys	horses or mules
with tragacanth income	118	2888.81	529.66	20.64	135	147	51
with only tragacanth income	13	1625	330.77	12.2	11	8	8
sample from the register	469	3799.91	635.49	31.99	727	674	258

Seeking astragali to scratch in early summer and harvest a few weeks later presumably required long travels under the sun. The temettuat register supposes that peasants were not alone in these excursions. Only two households among 118 did not have a single non-human worker. On average, 3.16 non-humans worked for each household with revenues from tragacanth trade. Still, one can only guess which animals joined a peasant on a journey to scratch plants and extract their sap. The oxen per household ratio was as low as 1.14 among tragacanth collectors. If they all had a pair of oxen, fewer peasants would persist in the tragacanth trade because they would prefer focusing on raising crops. Hence, the relatively

low oxen presence parallels the lower markers of wealth for tragacanth traders. Tragacanth collectors did not have a specific non-human companion preference. As astragalus essence would not overload any work animal, different types of non-human workers could assist sap collectors in their voyages. In the village of Elmacık, it was a workhorse that assisted Hacı Bekir oğlu Hüseyin in seeking astragali. This occupation was Hüseyin's only source of income, bringing him annually 250 kuruş according to the entry in the register. The horse was Hüseyin's only possession, and its value of 450 kuruş represented Hüseyin's whole wealth.[129] Ömer oğlu Mehmed's horse in Kozluca was also the only possession of this tragacanth collector. The register noted that Mehmed's companion's value was 400 kuruş, and their occupation annually brought 150 kuruş to the household.[130] It is almost certain that Hüseyin and Mehmed harvested tragacanth with the assistance of their workhorses.

Non-human assistants of other tragacanth collectors in Kemer are not easy to guess. The scribes of the first temettuat survey noted that Karaoğlan oğlu Mustafa in the village of Kozluca earned 550 kuruş totally from tragacanth trade.[131] Why would he keep such comprehensive livestock, including a pair of oxen, a cow, a bullock, a workhorse, and a donkey, if his only occupation was extracting tragacanth in June? According to the scribes of the second survey, Karaoğlan oğlu Mustafa's assets included cultivated and uncultivated fields of forty dönüm, a single-dönüm opium field, a pair of oxen, a workhorse, and a donkey. The register from 1845 noted that Mustafa was a farmer with 1510 kuruş annual income, earning 700 kuruş from log trade.[132] A similar confusion appeared for Hacı Bekir oğlu Osman in Elmacık. According to the register from 1840, Osman only had a pair of oxen and a pair of donkeys, two pairs forming a wealth of 650 kuruş. The same register noted that Osman's only source of income was the tragacanth trade that annually brought 300 kuruş.[133] The

129 The second household in the fourth row in OA. ML.VRD.TMT.d 10201: 13.

130 The third household in the seventh row in OA. ML.VRD.TMT.d 10201: 5.

131 The third household in the second row in OA. ML.VRD.TMT.d 10201: 7.

132 Household no. 83 in OA. ML.VRD.TMT.d 10200: 72.

133 The last household in the third row in OA. ML.VRD.TMT.d 10201: 13.

scribes of the second temettuat survey added to Osman's possessions fields of forty dönüm, a single-dönüm garden, and a single-dönüm opium plot. The register from 1845 recorded that Osman's household yearly earned 1095 kuruş, of which 300 came from log trade.[134]

Which register reflected the truth? Did tragacanth trade stand for Mustafa and Osman's single source of income? Or, were they indeed farmers with secondary revenues from log trade? These questions do not have easy answers. Yet, data is sufficient to underline the crucial role that non-human workers played in different economic activities in the villages of Kemer. According to official statistics, the Ottoman Empire exported nearly 160 tons of tragacanth gum to European countries in 1897.[135] This natural thickening agent served as an ingredient in cures, foods, textiles, paints, and glues.[136] Many households in Kemer traveled throughout the karstic landscape under summer heat to extract and collect this valuable product from astragalus plants. The collectors were not alone in their expeditions as they enjoyed the assistance of either an ox, a horse, a mule, or a donkey. Since tragacanth trade required high mobility instead of carriage power, the ox probably was not the best non-human companion for this job. The primary profession of the oxen in Konya was plowing, and most sap collectors would indeed prefer plowing vast grain fields with these strong non-human workers instead of looking for spiky bushes in the steppes. The tragacanth gum trade was an occupation that the poorest strata of peasants in Kemer practiced to supplement their revenues. Such a practice had no resemblance to grain production, and therefore it did not appear in the agenda of the oxen in Konya. It is understandable that the latter did not leave a substantial trace regarding their participation in the search for astragali.

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134 Household no. 12 in OA. ML.VRD.TMT.d 10200: 48.

135 Erhan Kılıç, "Arşiv Belgelerine Göre Osmanlı'da Odun Dışı Orman Ürünleri" (4th International Non-Wood Forest Products Symposium, Bursa: Bursa Technical University Faculty of Forestry, 2018), 517.

136 Shadpour Mallakpour, Farbod Tabesh, and Chaudhery Mustansar Hussain, "Potential of Tragacanth Gum in the Industries: A Short Journey from Past to the Future," *Polymer Bulletin*, no. 80 (2023): 4645.

§ 3.9 Conclusion

The continental climate that reigned over most parts of the Anatolian plateau marked the Province of Konya. There was considerable ground for agricultural activities on a landscape where karstic formations and extensive plains cohabited. Rivers and lakes would compensate for low humidity. These environmental characteristics of the province maintained their general dominance in the district of Hamid, with the peculiar influence of a mild climate coming from the south through the Taurus Mountains.

Cereal cultivation was the most prominent occupation of the people in the villages of the district of Hamid. Peasants raised grains with their oxen, whom they kept in pairs. The yield households received during the cereal harvest made up more than half of their yearly income. Moreover, there were 2.05 oxen per farmer household in the chosen sample. The low population density and the topographic conditions of the Anatolian plateau gave farmers of Hamid the precious opportunity of cultivating lands as vast as forty dönüm on average. If a pair of oxen could till three to four dönüm per day,[137] farmers of Tefenni and Kemer needed two weeks for a single tour of plowing on their fields. A good tillage work from different directions would take months with the simple wooden symmetric plow of Anatolian *karasaban*. In the remaining time, farmers in Konya's Hamid district would chop down cedars and junipers in the forest and carry the logs kilometers away with oxen or donkeys to sell them in villages or nearby markets. In the meantime, they would take care of their little plots of vineyards, kitchen gardens, and orchards, once again, with the assistance of non-human workers who probably carried their stuff to the market. In summer, the rush for harvesting grains, vegetables, fruits, opium, or tragacanth gum would mobilize every human and non-human agricultural laborer for nights and days.

If watering opportunities set the upper limit of productivity, it was reasonable that farmers of a semiarid region received an output as

137 Güran, *19. Yüzyılda Osmanlı,* 97.

modest as twenty-one kuruş per dönüm. The efforts of the Bozçay River would fall short of thoroughly modifying the microclimate that prevailed over the villages in the sample. Hence, oxen's efforts to scratch the plateau's surface with simple plows played the leading role in grain harvest. Temettuat registers failed to expose the labor that non-human workers offered in various occupations such as log trade, opium harvest, tragacanth gum collection, or garden cultivation. They also concealed how the oxen's marginal contribution decided the acreage of cultivation in the endless plains of central Anatolia. As Keyder and Pamuk accurately point out, in a region with considerable land availability, the number of oxen traced the upper limit of agricultural production.[138] The scribes who prepared the temettuat registers of Konya simply noted the number of oxen without emphasizing their vital role for farmer households. In fact, these bare numbers are rare and precious traces of the oxen from mid-nineteenth-century Konya.

138 Keyder and Pamuk, "1945 Çiftçiyi Topraklandırma," 60-61.

TABLE 3.15 General data from the sample of Konya

register no.	house-holds	farmer house-holds	cultivated land size per farmer (dönüm)	annual gross grain product per farmer (kuruş)	annual grain yield per dönüm (kuruş)	oxen	oxen per farmer	annual income per resident (kuruş)	annual yield per pair of oxen (kuruş)	cultivated land size per pair of oxen (dönüm)
10200	356	281	39.07	845.39	23.38	542	1.93	1187.31	876.59	40.52
10201	144	110	44.99	-	-	260	2.36	757.99	-	38.07
10572	277	229	35.51	574.65	19.35	471	2.06	1097.20	558.79	34.53
TOTAL	777	620				1273				
AVERAGE			39.86	710.02	21.36		2.05	1014.16	779.37	37.80

4

Traces of Oxen in the Province of Edirne

The mid-nineteenth-century province of Edirne included various geographical settings that prevailed over different settlements around the Thracian peninsula. The subdistrict of Midye, settled in the middle of thick forests, lay on the Black Sea coast. The abundance of forests and numerous ports at a distance of only a few hours from the imperial capital made the subdistrict a charcoal hub in the eyes of the Ottoman bureaucracy. Most peasants in Midye toiled at the same time as coal carriers and grain producers. Sometimes strict imperial orders and sometimes their debts to merchants would force these peasants to abandon their occupations as individual farmers for a few days, if not weeks, and go collecting firewood and charcoal in the forests. Either in the grain fields or on the short journey from forests to the nearby port, pairs of oxen assisted peasants in undertaking the heaviest operations of grain farming and charcoal transfer.

The subdistrict of Akçakızanlık remained in the inner part of Rumelia, on a valley with fertile plains. Among various alternative occupations, grain farming kept its prominent place in the economic survival of the peasants both in Kızanlık and Midye. However, unlike in Midye, most peasants in Kızanlık would hardly know how to produce charcoal from fresh-cut logs without burning the whole forest. The most distinctive

agricultural occupation in the villages of Kızanlık was rose cultivation. In June, peasants of Kızanlık would rush into their grain fields and rosaries to harvest cereals and roses in a limited time span of a few weeks. The oxen, the irreplaceable non-human workers of grain farming, did not have a place in rosaries. Nevertheless, peasants of Kızanlık kept pairs of oxen since most households produced cereals and roses simultaneously.

The land availability in the Province of Edirne could not compete with the Province of Konya. On the other hand, Konya's arid soil could not compete with the high productivity of Edirne's agricultural lands watered by numerous rivers and more frequent precipitations. Mid-nineteenth-century farmers of Edirne could generate a considerably better harvest from a single acre of land than a farmer in Konya would. The relatively limited land availability and higher yields encouraged many farmers in Edirne to lease additional plots, even from different villages, to increase the acreage of their cereal harvest. The oxen in Edirne would walk with their human owners to pull the plow in different fields, carry firewood, or drag a cart loaded with hay or straw throughout the year.

§ 4.1 An Untimely Corvée Work



FIGURE 4.1 Map of the Province of Edirne. The blue spot marks the location of the Midye subdistrict and the green spot marks the Filibe district. SOURCE: Mehmed Nasrullah, *Memâlik-i Mahrusa-i Şâhâneye Mahsus Mükemmel ve Mufassal Atlas* (1325 [1909]).

In the nineteenth century, the Province of Edirne covered a historically and economically significant region[1] that included the districts (*sancak*) of Edirne, Kırk Kilise, Tekfur Dağı, Gelibolu, Dedeağaç, Gümülcine, Filibe, and İslimye. The province was part of the historical regions called either

1 Köksal underlines that the province was "well integrated into the world economy." See Yonca Köksal, *The Ottoman Empire in the Tanzimat Era: Provincial Perspectives from Ankara to Edirne* (Routledge, 2019), 124.

Thrace, Rumelia, or Ottoman Europe (*Avrupa-yı Osmani*). While districts of Dedeağaç and Gümülcine had coasts on the Aegean Sea (then called *Adalar Denizi* - the Sea of Islands), Gelibolu had coasts both on the Aegean and the Marmara, and Tekfur Dağı had a coast on the Marmara Sea. The Meriç River (also called Maritsa or Evros), with its major tributaries Arda, Ergene, and Tunca, flowed through the region. The Balkan mountain range and the Rhodopes shaped the topography and all human activities flourished on it. Istranca in the north and Koru in the south, mountains separated the inner parts of the province from the seas. The province included humid coastal regions, as well as inner areas with a continental climate. The variety of climatic conditions might have protected Edirne from the deadly consequences of the central Anatolian drought of the 1840s. When "the harvest in most Ottoman provinces did not show prosperity and abundance" in 1839, the drought had given its initial signals.[2] The Province of Edirne remained outside the drought's reach. The Ottoman administration ordered the direct and immediate transfer of any extra grains in Edirne's Akçakızanlık subdistrict to Istanbul, without selling a single grain seed elsewhere (*bir habbesi ahire verdirilmeyerek doğruca Dersaadet'e sevk ü irsal kılınacağı*). The biggest need was the five particular types of wheat, barley, and corn, the "necessary ingredients of bread."[3] Six years later, Edirne's immunity from the drought remained intact. Brief notes from local administrators show that the drought of 1845 caused severe losses in agricultural products in the Aegean islands of Midilli (Lesbos), Sakız (Chios), Bozcaada (Tenedos), and İmroz (Imbros).[4] Had the drought advanced a few dozen kilometers further north, it would have threatened the districts of the Province of Edirne. Throughout the

2 The document reported the situation as follows: *bu sene-i mübarekede memalik-i mahruse-i şahanenin ekser mahalleri mahsulatında feyz ü bereket runüma olmayup…* See OA. Ali Emiri Mahmud II (AE.SMHD.II) 91/7554, 25 Ramazan 1255 (2 Dec. 1839).

3 The scribe defined these cereals as follows: *nan-ı azizin ecza-yı lazımesinden bulunan hınta ve şair ve çavdar ve kokoroz ve darı misillü beş nevi zehair.* See OA. AE.SMHD.II 91/7554.

4 OA. A.MKT 29/30, 15 Şevval 1261 (17 Oct. 1845).

1840s, farmers of Edirne probably never experienced a loss in their harvest as serious as farmers of Konya experienced.

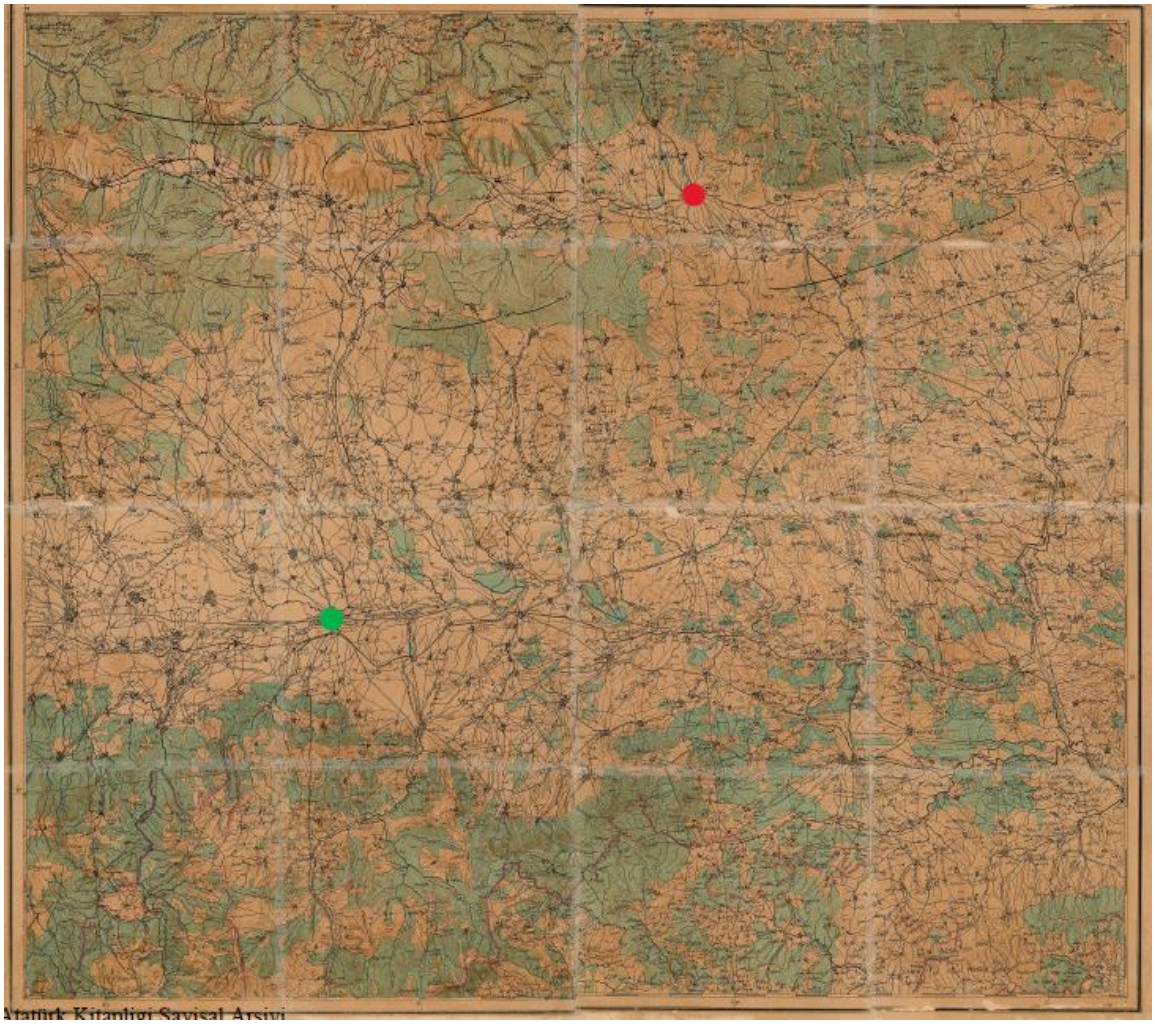

FIGURE 4.2 Map of the northern part of the Province of Edirne. The red spot marks the location of the Akçakızanlık subdistrict and the green spot marks the Filibe district. SOURCE: Map from İBB Atatürk Library archive, HRT 11054 in Fahreddin Türkkan Paşa Collection.

Even the indirect consequences of the drought caused grave concerns among peasants of mid-nineteenth-century Edirne. The fluctuation of temperatures in the 1840s later turned into "charcoal famines." The charcoal production could not respond to the increasing demand in the

Ottoman Empire, as the dry weather caused extremely cold winters.[5] The charcoal boats that Scottish traveler Charles MacFarlane saw arriving in the Golden Horn in the midst of a profound coal deficit in winter 1848[6] might have sailed from the Edirne province. Some villages on Edirne's coast to the Black Sea were responsible for the empire's charcoal production. Called *kömürkeş* (coal carrier), peasants in these villages regularly headed to the nearby forests and then the closest port to meet the requirements of the imperial administration.[7] Coal-carrying peasants were also grain producers and pursued both occupations at the same time. Their oxen played an indispensable role both in farming and charcoal transfer. Indeed, coal-carrying farmers and oxen in Edirne had "interwoven fates"[8] since they worked together throughout the year for plowing grain fields, threshing the harvest, and carrying charcoal. Human and non-human coal carriers would share the same stress upon Istanbul's coal demands.

Demands arrived in increasing numbers during the charcoal deficits following the mid-nineteenth-century drought. In February 1848, the winter season and the absence of suitable boats appeared as the immediate reasons that interrupted the transfer of coal waiting packed on the shores of Midye.[9] By May, it turned out that the cessation of the transfer was not only about maritime issues. While the log stock was still waiting on the shore, the administrative head of Midye (*kaza müdürü*), Elmas Ağa, had been forcing peasants to cut more trees and keeping them from their primary occupation, the charcoal trade. While Elmas Ağa continued to stock logs, he was indeed delaying the previously ordered shipments from Midye. The imperial army had demanded 4.5 thousand tons of

5 Çelik, "Scarcity and Misery," 96.

6 Charles MacFarlane, *Kismet, or the Doom of Turkey* (London, 1855), 171.

7 Exemption from certain taxes or symbolic payments upon delivery cannot conceal that the imperial administration forcefully mobilized these peasants for the required job. Assessing the log carriers (*kerestekeşan*) in Kocaeli, Çelik clearly emphasizes the corvée character of the work. See Çelik, "'It's a Bad Fate,'" 112.

8 Çelik, "'It's a Bad Fate,'" 127.

9 OA. Bab-ı Asafi Mektubi Kalemi (A.}MKT) 110/16, 4 Rabiulevvel 1264 (9 Feb. 1848).

firewood[10] and some coal merchants had already sent payments in advance for a charcoal shipment to Istanbul.[11] In the eyes of coal carriers and their oxen, the endless corvée work imposed by the subdistrict governor meant an irreversible time loss, which would soon result in great stress in preparing the delayed shipments. In fact, most coal carriers were also farmers, and each had a few acres of grain fields under cultivation. In June, they would halt any coal and firewood transfer in any event, either for Elmas Ağa, the imperial army, or coal merchants of Istanbul, because they needed to harvest and thresh their crops. In this case, the Ottoman government did not hesitate to intervene and side with the inhabitants of Midye against its own officer. By June, Elmas Ağa had been removed from his office because of his "inconvenience" (*uygunsuzluğu cihetiyle*).[12] One can never know if Ottoman authorities acted with a sincere feeling of justice for the people of Midye or a sincere bitterness due to Elmas Ağa's mismanagement of resources amid a coal deficit while making this decision. In the end, the coal carriers presumably had the opportunity to work for their own harvest in summer 1848. At once, they would also start preparing charcoal and felling trees for the delayed shipments. It was not going to be easy to close the deficit. As early as mid-May 1848, a letter addressing the tax collector (*muhassıl*) of Vize had already expressed that Istanbul expected from Midye a bigger coal transfer than the previous year.[13] Elmas Ağa's inconvenient log demands should have upset the peasants' whole schedule. Their oxen would feel the high stress level, too. The inconveniences of the human world were translated into heavier and longer work for the non-human workers in Midye. The oxen might not get to know the subdistrict governor, imperial officers, merchants, or moneylenders; nevertheless, they could recognize how their working tempo changed once these actors put pressure on human coal carriers.

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10 The weight of the imperial army's log demand was 20 thousand *çeki* precisely. For the measure unit *çeki*, see Kallek, "Çeki."

11 OA. MVL 58/77, 28 Cemazeyilevvel 1264 (2 May 1848).

12 OA. A.}MKT 132/2, 1 Recep 1264 (3 June 1848).

13 OA. A.}MKT. 128/51, 12 Cemazeyilahir 1264 (16 May 1848).

In June 1855, the head official of Edirne's Midye subdistrict received an explicit order from Istanbul. The amount of firewood and coal that arrived at the imperial capital was insufficient, and Istanbul already observed their deficit (*daha şimdiden müzayaka sureti meşhud olduğuna*) in the middle of summer. The government informed the administrative heads of Edirne's coal-producing settlements about the situation. The order was the immediate expansion of firewood and charcoal collection in a number of subdistricts, including Midye, and the acceleration of these crucial materials' transfer to Istanbul. Local officials had reported that the reason behind the insufficient transfer of the desired materials was the usage of carts and workhorses for threshing (*iskelelere hatab ve kömür nakleden araba ve bargirlerin bazı mertebe harman sairede kullanılmasından neşet eylediği ihbar kılınmış*). Given the urgency of Istanbul's needs, it was no longer possible for the authorities to permit people to use their carts and workhorses for threshing until the transfer of a sufficient amount of firewood and coal (*hatab ve kömürün sevk ü irsaline kadar harman sairede kullanılması tecviz olunamayacağı*).[14]

Weather conditions already posed a natural limit on woodcutting and charcoal making. These outdoor activities generally began in spring and continued until fall, more precisely, from May until November.[15] Nevertheless, as most woodcutters were also farmers, their agricultural activities further limited their fuel production and transportation into a span "before sickle and after threshing."[16] It was critical to find the occasion to go chopping wood in the forest in May. Otherwise, the harvest and threshing would consume the whole summer. The autumn offered the most suitable time for firewood and charcoal collection, except for the rainy days, which would excessively shorten the already-limited time span. Especially after the vineyard, many peasants, mainly households with poor revenues according to Braudel, would seek an additional income by

14 OA. Sadaret Mektubi Kalemi Umum Vilayat Evrakı (A.}MKT.UM) 199/4, 6 Şevval 1271 (22 June 1855).

15 Uzun, "İstanbul'un İaşesi."

16 Tok, "From Wood to Coal," 81-82.

carrying goods.[17] In mid-nineteenth-century Midye, the place that transportation occupied in peasants' lives was so profound that it was more than a secondary economic activity that only impoverished households practiced occasionally. The Ottoman bureaucracy had officially categorized the people in Midye's villages as coal carriers. Yet, these peasants were also grain producers and would not watch their harvest remain on the threshing floor due to unexpected tasks stemming from their official identity. Already struggling with the tight agenda imposed by nature on rural life, the Ayastefanos village presumably did not welcome the last imperial order regarding firewood and charcoal transfer they received in June 1855. It is not possible to guess whether local administrators minutely implemented the order to mobilize all non-human carriers and carts for the sole purpose demanded by the imperial administration. Suppose Ottoman officers controlled the houses in the Ayastefanos village one by one in 1855. In that case, they might see Yorgi veled-i Kiryako in the rush for threshing the harvest with a pair of water buffalo oxen. Yorgi would have harvested wheat on his three-dönüm grain field.[18] Had anyone asked Yorgi to reserve his buffaloes and ox cart for fulfilling Istanbul's latest demands, he would probably remind them that his single pair of buffalo oxen had not yet finished threshing the grain harvest. Ottoman officers would hear the same response from Yorgi's neighbor, Yanaki veled-i Mavridi. Yanaki was in his mid-forties[19] and a single pair of oxen constituted his whole non-human workforce.[20] He could not harness his cows or pigs to an ox cart loaded with logs and coal.

Village visits must be time-consuming. Besides, direct contact with coal carriers might be risky for Ottoman local administrators in order to circulate imperial demands as sensitive as corvée charcoal collection. For the Ottoman bureaucracy, a practical way to enforce and control the

17 Fernand Braudel, *Civilisation matérielle, économie et capitalisme: Les Structures du Quotidien*, vol. 1 (Paris: Armand Colin, 1979), 373.

18 OA. ML.VRD.TMT.d 6172: 7.

19 Yanaki veled-i Mavridi from the Ayastefanos village was twenty years old in 1831. See person no. 40 in OA. NFS 3978, 29 Zilhicce 1246 (10 June 1831): 4.

20 OA. ML.VRD.TMT.d 6172: 21.

charcoal transfer was to declare quotas for each settlement. The subdistrict governor would probably wait on the shore to control whether the villages filled their coal and log quotas. Some residents of the Ayastefanos village might contribute to the imperial duty without ceasing their threshing work. For instance, if Tanaş veled-i Yorgaki and Kiryako veled-i Yorgi both spared a workhorse and a pair of oxen for the charcoal work, each farmer would still have another pair of oxen to thresh their harvest in the village.[21] As long as their physical conditions allowed them, Tanaş and Kiryako might themselves go to carry logs and charcoal from the forest to the port, whereas less experienced members of their households threshed the produce with the remaining pair of oxen at home. The village was less than an hour away from the coast, and the coal carriers would return home before sunset. However, most farmers in the Ayastefanos village kept a single pair of oxen and did not share the margin of maneuver that Tanaş and Kiryako had. The pressure coming from the subdistrict center would incite peasants like Yorgi veled-i Kiryako and Yanaki veled-i Mavridi to make a choice between participating in the collection of wood and coal or threshing the harvest. It was not possible to carry out both tasks at the same time with a single pair of oxen. Corvée work must be a burden for the whole village. At times of charcoal collection, some peasants could try -maybe secretly- keeping up the routine work of their own households with their additional non-human workers. On the other hand, most peasants needed to dedicate their whole human and non-human workforce to the imperial task at the expense of their own agricultural activities. Presumably, Yorgi and Yanaki would join their neighbors in the collective efforts to meet the charcoal quota expected from Ayastefanos and postpone the threshing work for a couple of days. They were at the midst of the contradiction between their general efforts for economic survival and the imperial duties that administrators imposed on them. As the order arrived in the middle of the threshing season, peasants had to decide whether to take their workhorses, oxen, and carts to the threshing floor or the forest. The time pressure complicated

21 OA. ML.VRD.TMT.d 6172: 2, 14.

the situation. Farmers needed to separate the grains and straws of their wheat before the harvest got ruined. At the same time, they needed to spend some working days on the log and charcoal transfer for the residents of Istanbul.

Yorgi veled-i Kiryako and Yanaki veled-i Mavridi in Midye's Ayastefanos village might have heard about the Tanzimat Edict when it was promulgated sixteen years ago.[22] Cengiz Kırlı asserts that the Tanzimat's popular understanding was marked by novelties in taxation.[23] Yet, the Tanzimat's clause regarding the abolition of corvée must have overshadowed the news about a new tax system in the villages charged with timber or charcoal collection for the empire. As early as 1841, villagers from Ahyolu (Pomorie today), another subdistrict on the Black Sea coast only seventy-five kilometers away from Ayastefanos, had demanded their release from corvée service with references to the Tanzimat's promise.[24] Following a possible series of negotiations with the Tanzimat tax collector (*muhassıl*), they informed him about their "pleasure" regarding the idea of paying tithes for their produce instead of carrying timber and coal for the Samakocuk foundry.[25] Villagers from Ahyolu had chosen farming for their own sake instead of working for the imperial foundry. However, sixteen years after the Tanzimat Edict, Ottoman authorities saw no problem in forcing peasants of Midye to prepare and carry charcoal and firewood in the middle of the threshing season. Governmental efforts to mobilize carts and workhorses in Midye for this sole purpose are a clear marker of a preference at the expense of the local grain production.

22 In 1840, a few months after the edict's promulgation, the people of Vranje (today in southern Serbia) could "mobilize Tanzimat rhetoric" in their petition against the district governor Hüseyin Paşa, whom they accused of forcing them to provide corvée labor in iron mines and his own farms despite the edict's promise to abolish corvée. See Kırlı, "Tyranny Illustrated," 3–36.

23 Kırlı, *Yolsuzluğun İcadı,* 30.

24 Çelik, "'It's a Bad Fate,'" 124.

25 OA. C.ML 66/3027, 11 Cemazeyilevvel 1257 (1 July 1841). The document summarized the peasants' request as follows: *Tanzimat-ı hayriye icabınca kendülerinden öşr-i emval taleb olunmuş ve kendüleri dahi bu cihetden hoşnud bulunmuş olduklarından artık dökümhane hizmetinde olmayup olvechle öşr-i emval ita etmek üzere yedlerine bir kıta emr-i ali itası…*

Meanwhile, if peasants did not insist on reserving their non-human carriers and carts for threshing, authorities would not feel the necessity to issue such a detailed order. Maybe Yorgi and Yanaki would like to become full-time grain producers, too. While burning logs in the forest, the two peasants might have imagined living a simple farmer's life, in which oxen carried logs only to heat their own houses. Peasants of Midye and their non-human workers surely had a stressful work schedule in the summer of 1855.

Most villagers in Edirne undertook different occupations simultaneously, such as grain production, coal carriage, and woodcutting. It had to be tiring to plan which economic activity they would reserve their limited time and energy for. However, they were not alone. They always enjoyed being in the company of non-human workers. The latter would carry packs and pull objects. Meanwhile, they would graze and fertilize the soil whenever and wherever they wanted. Just like their owners, non-human workers in Edirne specialized in multiple occupations. Contending decisions on the work agenda of oxen or workhorses might result in problematic situations. Their employment in one work meant their absence in another. Some non-human workers might replace their fellows in particular jobs, but some work required the specialized labor and experience of workers from specific species. The oxen held their unchangeable position in grain farming but were still helpful in a number of activities in which their human owners were involved. Eight temettuat registers from Edirne's subdistricts of Midye and Akçakızanlık constitute the basis of the following analysis.[26] The selected registers include almost seven hundred entries,[27] each representing a separate household. Fluctuations among entries do not conceal the general tendencies and overall characteristics that shaped people's economic activities in Midye and Kızanlık. Non-human workers, oxen in the first place, actively participated in most of these activities. Humans exploited the oxen's muscle power to carry stuff, till

26 OA. ML.VRD.TMT.d 5203, 5204, 5205, 5206, 5207, 6170, 6171, 6172.

27 As expressed above, people who had left their settlement a long time ago and did not actually live there were excluded during the calculation. Once the absentees were excluded, there remained 697 households for the current analysis.

the soil, or drag a cart. Although registers do not give direct clues that refer to this exploitation, details about people's economic activities in Edirne pose a ground for imagining the oxen's role and contribution in nineteenth-century rural life.

§ 4.2 The Edirne Sample

4.2.1 *The Subdistrict of Midye*



FIGURE 4.3 Satellite view of the Midye subdistrict. The pointers mark the location of the three nineteenth-century Ottoman villages covered in this chapter. SOURCE: Prepared on ArcGIS Online.

By the mid-nineteenth century, Midye was a subdistrict of Edirne's Vize district, on the coast of the Black Sea. In 1859, the Ottoman bureaucracy counted only nine villages and three thousand people in Midye.[28] The yearbook of Edirne of the Hijri year 1288 (1872) noted that there were only twelve villages in Midye and no big farms yet existed.[29] The population

28 OA. NFS 4517, 29 Zilhicce 1275 (30 July 1859): 2.

29 *Salname: 1288*, 165.

had a mixed ethnocultural character with a noticeable Rum majority.[30] The temettuat registers from Midye covered three villages: Korfekolya, Pulaça, and Ayastefanos. Almost two hundred households lived in these villages, of which 140 raised grains and corresponded to the farmer category. Coal and cereals remained central to the economic activities in Midye's villages. The registers classified 128 of 197 households as both "coal carriers and farmers" (*erbab-ı kömürkeş ve ziraat*), alongside twelve coal carriers (*erbab-ı kömürkeş*) and five agriculturists (*erbab-ı ziraat*). Peasants who belonged to the last two categories apparently focused on a single occupation. Charcoal transfer and farming both required the extensive labor of oxen, the most crowded category of non-human workers in mid-nineteenth-century Midye.

Three villages in Midye shared the same geographic setting. They were surrounded by thick forests and were close to the coast, enjoying a variety of port alternatives. A four-hour walk's distance separated the village of Korfekolya from the nearest port, İğneada.[31] More than three hundred people living in Korfekolya were distributed to eighty households. Most residents had Turkish names, and the temettuat register listed the thirteen "*zımmi*" (the status referring to non-Muslim Ottoman subjects) households at the end of the list.[32] Pulaça was a smaller village, where barely three hundred residents lived in sixty-four households.[33] The village's distance from the İğneada port was around seventeen kilometers, almost the same distance between Korfekolya and İğneada. Not a single Muslim name appeared in the temettuat register prepared for Pulaça.[34] Indeed, the population register of 1842 classified the residents of Pulaça

30 A twentieth-century map that a Bulgarian ethnographer prepared supports the majority of the Rum population in Midye. Miletich's map indicates Midye as a predominantly Greek settlement. See Lyubomir Miletich, "Етнографска Карта На Одрински Вилает." Sofia: Българска академия на науките, 1918. https://tr.wikipedia.org/wiki/Dosya:Ethnographic-map-Thrace-1912.jpg.

31 Korfekolya is today called Avcılar.

32 OA. ML.VRD.TMT.d 6170: 30.

33 Pulaça is today called Sislioba.

34 OA. ML.VRD.TMT.d 6171.

as members of the Bulgarian community.[35] The Ayastefanos village was smaller than the two neighboring villages.[36] Only two kilometers separated the village from a little port nearby. However, peasants would often prefer to take a three-hour walk to İğneada, where bigger boats could dock. Approximately two hundred people living in fifty-three households in Ayastefanos belonged to the Rum community.[37] Ahmed bin Mustafa and Osman bin İsmail, two smiths (*demirci*) with the only two Muslim names in the village, appeared at the bottom of the temettuat register.[38] Rum, Bulgarian, and Muslim people cohabited in the subdistrict.[39] Midye's heterogeneous ethnocultural character did not indicate any demarcations concerning coal carrying and crop raising. Regarding livestock, the fact that most Christian Orthodox households raised pigs (referred to as "*kara canavar*" in temettuat registers) is of secondary importance for the current analysis about work animals.[40] The temettuat registers from 1845 support that households from different ethno-religious communities in Midye carried coal, raised crops, and relied on the strong muscles of oxen to undertake these exhausting jobs.

35 OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842): 117.

36 Ayastefanos is today called Beğendik.

37 OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842): 113.

38 OA. ML.VRD.TMT.d 6172: 24.

39 It is impossible to grasp from the limited information that temettuat registers noted, but at least a portion of the Muslim population in Thrace probably belonged to the Pomak community.

40 In 1845, Midye was among the subdistricts of Edirne that would provide two hundred pigs (*iki yüz res kara canavar*) for the consumption of the ambassador of Austria and his entourage. Two years later, the administrative bodies of the same settlements (Vize, Terkos, Midye, Istranca) had to assist a similar purchase for the consumption of the ambassador of Denmark. See OA. Cevdet Hariciye (C.HR.) 112/5557, 24 Zilkade 1261 (24 Nov. 1845) and Bab-ı Asafi Divan-ı Hümayun Düvel-i Ecnebiye Kalemi (A.}DVN.DVE) 9/13, 22 Şevval 1263 (3 Oct. 1847).

TABLE 4.1 The Subdistrict of Midye

temettuat register no	village name	number of households in 1845	estimated population in 1842[41]	farmer households
6170	Korfekolya	80	328	44
6171	Pulaça	64	305	59
6172	Ayastefanos	53	205	37
TOTAL		197	838	140

4.2.2 *The Subdistrict of Akçakızanlık*

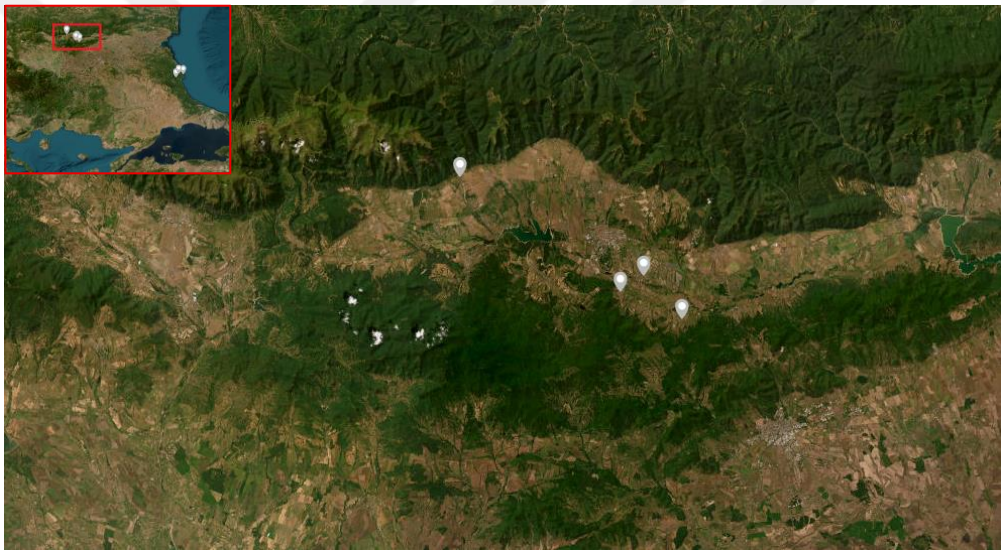

FIGURE 4.4 Satellite view of the Akçakızanlık subdistrict. The pointers mark the locations of the nineteenth-century Ottoman villages covered in this chapter. SOURCE: Prepared on ArcGIS Online.

Akçakızanlık or Kızanlık was a subdistrict of the Filibe (Philippopolis) district, located on a vast plain framed by the Balkan Mountains from the

41 I multiplied the population numbers issued in the surveys of 1842 by two for retrieving women, the missing half of the population. I also added an eight-percent margin of error. See OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842).

north and Sredna Gora (the Middle Mountains) from the south.[42] The Ottoman bureaucracy's population surveys from 1859 counted fifty villages and more than 21 thousand people in Kızanlık.[43] By the early 1870s, the subdistrict covered forty-eight villages, as well as five big farms,[44] where lived 4153 Muslim and 3512 non-Muslim households, representing a total population greater than 25 thousand.[45] More than a hundred mills operated in Kızanlık[46] to serve this relatively crowded population. The abundant presence of water sources (especially the Tunca River) within the subdistrict did more than turn the wheels of flour mills. They also generated a vivid trade network. Traders resorted to thousands of flat-bottomed rafts produced from pinewood in Filibe to carry grains and timbers. On the coast of the Aegean Sea, it was the İnöz subdistrict ("Ainos" in Greek, today called "Enes") of the Dedeağaç (Alexandroupolis) district that received Filibe's economic products to ship them to the imperial capital or abroad.[47] In June, farmers of Akçakızanlık would thresh their cereals under the charming smell of roses. Most grain producers also collected roses from the famous Rose Valley. The Sofular-ı Zir village was a small settlement where slightly more than a hundred people lived in fewer than thirty households.[48] The villages of Yemişler[49] and Huzerler[50] both had a population of around two hundred. In the Hamursuz village, seventy-six households hosted around four hundred people.[51] With more

42 For a detailed work about the nineteenth-century Filibe district, see Neriman Ersoy, "XIX. Yüzyılda Filibe Şehri (1839-1876)" (PhD Thesis, İstanbul, İstanbul Üniversitesi, 2003).

43 OA. NFS 4517, 29 Zilhicce 1275 (30 July 1859): 2.

44 *Salname-i Vilayet-i Edirne: 1288.* Edirne Vilayet Matbaası, 1871, 164.

45 *Salname: 1287*, 144-45.

46 *Salname-i Vilayet-i Edirne: 1290.* Edirne Vilayet Matbaası, 1873, 303.

47 *Salname: 1287*, 166.

48 Sofular-ı Zir is today called Skobelevo (Скобелево).

49 Yemişler is today called Ovoshtnik (Овощник).

50 Huzerler might be today's Rozovo (Розово).

51 Hamursuz is today called Razhena (Ръжена).

than three hundred households and almost a thousand people, Maksi[52] was considerably more crowded than its neighboring villages. These five villages from Akçakızanlık comprised five hundred households, of which 445 were farmers. The selected temettuat registers recorded the possessions and sources of revenues that shaped the lives of almost two thousand people who lived in the villages of Yemişler, Sofular-ı Zir, Hamursuz, Huzerler, and Maksi. Farmers of Kızanlık would not be able to produce wheat or carry their rose oil shipments to the port without the efforts of oxen. Oxen's rough hooves held the key for their human owners to harvest on the fertile plain and the picturesque valley where these villages were once settled.

52 I was not able to locate the village of Maksi. I can only guess that such a crowded village must have become a significant town center by the twentieth century.

TABLE 4.2 The Subdistrict of Akçakızanlık

temettuat register no	village name	number of households	estimated population[53]	farmer households
5203	Yemişler	47	235[54]	43
5204	Sofular-ı Zir	29	143[55]	23
5205	Hamursuz	76	419[56]	74
5206	Huzerler	32	214[57]	26
5207	Maksi	316	966[58]	279
TOTAL		500	1976	445

§ 4.3 Yields

Peasants of nineteenth-century Edirne had a variety of options for earning a livelihood. They raised cereal crops, collected logs, produced charcoal, harvested roses, and transferred their produce via alternative maritime routes. In each operation, oxen helped peasants of Edirne by carrying out arduous tasks. Did various agricultural activities, including grain farming on Thracian plains or a lucrative occupation like rose oil production, bring considerable wealth to the people of Edirne? Archival findings only leave a blurry impression of the socio-economic level of

53 I multiplied the male population numbers issued in the surveys of 1845 by two and added an eight-percent margin of error.

54 There are 109 male residents in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 74.

55 There are 59 male Muslim residents in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 13 and 7 male non-Muslim residents in OA. NFS 4393, 29 Zilhicce 1261 (29 Dec. 1845): 9.

56 There are 160 male Muslim residents in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845):60 and 34 male non-Muslim residents in OA. NFS 4393, 29 Zilhicce 1261 (29 Dec. 1845): 16-17.

57 There are 78 male Muslim residents in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 71 and 21 male non-Muslim residents in OA. NFS 4393, 29 Zilhicce 1261 (29 Dec. 1845): 18-19.

58 There are 447 male residents in OA. NFS 4383, 3 Recep 1246 (18 Dec. 1830): 41-44.

Edirne's residents. Elhac Mehmed Faris Efendi, a distinguished nineteenth-century Ottoman subject, had a negative impression of the region's economic welfare. As the *ayan* of the subdistricts of Zağra-i Atik, Çırpan, and Akçakızanlık, the latter had received the privilege of tax collection with a battalion of soldiers in the three subdistricts for the Hijri year of 1246. In a petition he wrote to Sultan Mahmud II in June 1830, Hacı Mehmed Efendi politely demanded an additional privilege for also collecting the *cizye* tax in the three subdistricts. He complained that the people of these three subdistricts were "poor" (*fukara*).[59] Did Hacı Mehmed's argument have an actual basis? Or did he try to mislead the sultan about the economic situation of the concerned subdistricts to enlarge the domain of his economic privileges?

A tax register from 1836 may include some clues about Akçakızanlık's economic situation. The Ottoman Empire imposed the tax called *cizye* on its non-Muslim subjects. It would amount to a considerable sum in settlements like Kızanlık, where a significant part of the population was Christian. Ottoman bureaucracy would classify non-Muslim households in proportion to their *cizye* payments. The upper strata were called *ala*, average households were called *evsat*, and the lower strata were called *edna*. The tax register about Akçakızanlık's cizye payments collected in the Hijri year of 1251 employed this categorization called *esnaf-ı selase* (three classes). According to the document, the *cizye* levels showed (by stating numbers for each village) that there were 560 *ala*, 5155 *evsat*, and 865 *edna* non-Muslim households in the whole subdistrict. The document also noted that 882 households had recently ascended from the lowest category to become *evsat*, and 107 households had ascended from *evsat* to *ala*.[60] The absence of any sign of declassification within the document cannot prove that the subdistrict passed through a straightforward economic boom that caused the settlement to prosper as a whole. On the other hand, the data it bore implies that the subdistrict did not have a severe financial problem. Households with an average economy

59 OA. Hatt-ı Hümayun (HAT) 1036/42964, 29 Zilhicce 1245 (21 June 1830).

60 OA. Bab-ı Defteri Ceride Odası Defterleri (D.CRD.d) 40467, 30 Zilhicce 1251 (17 Apr. 1836).

represented seventy-eight percent of the 6580 *cizye* payers in 1836, while the lower strata (where the "*fukara*" would exist) constituted only thirteen percent of the non-Muslim population. Thirty percent of households in Kızanlık did not have a single head of ox.[61] The poorest strata among *cizye* payers should have substantial intersections with the list of oxless households. The lack of non-human workers would minimize the profit a household could make in agricultural activities. Likewise, a poor household would not be able to easily afford to purchase or even rent a non-human worker, especially the oxen, who always had a tight schedule throughout the year. The extent of the richness that farmers of Kızanlık produced and shared may not be easy to grasp precisely. However, it is certain that non-human workers played a considerable role in the economic capacity of peasants in nineteenth-century Edirne.

Rumelia was known for its productive land, described as "*mümbit ve mahsuldar*" in an early-eighteenth-century document.[62] Ottoman bureaucrats frequently resorted to sources from the Edirne province in cases that concerned the provision of the imperial capital. With its substantial agricultural production and available maritime transport possibilities, Kızanlık was among the subdistricts the imperial administration mobilized to feed Constantinople. A document from the beginning of the nineteenth century reported the preparations for shipping a certain amount of wheat that was purchased from Akçakızanlık in line with an imperial order. The remaining 610 *keyl* of the purchased wheat needed to be urgently delivered from Akçakızanlık to the port of Tekfur Dağı within a few days, not leaving a single grain behind (*bir danesi geriye kalmayarak*) before heading to Istanbul.[63] The Province of Edirne was rich in meadows and valleys that favored many agricultural activities. Alongside cash crops like tobacco and cotton, grains signified a considerable portion of Edirne's agricultural products. Edirne's yearbook of 1287 (1871) announced that farmers in the province recently harvested at least nineteen

61 In my sample for Kızanlık, 145 households do not have a single ox and fifty-three households among them have neither donkeys or any other non-human workers.

62 Karademir, *Osmanlı Yeni Çağı'nda,* 45.

63 OA. HAT 978/41548, 7 Rabiulahir 1225 (12 May 1810).

million *keyl* of cereals (wheat represented more than half, while barley came to 3.9 million and rye 2.5 million *keyl*).[64] Official statistics counted that the province's grain production in 1897 attained 355 million tons in weight and neared 220 million kuruş in value.[65] The yearbook of 1304 (1887) graded the terrain's productivity (*kuvvet-i inbatiye*) in Edirne only as "average" (*mutavassıt*). However, it also underlined that farmers within the province had mastered the practice of agronomy (*fenn-i ziraatin kısm-ı amelisini pek ala bilirler*). According to the yearbook, villagers of Edirne collectively decided on practical issues about grain production, and young farmers were keen to respect the elderly's decisions. Though lacking any details about this exciting legacy of collective decision-making and inter-generational transfer of knowledge, the yearbook concluded that farming in Edirne was highly improved compared to Anatolian farming (*ziraat Edirne Vilayeti'nde Anadolu'ya nisbetle pek ziyade terakki etmiştir*).[66] Did farmers of Edirne really have merely average yields despite their supposedly improved agronomy methods? What kind of impact did the services that farmers expected from oxen have on the economic activities in the villages around Edirne? Temettuat registers of Edirne's Akçakızanlık and Midye subdistricts suggest that grain farming was the prominent source of income for most peasants. Moreover, they obtained relatively rich yields in Edirne thanks to the favorable environmental conditions and the extensive efforts of their oxen.

Tithe payments are exceptional sources for grasping the yield. The consulted registers included 585 farmers who had annually paid over thirty thousand kuruş worth of tithe[67] for cereals. A rough calculation asserts that the worth of the yearly gross cereal product per farmer is 526.29 kuruş. If the average annual income of the 697 households remained around a thousand kuruş,[68] a limited number of grain types

64 *Salname-i Vilayet-i Edirne: 1287*. Edirne Vilayet Matbaası, 1870: 160.

65 Güran, *Resmi İstatistiklere Göre,* 174-75.

66 *Salname-i Vilayet-i Edirne: 1304.* Edirne Vilayet Matbaası, 1887, 271-74.

67 They paid approximately 61,575 kuruş in total in the last two harvest periods of 1844 and 1845.

68 Precisely 1029.86 kuruş according to my calculation.

(wheat, barley, and corn varieties) directly represented a considerable portion of the economic production in the two subdistricts. The average weight of cereal production in revenues was sixty-three percent in the sample from Akçakızanlık. For instance, in the Yemişler village, the average grain harvest represented more than seventy-seven percent of the village's average income. Meanwhile, the village of Huzerler posed an exception from Kızanlık because the grain harvest of 332 kuruş was only thirty-five percent of the average household income. In Midye's Korfekolya village, the average annual yield from a plot comprised nearly sixty percent of the average household income. However, the percentage was as low as twenty-two percent in Pulaça and thirty-seven percent in Ayastefanos. The relatively low dependence on grain production in a village pointed to a variety of alternative economic activities. Higher percentages of cereal yields over total revenues marked a relatively higher dependence on grain fields, and thus on the oxen's labor.

TABLE 4.3 Tithes, yields, and income (in kuruş)

temettuat register no	village name	total annual tithe payment for cereals	average yearly output per plot	yearly output per dönüm	gross cereal product per farmer	average annual household income (non-farmers included)
5203	Yemişler	3585.6	851.61	51.67	833.86	1098.04
5204	Sofular-ı Zir	707.5	632.43	62.29	307.61	848.49
5205	Hamursuz	6425.1	849.35	55.68	868.26	1163.95
5206	Huzerler	500.8	332.45	50.76	192.60	937.02
5207	Maksi	14,176.6	598.54	69.03	508.12	1127.12
6170	Korfekolya	2520.3	599.22	60.08	572.80	1021.63
6171	Pulaça	1559.8	253.19	36.13	264.37	1162.73
6172	Ayastefanos	1312.1	322.80	37.53	354.61	879.95
sum		30,787.73				
average			554.95	52.90	526.29	1029.87

Temettuat registers noted the financial return that households received from their cultivated terrains. The farmers the consulted registers noted had an average yield of approximately 555 kuruş from their plots. Combining the data about yields and lands, it corresponded to 52.90 kuruş per dönüm yearly. This last calculation marked the land's productivity. The average productivity attained sixty-nine kuruş per dönüm in Maksi, sixty-two in Sofular-ı Zir, and sixty in Korfekolya. Farmers in these villages would earn as much as six hundred kuruş from a modest field of ten dönüm. The lowest productivity in the sample was in Pulaça and

Ayastefanos, two villages from Midye. In these villages, farmers earned consecutively thirty-six and thirty-seven kuruş per dönüm on average. As a considerable portion of the tenant farmers' harvest in these two villages of Midye went to landowners, the final share of the grain harvest in the village's average income remained relatively low. Still, a grain plot of ten dönüm in the Pulaça and Ayastefanos villages would easily bring more than 350 kuruş, which was not a great score but still a considerable sum for most peasants. The sample's average return of fifty-three kuruş per dönüm indicated a remarkable productivity that only a few, if any, Ottoman provinces would attain. Unfortunately, temettuat registers do not bear a deliberate clue to explain the outstanding agricultural productivity in mid-nineteenth-century Edirne.

What factors might have contributed to such a high score? Abundant with vivid rivers and dense forests, the Thracian peninsula certainly receives and keeps more humidity than the inner parts of the Anatolian plateau. Long rivers and a rich flora also contribute, along with moisture, to Rumelia's agricultural productivity. Although temettuat registers did not note it, the improved agronomy methods that the provincial yearbook of 1304 referred to must have also played a considerable role in Edirne's grain productivity. Karademir regards an elaborated division of labor in agriculture as a marker of high productivity levels.[69] In that sense, the presence of various professions in Edirne's temettuat registers may have a share in the outstanding productive yields. For example, Dobra oğlu Kula,[70] Kergan oğlu Todor,[71] and Baska[72] from Kızanlık's Maksi village were mowers (*tırpancı*). Their profession was specific enough to be called after their instrument, the scythe. The sample had twenty-nine shepherds, among whom eleven specialized in taking care of bovines and were called *sığırtmaç,* whereas the remaining shepherds had the generic label of *çoban*. There were fifty-three servants (*hizmetkar*) in the sample.

69 Karademir, *Osmanlı Yeni Çağı'nda*, 95.

70 OA. ML.VRD.TMT.d 5207: 108.

71 OA. ML.VRD.TMT.d 5207: 101.

72 OA. ML.VRD.TMT.d 5207: 16.

The service of Dari veled-i Dimitri from Midye's Korfekolya[73] and Yevan veled-i Kosta from the neighboring Ayastefanos village[74] might have remained at the domestic level because they were marked as *kapı uşağı*, which probably referred to the mansion where they worked. However, there is no such apparent work definition for the fifty-three servants. Among the latter group, thirty-seven servants who had a grain field, a garden, or a vineyard certainly had a noticeable knowledge and practice in agriculture. So, they might be helping their employers with farming, too. Some service contracts might have a specifically limited duration. Meno from the Maksi village worked as a daily laborer (*gündelikçi*). His own grain field, rosary, and vineyard suggest that Meno's field of specialization was farming instead of domestic work. So, he probably represented another pattern of agricultural labor in Edirne.[75] The sample had seven watchmen (*bekçi*), who would be keeping an eye on the barns and threshing floors, especially after the harvest. The existence of various specific professions in the villages of Edirne points to a complex division of labor in agriculture. The specialization in agrarian jobs should have played a crucial role in receiving high yields. Most of these jobs would require close contact with non-human animals. An undeniable fact is that farmers and agricultural laborers in Midye and Kızanlık would not be able to till a vast grain field with hand tools deep enough to raise cereals that would eventually be worth fifty kuruş per dönüm. As specialized plowing professionals, the oxen had an incontestable share in Edirne's spectacular harvest score. Oxen's contribution to grain farming would be incomparably bigger than that of a daily laborer or a hay mower.

A lack of the temettuat surveys was the absence of profit and loss calculation. The registers give the estimated revenues but do not list any costs such as rents, debts, wages, or reserved seeds for the recorded households. Therefore, only a portion of the fifty-three kuruş that farmers of Edirne earned in 1845 per dönüm of grain field would become their profit. If a farmer already had a huge amount of debts, the fertile lands of

73 OA. ML.VRD.TMT.d 6170: 33.

74 OA. ML.VRD.TMT.d 6172: 23.

75 OA. ML.VRD.TMT.d 5207: 11.

Rumelia might not give enough produce to save the farmer from poverty. For example, the devoted efforts of Mavi Ömer oğlu Süleyman from Kızanlık's Hamursuz village were never enough to ensure a good living for his family. Süleyman, a thirty-year-old man with a red beard,[76] produced cereals (wheat, rye, and corn), cultivated a two-dönüm vineyard and a two-dönüm rosary, reaped grasses, and sold the straw he prepared from the grass. Still, all these endeavours brought Süleyman a modest annual income of less than six hundred kuruş.[77] He would pay taxes for his harvest of wheat, rye, corn, roses, grapes, and even grass (*kiyah*). Süleyman had two brothers: thirty-four-year-old Ahmed and twenty-two-year-old Halil, who both had "blond mustaches."[78] Each brother had inherited from their father, Mavi Ömer, a seven-dönüm grain field under the plow, another six-dönüm land at fallow, a two-dönüm rosary, and a single-dönüm vineyard. In addition to their available arable lands, Süleyman's two brothers had rented additional grain fields of three and five dönüm to increase their cereal production. As a result, Halil's household income had increased to 708 kuruş and Ahmed's to 870 kuruş.[79] However, it is not possible to estimate the profit Mavi Ömer's young sons would have after reducing the costs, especially the rents. If registers were accurate, the Mavi oğlu brothers did not earn much, and at least a portion of their revenues would be spent to cover their costs. Each of the three brothers had a dairy cow and a pair of oxen. In return for their efforts, the cattle would eat some of the hay their human owners collected from fields and meadows. The labor of six oxen on the fertile lands of Rumelia could not bring evident wealth to the Mavi oğlu brothers in Hamursuz. Maybe Hacı Mehmed Faris was right and many peasants in mid-nineteenth-century Edirne were stuck in poverty despite the high productivity of the land and the abundance of non-human plowers.

76 See household no. 18 in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 61.

77 OA. ML.VRD.TMT.d 5205: 30-31.

78 OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 61.

79 OA. ML.VRD.TMT.d 5205: 30-31.

§ 4.4 Land

The Balkan mountain range marks the morphology of Thrace. Midye is situated in the eastern part of the peninsula, where humid forests surround the vicinity of the Istranca Mountains. On the other hand, the region's inner parts have vast flat lands suitable for agriculture.[80] Akçakızanlık is located in the middle of the Thracian plain in the north of the Rhodopes, which constitutes one of the most extensive lowlands of the Balkans.[81] While forests partly limit Midye's hinterland, Kızanlık has a relatively more comfortable position in the flat inner part of the peninsula. The diverse topography engenders local climatic variabilities, too. According to Thornthwaite's classification of humidity, Midye, on the Black Sea coast, is in a moist subhumid[82] area, whereas Kızanlık remains in a dry subhumid[83] area. The region's robust topography and mild climate saved farmers of Ottoman Midye and Kızanlık from profound problems of land and irrigation. The region's precipitation level was also important for oxen, who would pull the plow more easily in a moistened soil instead of a cracked land hardened by aridity. Kızanlık's plain landscape would reflect another delicate preference of these non-human plowers, who did not have to face the risk of climbing or descending sharp slopes.

The simple topography and other environmental characteristics of the Province of Edirne offered farmers adequate pieces of grain fields. Yet, many grain producers would still look for extra land to increase their production volume. Given the high productivity level of the soil, each additional acre could bring a noticeable additional source of income. In the

80 Muhammed Cüneyt Bağdatlı and Esra Can, "Spatial Analysis of Soil Resources Potential by Using Geography Information Systems (GIS): A Case Study from Thrace Region, Turkey," *International Journal of Innovative Research and Reviews* 5, no. 2 (2021): 46.

81 Jane M. Reed, Boris Kryštufek, and Warren J. Eastwood, "The Physical Geography of The Balkans and Nomenclature of Place Names," in *Balkan Biodiversity*, ed. H.I. Griffiths, Boris Kryštufek, and Jane M. Reed (Springer, 2004), 14.

82 Sırrı Erinç, "Climatic Types and the Variation of Moisture Regions in Turkey," *Geographical Review* 40, no. 2 (Apr. 1950): 226.

83 İlker Eroğlu, "Meriç Nehri Havzasında Sıcaklık ve Yağış Değerlerinin Dönemsel Trend Analizi," *Avrupa Bilim ve Teknoloji Dergisi*, no. 23 (Apr. 2021): 751.

Midye subdistrict, land leases defined a complex network that linked the three selected villages. Forests (and the Black Sea for the latter) strictly limited the arable lands around the villages of Pulaça and Ayastefanos. Therefore, many farmers from these villages sought to rent lands from Korfekolya, which was settled on a relatively vast plateau. Mavridi veled-i Dimitri from Pulaça had rented a grain field of four-and-a-half dönüm from the Korfekolya resident called Baki oğlu damadı Ömer Ağa. Neither forty-seven-year-old Mavridi nor his twenty-one-year-old son Kiryako had a piece of uncultivated land.[84] Both households had used all the terrain they had (eight dönüm for each) to raise wheat, rye, barley, and corn. Alongside their grain production, six cows, a pair of pigs, and a beehive annually brought between 1370 and 1470 kuruş to each household.[85] Mihal veled-i Dimitri, their twenty-eight-year-old neighbor with a blond mustache,[86] had followed the same course and rented a three-and-a-half dönüm grain field from the same Ömer Ağa. Mihal's household did not have a single dönüm of land under their usufruct and had an annual income as modest as 511 kuruş.[87] All three households were farmers and coal carriers at the same time, and each kept a pair of oxen. Their landlord, Ömer Ağa, was a prominent coal trader who frequently visited Istanbul to sell charcoal lots as heavy as two hundred tons.[88] Mavridi, Kiryako, and Mihal would pay regular visits to Korfekolya to take care of the plots they rented from Ömer Ağa. Only nine kilometers separated the two villages. Maybe

84 Mavridi was thirty-three years old and had a blond mustache, and Kiryako was seven years old at the time of the population survey of 1831. See people no. 10-11 in OA. NFS 3978, 29 Zilhicce 1246 (10 June 1831): 4.

85 OA. ML.VRD.TMT.d 6171: 22-23.

86 Although their fathers bore the same name, Dimitri, population surveys do not claim any kinship between Mavridi veled-i Dimitri and Mihal veled-i Dimitri. Indeed, the popularity of the name Dimitri can give a simple but convincing explanation. Mihal had a one-year-old son named Valko in 1842. See person no. 87 in OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842): 121.

87 OA. ML.VRD.TMT.d 6171: 31.

88 In 1853, Ömer Ağa brought 188 thousand *vukıyye* of coal to Istanbul. See OA. A.MKT.UM 130/45 23 Cemazeyilahir 1269 (3 Apr. 1853). For the calculation of *vukıyye*, see Cengiz Kallek, "Okka" (İstanbul: TDV İslâm Araştırmaları Merkezi, 2007).

the three farmers would schedule their visits together. The crowded procession would set off from Pulaça before sunrise. The heavy steps of six oxen and the squeaky sounds of their carts would advance on narrow pathways through the dark forest for more than two hours. A crowded entourage would always be safer against the risk of an unexpected encounter with the non-human animals living in the forest. After a few hours of work on Ömer Ağa's plots, the three farmers and their human and non-human companions had to take the same journey back, this time with tired muscles. As tenants shared their produce with the landlord, they would probably use Ömer Ağa's threshing floor, so they did not have to carry their produce back to Pulaça after harvest in June. Still, they might take their oxen to Korfekolya to accelerate the threshing work and carry their share back to Pulaça. An economist's perspective might expect oxen to serve their human owners as "fixed assets." However, in the example of Midye, these non-human agricultural laborers moved along with their human owners to plow plots that remained kilometers away from their barns. Land leases in Edirne stood on a network generated by the labor of human and non-human plowers from different villages.

According to the sources and data, the problem of access to enough acreage of land did not occupy the first place for most peasants in Midye and Kızanlık. The sample had 120 households without cultivated fields, seventy-nine from Midye and forty-two from Akçakızanlık. They represented seventeen percent of the whole sample. Their average annual income was 515 kuruş, which was significantly below the sample average. Forty-nine households with no cultivated grain fields were not actually landless because they had paid tithes for cereals, grapes, fruits, walnuts, roses, or flax. They raised these products either in their little gardens or on the fields that they rented from other peasants. Apart from these households with uneven farming activities, there were fourteen households with uncultivated lands. If sixty-three households had at least minimum access to agricultural plots, there remained fifty-seven households who deserved the "landless" qualification the most. The average annual revenues of this segment were as low as 369 kuruş. The people in this segment included seventeen servants, ten shepherds, eight coal carriers,

and five dependent people, but no farmers. Some of them were already engaged in specific occupations. Some did not have the economic or physical means to undertake grain production. Yet, the data from the sample suggest that access to grain fields was not the most decisive problem for most peasants in Kızanlık and Midye. Eighty-two percent of the whole Edirne sample had at least a single dönüm of cultivated grain fields.

If there were a land access problem in Edirne, the agricultural servants would be the ones who would feel this problem the most. There were forty-eight servants (*hizmetkar*) in the sample. Twenty-six servant households had at least a single dönüm of cultivated land. Six servants earned more than a thousand kuruş. Some of the relatively wealthy servants had rented their cultivated fields out to other peasants. A servant called Trifon from the village of Maksi earned 185 kuruş from the five-dönüm-wide field he rented out. He also had non-cultivated fields, a rosary, a vineyard, and eight sheep. Meanwhile, his work in the service of another farmer brought his family three hundred kuruş, which made up a third of the household's annual revenues of 913 kuruş.[89] Yevan oğlu Yevan, Trifon's neighbor from Maksi, had rented out his cultivated fields of four dönüm but continued his own agricultural production in a rosary and a vineyard. The two hundred kuruş he brought his family from his labor in the service of another farmer made up twenty-two percent of the household's total income of 905 kuruş.[90] Todor, another servant living in the same village, had leased out a field of seven dönüm but kept his production in a vineyard and a rose garden. His work in other farmers' plots brought him only 250 kuruş, and his total income was as modest as 462.5 kuruş.[91] It is puzzling that Todor rented out his field instead of producing his own crops on it. Eleven other servants in the same village had leased out their plots but continued their own agricultural production alongside their work in the fields of some wealthier farmers. This apparently contradictory phenomenon conceals the urgency of the land access problem. The fourteen servant households in the village of Maksi might have

89 OA. ML.VRD.TMT.d 5207: 52.

90 OA. ML.VRD.TMT.d 5207: 61.

91 OA. ML.VRD.TMT.d 5207: 111.

preferred leasing their plots out to minimize the costs of agricultural production. In that case, they might also stop working on their own vineyards and rosaries. A crucial common point of these households is that they did not keep a single ox, even though most of them kept other non-human animals in their barns. Probably, the ox was an expensive investment item that discouraged these servants from becoming independent farmers. The access to land would not cause the same level of anxiety as the access to oxen for these fourteen servants. Four servants from Kızanlık's Maksi village and six from Midye had neither an agricultural plot nor a non-human animal. Their only possession was the houses they lived in, and their only source of income was their service to other people.[92] The annual income of these servants varied between two hundred and five hundred kuruş, with an average of 306.5 kuruş. If there were a problem with access to land in the sample from Edirne, these ten households would be precisely the ones suffering from it the most. They represented an excessively unfortunate segment in villages where the majority of households enjoyed at least a few dönüm of grain fields. Even if landless households somehow acquired a plot, they would face a more decisive problem in preparing that land, access to oxen.[93]

The eight registers from Edirne noted that nearly seven hundred households had 6774.5 dönüm of plots under cultivation and 4602 dönüm of uncultivated plots.[94] The average acreage per farmer household was 11.58 dönüm. Once rosaries, gardens, and terrains under fallow were added, it would turn out that farmers in Midye and Kızanlık had far more than a dozen dönüm under their usage. Although temettuat registers did not leave a clue about the agronomy methods, the sample's relatively high

92 In little notes the scribes added to the entries, the registers explained the situation of these landless servants as follows: *sakin olduğu hanesinden gayrı emlak ve arazi ve hayvanat-ı sairesi olmayıp hizmetkarlık ile meşgul olduğu*.

93 In case a farmer rented oxen, the owner of the non-human workers would demand as much as half of the harvest as payment in twentieth-century Ethiopia, where access to oxen was more important than land size. See Aune et al., "The Ox Ploughing," 277.

94 Terrains remaining under fallow represented 41.8 percent of the whole farmlands that the consulted registers noted.

average yearly income of 1030 kuruş suggests that farmers of Edirne managed to extract a considerable richness from the soil. Yet, the fertility of a land alone was not enough without the oxen's efforts to prepare it for the next harvest.

TABLE 4.4 Land and acreage (in dönüm)

temettuat register no	village name	size of the plots under the plow	uncultivated plot size	cultivated plot size per farmer household
5203	Yemişler	769.5	462.5	17.90
5204	Sofular-ı Zir	275.5	163	11.98
5205	Hamursuz	1264	1181.5	17.08
5206	Huzerler	172	38.5	6.62
5207	Maksi	2915.5	1829.5	10.45
6170	Korfekolya	647	657.5	14.7
6171	Pulaça	413.5	88.5	7.01
6172	Ayastefanos	317.5	181	8.58
sum		6774.5	4602	
sample average				11.58

The data in the registers show that there was considerable traffic in land renting or sharing in Edirne. A portion of the cultivated lands in the sample were plots that some less wealthy farmers rented from wealthier farmers. If peasants with little or no fields had not rented plots to cultivate grains, they might search for alternative occupations outside their villages, and the acreage of fields under the plow would be even narrower. Land leases indirectly contributed to the total cereal harvest in the sample. The average acreage of cultivated lands per farmer household remained below ten dönüm in three villages. The average acreage of grain fields was seven dönüm per farmer in Midye's Pulaça, 8.6 dönüm in Ayastefanos, and 6.6 dönüm in Kızanlık's Huzerler village. In the Huzerler

village of Akçakızanlık, twelve households preferred leasing fields to increase the acreage of their grain cultivation. These were all farmer households who paid for cereal tithes. Eleven of these tenant households already had their own cultivated lands. The average acreage of the tenants' own lands was four dönüm, and the average plot they rented was 4.75 dönüm. Six households also had some uncultivated lands. In Huzerler, tenants aimed to increase the volume of their cereal harvest by renting land. Three peasants in Midye's Ayastefanos village, Tanaş veled-i Timor oğlu Dimitri, Yorgi veled-i Dali, and Dimitri veled-i Yorgi did not have their own fields but cultivated grains on the plots of other people without paying any fees (*tarlalarına bilaücret zer etmiş*). The last two peasants had the chance of having their mother and father as landlords.[95] In Pulaça, six landless peasants raised cereals on other plots, still without a fee (*bilaücret*). Their landlords did not seem to be their family members, as in the case of Ayastefanos, but were called their "partner" (*şeriki*).[96] The absence of rent may point to a sharecropping pattern, in which the cultivator and the landlord shared the harvest. Apart from these households, two peasants from the same village (households no. 20 and 42) were indeed tenants, who paid a rent (*icar*) for cultivating grains on other people's plots. Three of these landless peasants (households no. 39, 42, 60) preferred to work in fields in the neighboring village of Korfekolya. No one would accuse Mavridi veled-i Dimitri[97] due to his land preference because the neighboring village apparently had bigger land availability than Mavridi's own village. The average acreage of land under cultivation was more than fourteen dönüm per farmer in Korfekolya. In addition, the acreage of uncultivated plots in Korfekolya was bigger than the lands under the plow, which could also be another marker of land availability (if there were no attempt at tax evasion or technical error). The relatively low acreage of empty agricultural plots in the two other villages from Midye (eighteen percent in Pulaça and thirty-six percent in Ayastefanos) indicates that reserving a field for fallow was a luxury under the existing

95 OA. ML.VRD.TMT.d 6172: 15, 16, 19.

96 Households no. 16, 27, 39, 50, 52, 60 in OA. ML.VRD.TMT.d 6171.

97 Household no. 42 in OA. ML.VRD.TMT.d 6171: 22.

conditions. Farmers in these two villages seeded their fields as often as possible and reserved lands from Korfekolya in case they wanted to expand their harvest.

Tenants in the sample do not endorse the general association of landlessness with poverty. The average annual income of the aforementioned twenty-three landless farmers was 1070 kuruş, slightly higher than the sample average. Except for Kosta veled-i Viko, who had four oxen,[98] the remaining twenty-two landless households kept a pair of oxen. The data suggest that land leasing and sharecropping practices encouraged farmers in Edirne to continue or further expand their grain production. These farmers already had pairs of oxen in their barns but lacked the sufficient acreage of fields they needed for producing cereals. Access to oxen was a bigger prerequisite to raise crops, and most farmers in Edirne were keen to walk for hours with their precious non-human plowers to work in fields that they rented sometimes from other villages. After that point, they could rely on the region's high productivity.

§ 4.5 Oxen

A sixty-three-year-old farmer with a grey beard called Mehmed bin Veli lived in Akçakızanlık's Sofular-ı Zir village. He had four sons: Bektaş (22), Hasan (10), Ali (7), and Mehmed (4).[99] Mehmed's elder son Bektaş, "Veli oğlu Bektaş bin Mehmed" according to the temettuat register, had taken care of his household's affairs by 1845.[100] Six burdensome decades might have lessened his father's will and power to continue undertaking the demanding tasks of rural life. The household had four dönüm of land, of which they had cultivated a single dönüm and left the remaining portion fallow. The unsuitable location or the poor condition of the fallow lands might have encouraged Bektaş to rent an additional four-dönüm grain field. The landowner was called Dürzi oğlu Ali, an orphan who shared the

98 OA. ML.VRD.TMT.d 6171: 15.

99 OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 13.

100 OA. ML.VRD.TMT.d 5204: 5.

same name and age with one of Bektaş's little brothers. The two seven-year-old children would play games together around the village. The infant landowner had rented out fields of ten dönüm and left another ten dönüm uncultivated. Ali's mother might be alive, and she may be the person who managed the household's agricultural activities, indeed. However, the temettuat scribes presumably preferred noting a seven-year-old male person as the household representative instead of a woman. The unfortunate child's household somehow managed to receive 306 kuruş annually from leasing out their fields.[101] Meanwhile, the household of Veli oğlu Bektaş earned almost six hundred kuruş, which was below the village average but considerably higher than the Dürzi oğlu family's score. The latter household had a reasonable acreage of arable land but lacked the crucial factor, a workforce to cultivate it. On the other hand, the Veli oğlu family had a relatively crowded human workforce and, above all, a pair of oxen. Oxen were more important than land in mid-nineteenth-century Edirne. Owning arable lands was significant as long as a household had a pair of oxen to cultivate them.

Yield, land, and oxen worked as a whole. Data about yield and land needs to be combined with oxen data. The consulted temettuat registers recorded 1141 oxen. Oxen per farmer for the whole sample defines a pair, 1.95 precisely. The ratio between the acreage of cultivated lands and oxen varies between 5.4[102] and 5.9[103] dönüm for each head of oxen. Overall, each pair of oxen in Edirne would plow slightly less than a dozen dönüm throughout the year. The non-human plowers would have an indispensable contribution to the cereal harvest. The yearly gross grain product of the whole sample divided by the total number of oxen was 269.83 kuruş. Similarly, the ratio between the average annual yield each household earned from a plot and the average number of oxen per farmer was 257.55 kuruş. Departing from a yield estimation based on cereal tithe payments of 1844, each pair of oxen would bring a yield of almost 540 kuruş each year. An average pair of oxen in mid-nineteenth-century Edirne was

101 OA. ML.VRD.TMT.d 5204: 13.

102 It is the average acreage per farmer divided by average oxen per farmer.

103 It is the total acreage of cultivated lands divided by the total number of oxen.

responsible for preparing a field of a dozen dönüm before seeding. Following the harvest, the same non-human team would thresh cereals worth more than five hundred kuruş. Their human owners would sell the grains and take the money, whereas the non-human threshers would keep the hay.

TABLE 4.5 Oxen, land, and yields

temettuat register no	village name	total number of oxen	number of oxen per farmer	cultivated land size per pair of oxen (in dönüm)	annual yield per pair of oxen (in kuruş)
5203	Yemişler	85	2.02	17.69	340.58
5204	Sofular-ı Zir	40	1.74	13.78	255.70
5205	Hamursuz	159	2.20	15.51	328.02
5206	Huzerler	54	2.08	6.37	824.28
5207	Maksi	447	1.60	13.04	353.75
6170	Korfekolya	148	3.36	8.74	788.36
6171	Pulaça	122	2.07	6.78	185.46
6172	Ayastefanos	80	2.16	7.94	634.30
the whole sample		1141	1.95	11.23	539.66

The 697 households that the consulted eight temettuat registers recorded had differences and cleavages among them. First, the sample belonged to two separate subdistricts of Edirne, one on the coast of the Black Sea and the other in the inner part of Thrace. Secondly, they carried out various alternative economic activities besides farming and raised alternative crops. Thirdly, they had internal socio-economic differences that separated neighbors. The number of oxen that appeared in registers partly reflected such differences. At the most visible level, the number of oxen

worked as a social marker for households. It was not a coincidence that the average size of lands under cultivation, the average amount of tithe payments for grains, the average yields in the last harvest, and the average annual revenues showed a perfect correlation. If a household had more oxen than their neighbors, one would expect that they also had bigger lands, yields, tax payments, and incomes than their neighbors. The number of oxen was a reliable social marker.

As the data verified, keeping a pair of oxen set the norm. Only eleven households showed the marginal case of keeping three oxen or a single ox. The evident dominance of pairs stemmed from the design of the plow. If no farmer in mid-nineteenth-century Edirne owned the Roman *carruca*,[104] the plow (either in a symmetrical or asymmetrical design, either with an iron or wooden share) they used required no more than a pair, no less than a pair, but strictly a pair of draft animals. The data reveal that the technical details about the plow also set the socio-economic barrier among households. The table below positions the average plot size, average tithe payment for grains, average yields, and average annual revenue, all just below the average levels for the households that kept a pair of oxen. The latter's dominance might explain it. Households with a pair of oxen represent 61.5 percent of the sample. Yet, it is nearly impossible to assert whether oxen came with a specific production capacity (and accordingly wealth) or if wealth brought the suitable number of oxen to exploit the existing production capacity.[105]

Households with a pair of oxen were not a homogeneous category. Thirty-six did not have any plots under cultivation, and seventeen had not paid a single kuruş of levy for grains. Twenty-seven households among landless oxen-keeping households also carried coal (the document categorized eight of them as simply *kömürkeş,* "coal carrier," without any reference to farming). The category of households with two oxen

104 The *carruca* required the simultaneous work of six to eight non-human workers.

105 Pullen suggests that it was the possession of oxen and a plow (at a time when they still represented the new technology in farming) which allowed people to accumulate wealth and become elites in the Early Bronze Age. See Daniel J. Pullen, "Ox and Plow in the Early Bronze Age Aegean," *American Journal of Archaeology* 96, no. 1 (1992): 54.

also included two log traders (*hatabçı*) and a miller (*erbab-ı asiyab*). Instead of agriculture, these households could exploit their oxen's muscles for the mentioned occupations. Their oxen probably pulled coal carts, dragged logs, and carried flour sacks. Besides non-farming activities, the absence of cultivated lands also pointed out relative poverty. The average annual income of the thirty-six landless households was 698.12 kuruş, still above the average level of households without oxen (553.4 kuruş) but nearly forty percent lower than their actual category average (1129.8 kuruş). Though they did not plow vast fields, these landless households still showed the economic capacity to feed non-human workers as massive as the oxen, who required "grazing, feeding, and time to care."[106]

106 Pullen, "Ox and Plow," 53.

TABLE 4.6 The distribution of oxen among households

households that kept	number of households	total number of oxen	average land size under cultivation (dönüm)	average tithe payment for grains (kuruş)	average yields (kuruş)	average yearly income (kuruş)
more than two pairs of oxen	5	44	99.6	693.1	6828.22	5904.46
two pairs of oxen	53	212	22.06	213.69	2296.8	2142.72
three oxen	8	24	18.13	206.75	2173.25	1656.06
a pair of oxen	429	858	11.35	101.94	1191.29	1129.79
sample average			9.72[107]	97.89	1109.9	1029.88
a single ox	3	3	7	97.33	1102.33	819.83
no oxen	199	0	2.52	12.74	326.94[108]	553.44
TOTAL	697	1141				

The most crowded group, households keeping a pair of oxen, was not homogeneous. Differences within the group posed a viable ground for examining questions about land, yield, and oxen in Edirne. Keeping the number of oxen fixed at two, tendencies concerning the data about lands and yields became easier to seize. There were 393 households in the sample of Edirne that kept a pair of oxen and had at least a dönüm of land under cultivation, either directly under their usufruct or seasonally rented.[109] The size of cultivated lands, revenues, tithe payments, yields,

107 The calculation is based on the number of whole residents within the sample. The average size of lands under cultivation among field-owner households was 12.31 dönüm.

108 The calculation of the total yields in kuruş and the yield per dönüm ratio for households without oxen are based on the 116 households that had cultivated lands but no oxen.

109 Many peasants within the sample did not have their own plots and cultivated crops on plots they rented from wealthier peasants. If a household cultivated grains on a plot

and annual revenues were in a strict correlation. The distribution of the group into segments according to the size of their lands under cultivation perfectly confirms the tendency. Segments with smaller fields had smaller yields, tax payments, and revenues than segments with bigger fields. The relationship was inverse regarding productivity. The bigger lands where wealthier farmers cultivated grains were less productive than the smaller lands of farmers with smaller annual incomes. Plots of twenty or more dönüm had an average yield per dönüm ratio as low as 47.1 kuruş, much smaller than the group's average of 60.43 kuruş and even smaller than the sample's average of 52.9 kuruş. Meanwhile, farmers who cultivated on the seventy-five plots that were less than six dönüm annually obtained as much as 89.91 kuruş per dönüm.

TABLE 4.7 Households that kept a pair of oxen

the size of their land under cultivation (dönüm)	number of households	total number of oxen	average land size under cultivation (dönüm)	average tithe payment for grains (kuruş)	average yields (kuruş)	average yield per dönüm (in kuruş)	average yearly income (kuruş)
20 and more	48	96	24.19	193.19	2203.22	47.1	1549.66
16-20	39	78	17.18	171.13	1750.6	51.25	1450.14
12-16	74	148	13.56	121.7	1416.07	52.35	1247.78
9-12	79	158	10.06	95.19	1073.09	53.06	1149.46
6-9	78	156	7.16	71.45	846.31	60.02	1032.77
1-6	75	150	3.67	45.44	564.62	89.91	865.49
TOTAL	393	786					
AVERAGE			11.35	105.63	1200.89	60.43	1169.34
sample average			9.72	97.89	1109.9	52.9	1029.88

they rented from someone else, the status of the land did not affect my calculation. A considerable portion of the cultivated lands assessed in the table were rented plots.

Households that kept two pairs of oxen constituted the third most crowded group after households with two oxen and without oxen. Fifty-two households kept two pairs of oxen and had lands under cultivation. Kosta veled-i Viko, who also kept four oxen, did not take place in the calculation because he did not possess any land, and the acreage of the field he rented from his partner is missing.[110] The data concerning households with four oxen reflect the same tendencies as those concerning households with two oxen. As the size of cultivated lands grew, yields and revenues increased, too. Fourteen households with thirty to fifty dönüm of cultivated fields had totally paid a grain tithe of 4819.3 kuruş in the previous two harvests. In contrast, nineteen households with one to fifteen dönüm of plots had paid 1961.65 kuruş. Fourteen holders of bigger lands had an average annual income of nearly 2660 kuruş, whereas nineteen households with moderate-size fields earned 1653 kuruş on average. Regarding productivity, the inverse correlation between the land size and yields per dönüm functioned perfectly. The average yield per dönüm of the wealthiest group remained below 46 kuruş while the return of the group with moderate-size plots was above 66 kuruş per dönüm.

110 The register noted: *tarlaları olmayıp şeriki tarlalarına zer etmiş olduğu*. See household no. 27 in OA. ML.VRD.TMT.d 6171: 15.

TABLE 4.8 Households that kept two pairs of oxen

the size of their land under cultivation (dönüm)	number of households	total number of oxen	average land size under cultivation (dönüm)	average tithe payment (kuruş)	average yields (kuruş)	average yield per dönüm (in kuruş)	average yearly income (kuruş)
30-50	14	56	38.75	344.24	3605.64	45.83	2659.45
15-30	19	76	22.37	236.63	2524.29	56.87	2250.63
1-15	19	76	9.55	103.24	1104.91	66.42	1652.9
TOTAL	52	212					
AVERAGE			22.06	213.69	2296.8	62.84	2142.72
sample average			9.72	97.89	1109.9	52.9	1029.88

The oxen's role initially disappears in the calculations based on fixed numbers of draft oxen. A comparison between calculations for households with a pair of oxen and households with two pairs can invite the laborious non-human workers to the scene. Seventy-five households that kept a pair of oxen for tilling their plots of one to six dönüm scored the unchallengeable return level of ninety kuruş per dönüm. Meanwhile, 231 households that worked on fields of a size of six to sixteen dönüm with a single pair of oxen could have only 55.18 kuruş per dönüm on average. The average productivity decreased to as low as 48.96 kuruş per dönüm for eighty-seven households that raised crops on plots of a size of at least sixteen dönüm or much more. Seventeen households with two pairs of oxen that had plots of seven to fourteen dönüm earned 55.4 kuruş per dönüm annually. The 182 households keeping a single pair of oxen that had plots of the same size earned 54.3 kuruş per dönüm, just one kuruş below the average return of their neighbors with four oxen.

How could a field that two oxen plowed and one that four oxen plowed have almost the same level of productivity? Unfortunately, registers do not give detailed information about soil composition, irrigation opportunities, and plows. Details about factors of agricultural

productivity are utterly absent in temettuat registers. Yet, it is not a secret that the design of various plow models that Ottoman farmers used strictly required a pair of oxen. In the absence of plow designs that allowed the operation of multiple pairs of oxen, the economic benefit of having an extra pair of oxen could remain at a marginal level. Theoretically, the number of days a farmer with two pairs of oxen plowed the same field would be half the number of days that his neighbor with a single pair of oxen needed. The farmer with four oxen could decide to plow the field still with a single pair of non-human workers and take the extra pair to other lucrative occupations such as coal or log trade. He could also lease the extra pair to his neighbors in return for money.[111] In another scenario, the farmer could deviate from the mentality of a *homo economicus* and feed an extra pair of oxen for random domestic tasks that a pair of donkeys could also somehow carry out. Such cases (regarding which, unfortunately, registers remained silent) could conceal the agricultural productivity that an extra pair of oxen would theoretically bring.

After all the calculations above, it is necessary to remember the substantial epistemological limits of the records. Even in a small village, the headmen or the local religious representative would hardly be able to state the precise level of yield or the cultivated land acreage of each household one by one. In an income register, coherence could ensure the balanced distribution of the tax burden among neighbors. Alp Yücel Kaya interprets consistencies in temettuat registers as the result of a cooperation and consensus on the local level.[112] The general consistency of the data regarding lands, tax payments, and yields in the registers suggests that the preparers of the documents paid great attention to coherence. Wealthier households generally owned more possessions, earned more money, and paid more taxes than their impoverished neighbors. Once a register fulfilled this tacit principle, the number of oxen was only a technical detail for the scribe. A headman, an imam, a priest, or a scribe would

111 Examples of similar transactions are situated in a sixteenth-century land register from southeast France (Sisteron). The scribes inscribed that oxen brought rental income to their human owners. See Sclafert, "Sisteron au début," 172.

112 Kaya, "In the Hinterland," 263-64.

pay greater attention to information about worker bovines if the latter were subject to taxation. What did the non-human workers that appeared in the temettuat registers actually do? Deepening the analysis in the two chosen subdistricts can help define the labor humans expected from the oxen in the villages around Kızanlık and Midye.

The most popular non-human worker in Akçakızanlık was the ox. The Anatolian taurine ox prevailed over the water buffalo ox, as the latter had only six members[113] in the whole sample. The subdistrict sample of five hundred households included 785 oxen. The average number of oxen per farmer for the entire subdistrict sample was 1.76, slightly less than a pair. The village of Sofular-ı Zir[114] lowered the ratio, with 1.74 oxen per farmer. Yet, the contribution of the last village, which covered 316 households, was even more decisive. There were only 1.6 oxen per farmer in the Maksi village. Annual gross grain product per farmer (508.12 kuruş in the village and 542.09 in Kızanlık) and acreage per farmer (10.45 dönüm in the village and 12.8 in Kızanlık) remained at an average level. The village scored the highest annual grain harvest per acreage with 69.03 kuruş per dönüm (it is 52.90 kuruş per dönüm in the whole sample). However, the productivity of the land itself could not explain why farmers kept fewer oxen. The rosaries in the village brought a considerable income compared to the grain fields (15,106 kuruş of rose tithe estimated for the harvest seasons of 1844-45 and 28,353.2 kuruş for cereals). Yet, it could neither offer a solid explanation. On the other hand, the availability of another type of non-human worker may clarify the situation.

113 There were a pair of buffalo oxen in the Yemişer village (owned by household no. 3) and two pairs at Mehmed Emin Ağa's farm in the village of Hamursuz.

114 I narrowed down my calculation in the temettuat register no. 5204 to its first fifteen pages. The entries in the remaining ten pages of the document that covered two sub-settlements with a total of forty-six households, unfortunately, lacked important elements such as profession as well as livestock assets. Hence, the data extracted from this register represents the first list within the document and excludes the following two sub-settlements.

TABLE 4.9 Oxen and oxen per farmer ratio in Kızanlık

temettuat register no	village name	oxen	farmer household	oxen per farmer
5203	Yemişler	85	43	2.02
5204	Sofular-ı Zir	40	23	1.74
5205	Hamursuz	159	74	2.20
5206	Huzerler	54	26	2.08
5207	Maksi	447	279	1.60
TOTAL		785	445	1.76

Peasants in the village of Maksi kept 160 donkeys (*hımar*) and 41 mares (*kısrak*). If the latter were added, the non-human worker per farmer ratio in the village would attain 2.32. All households that kept mares also had oxen, leaving little chance for possible competition between these two non-human workers. The case of donkeys left bigger traces for such a reckoning. There were fifty households in the village that kept donkeys but no oxen. The average annual income of the fifty households with donkeys but no oxen was 824.53 kuruş, significantly lower than the village average (1127.12 kuruş). So, they had lower economic capacity to feed oxen. Another explanation for these households' avoidance of oxen-keeping can be their lack of engagement in grain production. Thirty-one households had paid tithe for cereals in the previous harvest season, but the register officially categorized only three as farmers. The fifty households had paid in the last year only 241.9 kuruş as tithes for cereal and more than fivefold, 1215.5 kuruş, for roses. The register recorded that forty-four of these households earned revenues from particular occupations that made approximately 37.67 percent of their total annual income stemming from their work as *abacı, bekçi, boyacı, cebeci, çoban, değirmenci, domuzcu, dülger, hizmetkar, ispitçi, muytab, orakçı, sığırtmaç,* and *tırpancı*. If the thirty-one "farmers" (according to my categorization) were excluded from this category, there would be 1.8 oxen per farmer in the village, a considerably higher ratio than the first calculation. The

abundance of a non-human worker as humble and helpful as the donkey and the alternative sources of income instead of grain production can explain the relatively low oxen per farmer ratio in the last register.

TABLE 4.10 Households with donkeys but no oxen in register no. 5207

	number of households	annual income (kuruş)	number of donkeys	tithe for cereals (kuruş)	tithe for roses (kuruş)
TOTAL	50	41,226.5	65	241.9	1215.5
AVERAGE		824.53	1.3	7.8	31.17

How costly was it to feed a water buffalo? At the financial level, keeping a pair of taurine oxen or buffalo oxen was the same since neither produced any immediate taxable source of income, such as milk or offspring. Temettuat surveys did not impose any tax on work animals. At the micro-economic level, since buffaloes were larger than taurine oxen, they required more fodder than the latter. Still, registers show that people in Midye did not consider their preference for buffaloes as a luxury. The average revenues of households that preferred keeping buffalo oxen did not derive from the general average. Seventy-four households in Midye's three villages kept buffalo oxen. Once the two extraordinarily wealthy households[115] were excluded from the calculation, the average yearly revenue of seventy-two households was 1239.41 kuruş, slightly higher than the whole subdistrict's average of 1021.44 kuruş. Fifty-five buffalo oxen keeper households only had a pair of water buffalo oxen and did not keep any taurine oxen. The latter group's average yearly income was 1031.87, slightly above the subdistrict average. With their nearly perfectly average income level, the households with only buffalo oxen represented

115 Elhac Hafız Mustafa Efendi bin Mehmed (no. 12 in register 6170) had a yearly revenue of 4601 kuruş and Hasan Ağa bin Mehmed (no. 39 in the same list) annually earned 12,058.3 kuruş. Mustafa Efendi had 130 dönüm of cultivated lands while Hasan Ağa had 150 dönüm. These two households certainly did not represent the average economic level in Midye. That is why they were excluded from the calculation regarding buffalo owners.

a pure preference for the water buffalo over the Anatolian taurine cattle. The preference was based on a practical necessity. Households in Midye practiced both coal transport and farming at the same time. The Ottoman Empire had an established division of labor regarding non-human workers, according to which buffaloes needed to be employed in the heaviest tasks of forestry. In 1844, the lack of buffaloes in the villages of Kocaeli had appeared as a problem serious enough to threaten timber provision for the imperial dockyards.[116] In Edirne's Midye subdistrict, worker members of the same species were employed in charcoal transfer from forests to the nearest port.

TABLE 4.11 Households that kept buffalo oxen

households that kept	number of households	number of buffalo oxen	number of taurine oxen	average yearly income
two pairs of buffalo oxen	2	8	14	8329.65
a pair of buffalo oxen	72	144	40	1239.41
at least a pair of buffalo oxen	74	152	54	1431.04
only a pair of buffalo oxen	55	110	0	1031.87

Temettuat registers noted that there were 350 oxen, 166 barren cows, 51 horses, three mules, and three donkeys in Midye's three villages. The ox was the most abundant labor animal. These records support that the coal transfer economy in Midye operated on the shoulders of bovines, especially members of the water buffalo genus. Most of these non-human colliers were castrated males. However, it would not be surprising to come across "female colliers" on the paths surrounding the villages of Midye. If there was no taboo in Anatolia about treating barren cows as work animals, at least some of the barren cows that appeared in Midye's registers got to know the scent of coal and probably hated it because it meant long marches between forests, villages, and the port.

116 Çelik, "'It's a Bad Fate,'" 119.

TABLE 4.12 Non-human workers in Midye

temettuat register no	village name	taurine oxen	water buffalo oxen	barren cows	horses	oxen per farmer
6170	Korfekolya	94	54	92	25	3.36
6171	Pulaça	82	40	44	17	2.07
6172	Ayastefanos	22	58	30	9	2.16
TOTAL		198	152	166	51	

§ 4.6 Coal

A significant part of the economy of Midye turned around grains and coal. If the coal were "so abundant" in the province that only a few villagers in Edirne needed to purchase coal from elsewhere,[117] as the yearbook of 1304 proclaimed, this abundance would be most evident in the subdistrict of Midye. The subdistrict was among the few natural anchorage points on the Thracian shores of the Black Sea,[118] which facilitated the coal transfer between Midye and the imperial capital.

The coal that Midye produced was indeed charcoal. Provincial yearbooks refer to the coal mine in Filibe's Hasköy subdistrict and the iron mine in Midye's Samakocuk village but do not mention any coal mines in Midye.[119] The abundance of woodlands and the existence of a foundry in Midye endorse the charcoal assumption. The charcoal is a derivative of wood, but its energy content is about fifty percent higher than that of firewood.[120] So, there is reason to assume that forests around the Istranca Mountains served as a rich heating source for Midye's foundry. In 1855,

117 *Salname: 1304*, 271

118 E. P. Dimitriadis and G. P. Tsotsos, "Transport Geography and Local Development in 19th Century Thrace," *Balkan Studies* 40, no. 2 (1999): 290.

119 *Salname: 1287,* 173.

120 Tok, "From Wood to Coal," 27-28.

the imperial government informed the head official of Midye that the coal Istanbul demanded needed to be "dustless" (*kömürün topraksız olması*).[121] It was a relevant remark because charcoal pieces could easily turn to dust during their transportation from the forest to the shore, which decreased the fuel's quality.[122] Moreover, Midye's temettuat registers were full of "coal carriers" (*erbab-ı kömürkeş*) but did not include any coal miners because the subdistrict's coal production was based on charcoal production by burning the cut wood in the forest instead of extracting coal from underground ore. In conclusion, the people of Midye produced charcoal and carried it from the forest, its production place, to the pier.

The Ottoman administration mobilized the peasants of Midye to feed the imperial capital with the materials they extracted from non-human nature. In March 1801, an Ottoman subject named Petko wandered around Midye with the task of transferring to Istanbul "any amount of" coal (*her ne mikdar hasıl ederse*) suitable for the foundries of the imperial armory.[123] In late May, logs were the center's urgent demand from Midye for the usage of the capital's residents. Boats in the ports of Alaplı and Ereğli needed to carry anything but logs (*hatab*) to Constantinople. The document discouraged the transfer of timber (*kereste*) or any other product in these boats until the time of harvest (which was about to start in a few weeks).[124] The subdistrict administration of Midye held the responsibility for the log transfer from the subdistrict to Istanbul, as later correspondences carefully underlined.[125] The boats that carried firewood and charcoal from Midye to Istanbul had a limited sailing period due to

121 OA. A.}MKT.UM 199/4, 6 Şevval 1271 (22 June 1855).

122 Tok, "From Wood to Coal," 46.

123 OA. Cevdet Askeriye (C.AS) 89/4123, 15 Şevval 1215 (1 Mar. 1801).

124 OA. Ali Emiri Selim III (AE.SSLM.III) 23/1307, 13 Muharrem 1216 (26 May 1801).

125 See OA. AE.SSLM.III 65/3959, 29 Muharrem 1216 (11 June 1801) and AE.SSLM.III 157/9444, 20 Safer 1216 (2 July 1801).

arduous weather conditions.[126] Istanbul's demands for coal and log[127] shipments from Midye continued throughout the century. The subdistrict directly contributed to the imperial armory by sending the suitable logs required for producing artillery carriage (*top kundağı*) and other military equipment.[128] Still, not all shipments regarded the provision of imperial institutions or the capital. In 1863, a distinguished trader ("*hayriye tüccarı*," a privileged trader with imperial charter) called Halil Efendi signed a commercial contract with Yeni Ahmed Ağa, a resident of Midye's Korfekolya village, for the purchase of 180 wagons of coal.[129] For certain people, coal and logs of Midye were profitable commodities. In 1853, Baki oğlu damadı Ömer Ağa, a trader from Korfekolya, transported 188 thousand *vukıyye* of coal to Istanbul. A controversy between Ömer Ağa and a coal trader called Kömürcü Salih about the quality of the charcoal encouraged the latter to write a petition demanding a payment of 2158 kuruş from Ömer Ağa. However, craftsmen representatives Kethüda Ali Ağa and Edhem Ağa testified that indeed Salih needed to pay Ömer Ağa 5344 kuruş instead.[130] The disputed payment concerned only sixty thousand *vukıyye*, less than a third of Ömer Ağa's entire shipment. Still, the disputed money was multiple times bigger than the annual income of an average coal carrier household in Midye, maybe bigger than their whole wealth. Not all peasants profited from the coal trade like Baki oğlu damadı Ömer Ağa did. Charcoal did not bring great richness to the people who actually produced and carried it.

One could ask Bayram bin Ballı Mehmed in Korfekolya how life was for an ordinary coal carrier. There is no clue if this thirty-eight-year-old

126 Tok, "From Wood to Coal," 86.

127 A brief document from 1835 indicated the amount of the firewood (*ocaklık hatab*) transports from Midye and twenty-one other subdistricts around the capital. OA. C.ML 594/24474, 29 Rabiulahir 1251 (24 Aug. 1835).

128 *Salname: 1287*, 168.

129 OA. Hariciye Nezareti Mektubi Kalemi Evrakı (HR.MKT) 435/54, 16 Zilkade 1279 (5 May 1863). For "hayriye tüccarı," see Mübahat S. Kütükoğlu, "Hayriye Tüccarı." In *TDV İslâm Ansiklopedisi*, 17:64–65. Istanbul: TDV İslâm Araştırmaları Merkezi, 1998.

130 OA. A.DVN 85/24 1 Cemazeyilevvel 1269 (10 Feb. 1853) and A.MKT.UM 130/45 23 Cemazeyilahir 1269 (3 Apr. 1853).

coal carrier with a black mustache had a family.[131] Bayram was also a farmer with twenty-dönüm-wide lands, of which he could cultivate fifteen dönüm with a single pair of oxen. He would raise wheat, barley, and rye and carry charcoal with his presumably only companions, a pair of oxen. Despite his endeavors, these efforts brought him an income as low as 472 kuruş.[132] Although he had a noticeable size of grain fields, Bayram bin Ballı Mehmed's harvest was limited to his oxen's capacity to plow a sufficient acreage in times when they did not carry coal from the forest to the port of İğneada. These human and non-human coal carriers had multiple employers. Sometimes they would work for a coal trader like Ömer Ağa, not to get rich like him but probably to cover their debts, and sometimes they would do corvée work to fulfill the charcoal quota imperial officers demanded from their village. Once they had time and energy, Bayram and his two bovine fellows could take care of their cereal crops.

Contribution to imperial institutions did not guarantee prosperity. The iron mine and foundry in Midye's Samakocuk village (the material gave the settlement its current name, Demirköy) fed the Imperial Arsenal.[133] Villagers produced wrought iron and manufactured the pieces called *helon* (a specific type of pig iron used to cast cannon balls or chain shots[134]) for the arsenal. They had certain privileges, such as freely extracting logs and producing coal from the woods around the villages of Korfekolya and Apopolo without paying taxes.[135] However, it is difficult to estimate if such tax exemptions and iron production brought excessive richness to the village or the subdistrict in general. By 1802, the manufacturers of helon ("*helonkeş reaya*" as marked at the bottom of their petition) in Samakocuk found themselves in a burdensome situation when their debts to fifteen moneylenders (*murabahacı*) from Istanbul and the

131 See person no. 42 in OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842): 108.

132 OA. ML.VRD.TMT.d 6170: 14.

133 *Salname: 1287*, 173.

134 Günhan Danışman et al., "Demirköy-Samakocuk Iron Foundry: An Industrial Archaeology Project at an Ottoman Metal Work-Shop Complex in Thrace," *TÜBA-AR Türkiye Bilimler Akademisi Arkeoloji Dergisi*, no. 10 (Jan. 2007): 93-94.

135 OA. Cevdet İktisad (C.İKTS) 29/1430, 29 Cemazeyilevvel 1230 (9 May 1815).

pressure the latter exercised attained an unbearable level.[136] The following year, the villagers still "did not have the power to pay their debts."[137] Whereas boats carried coal, iron, and logs away, indebtedness remained intact in Midye throughout the century. In 1862, Bergoslu Deliköle Hacı Hüseyin Ağa decided to seize a coal shipment from Midye to Istanbul in return for the debts of the villagers of Korfekolya. The latter owed plenty (*haylice*) debts to Hüseyin Ağa for the grains they had purchased from him.[138] Hüseyin Ağa proved keen to seize the shipment that coal traders from Istanbul ordered from Midye.[139] How could peasants of Midye amass debts as huge as whole shipments (as in the Korfekolya case) or as severe as one that would make them think about "fleeing away" (*terk-i evtan* as helon manufacturers expressed in their petition)? Fluctuations in the coal market or the frequency of the corvée work for logs could provide an explanation. Their trade with Hüseyin Ağa might offer the contrary, but, indeed, peasants of Midye were not totally dependent on grain imports. As temettuat registers recorded, they carried coal, cut trees, and still insisted on raising crops in the time remaining from their alternative occupations. The total worth of cereals that 140 farmer households in Midye yearly produced was around forty-five thousand kuruş. Peasants around Midye sacrificed a great portion of their limited time and energy while trying to fill their charcoal quotas. Still, they returned to their agricultural plots on every occasion and maintained grain farming to a greater degree. One can guess that at least some coal carriers in Midye

136 A group of bandits had recently plundered the village. Although the petition does not make a connection between the tragic incidence and the villagers' debts, the assault could also make part of the moneylenders' strategy of pressure. See OA. C.AS 1060/46648, 4 Safer 1217 (6 June 1802).

137 OA. C.İKTS 31/1528, 29 Rabiulahir 1218 (18 Aug. 1803).

138 OA. Sadaret Mektubi Kalemi Nezaret ve Deva'ir Evrakı (A.}MKT.NZD) 440/26, 14 Safer 1279 (11 Aug. 1862).

139 In response to the efforts of Hüseyin Ağa's partner Balıkçı Hacı Ali Ağa to keep the shipment, Ottoman authorities mobilized the municipality of Istanbul to capture the boat and hand over the shipment to its intended owners, which were the coal traders of Beşiktaş and Kasımpaşa. The boat somehow ended up at the Selimiye barracks in Üsküdar. See OA. MVL 850/62, 16 Rabiulevvel 1279 (11 Sep. 1862).

would not choose the same career if they had a chance to make a choice. Their continuous efforts to produce cereals, even if it necessitated renting plots from another village, can be read as a mark of their preference for farming over coal carrying.

It was the non-human workers who accompanied the peasants of Midye in all burdensome activities. The return might not be a great prosperity for most toilers. Yet, findings from the registers give clues for capturing the role non-human workers played in the economic activities in Midye. The registers recorded that humans in these three villages kept 350 oxen as their non-human workers. The fact that people from the same household simultaneously carried charcoal and raised grains makes it almost impossible to decipher the separate roles oxen played in these two different activities. The preference for different species possibly indicates a mark between these two works. As mentioned before, keeping Anatolian taurine cattle (*karasığır*) was the norm in Anatolian villages because of the species' resilience and less costly accommodation compared with the buffalo genus. The sample from Midye deviates from this general tendency by the abundance of buffalo oxen. 152 out of 350 oxen in Midye belonged to the buffalo species. In other words, buffalo oxen represented more than forty-three percent of the oxen population in the three villages of Midye. The yearbook of 1304 noted that the size of the cattle in the Province of Edirne was average (*mutavassıt*) but still useful for purposes of plowing and transport. The yearbook assumed that a taurine ox from Edirne embodied 250 kilograms of meat while a water buffalo ox supposedly contained 350 kg.[140] The water buffalo had bigger bodies to feed than the taurine cattle and was more costly to keep in a barn than the latter. However, a buffalo ox could carry heavier carts, thus more coal, which would positively alter the cost-profit equation in the eyes of a mid-nineteenth-century coal carrier peasant. The preference for water buffaloes in Midye points out buffaloes' role in carrying charcoal from forests to villages and ports.

140 *Salname: 1304*, 272-73.

The documents categorized some households as simply "coal carriers." These households with no cultivated plots or grain tithe payments might lead to a differentiation between coal carrying and crop raising, two intermeshed tasks in Midye. However, the existing data remains insufficient for sharpening the analysis of buffalo usage in coal transport. There were only ten households[141] (one half had Muslim and the other half had Christian names) in the three villages that carried coal but did not practice farming. Nine kept a pair of Anatolian taurine oxen, and the remaining one did not keep a single non-human animal. If water buffalo oxen were well-known specialists in transport, such a particular group of people specialized in coal transport would resort to buffaloes. An explanation of their preference for taurine oxen involves the economic incapacity of feeding a non-human worker as huge as a buffalo ox for the whole year. These ten households yearly earned, on average, almost half of what people in the three villages earned. Did İsmail bin Mustafa (no. 55 in register no. 6170) and Ali bin Osman (no. 61) force the two barren cows they kept to carry coal? If there were a way to prove it, it would clarify the peasants' efforts to minimize cattle feeding costs by resorting to weaker but less demanding non-human workers. Still, it will not conceal the fact that the water buffalo ox was the most preferred charcoal carrier in mid-nineteenth-century Edirne. No other non-human carrier could compete with him in pulling overloaded coal carts or dragging massive tree trunks along the narrow pathways through thick forests for reaching the nearest pier.

141 Register no. 6170 marked household no. 63 as solely "coal carrier" although it is obvious that they also practiced farming. The household's representative, Ömer bin Sakallı Mehmed, had a revenue as high as 2532 kuruş per year and cultivated at least twenty dönüm of lands. Ömer's rich livestock included a pair of oxen, two dairy water buffalo cows, a buffalo heifer, eight dairy cows, two barren cows, five heifers, six bullocks, a dairy mare, a barren mare, and a horse. Although categorized solely as *erbab-ı kömürkeş*, I intentionally excluded this household from the list of coal carriers because it did not fit the typology at all. I can only speculate that Ömer bin Sakallı Mehmed was in fact Baki oğlu damadı Ömer Ağa. However, I could not verify it and I would expect a considerably longer list of assets and bigger income from a wealthy coal trader who would earn thousands of kuruş from a single shipment.

TABLE 4.13 Non-farmer coal carrier households and their non-human animals

register no.	household no.	non-human animals[142]	annual revenue (kuruş)
6170	20	a pair of oxen	525
6170	31	a pair of oxen	630
6170	55	a pair of oxen, a dairy cow, a barren cow	950
6170	61	a pair of oxen, a barren cow	388.5
6170	64	a pair of oxen	500
6170	2 (in the list for the *zımmi*)	-	630
6170	7 (in the list for the *zımmi*)	a pair of oxen	630
6172	40	a pair of oxen	556.5
6172	45	a pair of oxen	420
6172	48	a pair of oxen	400
TOTAL		eighteen oxen, a dairy cow, two barren cows	5630
AVERAGE		1.8 oxen per household	563

§ 4.7 Rosaries

Grain production was crucial for farmers in Kızanlık, yet the subdistrict's most renowned agricultural product was the rose. Kızanlık was home to the famous rose production basin called the "Rose Valley." Following warm winters and rainy springs, flowers of the Rose Valley would blossom with their high-quality oil essence.[143] A document addressing the grand vizier in 1851 confessed that Ottoman officials did not know the exact gross revenue that rose oil generated in Kızanlık. In consequence, the amount of the levy they aspired to impose on rose oil producers and

142 All cattle in the table belonged to the Anatolian taurine species.

143 Hava Selçuk, "Akçakızanlık Gül Bahçeleri." In *8th International Congress on Social Sciences*, 41. Tekirdağ: Tekirdağ Namık Kemal Üniversitesi, 2022.

traders also remained unknown (*gül yağı rüsumunun hasılat-ı sahihesi hakkıyla meydana çıkarılamamış*). Anyone could easily hide the product under their "bosom" during tax surveys. There was no way to overcome "malign" (*fesad*) tax evasion efforts in the case of rose oil. Thus, fewer people volunteered to collect the rose oil tax.[144] In 1852, Bakırzade Mehmed Efendi won a tender for collecting customs duty (*resm-i gümrük*) of rose oil in Akçakızanlık.[145] However, the provincial parliament of Edirne later informed that his contract was annulled because Karlovalı Osman Ağa intervened and promised to provide 100 thousand kuruş in forty-one days for the same office.[146] The Ottoman bureaucracy might have faced problems establishing a stable mechanism for taxing rose oil in Kızanlık. On the other hand, local people continued to grow roses and extract their oil. A farmer household's decision to concentrate on rosaries or stick with grain production would seriously affect the number of oxen they kept. These strong non-human agricultural laborers were experts in grain farming, but they could have only a marginal role in rose oil production.

Oxen were the most helpful workers that a farmer could have in a grain field, but the same non-human workers might turn into a farmer's biggest enemies in a rosary, where they could ruin a portion of the harvest with a single false move. In Kızanlık's village of Hamursuz, three related households named after a certain Osman would hardly abandon their rose gardens. In 1845, temettuat scribes estimated that Hüseyin and Mustafa would each earn around ninety kuruş from their rose harvest, which pointed to a considerable source of income, especially for the younger and poorer brother. Meanwhile, Osman's descendants would neither slaughter their three pairs of oxen as long as these non-human plowers worked without a problem in the grain fields. Despite their

144 OA. C.ML 197/8180, 29 Recep 1267 (30 May 1851).

145 OA. MVL 333/22, 3 Muharrem 1269 (17 Oct. 1852).

146 OA. MVL 334/29, 8 Rabiulahir 1269 (19 Jan. 1853). It is worth underlining that such auctions for tax collection and unexpected contract modifications took place in an atmosphere of competition between the local elite of Edirne for "maximiz[ing] their grip on state and local positions." See Köksal, *The Ottoman Empire,* 107.

engagement in different occupations, the three households named after Osman primarily relied on cereal farming, which was unthinkable without their oxen. Forty-year-old Hüseyin bin Osman was the eldest brother, and his household had the highest annual income with eight hundred kuruş. Hüseyin's younger brothers, Ömer, a thirty-two-year-old man with a blond beard, and Mustafa, a twenty-five-year-old man with a blond mustache, earned slightly less, respectively 557.5 and 605 kuruş per year.[147] All three brothers had four-dönüm-wide grain fields, four-dönüm-wide fallow lands, two-dönüm-wide rose gardens, as well as little vineyards and pasturelands.[148] Yet, their primary source of occupation was grain farming. Each household had rented additional plots of four to five dönüm to increase the acreage of their wheat, barley, and rye production. The three brothers might represent three separate households, but they should constitute a big single workforce with the inclusion of the wives and daughters they probably had. Still, the scribes apparently neglected female household members during both the population and temettuat surveys. The strongest members of the Osman oğlu workforce were certainly the six oxen they kept, but each worker should have a specific function. Such a relatively crowded team could follow multiple strategies at the same time. They would have the tightest schedule in the summer season. While Ömer would bring the wheat harvest from the field on an ox cart, Hüseyin would be threshing it with another pair of oxen at home. At the same time, Mustafa would be reaping grasses and attaching them to the back of the remaining pair of oxen so that their wives could later prepare straw. The wives and children of the three brothers would either help Hüseyin with the threshing work or go picking roses. If women headed to the rosaries, no oxen would be left for them, and, indeed, they would not be looking for the oxen's assistance during the rose harvest. Some human members of the Osman oğlu workforce might collect roses in straw baskets, while the remaining human and non-human members would be taking care of the cereal harvest. The relatively rich total labor

147 See household no. 17 in OA. NFS 4392, 3 Rabiulevvel 1261 (12 Mar. 1845): 61.

148 OA. ML.VRD.TMT.d 5205: 27-28.

sources of the aforementioned three households from Hamursuz might have enabled them to simultaneously carry out dissimilar agricultural activities such as grain farming and rose production. They kept pairs of oxen for their grain fields but still continued raising roses in their gardens, which were small and delicate enough to keep away from the oxen's heavy hooves.

In the villages of Kızanlık, most peasants worked in their plots for cultivating grains and in their rosaries for raising roses simultaneously. Seventy-eight percent of the sample (390 households) living in the chosen five villages had paid levies for roses. The average rose tithe payment could compete with the levy for cereals in some villages. In Huzerler, the tithe for roses (four hundred kuruş) was nearly eighty percent of the tithe paid for cereals. In the village of Maksi, the 7553 kuruş that peasants had paid as tax for raising roses was greater than half of the tithe they had paid for raising grains. Most of these rose cultivators were the same people who also grew cereals at the same time. Therefore, rosaries occupied a significant part in Kızanlık's rural life. Most farmers devoted much of their labor to rose cultivation and received a substantial income from this elegant and lucrative product.

TABLE 4.14 Annual tithe payments for harvesting cereals and roses

register no.	annual tithe for cereals (kuruş)	annual tithe for roses (kuruş)	number of rose tithe payers	average rose tithe per payer (kuruş)	average cereal tithe per farmer (kuruş)
5203	3585.6	621	28	22.18	83.39
5204	707.5	45	9	5	30.76
5205	6425.1	1503	55	27.33	86.83
5206	500.75	400	24	16.67	19.26
5207	14,176.6	7553	274	27.57	50.81
TOTAL	25,395.55	10,122	390		

What role did non-human workers play in agricultural activities around Kızanlık? Since most households worked simultaneously in rosaries and grain fields, it is not easy to dissociate the oxen's marginal role in these two different types of plots. Still, one can assume that farmers did not use (or even want to see) oxen in rosaries. They could be helpful in plowing and fertilizing the soil. However, their enormous bodies and massive hooves surely would ruin the produce in a rosary. Only seventeen households in the whole sample of Kızanlık had paid tithe for roses but did not cultivate a grain field. The seventeen households did not provide a pattern regarding their yearly income level or occupations. However, the data about these households still offered clues about the oxen's secondary, or maybe absent, role in rose production. Among six households that kept pairs of oxen, five practiced specific professions and received income since they worked as log traders (*hatabçı*), the village guardian (*bekçi*), shepherds (*çoban* or *sığırtmaç*), millers (*değirmenci*), servants (*hizmetkar*), a wheel repairer or manufacturer (*ispitçi*), a construction carpenter (*dülger*), or manufacturers of specific textiles (*cebeci*). In some cases, registers tried to clarify the role of non-human workers in the form of little notes. As work animals did not generate directly taxable products such as milk and offspring, some scribes felt the necessity to explain their role further. Just above the pair of Anatolian taurine oxen that Kara Gülle oğlu Osman kept in the village of Yemişler, a little note inscribed that the worker bovines were related to Osman's log trade profession: *hatabçılığı tetimmesinden olduğu*.[149] The register no. 5207 included a different case. The scribes who surveyed the Maksi village classified households no. 151 and 152 as "farmers" (*erbab-ı ziraat*), although they did not record any plots on their behalf. In line with the occupational classification, the two pairs of oxen the households kept had the additional note explaining that the worker bovines made part of the farming activities: *çiftçiliği tetimmesinden olduğu.*[150] In fact, Kirke, the representative of the household no. 151, earned most of his income from manufacturing (*cebecilik*), which

149 See household no. 19 in OA. ML.VRD.TMT.d 5203: 12.

150 OA. ML.VRD.TMT.d 5207: 79.

brought him 420 kuruş each year. While the rosary's yearly financial contribution to the household was 54.5 kuruş, four dairy sheep annually brought 22.5 kuruş, four barren sheep brought 16 kuruş, and a dairy cow brought 50 kuruş. A detail that reinforced the household's supposed farmer identity was their payment of tithes for raising corn (3 kuruş) and haricots (2 kuruş). However, the information about the fields in which crops grew was missing. For Kirke's neighbor Dimo, the situation was no less complicated. Most of Dimo's revenue came from a rosary (in the size of six *evlek*) that brought 570 kuruş on average yearly and a single-dönüm vineyard that brought 285 kuruş. With the six sheep's contribution of 17 kuruş, the household's estimated yearly income was 872 kuruş.[151] Roses and grapes usually did not call for the intensive labor of as huge muscles as the oxen had, and many cultivators preferred short tools for working in a vineyard or rose garden. Yet, if Dimo really had a pair of oxen, as the register noted, they had to contribute to rose or grape cultivation at least by carrying stuff, if not by tilling the soil. The remaining eleven households that raised roses but did not have a crop field did not keep any oxen. The absence of oxen and their appearance in relation to specific occupations in this particular group of households among five hundred support the assumption that the oxen's role in rose cultivation was only secondary, if not absent at all. Some farmers might even raise fences around their rosaries to prevent the entry of their own non-human plowers. Rose cultivation and cereal farming represented two different agricultural strategies. The former strategy nearly completely excluded the oxen, while the latter strategy was largely based on the oxen's labor. Most farmers in mid-nineteenth-century Kızanlık managed to reconcile these two different agricultural activities. They would still have occasional difficulties reconciling oxen's heavy hooves with tender rose petals.

151 I recalculated and corrected the register's estimation of 882.5 kuruş.

TABLE 4.15 Households that grew roses but did not have grain fields

temettuat register no	household no.	non-human workers	sources of income	annual tithe payment for roses (kuruş)	average yearly income (kuruş)
5203	5	a pair of oxen	a rosary and log trade	3	337
5203	19	a pair of oxen	a rosary, a vineyard, four fruit trees, and log trade	30	460
5204	19	-	a rosary, a vineyard, and his profession as the village guardian	1.5	392.5
5206	17	a pair of oxen	a rosary and his profession as a cattle shepherd	5.5	365
5207	5	-	a rosary, a vineyard, his profession as a miller	36.5	1085.5
5207	29	a donkey	a rosary, a walnut tree, his profession as a servant	55	835
5207	48	-	a rosary and a vineyard	15	200
5207	66	-	a rosary, a vineyard, his profession as a servant	20	600
5207	79	a pair of donkeys	a rosary, a vineyard, a walnut tree, and his profession as a wheel repairer (*ispitçi*)	39	754
5207	83	a donkey	a rosary, a vineyard, a walnut tree, and his profession as a miller	103	1608
5207	121	a pair of oxen and a pair of donkeys	a rosary and his profession as a textile manufacturer (*cebeci*)	20	575
5207	130	a donkey	a rosary, a vineyard, and his profession as a carpenter (*dülger*)	25	804.5
5207	150	a donkey	a rosary and his profession as a servant	25	660
5207	151	a pair of oxen	a rosary and his profession as a textile manufacturer (*cebeci*)	20	563
5207	152	a pair of oxen	a rosary and a vineyard	55	872

5207	169	a donkey	a rosary, a vineyard, and his profession as a servant	30	914
5207 (list of Aşağı Mahalle)	27	a donkey	a rosary and his profession as a shepherd	8	399.5

§ 4.8 Conclusion

For thousands of years, the ox occupied an indispensable place in farming. No rival draft animal could threaten the vital role of the ox for agriculture in a great portion of the regions that the Ottoman Empire covered. The Province of Edirne joined the areas where the unmatched hegemony of the ox as the plowing champion prevailed. Trade routes within the province flew through the branches of the Maritsa to reach the Aegean Sea or climbed over mountains to reach the Black Sea. People were busy loading timber, grains, and coal into boats in the docks. These products that the province exported did not have tags on them, but everyone would know that they were the outcome of operations mainly carried out by the oxen. It was these non-human workers with horns and tails who dragged logs, pulled coal carts, plowed the soil, threshed the harvest, and carried grain sacks. The oxen could not express themselves in human words. So, they left only a few indirect traces of their hard work in the human archives.

The traces that oxen left in temettuat registers from the Province of Edirne were in the form of numbers. Registers carefully noted the number of oxen that each household kept. In line with the widespread pattern, oxen lived in pairs in the barns of households that raised cereals. In all the villages the sample covered, the average number of oxen per household with grain tithe payment varied around two. If a household did not keep oxen, they usually had a solid explanation, such as not cultivating grains or practicing a specific profession. Farmers who cultivated roses in Akçakızanlık did not need the labor of oxen. Their rosaries of one or two acres did not require the strong muscles of an ox. Some of them decided to employ donkeys (weaker but less costly workers than oxen)

in case they needed the help of a non-human worker. In Midye, coal carriers preferred the oxen's strong muscles to assist their trade. A considerable portion of the ox population in Midye belonged to the water buffalo species and helped their coal carrier human fellows in dragging carts or maybe huge logs. Their human owners exploited these competent workers all year long. They were always busy tilling the soil, pulling carts, or carrying goods to the port.

Changes in the human world would seriously affect the lives of non-human workers. If oxen could clearly understand the discussions of the human world, they would be more than happy in 1839 to hear the news about the end of all corvée. Years after the Tanzimat Edict, the Ottoman government continued to directly impose corvée work on certain villages for particular services such as log and coal collection. Such imposed tasks concerned not only human peasants but also their non-human fellows. In June 1855, when the imperial order about the capital's coal provision arrived in the subdistrict of Midye, at least some peasants would have remembered the Tanzimat Edict's promise. Bayram bin Ballı Mehmed could have abandoned threshing his harvest of fifteen dönüm and taken his single pair of oxen to the forest to carry charcoal and firewood for Istanbul in June 1855. He would be forty-eight years old and without a grown-up son to whom he could delegate at least a portion of his burdensome affairs.[152] Dragging a squeaky empty cart from the village to the forest, the two non-human coal carriers would somehow sense Bayram's anguish. Sixteen years ago, a declaration from Istanbul had come close to triggering changes that would ease the burden for Bayram and his oxen. However, the following orders coming from Istanbul later confirmed that these human and non-human peasants of Midye's Korfekolya village were not going to have the comfort to focus on grain farming. The human social order could not finalize the anticipated change; thus, the oxen of Midye continued to experience the exhausting stress of threshing cereals and carrying charcoal carts at the same time.

152 See person no. 42 in OA. NFS 3980, 1 Muharrem 1258 (12 Feb. 1842): 108.

The numbers in the temettuat registers do not explicitly explain the oxen's stressed work agenda. The quantitative data in the consulted temettuat registers remain silent regarding farmers' agronomy methods in Edirne. The registers do not bear details of the labor processes farmers employed and the financial results they obtained. They neither have a clear answer to the problem of peasant indebtedness that other archival documents underline. However, the sample from the Province of Edirne provides enough information for further analysis. The oxen's marginal contribution to yields will undoubtedly demand more research. Yet, the sample shows strong tendencies concerning the distribution of oxen among households from different occupations and at various socio-economic levels. A comparison between the temettuat data of different provinces will deepen the analysis.

TABLE 4.16 General data from the sample of Edirne

register no.	house holds	farmer house-holds	cultivated land size per farmer (dönüm)	annual gross grain product per farmer (kuruş)	annual grain output per dönüm (kuruş)	oxen	oxen per farmer	annual income per resident (kuruş)	annual yield per pair of oxen (kuruş)	cultivated land size per pair of oxen (dönüm)
5203	47	43	17.90	833.860	51.67	85	2.02	1098.04	340.58	17.69
5204	29	23	11.98	307.609	62.29	40	1.74	848.49	255.70	13.78
5205	76	74	17.08	868.257	55.68	159	2.20	1163.95	328.02	15.51
5206	32	26	6.62	192.596	50.76	54	2.08	937.02	824.28	6.37
5207	316	279	10.45	508.122	69.03	447	1.60	1127.12	353.75	13.04
6170	80	44	14.71	572.80	60.08	148	3.36	1021.63	788.36	8.74
6171	64	59	7.01	264.37	36.13	122	2.07	1162.73	185.46	6.78
6172	53	37	8.58	354.62	37.53	80	2.16	879.95	634.30	7.94
TOTAL	697	585				983				
SAMPLE AVERAGE			11.58	526.29	52.90		1.95	1029.87	539.66	11.23

5

Traces of Oxen in the Province of Kastamonu

Kastamonu is on Anatolia's coast to the Black Sea. The region is known for its forests and various products carved from timber. The İsfendiyar (Küre) Mountains, which protect Kastamonu's forests on their steep slopes, also limit the arable plain land that remains for farmers. Isolated from the rest of the province, Cide suffers the most from the negative effects of the topography. In the mid-nineteenth century, peasants in Cide were in an endless and exhausting struggle to ensure their economic subsistence. The strictly narrow acreage of grain fields required most farmers to diversify their income. Woodcutting and transferring logs to the Black Sea coast was an equally vital work for most peasants in nineteenth-century Cide as grain farming. Both occupations demanded devoted efforts from oxen, without whom human peasants would be dragged into debt cycles or famine. Many people would seek new careers far away to escape from the region's harsh conditions, which required permanent struggle for economic subsistence in rural Kastamonu.

The humid climate and frequent precipitation in Kastamonu imposed additional stress on the harvesting and threshing operations. Untimely orders from the imperial center or abuses of provincial notables sometimes incited peasants to make difficult choices between transferring logs as corvée work, taking care of their own produce, or even rioting.

Most farmers were simultaneously involved in various occupations such as grain farming, log trade, and fruit cultivation, but they had a narrow workforce, which they could not mobilize for two completely separate causes on the same day. The peasant workforce of a family included the arms of suitable family members and a single pair of oxen, who all needed to put great efforts throughout the year to achieve an excessively modest income in nineteenth-century Cide. The delicious apples and plums that grew in little orchards were insufficient to paint Cide's unkind rural conditions in vivid colors. Farmers and their oxen would spend one day toiling in the fields and the other day having an arduous march from the forest to the coast for transporting logs. On some occasions these toilers expressed themselves in different ways. Although most of their demands were not fulfilled as they would expect, they succeeded in leaving their traces in the archives of the Ottoman Empire.

§ 5.1 A Missing Husband

In the summer of 1860, Emine Hatun submitted a petition from Istanbul to the governor of Kastamonu about her missing husband. It had been over a year since the gunsmith (*tüfenkçi esnafından*) called Kara Halil oğlu Ali Osman left for his hometown, Cide, for a two-month-long visit. The maintenance he left to his family before departing could cover their needs for barely two months. Left alone with two daughters in misery and shock (*sefil ü sergerdan*), Emine felt in complete deprivation (*müzayaka*) and demanded that her husband be brought to Istanbul (*Dersaadet'e ihzarı*).[1]

The hilly landscape of Cide offered limited opportunities for agricultural production.[2] Most villages in Cide were "dispersed" and included

1 OA. A.}MKT.UM 417/33, 9 Muharrem 1277 (28 July 1860).

2 Analyzing the temettuat registers of Aydın's Akçay Basin, Işık associates the Yaykın Plateau's hilly terrains with unfavorable economic conditions and villages of small size. The same analogy will certainly work for Cide. See Şevket Işık, "Tarihsel Coğrafya Açısından Temettuat Defterlerinin Değerlendirilmesi ve Aşağı Akçay Havzası Örneği," *Ege Coğrafya Dergisi* 10 (1999): 254.

only "two or three houses" (*bu havali kuraları ekseri dağınık ve iki üçer menzilden ibaret olduğundan*). The Ottoman bureaucracy simplified the situation by combining every two or three villages under a group called "divan," yet even most of these combined structures were rarely crowded (*bu divanlarda dahi kalabalık olanları nadir idüğü*).[3] Villages around Cide were losing their residents to other corners of the empire. People were leaving the subdistrict to practice different occupations far away. Kara Halil oğlu Ali Osman was a single example. Emine Hatun's petition underlined that the Ahmedli village[4] in Cide's Kayadibi Divanı was Ali Osman's "homeland" (*memleket*). So, if not Ali Osman himself, his father was certainly born there and left the village sometime long before the 1840s.[5]

Kara Halil oğlu Mehmed bin Ali and Halil bin Ali, two peasants in the Ahmedli village, might be Ali Osman's elder brothers. By 1841, Mehmed was a forty-five-year-old man with a black beard, and Halil was a forty-year-old man with a brown mustache.[6] Sometime around the late 1810s, their father, Ali, might have been concentrating on a difficult decision when he had another son, Ali Osman. He might have considered twenty-year-old Mehmed and the adolescent Halil old enough to keep an eye on their few acres of arable land and a bunch of fruit trees in Ahmedli.[7] Eventually, he might have made up his mind and head to Istanbul, probably in his late-thirties or early-forties. It is probable that Kara Halil oğlu Ali left his wife in Ahmedli while embarking on a one-way adventure with

3 These statements take place in a financial report about payments for village headsmen. A representation of how the Ottoman bureaucracy undermined these dispersed and underpopulated villages is that they paid the salary of only a single headsman in a divan that multiple villages constituted. OA. Maliye Masarıfat Defterleri (ML.MSF.d) 1431, 20 Cemazeyilevvel 1256 (20 July 1840).

4 Although the scribe noted the village's name as Ahmaklı, Ali Osman's actual homeland should be the Ahmedli village within Kayadibi Divanı. The village's current name is Günebakan.

5 Ali Osman's name is not mentioned in the population register of 1841. For the village of Kayadibi's Ahmedli, see OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 354.

6 See household no. 10 in OA. NFS 865: 355.

7 By 1845, Kara Halil oğlu Mehmed in Ahmedli had a three-dönüm grain field and three fruit trees. See OA. ML.VRD.TMT.d 3256: 27.

considerable uncertainties. The unfortunate woman, whose name will remain unknown, would be taking care of the domestic tasks that would be expected from women in nineteenth-century Anatolia and also help Mehmed and Halil cultivate wheat and corn. Her husband would not only find a job but also start a new life in the imperial capital. He would still occasionally visit Kastamonu to support his trade in Istanbul. Many artisans in the villages of Cide worked with wood, such as the spoon producers (*kaşıkçı esnafı*)[8] who carved boxwood for producing spoons and various objects.[9] Maybe Ali had such neighbors who helped him with his trade. He might order them timbers in specific shapes or finished wooden products, which he would load on an ox cart and carry with him way down to the coast on his return to the imperial capital. Ali's two sons would assist him until the harbor. There, they would return with an empty cart pulled by their oxen. Soon, his family in Ahmedli would hear the news about Ali's second wife in Istanbul and his newborn son, Ali Osman. In the following years, Ali would visit Kastamonu with his youngest son. Ali Osman's stepbrothers might take him to plowing the grain field or chopping wood in the forest, always in the company of oxen. Little Ali Osman would sit on the uncomfortable cart, watching the slow but strong movements of the massive non-human workers under the yoke.

It is likely that Kara Halil oğlu Ali did not have the physical condition for another Kastamonu visit by 1845, if he was still alive then. By that time, Ali Osman would be a grown-up young man already with a certain experience of apprenticing at Istanbul's gunsmith workshops. Had the latter visited his father's homeland in 1845, he would have found Mehmed in a bitter condition. It would have been a year or two since the fifty-year-old

8 In 1847, spoon producers in Cide made a complaint about Hazinedar oğlu Tahir, the local authority for timber tithes. By forcing the producers to pay tithes for both the box trees they cut and the spoons they carved, Tahir had accumulated as much as 180 thousand spoons in his hands according to the allegation. See OA. C.İKTS 7/308, 24 Zilhicce 1263 (3 Dec. 1847).

9 People in Cide continue to carve spoons from boxwood. They also produce backgammon checkers and numerous souvenirs. See Esra Türkyılmaz, "Anadolu Şimşirinin (*Buxus sempervirens* L.) Bazı Morfolojik ve Fiziksel Özellikleri" (M.A. Thesis, Ankara, Gazi Üniversitesi, 2005): 14-16.

farmer lost his younger brother, Halil.[10] One can only speculate if Ali's first wife was alive or if Mehmed had a wife and daughters by 1845. Still, he would enjoy the company of his twelve-year-old son, a dairy cow, and a single ox. Mehmed had left a single dönüm at fallow and cultivated wheat and corn on a three-dönüm field.[11] Hoeing a little plot of three dönüm with hand tools instead of plowing with a pair of oxen was not preferable, but could still be reasonable in case Mehmed avoided renting a second ox. However, one should have asked him under which conditions Mehmed earned the 150-kuruş annual income from timber trade (*ticaret-i keresteden*). As Anatolian ox carts were designed for a pair of oxen (like the plow), a single ox would not pull a cart to carry logs from the forest. Mehmed's ox would either drag a heavy tree trunk or carry bundles of light branches. Risky work involving solid trunks should not be the first choice of a fifty-year-old man. On the other hand, the second option would cost him more frequent and longer trips to the woods until he earned 150 kuruş. Mehmed's household's yearly revenues were only 255 kuruş, and the descendants of Kara Halil in Ahmedli needed to rely on chopping and carrying logs for their economic survival. Resident of Istanbul, Ali Osman, would hardly know how to support his stepbrother's family in Kastamonu. If he were wealthy enough, he might simply buy them a second ox to ease their toils…

The temettuat register for the village group called Kayadibi Divanı recorded 209 households,[12] which included a population estimated to be

10 Halil bin Ali, who was recorded in the population register of 1841, does not appear in the temettuat register of 1845. If he had left the village, like his father, the scribes would still mark his name with a brief note about his absence. The scribes neither put a note about his death or marked Mustafa bin Halil, Halil's fourteen-year-old son, as an orphan. So, Halil had presumably passed away long time before the temettuat survey, and his modest possessions and remaining family members should have somehow united with his elder brother's family. Halil's appearance in the population register decreases the possibility of a tax evasion effort by doubling households because the scribes would usually take copies of the previous registers with them and control the data in lieu.

11 OA. ML.VRD.TMT.d 3256: 27.

12 OA. ML.VRD.TMT.d 3256.

greater than 1200.[13] By the time of the temettuat survey, nine households did not actually live there. Three of them were absentee landlords from the distinguished Hasan Çelebizade family. The reason for the remaining absentees' departure is not apparent. One can suppose that some had left their villages to find different job opportunities far away from their homeland. And some of them might have joined their former neighbor Kara Halil oğlu Ali or his son, Ali Osman, in the imperial capital. The village of Ahmedli in Kayadibi had thirty-six households and ninety male residents, which would refer to around two hundred residents in total.[14] The scribes of the temettuat survey in 1845 did not write any notes about other possible emigrants from Ahmedli. If the surveyors had missed some emigrants, there could be more people from the village of Ahmedli who might have set off for new careers in different parts of the empire, just like Kara Halil oğlu Ali and Ali Osman would have done. Ancestors of some people in Kayadibi might have found themselves as far as in the Tigris-Euphrates basin in the eighteenth century to work as carpenters or caulkers in the imperial shipyards in Birecik and Basra alongside other artisans from the Black Sea or other coastal regions of the empire.[15] In the late-eighteenth century, people from Kastamonu constituted the most crowded community among the boatmen (*kayıkçı*) in Istanbul's harbors.[16] The Cide subdistrict, and more precisely its little port settlement called Gideros, were perceived as a source of skilled carpenters and caulkers to be drafted for the Imperial Dockyard in Istanbul. By the mid-nineteenth century, workers from Gideros provided one of the largest

13 The population register of 1841 recorded 516 male residents in the villages of Kayadibi Divanı. See OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 332.

14 OA. NFS 865: 354.

15 Husain, *Rivers of the Sultan,* 53.

16 Cengiz Kırlı, "İstanbul'da Hemşehrilik Tabanlı Tabakalar/Yoğunlaşmalar," in *Antik Çağ'dan XXI. Yüzyıla Büyük İstanbul Tarihi* (TDV İslam Araştırmaları Merkezi, 2015), https://istanbultarihi.ist/104-istanbulda-hemsehrilik-tabanli-tabakalar-yogunlasmalar.

immigrant groups in Kasımpaşa's Seyyid Ali Çelebi neighborhood.[17] Presumably, they all had a story about their departure from their homeland.

Eventually, Ali Osman ended up as a gunsmith in Istanbul. There is no way to know why he left his family in 1859, and whether his sincere motive was to return soon or disappear once and for all. Ali Osman might have accumulated debts and found the easiest way to overcome the moneylenders' pressure by enrolling in the massive army of "missing husbands,"[18] bypassing the legal and moral obligations of divorcing Emine. He should be around the age when his father, Kara Halil oğlu Ali, had left Kastamonu and his first wife. Heading to Kastamonu's Cide subdistrict, Ali Osman had to embark on a boat from the imperial capital to the port of Cide. The four-hundred-kilometer-long trip would certainly take a few days, which would grant Ali Osman enough time for reckoning about his decision resembling a case of intergenerational transmission of behavior. It was ironic that the village his father had left was going to be Ali Osman's place of refuge for a new start. He would see ox carts in the harbors the boat entered. The non-human carriers would be resting near the dock to recover from the exhausting trip from the hinterland. They would wait for the human workers to load the goods that the boat brought. Once loaded, the ox carts would hit the road to carry the fresh goods to the nearest market. The boat Ali Osman embarked on might not stop at every harbor on the Black Sea coast. If that was the case, he needed to disembark at Cide, the nearest big port to his father's homeland. There, he would look for a local boatman who would sail to Aydos. Only a dozen or two boats would be permanently harbored in the port of Cide, mostly little boats called *sandal* and *çekdirme*.[19] If the gunsmith could not barter

17 Akın Sefer, "Connecting Neighborhoods with Worksites: Coercion, Labor Migration, and Shipbuilding Workers in Late Ottoman İstanbul," *New Perspectives on Turkey*, 2025, 10-14.

18 Başak Tuğ asserts that missing husbands and deserted wives were not a rarity in the Ottoman Empire. Indeed, desertion was accepted as a valid and common reason for the annulment of marriages. See Başak Tuğ, "Ottoman Women as Legal and Marital Subjects," in *The Ottoman World*, ed. Christine Woodhead (Routledge, 2012), 365.

19 *Kastamonu Salnamesi:* 1321. Kastamonu Vilayet Matbaası, 1903, 327.

for a reasonable price, he had to walk the four-hour-long way there. Before setting off to Ahmedli, Ali Osman certainly needed a good rest. More than forty kilometers separated Aydos from Ahmedli. He could try hiring an ox cart, but a driver would hardly accept forcing his oxen to climb the steep hills that separated Kastamonu's villages from the Black Sea coast. Ali Osman had to cover the major part of the remaining route on foot unless he was lucky enough to come across a neighbor from Ahmedli, who would be returning from the port with an empty ox cart.

It was not safe to sail in the Black Sea in winter. Therefore, the gunsmith might have left for Cide in the summer of 1859. Kara Halil oğlu Mehmed would ask his stepbrother whether he had come to collect suitable timbers to produce rifles in his workshop in Istanbul. The answer might be unclear. Mehmed would be glad to host Ali Osman since the latter would assist Mehmed's family in the harvest of cereals and fruits. By the grape harvest, the vintage would signal the belated end of his supposedly two-month-long absence, if not the depletion of the maintenance in Emine Hatun's hands. Mehmed would be sixty-four years old by 1860 and welcome the aid of a man as skillful as Ali Osman. Mehmed was older than before, but his son would have been gradually taking over his role in the household's economic activities. Still, it was unlikely for Mehmed to accumulate the money he needed to buy a second ox that he had lost by 1845. Ali Osman might aspire to stay in the Ahmedli village for a longer period until the moneylenders from Istanbul or the Ottoman authorities found him. Yet, if the gunsmith did not want to cause an economic burden to Mehmed's family, he needed to provide them with the labor of the missing ox to increase their grain and timber output at the end of the next harvest. The maintenance money Ali Osman gave his family might actually be most of his money. He would have spent a considerable sum on the way from Istanbul to Kastamonu, too. In the case he lacked cash money, he would probably not afford to buy or rent an ox for his stepbrother's family. Then, he needed to perform like one. Ali Osman had to work as hard as an ox to hoe the soil and carry heavy logs. Maybe this was the price he had to pay for his new start in Kastamonu.

§ 5.2 An Influential Shipbuilder

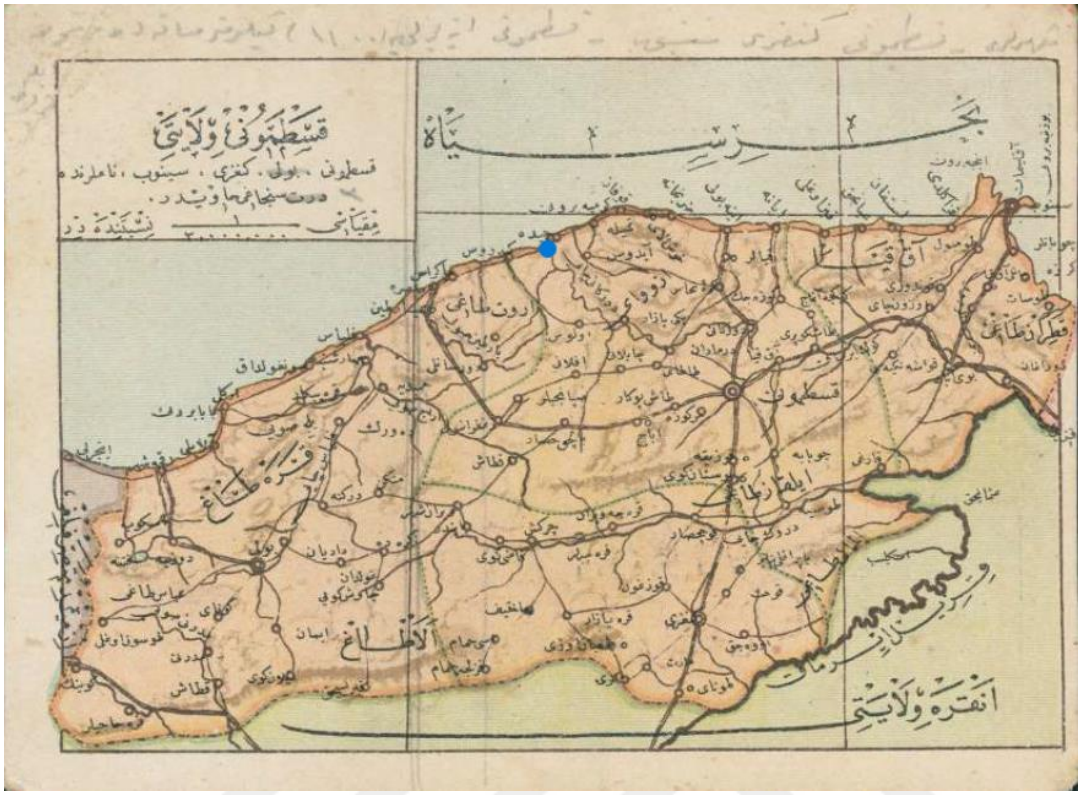

FIGURE 5.1 Map of the Province of Kastamonu. The blue spot marks the location of the subdistrict of Cide. SOURCE: Postcard from İBB Atatürk Library archive, Kartpostal Arşivi 28335.

Mid-nineteenth-century Cide was a subdistrict (*kaza*) of the Kastamonu province[20] in the center of the northern part of Anatolia. The drought that

20 By 1845, when the Ministry of Finance undertook temettuat surveys, Kastamonu belonged to the provincial administration of Bolu. Correspondingly, temettuat registers recorded that Cide was a subdistrict of Kastamonu and the latter had the status of subprefecture (*kaymakamlık*) vis-à-vis the Bolu province. Kastamonu became a separate province in 1846. See Burhan Şahin, "Cumhuriyet Öncesinde Kastamonu'nun İdari - Nüfus ve Etnik Yapısı (1839-1903)" (PhD Thesis, Ankara, Ankara Üniversitesi, 1992): 8 and Alperen Yalçın Bazna, "Osmanlı Taşra İdaresi: Kastamonu Örneği (1839-1876)" (PhD Thesis, Çankırı, Çankırı Karatekin Üniversitesi, 2021): 133.
Taking the risk of anachronism, I preferred to refer to Kastamonu as a province in the title of a chapter that is based on temettuat registers of 1845. The reason is that the sample from Cide is closer to the town of Kastamonu than Bolu and accurately shares

devastated central Anatolia in the 1840s affected the continental parts of the Province of Kastamonu just prior to the temettuat survey. The government sent ox and seed aid to farmers in Kuzyaka in 1844 and Sorgun in 1845,[21] two settlements remaining under the influence of central Anatolia's continental climate. On the northern side of the mountain ranges, Kastamonu's coastal parts stayed outside the scope of the mid-nineteenth-century drought.[22] The humid climate of the Black Sea region provided Kastamonu with the "charm of its water and air" (*letafet-i ab ü hava*).[23] The Cide subdistrict, on the coast of the Black Sea, shared the general environmental conditions of Kastamonu, which were marked by thick forests and humid air. Kastamonu's yearbook of 1288 (1871) noted that 17,412 people (all Muslim)[24] lived in the 4250 households recorded in Cide.[25] Most of them lived in villages settled in valleys and hills that surrounded Cide. Peasants would raise cereals and fruits, and earn a living from the forest as well. The oxen were their most essential companions. These non-human workers would pull the plow in the field and drag the heaviest logs in the forest.

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common geographical features of Kastamonu. Emphasizing the province of Bolu could be more accurate regarding the administrative scheme by the time of the temettuat surveys, but I sought consistency in geography rather than bureaucracy.

21 Erler, *Osmanlı Devleti'nde*, 140-41.

22 The relatively humid climate of Kastamonu did not promise absolute protection against droughts. Because grain fields had a limited acreage in the hilly parts of the province, such as Cide, Kastamonu's cereal production could show an inherent fragility against climatic fluctuations. Kastamonu was one of the Anatolian provinces that badly suffered from the droughts of 1874-75 and 1894. See Dölek Sever, "Geç Dönem Osmanlı İmparatorluğu'nda Hayvan," 171 and Erler, "Animals during disasters," 343.

23 *Salname-i Kastamonu: 1286*. Kastamonu Vilayet Matbaası, 1869: 81.

24 The yearbook apparently neglected the non-Muslim residents of Cide. At least seventeen (fifteen of them were Rum) Christian men lived around the port of Cide and paid the *cizye* levy in 1849. See OA. Maliye Varidat Muhasebesi Cizye Defterleri (ML.VRD.CMH.d) 650, 29 Zilhicce 1265 (15 Nov. 1849).

25 Cide covered roughly around ten percent of the whole population of the district of Kastamonu both in terms of people and households. See *Salname-i Kastamonu: 1288*. Kastamonu Vilayet Matbaası, 1871: 147.

Many people in Cide worked in the port in maritime jobs, including shipbuilding. The coastal work largely depended on forests. Forests and coasts around Kastamonu provided the Imperial Navy with the particular logs and competent people it needed. In the late eighteenth century, the Imperial Dockyard awaited the arrival of carpenters from the Black Sea coast to build and repair ships for the Imperial Navy. Among several settlements that documents referred to, such as Sakarya, Ereğli, Filyos, and Bartın, they underlined the importance of two particular places: Cide and Gideros.[26] The Ottoman bureaucracy acknowledged that these two little port settlements had an abundance of people who worked as carpenters (*Gideros ve Cide taraflarında amele-i merkumenin kesret-i vücudu tahkik olunmuş olduğu*).[27] These two little settlements were not only renowned for their talented carpenters but also for large timbers, usually used for building ship masts.[28] In 1796, the navy's demand from Cide was rather peculiar. The navy needed large timbers of pine trees (*çam ecnası kereste*) for building a large pool in the Imperial Dockyard. The timbers were so large that the document reported the necessity of transferring vessels from Istanbul because the boats in Cide and Gideros were not suitable for the carriage.[29] From their collection to transfer, each step of the navy's particular orders required a complicated, days-long labor organization that involved woodcutters, carpenters, dock workers, and oxen. The last category of workers played the most essential role. Only workers as strong as the oxen were able to drag such huge pieces throughout thick forests. These non-human workers would slowly but steadily transfer massive tree trunks that could not be loaded on most vessels.

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26 Today, Gideros is no longer a strategic harbor but a lovely little bay located eleven kilometers away from the center of Cide.

27 OA. Cevdet Bahriye (C.BH) 194/9088, 5 Safer 1207 (22 Sep. 1792) and C.BH 163/7711, 29 Safer 1207 (16 Oct. 1792).

28 Tuncay Zorlu, "Tecnhological Developments in the Ottoman Navy during the Reign of Selim III" (PhD Thesis, Istanbul, Boğaziçi University, 2004).

29 OA. C.BH 188/8849, 15 Zilkade 1210 (22 May 1796) and C.BH 188/8850, 17 Zilkade 1210 (24 May 1796).

By the early nineteenth century, the collection of timber columns suitable for ship masts (*seren sütunu mubayacılığı*) had long ago become "a custom" (*bermutad*) in Cide. In the Hijri year of 1235 (1820), Hasan Çelebizade Halil Ağa held the office for this task until his predecessor's efforts hindered Çelebizade's enterprise. He reported in a petition that Duman oğlu Mustafa from Kastamonu and Memiş oğlu Eyüb, the former collector of masts, came together to spread the word around Cide that Hasan Çelebizade would force peasants to cut and carry more logs than needed.[30] Five years later, Hasan Çelebi oğlu Halil Ağa was no longer the mast column collector and had already spent a year in exile. The document from April 1825 does not clarify the former mast collector's place of exile or the role of the allegations against him in his dismissal from office. Instead, the scribe reminded, "mast columns, the special supplies of the Imperial Navy ships, had been collected for the Imperial Dockyard immemorially from Gideros and its surroundings" (*Donanma-yı Hümayun sefaininin levazım-ı mahsusasından olan cunda serenleri öteden beri Gideros ve havalisinden Tersane-i Amire'ye celb ü cem olunur iken*). Halil Ağa's exile (*nefy ü iclası*) had a negative effect on the working of the Imperial Navy, as Halil's successor Abbas could not provide a single column or mast from Cide. The document ordered the transfer of the 1405 columns waiting on the shore since the removal of Halil Ağa from the office and the reassignment of the exile for this crucial task.[31] By 1840, his son had taken over Halil Ağa's business. The navy had charged Hasan Çelebizade Hasan Bey for building an imperial ship (*sefine-i hümayun*) in the port of Gideros.[32] At the same time, he was also hiring caulkers for another imperial ship construction in the Sinop district.[33] Despite his numerous services for the empire, Hasan Bey's endeavors apparently found little support from the people of Cide. While transferring logs from forests for Hasan Bey, most peasants in Cide would remember the time of his father, Halil Ağa. The corvée log transfers that the Hasan Çelebizade family

30 OA. C.BH 91/4369, 12 Recep 1235 (25 Apr. 1820).

31 OA. C.BH 204/9522, 29 Şaban 1240 (18 Apr. 1825).

32 OA. C.BH 226/10510, 29 Zilhicce 1255 (4 Mar. 1840).

33 OA. MŞH.ŞSC.d 5741, 29 Zilhicce 1256 (21 Feb. 1841): 38.

demanded shaped the life of Cide's peasants and oxen. Villages around Cide would mobilize all their human and non-human workforce to collect the amount of timber the Çelebizade family demanded. Peasants could plow their own fields or harvest their produce only if they could spare their time from the corvée work. Their oxen would recognize no difference between the reign of Halil Ağa and Hasan Bey, as they regularly dragged huge tree trunks from the forest to the coast in an exhausting tempo.

On 20 March 1840, the local assembly of the Kastamonu district in Küre-i Nühas decided to reserve the office of "acting tax collector" (*muhassıl vekili*) for local notables in each subdistrict.[34] The reason was the abundance of the uncollected taxes (*bekayanın kesreti*) in the concerned subdistricts.[35] Moreover, Cide was considered as a vast subdistrict with an excessively steep rocky terrain on the coast (*sahil-i bahirde gayet sab ü sengistan*). So, a "foreigner" (*ecnebiden*) tax collector might not ensure the security in Cide.[36] The district assembly, which was itself a product of the Tanzimat process, would rely on the existing provincial notables to substitute the tax collector called *muhassıl*, which was another office the Tanzimat brought. Unsurprisingly, Hasan Çelebizade Hasan Bey was appointed as Cide's acting tax collector. The decision further deepened the local people's resentment against the Hasan Çelebizade family. On April 11, five to six people from each of the four areas (*nahiye*) of the Cide subdistrict gathered to level a charge against Hasan Bey with the allegation that the defendant tyrannized the population both in the time of his father and in his time (*gerek babasının vaktinden ve gerek kendi zamanından ahaliye pek çok zulüm etdikleri*). The defendant had forced the people of Cide multiple times to cut and transport timbers for the building of

34 Bazna, "Osmanlı Taşra İdaresi," 83.

35 OA. MŞH.ŞSC.d 5741, 29 Zilhicce 1256 (21 Feb. 1841): 8. For a meticulous transcription, see Gamze Bozoklu, "104 Numaralı Kastamonu Şer'iyye Sicilinin (H. 1256/ M. 1840) Transkripsiyon ve Değerlendirmesi" (M.A. Thesis, Kastamonu, Kastamonu Üniversitesi, 2021), 47.

36 OA. MŞH.ŞSC.d 5741, 29 Zilhicce 1256 (21 Feb. 1841): 38. For transcription, see Bozoklu, "104 Numaralı," 96.

imperial ships in the port of Gideros. The plaintiffs initially demanded an indemnity as high as 1,181,615 kuruş.[37] This enormous sum was nearly eleven percent of the gross yearly revenues of the residents in the whole of Kastamonu.[38] It is impossible to know how peasants of Cide calculated an indemnity as huge and precise as they demanded. The amplitude of their request should be an expression of an accumulated resentment against the decades-long corvée work for the Hasan Çelebizade family. A few months after the declaration of the Tanzimat Edict, the people of Cide were ready to reclaim the wealth that a local dynasty had taken from them via forced labor.

Historians argue that most *muhassıl*s acted together with the prominent people from the local elite.[39] While affirming the continuity of the prominent role of provincial notables in the *muhassıl* assemblies, Ayla Efe points out the differences between the new system and the former tax farming practices. According to the author, tax farmers would formerly concentrate all the authority in their own hands; whereas, in the *muhassıllık* system, the distribution of the tax collection authority between the *muhassıl* and the local assembly would result in a financial centralization that could infiltrate at the grassroots level.[40] However, the *muhassıl* himself might belong to the local elite, too. Then, the convention of a representative body -although it only represented the interests of the local elite- would be the sole novelty of the *muhassıllık* system, and the rule of provincial notables would remain intact. Nadir Özbek criticizes the historians who focus on the Tanzimat's formal novelties such as local assemblies but neglect the class composition of these legal bodies.[41] By spring 1840, Kastamonu's local assembly was headed by an "acting" tax

37 OA. İrade Meclis-i Vala (İ.MVL) 3/43, 11 Rabiulevvel 1256 (13 May 1840): 1.

38 The temettuat surveys of 1845 concluded that the income the whole district (*sancak*) of Kastamonu yearly generated was 10,877,198 kuruş. See Efe, "1845 Temettuat Sayım Sonuçları," 24.

39 Kaya, "Tanzimat'ın Bursa'da Uygulanması," 16.

40 Ayla Efe, "Muhassıllık Teşkilatı" (PhD Thesis, Eskişehir, Anadolu Üniversitesi, 2002), 55-56.

41 Özbek, *İmparatorluğun Bedeli*, 34-35.

collector, Akil Bey,[42] who probably had interests similar to those of other acting officers in the same assembly, that is, distinguished people from every subdistrict. The assembly would act as a court, but the socio-economic composition of the assembly would have a negative impact on this court's impartiality. The assembly in Küre-i Nühas treated the case brought by the people of Cide under the shadow of a certain sympathy for its own member, Hasan Bey. The court authorities started by questioning the massive indemnity the people of Cide demanded. The peasants' spokespeople were not able to calculate with substantial proof before the court the sum of money that Hasan Bey and his father owed to each peasant household in the villages of Cide. Assembly members must have giggled among themselves while watching the peasant representatives get frustrated with each other under the stress of making impossible calculations before the authorities. Soon, peasants would lose the initial psychological superiority and confidence that had guided them until the gates of the assembly in Küre-i Nühas. Then, the court presidence would put an end to the peasants' desperate efforts by proposing them to acknowledge their inability to prove and calculate their actual indemnity. Although they could no longer insist on an indemnity amounting to a million kuruş, the peasants' spokespeople managed to firmly defend their cause by convincing the judges that Hasan Bey and his father had seized numerous possessions from them throughout the years.[43] It had become certain that the court could not guarantee Hasan Bey impunity, but could still ease his penalty. The assembly devised a settlement suggestion of 200 thousand kuruş, 50 thousand kuruş for each of the four areas. The advice and mediation of the district assembly gave results when the settlement was put to the vote and accepted. The settlement decision that made people grateful (*müteşekkir*) made Hasan Bey only "pleased"

42 Akil Bey passed on the office to a new *muhassıl* called Hasan İhsan Efendi in August 1840. See Bazna, "Osmanlı Taşra İdaresi," 95.

43 The assembly recorded it as follows: *mir-i mumaileyh ve babasının üzerlerinde ahalinin pek çok emvali olduğu dahi maznun olmuş.* See OA. İ.MVL 3/43, 11 Rabiulevvel 1256 (13 May 1840): 1.

(*hoşnud*).[44] The assembly further pleased the defendant by restructuring his payment. Members of the assembly decided that the poor (*fukara*) would prefer receiving goods, grains, and animals rather than cash money and added that it would also be more comfortable for the defendant to make the payment in kind.[45] It was this last decision that made Hasan Bey completely pleased and grateful. The defendant pledged before the court that he was henceforth going to stay at home, praying for the sultan, would always be ready whenever the assembly needed his aid, and would never interfere in the affairs of the subdistrict again.[46] Though in favorable terms for the defendant, the settlement between Hasan Bey and the representatives from the villages of Cide was a partial affirmation of the allegations of tyranny by the heir of the Çelebizade family. Yet, Hasan Bey was not going to live a tranquil retirement as he had expressed. Peasants and oxen in Cide were going to further enrich Hasan Bey's family by providing them with timber for many years.

Before heading home with a portion of their indemnity, peasant representatives from Cide underlined their request for the dismissal of Cide's whole tax collection team. They did not want to see people among them in the ranks of the assembly (*meclis memurlarını içlerinden istemediklerinden*). The next day, on April 12, the district assembly in Küre-i Nühas appointed a new bureaucratic team for the Cide subdistrict, headed by Abdi Ağa from a distinguished family in the Hoşalay subdistrict as the acting tax collector.[47] When the new team arrived in Cide, they were hindered by the local people, who forced them to resign from their offices. In late June, the district assembly charged Hasan Çelebizade Hasan Bey to chase down the perpetrators of the chaos in Cide and provided him with a military unit to enforce this task. Once the prominent organizers of the little riot either escaped or got arrested, a crowded group of more than half a thousand, consisting of farmers and the poor (*beş yüzden*

44 OA. İ.MVL 3/43, 11 Rabiulevvel 1256 (13 May 1840): 1.

45 OA. İ.MVL 3/43: 5.

46 OA. MŞH.ŞSC.d 5741, 29 Zilhicce 1256 (21 Feb. 1841): 13. For transcription, see Bozoklu, "104 Numaralı," 57.

47 OA. MŞH.ŞSC.d 5741: 13.

mütecaviz fukara ve rençber), eventually surrendered and pledged to never oppose the sultan's will again. They had also abandoned their reservations about Hasan Bey.[48] Finally, the assembly in Küre-i Nühas decided on Hasan Bey's return to Cide's tax collection office and lent him the subdistrict's tax register.[49] Complaints, interrogations, dismissals, and exiles could hinder the Hasan Çelebizade family's economic activities only partially and temporarily.

The abolition of all corvée by the Tanzimat Edict might have encouraged the peasants of Cide to raise their voice against Hasan Bey. It is almost sure that rivalries among the local elite played a role in stimulating the common resentment against Hasan Bey's appointment for tax collection or the organization of a small-scale upheaval against the new tax collector team from Hoşalay. However, the composition of the district assembly and its impotence to control the cleavages among the local elite immediately revealed the Tanzimat's dependence on provincial notables. Meanwhile, the central authority's problems regarding tax collection in 1840 would not threaten the entire wealth the Çelebizade family had accumulated from the timber trade over the decades. It is not surprising to come across another descendant of the family, Hasan Çelebi oğlu Mustafa, who held a share in the building of a ship in the port of Cide two decades later.[50] A control over the trade's whole process from the felling of the trees to the delivery of the shipment could easily be translated into loads of money.[51] Towards the end of the century, members of the Hasan

48 OA. MŞH.ŞSC.d 5741, 29 Zilhicce 1256 (21 Feb. 1841): 33.

49 For the summary of the same series of events, see Bazna, "Osmanlı Taşra İdaresi," 90-92 and Bozoklu, "104 Numaralı," 114-116.

50 OA. Sadaret Divan Kalemi Evrakı (A.}DVN) 137/83, 13 Cemazeyilahir 1275 (18 Jan. 1859).

51 By 1872, a certain Bekir Efendi was appointed to provide the required quantity and quality of timbers from Kastamonu's İnebolu for the construction of the new palace buildings in Beşiktaş along the Bosphorus. Rumors soon triggered an investigation to control whether Bekir Efendi had reached an agreement with the captains who delivered the log shipments from Kastamonu to overcharge the Ottoman government with outrageous prices. See OA. Bâbıâli Evrak Odası Ayniyat Defterleri (BEO.AYN.d) 955, 9 Safer 1295 (12 Feb. 1878): 90. For a meticulous transcription of the *ayniyat* register no. 955, see

Çelebizade family were still holding their firm position in Cide.[52] Timber trade via forced labor and lucrative building activities in the ports of the Black Sea had brought an incalculable wealth and a century-long fame to the Çelebizades.

The forests of Cide generated significant economic activities that culminated in the ports of Cide and Gideros. The oxen stayed at the center of these human endeavors. They would drag logs, pull carts, and plow grain fields. Most peasants in Cide both raised grains and cut logs at the same time. They could neither raise grains nor carry logs with the same efficiency without their non-human workers. Most oxen in Cide would seasonally plow the field and temporarily drag timber from the forest to the coast.[53] With outstanding strength and versatility, they formed the backbone of rural labor. The oxen were so strong that the outcome of their efforts could enrich the Hasan Çelebizade family, arm the Imperial Navy, and still provide a living -though at a very modest level- for thousands of peasants in Cide at the same time.

Aleyna Ecrin Öztürk, "955 Numaralı Kastamonu Ayniyat Defteri'nin Transkripsiyon ve Değerlendirilmesi (H. 1283-1295) / M. 1866-1878)" (M.A. Thesis, Erzurum, Atatürk Üniversitesi, 2025), 120.

52 In 1884, members of the Hasan Çelebizade family was stated at the top of the list prepared for showing the most prominent people in Cide. See Eyüp Akman, "19. Yüzyılda Kastamonu'nun En Zengin ve En Eski Aileleri," Kastamonu Gazetesi, accessed June 29, 2025, https://www.kastamonugazetesi.com.tr/19-yuzyilda-kastamonunun-en-zengin-ve-en-eski-aileleri-2/.

53 Many nineteenth-century farmers in North America preferred oxen over horses because of the former's versatility. The author explains, "summer use on the farm could be combined with logging in the winter." See Liebowitz, "The Persistence of Draft," 34.

§ 5.3 Surveying Kastamonu



FIGURE 5.2 Satellite view of the Cide subdistrict. The pointers mark the location of the twelve nineteenth-century Ottoman villages covered in this chapter. SOURCE: Prepared on ArcGIS Online.

Rivers flowing from the İsfendiyar Mountains, tracing deep valleys and pouring into the Black Sea, shaped Kastamonu's topography. Villages are dispersed through valleys all along rivers such as the Devrekani and Aydos. Rivers formed natural harbors where they met with the Black Sea. There, they created destination points for human economic activities in the surrounding villages. The sudden changes in altitudes and lack of vast plains in Kastamonu forced humans to adopt a dispersed pattern of settlement. The population of Cide's villages was so small that the Ottoman bureaucracy found the solution in combining close villages in village groups called *divan*. When scribes set off for the temettuat survey in 1845, they marked the name of each village but organized the registers according to the *divan* to which these villages belonged. The scribes had to proceed through valleys, walk up and down the hills, and pass rivers to complete the survey of a single village group. Each movement of these anonymous scribes from one village to another required a little adventurous journey. However, their difficulty in mobility would also extend their working days, and hence increase their final payment. Still, one can only speculate if these scribes would prefer working in a plain but arid

territory like in Konya or a humid but hilly terrain like in Kastamonu's Cide. In Cide, steep hills would prevent the scribes from the comfort of hiring an ox cart. So, they needed to walk from one village to another to record the number of oxen they would see there. The temettuat scribes produced separate registers for each village group. Therefore, a probable random enumeration of the final copies makes it impossible to recreate the exact route that the scribes followed. However, the results of Cide's population survey of 1841 are noted in a single register. The order of the villages in the population register suggests a highly consistent route to follow, which could have been the exactly same route that the scribes of the temettuat survey followed four years later.

The Port of Cide must be a good starting point for temettuat scribes in 1845. Some members of the temettuat team might have come from a different province and might have embarked on a boat to Cide. Moreover, they might need to fulfill some formalities in the subdistrict's administrative center before leaving for their long journey. Once the scribes met with each other and got ready, they would start the survey with Kuraçlı Divanı, only four kilometers away from the Port of Cide. It stood on a lowland, so they might have hired an ox cart to reach there. After the central village of Kuraçlı with eighteen households, Öksüzlü was the second most crowded village with eleven households, and Kasım was the least populated one with only five households. The whole village group had forty-four households and fewer than 250 people. As this was their first village group, the scribes should have spent at least a day getting used to the survey practice and passed the night in the last village before proceeding to the next one.

The scribes could easily walk from Kuraçlı to Erküd Divanı in less than two hours on the relatively flat terrain. Still, they would not be far from the coast since only five kilometers or a walking distance of an hour southwards separated Erküd Divanı from the Port of Cide. This village group comprised thirteen villages, where more than eight hundred people lived in 152 households. With only five households and fifteen male residents, the village of İslam Bey was Erküd's smallest village. Meanwhile, there were as many as thirty-four households in the Erküd

village.[54] The peasants must have offered their visitors delicious fruits from their numerous orchards. If the survey took place in summer, the scribes would taste plums while wandering around the harvested grain fields. Divan-ı Erküd's survey must have taken at least a few days if not a whole week.

The scribes' next destination, Asarcık Divanı, was ten kilometers away from Erküd. They had to climb the whole way, up to a five-hundred-meter altitude at a certain point, before arriving at their destination after an exhausting journey of approximately three hours. With eleven households, Yazı was the smallest village, and Velioğlu, with twenty-four households, was the biggest village in Divan-ı Asarcık. Overall, there were almost sixty households and fewer than four hundred people. A few days would be enough for the scribes to note down all the possessions in these villages. The scribes would be amazed by the furniture and objects that Asarcık's skillful carpenters had crafted. However, they would not be able to meet with these competent craftsmen because most of them had left their village to work elsewhere. They had escaped from the difficulties of grain farming on the hills.

The road from Asarcık to Altıntaş Divanı was considerably comfortable since the scribes would be descending this time. When they arrived in the valley, they would see their destination on the other side of the Aydos River. Altıntaş Divanı was settled on a three-hundred-meter-high hill. There were seven villages in Divan-ı Altıntaş, including the little villages of Kum and Beldibi, both having only eight households. More than sixty households and around 450 people lived in the whole village group. Had the scribes visited prior to the time of vintage, the peasants would not have been able to offer them grapes. Indeed, the survey's coincidence with the grape harvest would be undesirable for both parties because many villagers in Altıntaş had vineyards alongside their grain fields and would have difficulty in answering the scribes' detailed questions in the midst of the extreme tempo to harvest their grapes before the birds did.

54 The village of Erküd is today called Sırakaya.

The scribes needed to have a good rest and prepare enough provisions before setting off for their next destination. First, they would descend from Altıntaş to the valley level. Then, they needed to follow the course of the Aydos for more than a dozen kilometers. Once they approached the Black Sea, they would head to the hills for a three-hundred-meter climb before arriving in Bedi Divanı. At the end of the journey, the scribes would have walked for more than five hours if they had not hired an ox cart in the valley. The five villages in Divan-ı Bedi were settled on hills covered with forests, just a few kilometers away from the coast. Among them, Küplüce had around fifteen and Aldırat had only five households, not as crowded as the Bedi village,[55] which had as many as twenty-seven households. The whole village group included around sixty households and fewer than four hundred people. Whereas most villagers were cereal producers and woodcutters, their proximity to the sea had encouraged many of these peasants to work at the harbor as caulkers. The scribes would see that some caulkers had left their villages long ago to pursue their new career.

After the survey of Bedi Divanı, the scribes would descend the hills from which they had come a few days ago. After a three-hour descent with picturesque scenes of the Black Sea from the top of the hills, they would reach Ova Divanı. The village group was settled on the delta where the Aydos River met with the Black Sea. The combined settlement included villages with over a dozen but fewer than twenty households, such as Rumi, Sakallı, and Kuşcu. The nine villages that Ova included were home to fewer than a hundred households and approximately seven hundred people. Less than an hour's walk separated Ova's villages from the Port of Aydos. Like their neighbors above the hills, most peasants in Ova were farmers, but some peasants were engaged in caulking. The scribes would observe that the impact of this occupation in Ova was deeper than in Bedi. Divan-ı Ova was closer to the port, and it had lost more than thirty of its households to the harbor due to occupations related to caulking.

55 The Bedi village is today called Çamaltı.

After leaving Ova, the scribes would proceed westwards on the Black Sea coast. Once they passed to the other side of the Aydos, they needed to take another hilly route along the coastline with equally fantastic views they had seen on the pathway that separated the village groups of Ova and Bedi. As they approached their destination, they would see how orchards of fruit trees accompanied grain fields in Osmanlı Divanı. The village group was settled on a slope on the Black Sea coast, only seven kilometers away from the Port of Cide. Except for a little village with four households, the remaining three villages, such as Köseli, all had more than twenty households. The village group's total population of more than four hundred people was distributed to sixty-six households. Most of them had oxen to plow their fields and carry logs. The scribes would spend a few days before an equally long journey to their next destination.

From Divan-ı Osmanlı, the scribes should have walked seven kilometers down to the center of the Cide subdistrict. There, they might have left the register copies they had finished to the authorities and maybe take a long rest before continuing the rest of Cide's temettuat survey. Once ready, the scribe team could either sail from the Port of Cide towards the mouth of the Devrekani River or simply hire an ox cart to pass the five-kilometer flat road to Irmak Divanı. The village group stood on the delta where the Devrekani River met with the Black Sea. Neither Demirci nor Memişoğlu, none of the seven villages in the group had more than a dozen households, except for the central village, which had fourteen households. There were fewer than 450 people living in the sixty-three households that the village group covered. They were mostly farmers and had delicious fruit tree gardens alongside their cereal fields.

The scribes' next destination was more than forty kilometers away from Divan-ı Irmak. They must have taken a boat to shorten their trip. However, the Devrekani River was not the best choice if they wanted to arrive in Sökü Divanı. The scribes presumably returned to the subdistrict center and embarked on a boat on the Aydos River. After navigating a couple of hours against the flow, they would disembark for an approximately two-hour climb to their destination. Sökü Divanı was situated on the İsfendiyar Mountains with an altitude of more than seven hundred

meters. It was mainly composed of little villages such as Değirmenbaşı with nine households or Fırıncık with fifteen households. The eleven villages within the group were home to more than 120 households and almost a thousand people. The steep topography and the abundance of streams had encouraged some peasants in Divan-ı Sökü to invest in water mills. On the other hand, some peasants were engaged in land transportation to overcome the harsh terrain and their villages' long distance from the coast. Ox carts could not climb hills as steep as those around these villages. Oxen in Sökü were specialized non-human grain producers and log draggers. Yet, mules were lighter carriers than oxen. That is why Sökü had many muleteers, who would take the scribes to their next destination after they completed the survey in a week or two.

Sökü's muleteers would assist their visitors on a dangerous five-hour journey down the slopes of the İsfendiyar Mountains until the scribes reached a tributary of the Devrekani River. If they could find a raft, they would sail for a few hours to shorten their way to Üreğil Divanı. Then, they would still have to gain an altitude of four hundred meters before reaching the villages of Üreğil. There were five villages settled on the steep slopes of the İsfendiyar Mountains, at an altitude higher than five hundred meters. The village group included crowded villages such as Akçaoğlu with forty households, Kethüda with thirty-eight households, or Kezağzı with thirty-three households. Around 140 households and over eight hundred people lived in this village group that spread over the mountains. The surrounding hills could not discourage these people from cultivating cereals on the arable land they could find or felling trees in the surrounding forests. The scribes must have spent at least a week in Üreğil to carry out the survey and have a rest until their next adventurous journey.

A similar village group awaited the scribes a dozen kilometers to the east of Üreğil. They needed to walk for five hours through hills and valleys until they reached a vast plateau. Derebucağı Divanı was settled on a vast plain on the slope of a hill. The villages of Derebucağı had an altitude of around four hundred meters. The peasants of Derebucağı needed to walk for five hours to reach Irmak Divanı on the sea coast and another hour to

reach the Port of Cide. Or, they could walk for slightly more than an hour from their village to reach the Devrekani River. The Derebucak village, the group's central settlement, had as many as forty-seven households. In total, there were 150 households and approximately a thousand people in the five villages of Derebucağı. Most of them were farmers. After the harvest, they needed to carry their grain produce for slightly more than an hour from their village to reach the Devrekani, where they could embark on a raft and sail with the flow to reach the coast, where the market was. They would follow the same course whenever they needed to transfer logs. This time, it was the scribes' turn to take the same route after finishing the survey in Derebucağı.

The scribes should have returned to the subdistrict's center after Derebucağı. To reach a distant part of Cide, which was isolated from the villages the scribes had visited until then, they presumably took a boat and went as far as they could approach Kayadibi Divanı, thirty kilometers to the east of the subdistrict's center. Disembarking on one of the small natural harbors on the coast, the scribes would see the villages of Kayadibi Divanı dispersed on the hills only a few kilometers away from the coastline. A short but steep climb stood in their way. A village as small as Demirci, with only seven households, or another one as big as Ahmedli, with thirty-six households, were both included in the same group. Two hundred households and approximately 1200 people lived in the ten villages that Kayadibi Divanı covered. The villages might be close to the sea, but they were forty kilometers away from the Aydos and fifty kilometers away from Cide, two important harbors. Just like every village they had visited, peasants in this village group were also engaged in log trade alongside grain farming. Peasants of Kayadibi Divanı would often fell trees from the thick forests surrounding them and lead their oxen who would drag the logs until the coast. The scribes could see the same oxen drag heavy tree trunks in the forest one day and plow fields or thresh harvest the other day.

The temettuat scribes might have traced a completely different trajectory in 1845. Nevertheless, the route the population surveyors followed in 1841 offers a thorough tour of Cide that presents the subdistrict's

socio-economic and geographic structure. The oxen had an essential place in that setting. Findings from Cide's twelve temettuat registers provide clues leading to a better understanding of the essential role of oxen in nineteenth-century Anatolia.

TABLE 5.1 The sample for the Province of Kastamonu

temettuat register no.	village group name	number of households in 1845	estimated population in 1841[56]	farmer households
3256	Kayadibi	200	1216	189
3257	Erküd	152	868	149
3258	Derebucağı	150	1028	149
3259	Ova	96	713	88
3260	Osmanlı	66	428	65
3261	Kuraçlı	44	239	44
3262	Bedi	58	374	55
3263	Asarcık	58	384	55
3264	Üreğil	141	832	136
3265	Irmak	63	430	62
3266	Sökü	127	922	126
3267	Altıntaş	63	447	59
SUM		1218	7881	1177

§ 5.4 Yields

Cide has cool summers and warm winters, with little difference between day and night temperatures. It receives precipitation in all seasons

56 I multiplied the male population by two for retrieving women and added an eight-percent margin of error. See OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841).

throughout the year, especially in fall and winter. The implication of the Thornthwaite method on precipitation records for the years 1964-2004 classifies the region as "humid."[57] Excessive humidity before harvest is not favorable for cereals. Nevertheless, water during the growth of the crops is a crucial factor in productivity. If summer rains did not waste the product, the humid climate of Kastamonu would bring significant yields. Watering, one of the most decisive problems of farmers, would not be a substantial problem in Cide. Farmers in Konya longed for a water stream to pass near their plots. In Cide, a little current could ruin the whole field. In 1860, when a certain Hasan Efendi directed the course of a waterway into the garden of Cideli Hüseyin, it turned out enough to make the plot "idle" (*muattal*).[58] Farmers of Cide would rarely suffer from a lack of watering options.

Kastamonu joined other places in Anatolia, where grain production marked peasants' main agricultural activity. According to the official statistics of the year 1897, farmers in Kastamonu produced more than 232 thousand tons of wheat on more than 1.6 million dönüm and nearly 104 thousand tons of barley on a million dönüm of land.[59] With its surrounding villages, the Cide subdistrict contributed considerably to such a score. The yearbook of 1321 (1903) calculated that farmers of Cide practiced agriculture on 425 thousand dönüm of land and more than eight thousand dönüm of gardens and orchards. The prominent crops they raised were varieties of cereals such as wheat, barley, and corn: *hınta, şair, mısır, darı,*

57 Uğur Aktaş, "Kastamonu-Bartın Küre Dağları Milli Parkının, Bartın İli Sınırları İçerisinde Kalan Bölümünün Odunsu Florası" (M.A. Thesis, Zonguldak Karaelmas Üniversitesi, 2006): 24-28.

58 Hasan Efendi and Akça oğlu Abdullah used to jointly run a mill in Cide. After Abdullah's death, his brother Hüseyin, who served in the Imperial Navy, complained in a petition about Hasan Efendi's misconduct. Hüseyin claimed that Hasan Efendi seized the mill, threatened to beat up and slaughter Hüseyin's brother Ali, and changed the course of the waterway near Hüseyin's garden to ruin the plot (*su yolunu dahi bizim bostan üzerinden geçirip bostan dahi muattal kalmış*). See OA. A.}MKT.UM. 439/28, 14 Cemazeyilevvel 1277 (28 Nov. 1860).

59 Güran, *Resmi İstatistiklere Göre,* 173-4.

siyez.[60] Cide broadly shared the general socio-economic characteristics of Anatolia, where cereal farming defined the prominent occupation of a considerable part of the population.

The research sample that twelve temettuat registers from Cide offered recorded 1218 households.[61] Nearly ninety-seven percent of the sample, precisely 1177 households, had paid tithes for cereals in the year that preceded the temettuat survey. If the tithe payment of 1177 farmers was 12,963.5 kuruş, a simple calculation will suggest that the worth of grains they had collected in the harvest of 1844 was almost 130 thousand kuruş. The bi-annual output data that the scribes noted for cultivated fields indicates that they estimated the worth of the harvests in 1844 and 1845 as 280,843.5 kuruş. The data roughly confirms the tithe calculation, leaving an average of 140 thousand kuruş for a single year. The gross cereal return of 110 kuruş per farmer was a vital contribution to the average annual household income of 236 kuruş. Yet, despite their efforts, grain production brought less than half of the total income of most farmers in Cide. Farmers from the sample certainly earned more than half of their total revenues from different economic activities. Theoretically, the abundance of water sources in Anatolia would create a favorable productivity rate per acre. According to the data from the sample, the yearly agricultural output average in Cide varied around twenty-four kuruş per dönüm. Despite such an adequate yield, the Küre Mountains decisively limited the acreage of grain fields in Cide. Still, the main question in front of the farmers of Kastamonu was not about access to the land but ensuring their economic subsistence from a minimal acreage of agricultural plots. Farmers of Kastamonu had a question of land, which most farmers in Edirne and Konya did not share.

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60 *Kastamonu Salnamesi: 1321*, 326. The product preference of the region's farmers remains the same today. See Vedat Akbaş, "Tarımsal Klimatoloji Açısından Bir Değerlendirme: Kastamonu Örneği" (M.A. Thesis, Karabük, Karabük Üniversitesi, 2015): 136-42.

61 OA. ML.VRD.TMT.d 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267. I excluded from my calculations 117 household representatives who had left their villages long time ago and did not actually live there.

Could farmer households around Cide become rich from cereal production? Settled in the mouth of the Devrekani River and in the proximity of the Port of Cide, Irmak Divanı had an economically advantageous position compared to most villages in Cide. Proximity to markets meant losing less time on the road, so reserving more time for production or recreation. With 265 kuruş, Divan-ı Irmak had the highest average annual income among the selected village groups. Indeed, Irmak's score is only slightly higher than the sample average of 236 kuruş. Yet, a closer look at Irmak's Memişoğlu village will help imagine how some peasants could become relatively wealthier than their neighbors in Cide. The village was called after the family of Memiş oğlu Osman, who was a farmer with cultivated grain fields of ten dönüm and another six dönüm waiting at fallow. Given Cide's land scarcity, these acreages pointed to a considerable size, and Osman's 425-kuruş income was exclusively higher than the village average. Apart from his grain fields, Osman had six fruit trees and a vineyard. He would still carry and trade logs, but this burdensome occupation's contribution to his annual revenues was as small as a hundred kuruş. Osman gained more than sixty percent of his revenues from farming. Three oxen assisted Osman in his agricultural activities.[62] Twenty-five years after the temettuat survey, Osman had already left his belongings to his son, Hasan, long ago, and the time had come for Hasan to do the same. Among the possessions Memiş oğlu Hasan bin Osman bin Ebubekir left behind in Fall 1870, alongside common rural items like a barn, a haystack, a vegetable garden, several farming tools including iron plowshares, as well as a pair of oxen, there was also shares with different partners from different villages in two water mills, a water buffalo cow with stirks, another pair of stirks, and a bullock. Hasan's total wealth was estimated at 3984 kuruş.[63]

Hidayet oğlu rençber Halil bin Ali was another resident of the Memişoğlu village. He was a fifty-four-year-old farmer with a blond beard by the time of the temettuat survey in 1845. He had two sons, twenty-four-

62 OA. ML.VRD.TMT.d 3265: 10.

63 See verdict no. 40 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873): 15.

year-old Mehmed and eight-year-old Ali.[64] With an annual income of 389 kuruş, Hidayet oğlu Halil's household was almost as rich as the Memiş oğlu family and much wealthier than most residents of Irmak Divanı. The size of Halil's cultivated land was six dönüm, and he had an additional two-dönüm land in fallow. Halil also had six fruit trees, a pair of dairy cows, and a male stirk. However, his favorite non-human assistants must be the pair of oxen, who helped him earn 202 kuruş from log trade.[65] Chopping and carrying logs brought Halil's household slightly more than half of their whole income. In Fall 1872, when Mehmed (or Hidayet oğlu Mehmed bin Halil bin Ali as recorded in the register) died at the age of fifty-one, he would leave behind a gourd garden, three walnut trees, a pair of taurine and another pair of buffalo oxen, iron plowshares for symmetric and asymmetric plows, five beehives, and 340-kuruş-worth of wheat. Mehmed's total wealth was 5125 kuruş.[66] The common point between the two households is their relatively high annual revenues in 1845 and the many items in their inheritance documents that point to considerable investments in agriculture. The plots, non-human animals, and sophisticated instruments they possessed were indeed investments that resulted in considerable wealth, around four thousand kuruş for the former and five thousand kuruş for the latter. In Cide's limited topography, farmers from these two families tried every means to increase their households' revenues and apparently succeeded better than most of their neighbors. Both the Memiş oğlu and Hidayet oğlu households had axes among their possessions. They also had oxen, who would play the essential role in turning dead tree trunks into a richness to be exchanged in the market. Despite their endeavors in different agricultural activities, both families continued to collect and sell timber. The natural limits of grain farming in Cide had increased the importance of log trade, a secondary occupation for most peasants in the other parts of nineteenth-century Anatolia.

As the harsh topography and thick forests limited the acreage of arable lands in Cide, grain farming was only a partial contribution to

64 See household no. 4 in OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 161.

65 OA. ML.VRD.TMT.d 3265: 11.

66 See verdict no. 289 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873).

peasants' economic survival instead of a source of enrichment for them. The local notables of Kastamonu, such as the Hasan Çelebizade family, had considerable investments in the maritime sector. Members of the Hasan Çelebizade family had several farms around Cide, but everyone in Kastamonu would know that their main source of wealth had been log trade and shipbuilding. Not all peasants had the socio-economic position to win ship construction tenders and benefit from the corvée labor of their neighbors. In most villages in nineteenth-century Cide, agricultural production kept its form of subsistence farming done with a pair of oxen. Meanwhile, they still needed to resort to various occupations to ensure their livelihood. They were not alone. In the eyes of farmers in Cide, oxen were their irreplaceable agricultural laborers who put all their efforts into plowing the muddy land, threshing the harvest, and carrying the produce for kilometers away. These non-human workers also carried on their thick necks the key for farmers of Cide to diversify their economic activities. The oxen would drag large timbers, pull carts, or carry heavy baskets from the forest to the coast so that their human owners could have an additional source of income from log trade.

TABLE 5.2 Tithes, yields, and income (in kuruş)

register no.	village group name	total annual tithe payment for cereals	yearly output per plot	yearly output per dönüm	gross cereal product per farmer	average annual household income (non-farmer residents included)
3256	Kayadibi	1701	91.67	24.80	90	210.06
3257	Erküd	1827.5	134.74	24.52	122.65	261.51
3258	Derebucağı	1654	119.95	25.73	111.01	254.14
3259	Ova	842	104.35	24.91	95.68	207.14
3260	Osmanlı	700.5	116.88	24.23	107.77	244.2
3261	Kuraçlı	430	108.12	24.88	97.73	210.53
3262	Bedi	445	88.07	25.12	80.91	219.28
3263	Asarcık	546.5	108.37	25.06	99.36	227.46
3264	Üreğil	1995.5	161.41	25.72	146.73	254.95
3265	Irmak	675	118.18	25.14	108.87	264.99
3266	Sökü	1571	135.65	23.64	124.68	245.5
3267	Altıntaş	575.5	106.20	24.23	97.54	199.45
sum		12,963.5				
average			232.26	24.45	110.14	236

§ 5.5 Land

The İsfendiyar Mountains stand between the Black Sea and the Anatolian plateau. Canyons, valleys, hills, mountains, and rivers mark the stressed landscape around Cide. Flysch layers give the main lithologic character of

the plateau.[67] Steep cliffs and thick forests leave limited places for agriculture. The yearbook of 1903 associated Cide with unfavorable transport conditions because of its "steep" (*sarpça*) roads.[68] Due to the lack of suitable land routes between Cide and the provincial center of Kastamonu, most people would prefer embarking on little boats from İnebolu to reach the isolated subdistrict.[69] Since most villages were settled on the hills,[70] climbing steep paths was an indispensable part of daily life for farmers of Cide while going to their fields or carrying their products to the market.

Nearly 1200 farmer households in the sample shared 5743 dönüm of land under cultivation. The average acreage of cultivated lands per farmer remained smaller than five dönüm, 4.88 dönüm precisely. The average was higher than five dönüm in Erküd Divanı, Üreğil Divanı, and Altıntaş Divanı but lower than four dönüm in Kayadibi Divanı and Bedi Divanı. If the calculation included vineyards and gardens, the average plot acreage per farmer would barely surpass five dönüm. Temettuat registers clearly exposed the striking deficit of arable lands in Cide.

67 Muhammet Öztekinci, "Küre Dağları Milli Parkının Vejetasyon Ekolojisi ve İklim Değişikliği Senaryolarına Göre Değerlendirilmesi (Doğu Kayını Örneği)" (PhD Thesis, Karabük, Karabük Üniversitesi, 2023): 188.

68 *Kastamonu Salnamesi: 1321*, 367.

69 Fırat Küskü, "Kastamonu Vilayeti'nde İdari Yapı ve Sosyal Hayat (1876-1908)" (PhD Thesis, İstanbul, Marmara Üniversitesi, 2024), 29.

70 For a morphologic map of the region, see Öztekinci, "Küre Dağları," 189.

TABLE 5.3 Land and acreage (in dönüm)

register no.	village group name	plot size under the plow	cultivated plot size per farmer household
3256	Kayadibi	719	3.80
3257	Erküd	839	5.63
3258	Derebucağı	703	4.72
3259	Ova	376	4.27
3260	Osmanlı	316	4.86
3261	Kuraçlı	194	4.41
3262	Bedi	195	3.55
3263	Asarcık	243	4.42
3264	Üreğil	864	6.35
3265	Irmak	293	4.73
3266	Sökü	740	5.87
3267	Altıntaş	261	4.42
sum		5743	
average			4.88

Access to land was not a categorical problem in Cide. The question was not about the absence but the strictly limited acreage of land that farmer households shared. Among 1218 households in the sample, only forty-one did not have a single dönüm of land under their usufruct. There were only six landless agricultural workers among the landless households in the sample: Kızıl oğlu İbrahim, a sharecropper (*ortakçı*) who worked for Hasan Çelebizade Ahmed Bey,[71] and five servants (*adi hizmetkar makulesi*)

71 Household no. 4 in OA. ML.VRD.TMT.d 3258: 31.

from Asarcık Divanı[72] and Üreğil Divanı.[73] The remaining thirty-five households were all dependent people who survived thanks to the aid of their neighbors (*şunun bunun ianesiyle geçinmekte olduğu*), including eight orphans and a disabled person.[74] Ten households indeed had a few dönüm of non-cultivated lands, which further questioned the validity of the problem of access to land in Cide. Even if the "landless" category covered all of the forty-one households without cultivated fields, they would represent only three percent of the sample. In conclusion, most people in the villages of Cide could find a plot to work on, even though the plot size would be merely a few dönüm.

Only twenty-one households cultivated fields larger than ten dönüm. Four members of the Hasan Çelebizade family contributed the most to the statistics with their 340 dönüm of land under the plow in two different villages of Cide. Apart from twenty-one wealthy landholders and forty-one households without cultivated fields, the remaining 1156 households, i.e., ninety-five percent of the sample, raised crops on fields smaller than twelve dönüm. Large landholders excluded, the average size of the lands that 1156 farmers cultivated was exactly four dönüm, considerably smaller than the sample average of 4.88 dönüm.

Hilly lands of Cide did not promise generous fields to the farmer households who lived on them. The harvest on a plot as small as four dönüm would surely not bring wealth, and it could hardly ensure the subsistence of a family. The case of Kara Halil oğlu Ali Osman, the gunsmith from Istanbul, was not unique since many peasants from Cide had moved away to earn a living far away from their hometown. Some households from Bedi Divanı had resorted to coastal jobs. Apart from their cultivated grain fields of three dönüm and several fruit trees, four households in this village group received an income from their work as caulkers (*kalafatçı*).

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72 See Halil Usta oğlu Hasan in OA. ML.VRD.TMT.d 3263: 3.

73 See Kalyoncuoğlu Muhammed in OA. ML.VRD.TMT.d 3264: 3, Demirci oğlu Mustafa in OA. ML.VRD.TMT.d 3264: 7, Gebeş oğlu İbrahim in OA. ML.VRD.TMT.d 3264: 30, and Bali Beşir oğlu Yetim Osman in OA. ML.VRD.TMT.d 3264: 30.

74 For Hamza oğlu İbrahim, the register noted, *emlakı olmayıp kötürüm olduğu halde şunun bunun ianesiyle geçinmekte idüğü.* See OA. ML.VRD.TMT.d 3267: 9.

Packing the bottom planks of a vessel[75] brought around a hundred kuruş to the families of three caulkers in Bedi Divanı, making nearly half of their total annual revenues. Ömer oğlu Yusuf earned as much as two hundred kuruş from caulking and was considerably wealthier than his three caulker neighbors with a yearly income of 325 kuruş.[76] The occupation's contribution to the household budget varied between 45 and 62 percent of these caulkers' annual revenues. If caulking was an additional occupation alongside farming, skilled members of the four households presumably spent a few weeks or months of the year on the dockyard. They would later return to their villages to help their family cultivate land and harvest grains. Abdullah oğlu Ali, a pulley maker (*makaracı*),[77] and Kör oğlu Osman[78] were two other farmer households in the same village group who earned consecutively forty-five and fifty-eight percent of their total yearly income from dockyard jobs. According to the data in the register, the households above (at least partially) continued to stay in their villages but also practiced occupations related to shipbuilding. Receiving 154 kuruş from his twenty-five percent share in a vessel, İshak oğlu İshak, the first headman of the Nefs-i Bedi village, was indeed another farmer with earnings related to the sea.[79] At least two households in the same village group had left their villages for nautical occupations. According to the brief notes that scribes added during the temettuat survey of 1845, it had been thirty years since a certain Abdullah left for Istanbul to work at the dockyard[80] and fifteen years since İslam Bey oğlu Hasan joined his compatriot in the capital to work as a seaman (*gemici*).[81]

In Asarcık Divanı, the field of specialization was woodwork. Temettuat register no. 3263 recorded four carpenters who also had

75 More precisely, caulkers would pour melted pitch on the cracks between the boards. See Husain, *Rivers of the Sultan*, 57.

76 OA. ML.VRD.TMT.d 3262: 3.

77 OA. ML.VRD.TMT.d 3262: 2.

78 OA. ML.VRD.TMT.d 3262: 5.

79 OA. ML.VRD.TMT.d 3262: 12.

80 OA. ML.VRD.TMT.d 3262: 5.

81 OA. ML.VRD.TMT.d 3262: 18.

cultivated fields of either three or five dönüm and kept several non-human animals. With either 200 or 250 kuruş income from their work as carpenters, these households earned between fifty-six and seventy-five percent of their yearly revenues from woodwork.[82] The register clearly noted that three of these carpenters worked in Istanbul. Nevertheless, their possessions, including cultivated lands, fruit trees, oxen, and dairy cows, indicate that either they left some members of their households in their villages or these carpenters frequently returned to their homeland to practice farming. The situation was similar for İğdiş oğlu Mehmed, who earned two hundred kuruş from his profession of gunstock production (*kundakçı*) in Istanbul but continued to cultivate a five-dönüm land in his village and collect fruits from seven fruit trees while keeping a pair of oxen and a dairy cow.[83] The aforementioned carpenters of Asarcık had former neighbors who were equally talented as them. Five carpenters and two other households with related trades from the same village group had moved to Istanbul long ago. They had deserted their hometown once and for all and left behind uncultivated lands, their only assets that scribes could note during the temettuat survey of 1845. According to the register's notes, their term of absence in Cide had reached twenty-five to forty years. One of these carpenters, Ali oğlu Mustafa, had earned a relatively prestigious career as he worked in the Imperial Dockyard.[84] Apart from the given examples, six households in Bedi Divanı and five in Asarcık Divanı that appeared in the register lists had moved away from their villages long ago. Six were in Istanbul, three had joined the army, one had moved to another village still in Cide, and one had gone to an unspecified place. If the villages of Cide offered these households bigger and better agricultural plots, at least some of these deserters would not seek their future in Istanbul. Curiosity or talent could not thoroughly explain the concentration of caulkers or carpenters in a single village. The limited acreage of available agricultural lands pushed these people away, and the probable network of their compatriots in the places they went

82 OA. ML.VRD.TMT.d 3263: 4.

83 OA. ML.VRD.TMT.d 3263: 11.

84 OA. ML.VRD.TMT.d 3263: 14.

encouraged them to engage in peculiar professions. Meanwhile, peasants who stayed in their villages in Cide struggled to survive by cultivating grains on a few acres of land and seeking additional sources of income in the forest or by the sea.

Apart from a bunch of local notables like the Hasan Çelebizade family, what did wealthier peasants in nineteenth-century Cide do with their money if they had the opportunity and will to seek an economic venture? Given the land scarcity, they could not enlarge their grain fields, and none of their neighbors would normally sell their little plot of a few acres. The temettuat registers focus on households' productive capacities and try to translate them into the form of land and yields. Although most scribes noted down land leases, they still disregarded transactions that concerned non-human animals. However, livestock investments could be a crucial and popular economic practice for many peasants in mid-nineteenth-century Cide. If they could not enlarge their grain fields, peasants who were not overencumbered by debts could invest in non-human animals.

Registers of the local sharia court break temettuat registers' silence regarding livestock investments in Cide. In 1845, Büyük Mustafa oğlu Mustafa in Kayadibi Divanı was among the poorest farmers in his village, with an annual income of only seventy-three kuruş. He did not have a single non-human animal.[85] And he could probably borrow Büyük Mustafa oğlu Ömer's pair of oxen in case he needed to plow his two-dönüm grain field or carry logs from the forest. When Büyük Mustafa oğlu Mustafa bin Mustafa bin Feyzullah died in 1870, the kadı must have been tired while writing down Mustafa's numerous possessions about to pass on to his inheritors: two wives, both called Fatma, four daughters, and a son named Mustafa. Mustafa's total wealth was estimated as 10,298 kuruş.[86] He had fifty percent shares in eight pear trees, five walnut trees, and an apple tree, all planted in Mustafa's own village. The trees' location strengthens the possibility that Mustafa had inherited these shares from a deceased

85 OA. ML.VRD.TMT.d 3256: 43.

86 See verdict no. 20 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873): 7.

descendant, probably his father, and the other share must be in the hands of another inheritor, probably Büyük Mustafa oğlu Ömer. Still, inheritance cannot explain all shares in Mustafa's own inheritance record. It is improbable that Mustafa was brother to Akça oğlu Hasan from forty-kilometer-away Üreğil, with whom he shared a fifty-percent share in a heifer and a bullock. A considerable portion of Mustafa's wealth was represented by shares in non-human animals. The partners' various names and hometowns suggest that Mustafa did not inherit but invested in these shares. He had 1710-kuruş-worth half shares in a water buffalo ox, four cows, two heifers, and five bullocks. While the financial value of Mustafa's own livestock was estimated as 2640 kuruş, he still felt the necessity to get together with six different people from different villages around Cide to invest in cattle. It is not certain for how long shareholders would keep a shared non-human animal, let alone the shared cattle's complicated feelings about having multiple owners who lived in different villages. Büyük Mustafa oğlu Mustafa's exclusive enrichment was equally mysterious. Yet, he must have thought about possible complications before investing and still saw a financial benefit in sharing non-human animals with different people. There might be no cash transaction, but the people might have simply brought Mustafa some calves that they did not want to take care of. Still, Mustafa would consider the time and fodder reserved for these little ones as an investment. The enormous wealth he had accumulated in less than three decades points out that he somehow received beneficial returns from his investments.

Livestock investment was a common practice among the village groups around Cide. In Irmak Divanı's Memişoğlu village, Memiş oğlu Hasan bin Osman bin Ebubekir had shares with different partners from different villages in a water buffalo cow with stirks, two one-year-old taurine stirks, and a three-year-old bullock.[87] Let alone Hasan's full ownership of other non-human animals, only half shares in these bovines made up more than twelve percent of Hasan's four-thousand-kuruş wealth. In Erküd Divanı, an annual income of 387 kuruş made Kara

87 See verdict no. 40 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873): 15.

Süleyman oğlu Ali bin Hüseyin a relatively wealthy peasant in the Çolak village. A farmer in his thirties with a brown mustache,[88] Ali cultivated cereals on seven dönüm, kept another four dönüm at fallow, and also had eight fruit trees. In the time remaining from farming, he would collect logs in the woods with his pair of oxen.[89] Kara Süleyman oğlu Mehmed Kalfa bin Hüseyin bin Abdullah, who appears neither in the population register from 1841 nor in the temettuat register from 1845, should be Ali's brother. In the 1840s, Mehmed Kalfa must have been practicing a craft away from his father's village. One day, Mehmed returned Çolak as a journeyman (*kalfa*). His inheritance record from 1872 suggests that Mehmed Kalfa had mastered woodcraft since he had the tools of a construction carpenter (*dülger alatı*). Like his probable brother Ali, Mehmed was also a relatively wealthy peasant, leaving behind 4367.5-kuruş-worth possessions. He had fifty-percent shares in four cows and a four-year-old bullock, as well as twenty-five-percent shares in a cow with a stirk and also a female calf.[90] The total worth of Mehmed Kalfa's investments in livestock that he shared with four different people was more than seven hundred kuruş, representing more than sixteen percent of his total wealth. If the pair of oxen and the pair of bullocks that Mehmed wholly owned are added, it turns out that the journeyman had invested more than 1800 kuruş in non-human animals. Although the temettuat scribes did not note in 1845, Kara Süleyman oğlu Ali presumably had investments in bovines, too.

In Osmanlı Divanı, Hidayet Çelebi oğlu Eyüb had an annual income of 275.5 kuruş, slightly above the village group average of 244 kuruş. He was a fifty-four-year-old farmer with a brown mustache and had two sons by 1845.[91] Eyüb cultivated wheat and corn on five dönüm and kept two dönüm at fallow. Like most peasants in Cide, Eyüb also had a bunch of fruit trees and practiced log trade with his single pair of oxen.[92] Hidayet Çelebi

88 See household no. 5 in OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 17.

89 OA. ML.VRD.TMT.d 3257: 7.

90 See verdict no. 146 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873).

91 See household no. 24 in OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 144.

92 OA. ML.VRD.TMT.d 3260: 9.

oğlu İbrahim bin Salih bin Abdullah must have been Eyüb's nephew. Like his uncle, İbrahim had an average wealth, 2742 kuruş by the time he passed away in early 1872. Among the possessions İbrahim left to his wife Kezban and children, there were fifty-percent shares in a pair of male and female one-year-old stirks and a one-year-old male colt.[93] Adding the pair of oxen, the three-year-old bullock, and the cow with a calf that İbrahim wholly owned, the total worth of his investments in non-human animals would be 1250 kuruş, almost fifty percent of his whole wealth. The Hidayet Çelebi family's example indicates that livestock investments were not a luxury that only wealthy peasants enjoyed in nineteenth-century Cide. Even a peasant with a total wealth of less than three thousand kuruş could resort to investing in cattle.

In a harsh context of land scarcity, the bodies of non-human animals had replaced arable fields for peasants who sought to increase their financial assets and chances for economic subsistence. When a single cow was owned by two different people, her human partners would share the milk and calves she would produce. The temettuat scribes who estimated that the worth of a buffalo cow's annual milk yield would be twenty-five kuruş in mid-nineteenth-century Cide marked an income of half that number for shared cows. While surveying Sökü Divanı, the temettuat scribes estimated that Abdullah Bilal, a relatively wealthy farmer with an annual income of almost six hundred kuruş, received an income of fifteen kuruş from each of the three Anatolian taurine cows he owned. Yet, the worth of the milk yield his buffalo cow would produce was only 12.5 kuruş for him.[94] Indeed, Abdullah Bilal had only a fifty-percent share in the female bovine, and half of the milk yield would be reserved for the other human partner. Many farmers must have preferred investing in livestock, that is, living capital, rather than Cide's humid and insufficient soil. Grain fields were not abundant enough to fully ensure the subsistence of most farmer households. On the other hand, the cattle could at least provide them with milk and meat. Meanwhile, the "shared" bovines would

93 See verdict no. 148 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873).

94 OA. ML.VRD.TMT.d 3266: 29.

continue grazing without having a clue about the complicated financial network around them.

§ 5.6 Oxen

A few dönüm of cultivated land and a pair of oxen defined the norm in Anatolian farming. In the villages around Anatolia, most farmer households that worked on their own land for subsistence farming would need the service of a pair of oxen for tilling the soil and harvesting their produce. Farmers of Cide used oxen to produce grains, but most did not keep their non-human workers in pairs. The sample of Kastamonu slightly deviated from the general pattern of grain farming as the average number of oxen per farmer household drew near one. The number of oxen was a clear marker of wealth among peasants. While a pair of oxen pointed out a wealth slightly above the average, a single ox announced a risky situation in which the peasant household was on the margin of a lasting status of poverty. Renting another ox to complete the plow team might bring a cycle of debt that might result in the loss of their only non-human plower. For an oxless peasant household, continuing to produce cereals can be associated with endless human efforts for so little yields that would certainly fall short of breaking the desperate cycle of poverty and easily turn into long periods of hunger.

No one could know the miseries of oxless farming better than the Veli oğlu family in İslam Bey, the smallest village of Erküd Divanı. By 1845, Hüseyin was a forty-five-year-old farmer with a brown mustache.[95] He cultivated wheat, corn, and barley on ten dönüm and had another two dönüm at fallow. Five fruit trees, a vineyard, two dairy cows, and log trade annually brought Hüseyin's household 377.5 kuruş, which was a high income in comparison with Erküd's average of 249 kuruş. A pair of oxen helped Hüseyin in all his agricultural operations as well as in earning a hundred kuruş from collecting and selling timber.[96] His only son, Hüseyin

95 See household no. 5 in OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 32.

96 OA. ML.VRD.TMT.d 3257: 32.

bin Hüseyin, was a ten-year-old child during the temettuat survey.[97] Veli oğlu Hüseyin bin Hüseyin would pass away in 1872, at the age of thirty-seven. The wealth of 1718 kuruş that he left to his wife Emine and his two children, both named Mehmed, indicates an alarming financial degradation of his father's considerable wealth. By summer 1872, the Veli oğlu family had eighty-kuruş-worth wheat in their barns, an axe, a saw, and a wood auger (*burgu*).[98] So, Hüseyin bin Hüseyin was still practicing his father's occupations of grain farming and log trade. The variety of tools for wood crafting suggests that he had even improved his skills in shaping the timbers he collected. However, an essential lack in the Veli oğlu family's house in 1872 was non-human animals. Hüseyin bin Hüseyin did not leave a single farm animal to his inheritors. A relatively wealthy family in 1845 had lost their economic status alongside their pair of oxen in the following three decades. The family's tragedy should have deepened with the loss of Hüseyin, who was in his thirties. An unimaginably difficult life awaited Emine and her two sons if they insisted on cultivating cereals and collecting logs without oxen.

Oxen determined a peasant household's ability to sustain itself in nineteenth-century Cide. Households in the twelve registers from the subdistrict kept 1712 oxen. There were 1.45 oxen per farmer household. The average altered between 1.00 and 1.79 but did not fulfill a pair in any of the registers. The region's harsh topography may explain the relatively low average number of oxen per farmer. The immediate alteration of altitude between mountains and valleys posed a decisive obstacle against the usage of plows and other animal-driven instruments of agriculture.[99] In Anatolia's eastern coast on the Black Sea, the self-imposition of the topography had come to its logical conclusion with the excessive division

97 OA. NFS 865: 32.

98 See verdict no. 224 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873).

99 Specialized hand tools for turning the soil were not a novelty vis-à-vis oxen-driven plows in Anatolia. See Bryer, "The Means of Agricultural," 107-8.

of lands, over-employment in agriculture, and scarcity of oxen.[100] Likewise, mountain slopes and thick forests left relatively little land for the peasants of Cide to resort to oxen power in cereal farming compared to the large plains of the Anatolian plateau. Cultivating holdings as small as less than five dönüm and keeping a pair of oxen was itself an economic challenge for farmers around Cide.

TABLE 5.4 Households and oxen in the villages of Kastamonu's Cide

temettuat register no	settlement name	grain-producing households	cultivated land size per farmer household (dönüm)	number of oxen	oxen per farmer household
3256	Kayadibi	189	3.80	233	1.23
3257	Erküd	149	5.63	249	1.67
3258	Derebucağı	149	4.72	267	1.79
3259	Ova OBA	88	4.27	116	1.32
3260	Osmanlı	65	4.86	101	1.55
3261	Kuraçlı	44	4.41	44	1.00
3262	Bedi	55	3.55	92	1.67
3263	Asarcık	55	4.42	65	1.18
3264	Üreğil	136	6.35	197	1.45
3265	Irmak	62	4.73	101	1.63
3266	Sökü	126	5.87	167	1.33
3267	Altıntaş	59	4.42	80	1.36
SUM		1177		1712	
SAMPLE AVERAGE			4.88		1.45

100 In 1877, there were only 6616 oxen in the 480 villages of Trabzon. See Ahmet Karaçavuş, "XIX. Yüzyıl Sonu ve XX. Yüzyıl Başlarında Trabzon'da Tarım," *Uluslararası Karadeniz İncelemeleri Dergisi* 9, no. 9 (2010): 49-52.

A pair of oxen in Cide had to plow a field of 6.71 dönüm on average and would bring 151.44 kuruş in the harvest. There were only 4.24 dönüm of land for each pair of non-human workers in Bedi Divanı. In fact, the relatively high number of oxen per farmer household (1.67) in this village group gives the impression of lighter tillage work for oxen. However, the considerably low acreage did not mean that the oxen in the villages of Bedi worked less or more comfortably than their fellows in other villages. The average yield per pair of oxen was as low as 105 kuruş in this village group. So, the oxen of Divan-ı Bedi probably did extra jobs because their human owners needed to compensate for their relatively low income from cereal production. On the other hand, a pair of oxen would bring as high as 223 kuruş in the villages of Üreğil Divanı. In this village group, each pair of oxen needed to plow 8.77 dönüm on average. Still, the register no. 3264 does not indicate whether greater acreage and higher yield saved the oxen in Üreğil from overtime work. As the number of oxen per farmer household decreased, the land per pair of oxen ratio attained higher levels, such as 8.82 dönüm in Kuraçlı Divanı or 8.86 dönüm in Sökü Divanı. Cide's serious land deficit had disturbed the established pattern of grain farming with a pair of oxen. Since most peasants in Cide would hoe their little fields with hand tools, the low number of oxen may lead to inconsistent ratios regarding oxen's workload, such as in the case of Divan-ı Bedi. The nine-dönüm tillage work gives a deceptive image because the size of the grain fields that most peasants in the sample had was less than nine dönüm. In fact, a considerable portion of the arable lands in Cide would be prepared by simple human arms instead of strong bovine muscles attached to a plow. Inconsistencies in calculations about oxen's workload and yields in Cide essentially underline the strong bond between oxen, land, and yields. Scarcity in one of these elements will inevitably disrupt the other two elements. Limited arable land acreage in Cide was translated into a limited number of oxen, which would lead to weaker harvests that remained around 150 kuruş for each pair of oxen.

TABLE 5.5 Oxen, land, and yields

temettuat register no	settlement name	number of oxen	oxen per farmer household	cultivated land size per pair of oxen (in dönüm)	annual yield per pair of oxen (in kuruş)
3256	Kayadibi	233	1.23	6.17	149.51
3257	Erküd	249	1.67	6.74	160.17
3258	Derebucağı	267	1.79	5.27	133.88
3259	Ova	116	1.32	6.48	158.32
3260	Osmanlı	101	1.55	6.26	150.44
3261	Kuraçlı	44	1.00	8.82	216.24
3262	Bedi	92	1.67	4.24	105.30
3263	Asarcık	65	1.18	7.48	183.39
3264	Üreğil	197	1.45	8.77	222.86
3265	Irmak	101	1.63	5.80	145.09
3266	Sökü	167	1.33	8.86	204.69
3267	Altıntaş	80	1.36	6.53	161.96
SUM		1712			
SAMPLE AVERAGE			1.45	6.71	151.44

The sample had 369 households without oxen. The average yearly income of non-oxen-keeping households was only 127 kuruş, remarkably lower than the subdistrict's average, 236 kuruş. Forty-one households did not possess any cultivated land (thirty-five of them did not have any revenues at all), which explains why they did not keep any oxen. Among the remaining households without oxen, 327 households were farmers who had paid cereal tithes in the previous year. This group earned less than 140 kuruş annually, a considerably low income compared to the sample average of 236 kuruş. The oxless 281 farmer households yearly earned less

than two hundred kuruş. The latter might not have the economic power to feed oxen. Meanwhile, forty-seven households without oxen annually earned more than two hundred kuruş, providing a financial basis for feeding a non-human worker. Five of these households earned revenues from log trade, and two worked as carpenters in Istanbul,[101] so they were not full-time farmers. Apart from these households with alternative occupations, twenty-two households that earned more than two hundred kuruş but did not keep oxen had other farm animals in their barns. In addition to their five-dönüm-large cultivated fields, most of these households also had vineyards and fruit orchards. If the scribes did not skip marking the oxen in the barns of these farmer households, they probably borrowed the non-human workers of their neighbors in case they needed the help of a mighty arm in the field. Each time they took a neighbor's oxen to work in their own fields, the oxless peasants needed to pay back the non-human plowers' service to their human owners. They would pay rent or lease their own labor in their neighbors' fields, maybe in the time of harvest. Either way, the oxless households would lose money or time to be reserved for their own production. Moreover, most oxen-keeping farmers would plow their own fields before renting them. So, renters would sow their seeds remarkably later than their wealthier neighbors, which made the renters' plots more likely to suffer from less ground cover and increased risk of soil erosion. At the end, the grain fields where seeds were sown later would have lower yields.[102] Oxless farmers were trapped in a desperate cycle of poverty and debt. However, registers of Cide, unfortunately, do not indicate any clues about possible practices for oxen renting.

101 Although the register noted that these carpenters (Gedik oğlu Ahmed and Kığı oğlu Mahmud) worked in Istanbul, I still included them in my calculations because these two households had information about their cereal tithe payments, cultivated lands, and fruit trees, which I took as substantial indicators of their existence in their villages. See OA. ML.VRD.TMT.d 3263: 4.

102 Aune et al., "The Ox Ploughing," 277.

TABLE 5.6 Households without oxen

households without oxen	number of households	average land size under cultivation (dönüm)	average yearly income (kuruş)
with revenues higher than 200 kuruş	47	4.91	258.16
with revenues lower than 200 kuruş	281	3.18	119.4
without cultivated fields	6	0	156.67
with no revenues	35	0	0
TOTAL	369		

Though they are numerical sources, the temettuat registers include substantial information about social relations. On the question of oxen keeping, the same sources enfold some traces of the collective usage of these bovine workers. It is nearly impossible to prove that oxen inscribed under a household worked in the field of a neighboring household. However, family names point to the sharing of oxen between family members. For example, a certain Sarı İbrahim's two descendants equally shared his ten-dönüm land among them. While the register noted that Sarı İbrahim oğlu İbrahim had a pair of oxen, his brother Mehmed did not have any livestock at all.[103] There is reason to presume that İbrahim and Mehmed tilled their plots with the same pair of oxen mentioned under the entry of İbrahim's household. Likewise, it was more than likely that Kara Receb oğlu Hasan borrowed his brother Osman's pair of oxen to plow his land of fifteen dönüm.[104] Ömer oğlu Hasan and Osman, two brothers sharing ten dönüm of land equally, probably shared a single pair of oxen, too.[105] Temettuat registers from Cide include numerous examples of such presumable patterns of oxen sharing between households sharing the same ancestors. The scribes might have neglected oxen leases between oxen-keeping and oxless farmers in exchange for money, but they noted down

103 OA. ML.VRD.TMT.d 3256: 17.

104 The interfamilial hierarchy should be in favor of Hasan since Osman only had four dönüm of land. See OA. ML.VRD.TMT.d 3257: 28-29.

105 OA. ML.VRD.TMT.d 3258: 28.

many clues that indicate examples of interfamilial collective usage of oxen.

As each plow was pulled by two oxen, keeping oxen in pairs defined the norm in Anatolia. Despite the considerably low oxen per farmer ratio, the sample from Cide still supported the pattern of pairs since households with pairs of oxen represented sixty percent of all farmers. Odd numbers in oxen were exceptional. There were 134 households with a single ox and only twelve households with three oxen. The remaining 703 farmer households kept their oxen in pairs. Forty-seven households had two pairs of oxen, five households had six oxen, a household had eight oxen, and two households had as many as ten oxen in their barns. The 648 farmers who kept a single pair of oxen formed the majority, representing fifty-three percent of the entire sample. The slopes around Cide's villages were not steep enough to discourage the majority of farmers from plowing their fields with a pair of oxen.

The number of oxen a farmer household kept and its wealth showed a strong correlation. The sample from nineteenth-century Cide had 134 households with a single ox, yearly receiving 205 kuruş on average. Farmers who kept a pair of oxen were slightly wealthier than the sample average, with precisely five dönüm of cultivated lands and nearly 270 kuruş yearly income for each household with two oxen. Forty-seven households kept two pairs of oxen. These farmers cultivated lands of almost nine dönüm on average. The labor of four oxen significantly contributed to this group's average annual income of 417 kuruş. Eight households had more than two pairs of oxen. The average acreage of cultivated lands this wealthy segment owned was nearly forty-nine dönüm, and their average yearly income was 1807 kuruş. It is no coincidence that four of the eight households with more than four oxen belonged to the Hasan Çelebizade family. Ruling over an enormous wealth, Hasan Çelebizade Ahmed Bey and Hasan Bey each kept ten oxen, and each had a hundred-dönüm-large field under cultivation.[106] Such endless fields certainly needed the labor

106 Ahmed Bey and Hasan Bey's sources of revenues also included shares in vessels and two sawmills in different villages of Cide. See OA. ML.VRD.TMT.d 3264: 25.

of a crowded team of non-human workers. In the village called Nefs-i Bedi, the situation was complicated. İshak oğlu İshak, the village's first headman, represented the only household with more than a pair of oxen in the whole register that recorded the possessions of fifty-eight households. Yet, it is difficult to explain why the headman needed as many as eight oxen (six taurine oxen and two buffalo oxen) for cultivating a seven-dönüm grain field and a four-dönüm vineyard, put aside his four fruit trees. Although he had the financial capacity to invest in a share in a vessel, İshak's income was 410 kuruş. İshak's annual income can be considered relatively high for Cide's villages, but it does not express an extraordinary wealth in itself.[107] There was an incoherence between the headman's crowded barn and his relatively modest income. One can only ask if the village headman used his advantageous position during the temettuat survey to conceal a portion of his actual income or if he made a mistake while counting his oxen. In general, it was more probable to come across extra pairs of oxen in the barns of farmer households with bigger lands than the average acreage in the settlement.

TABLE 5.7 The distribution of oxen among households

households that kept	number of households	total number of oxen	average land size under cultivation (dönüm)	average yearly income (kuruş)
more than a pair of oxen	67	282	13	570.9
a pair of oxen	648	1296	5	269.52
sample average			4.88	236
a single ox	134	134	4.01	205.38
no oxen	369	0	3.05	126.36
TOTAL	1218	1712		

The multiplication of a farmer's lands under cultivation did not necessarily mean the multiplication of the pairs of oxen who would work on them. Having inspected the temettuat registers of two villages from the

107 OA. ML.VRD.TMT.d 3262: 12.

province of Aydın in western Anatolia, Mübahat Kütükoğlu does not affirm a strong correlation between the size of lands and the number of oxen owned by farmers.[108] Likewise, there is no clear correlation between land under cultivation and oxen in the registers of Cide. A household with six oxen might cultivate only twelve dönüm (as in the case of the household of Abdullah Bilal)[109] or a household with a fifteen-dönüm land under cultivation might keep a single pair of oxen (as in the case of the household of Ebu Ali oğlu Osman).[110] Possible tax evasion efforts and inevitable mistakes made while preparing the documents further complicate the situation. Though there was no evident correlation between field acreages and the number of oxen, the general tendency continued to match the relatively bigger size of lands and a bigger number of oxen within a settlement. Oxen, who often gave a clear image of wealth, did not give a crystal-clear image of a farmer's productive capacity in use.

A deeper look at the most crowded segment of the sample may help imagine the oxen's role in agricultural production in Cide. There were 648 households that kept a pair of oxen. A categorization among households with a pair of oxen exposes how acreage of fields, yields, tithes, and income went hand in hand. Households that cultivated lands smaller than five dönüm constituted the poorest strata among the farmers with a pair of oxen. The average farmer among 210 households in this segment cultivated three dönüm, produced grains worth seventy-five kuruş, and yearly earned 222 kuruş. Farmers with a pair of oxen who cultivated five dönüm of land formed the most crowded segment with 307 households. Their average cereal production was less than 120 kuruş in value, and their average annual income was 271 kuruş. Farmers whose cultivated fields were greater than five dönüm accordingly harvested and earned more than the less wealthy segments among the households with two oxen. The wealthiest segment's average annual income was above four hundred kuruş, and their average yield brought more than 240 kuruş. The productivity stood out from other factors. There was an inverse proportion between

108 Kütükoğlu, "Osmanlı Sosyal ve İktisadi," 409-10.

109 OA. ML.VRD.TMT.d 3266: 29.

110 OA. ML.VRD.TMT.d 3257: 32.

productivity and wealth. As acreage, yields, and income increased, the average yield per dönüm became smaller. While the lowest segment of households with a pair of oxen earned more than twenty-six kuruş per dönüm on average, the segment with five dönüm of cultivated land earned twenty-four kuruş, and the productivity decreased to twenty-two kuruş per dönüm in the vast fields of the wealthiest segment. Even a slight field inclination might significantly increase the difficulty of land tillage, but registers remain silent regarding the workload of the pairs of oxen who plowed plots in different acreages and with varying levels of productivity.

TABLE 5.8 Households that kept a pair of oxen

the size of their land under cultivation (dönüm)	number of households	total number of oxen	average land size under cultivation (dönüm)	average tithe payment for grains in 1844 (kuruş)	average yields in the previous two years (kuruş)	average yield per dönüm (kuruş)	average yearly income (kuruş)
10 and more	37	74	11.46	23.78	517.55	22.5	401.09
6-8	94	188	7.05	15.15	330.09	23.43	318.02
5	307	614	5	11.21	240.42	24.04	271.43
2-4	210	420	3	7.34	157.39	26.73	221.83
TOTAL	648	1296					
sample average			4.62	10.56	232.26	24.45	236

Farmers of Cide preferred the ox over any other non-human worker. The bovine population in Cide was highly crowded, including numerous dairy cows and their offspring. However, not a single barren cow appeared on the list. Cide's humid climate might accelerate the growth of grasses, but the subdistrict's stressed topography left limited grazelands for non-human animals. The data in the registers imply that farmers of Cide used their limited spatial and economic opportunities with remarkable efficiency. They either kept dairy cows to extract their milk or oxen to exploit their muscle power. Under harsh circumstances of survival, keeping non-

human workers as strong as oxen was a reasoned preference in Cide. In the twelve villages that Erküd Divanı covered, with their 249 members, oxen formed the most crowded category of the bovine population. There were only two pairs of water buffalo oxen. Farmers' preference for water buffaloes was more evident among cows. Peasants in Erküd Divanı kept 123 taurine cows and 39 water buffalo cows. The temettuat scribes estimated that each dairy taurine cow brought fifteen kuruş to her owner annually, whereas her buffalo co-workers each brought twenty-five kuruş. Apart from oxen, cows, and their offspring, there were no other bovines, such as barren cows or bulls, in the thirteen villages of Erküd (nor in the rest of the sample). As to other non-human workers, there were only eight mares in the divan. Another detail about livestock is that register no. 3257 did not record any sheep or goats. With 1.67 oxen per farmer household, the example of Erküd Divanı confirmed the efficient usage of limited topographic and economic opportunities for livestock keeping in Cide.

Mares (*kısrak*) constituted the second most crowded non-human worker group in Cide. Forty-two mares stayed in the barns of thirty-two households in the sample. They did not offer an alternative to oxen because all households with mares also kept oxen. Apart from Karaca oğlu Hüseyin, who kept a single ox,[111] the remaining thirty-one households had at least a pair of oxen. The average oxen per mare-keeping household was as high as three. The mare seemed to be a luxurious non-human worker choice. With an average annual income of 627 kuruş, mare-owning households represented a wealthy segment of the sample. The contribution of three big landowners (Ahmed Bey and Hasan Bey of the Hasan Çelebizade family[112] and Ebu Hüseyin oğlu Ali Osman[113]) was evident. Their shares in mills, sawmills, and vessels, as well as the great acreage of their fields, could at any time require the assistance of mares. In Sökü Divanı, eight dönüm of grain fields, seven fruit trees, and a share in a water mill brought Molla İbrahim more than four hundred kuruş each

111 OA. ML.VRD.TMT.d 3259: 14.

112 OA. ML.VRD.TMT.d 3264: 25.

113 OA. ML.VRD.TMT.d 3257: 10.

year.[114] İbrahim's barn included a pair of oxen, a pair of cows, and a barren mare, which all probably had considerable responsibilities for running the household's agenda. In another village in Sökü Divanı, Abdullah Efendi oğlu Sabit also had a grain field, some fruit trees, and a yearly income much higher than four hundred kuruş. In Sabit's barn, there were a pair of oxen, three dairy cows, two heifers, a mare, and a workhorse. Though he did not have a mule, Sabit probably rented out the last two non-human workers to earn the 255 kuruş he received from his occupation as a muleteer (*katırcı*).[115] The remaining twenty-seven households with mares all earned revenues from timber trade, which brought them 126 kuruş on average, a considerable sum for their average annual revenues of 377 kuruş. At least some mares in Cide must have carried logs and timbers. However, the mare would never replace the ox, who evidently dominated the non-human labor market in log dragging.

114 OA. ML.VRD.TMT.d 3266: 3.

115 OA. ML.VRD.TMT.d 3266: 32.

TABLE 5.9 Non-human workers in Cide

register no	settlement name	taurine oxen	water buffalo oxen	donkeys	mares	horses and mules	oxen per farmer
3256	Kayadibi	231	2	2	2		1.23
3257	Erküd	245	4		8		1.67
3258	Derebucağı	264	3		2		1.79
3259	Ova	116			5		1.32
3260	Osmanlı	101			1		1.55
3261	Kuraçlı	44					1.00
3262	Bedi	90	2	1	2		1.67
3263	Asarcık	65		1	1		1.18
3264	Üreğil	195	2		9		1.45
3265	Irmak	101			3		1.63
3266	Sökü	167			9	5	1.33
3267	Altıntaş	78	2				1.36
TOTAL		1697	15	4	42	5	1.45

Sökü Divanı was a hub in Cide for the peculiar occupation of muleteering. Nine muleteers that temettuat register no. 3266 recorded had an average annual income of 454 kuruş. By renting out non-human workers or carrying stuff with them, these households earned 207 kuruş on average, making up twenty-eight to seventy percent of their total revenues. At the same time, the register recorded them all as farmers (*erbab-ı ziraatten*) since they cultivated cereals on plots of eight dönüm on average. The profession's name came from the mule, but only two "muleteers" actually kept mules in their barns: Söylemez oğlu Mustafa and Hatib oğlu Ali.[116] Two muleteers sharing the family name "Abdullah Efendi oğlu" seemed

116 OA. ML.VRD.TMT.d 3266: 9, 23.

to actually rent out their mares and workhorses.[117] The remaining five muleteers did not keep any non-human workers other than oxen, but cows, calves, and goats. The insufficient number of alternative non-human workers was a sign of overtime work for the oxen in the villages around Cide. Alongside agricultural production, some oxen in Cide played a role in carrying people and goods through the deep valleys and high mountains of Kastamonu.

§ 5.7 Log Trade[118]

In 1820, Hasan Çelebizade Halil Ağa reported that Memiş oğlu Eyüb, his rival for the office of ship mast collection, had been spreading serious allegations about him around the villages of Cide. According to Halil Ağa's petition, Eyüb told the peasants that he would handle the operation with a single raft (*bir sal ile idare ederim*), whereas Çelebizade would force them to ramble the mountains (*cebellere düşürür*) for carrying an excessive number of columns (*bizlere seren sütunu ziyade çekdirir*).[119] It is impossible to know whether Halil Ağa reported Eyüb's claims accurately or if they were true. Yet, Halil Ağa's petition details the burdensome task of felling and carrying massive logs in Cide. After chopping tree trunks in the mountains, peasants hauled them toward the nearest river to load them in a raft. The yearbook of Kastamonu clearly indicated that some forests around Cide had a connection with rivers Filyos, Milan, Loç, Çıtak, Soğanlı, and Yenice for transferring logs to the seaside on rafts.[120] If Halil

117 OA. ML.VRD.TMT.d 3266: 32.

118 While temettuat registers of other provinces use the term "log" (*hatab* or *odun*) for defining this occupation, temettuat registers of Cide referred to the same job as "timber trade" (*ticaret-i kereste*). I do not suppose that most farmers around the villages of Cide stopped by a sawmill for cutting their rough logs into fine timbers. However, I respected the wording the registers preferred by using in this part "logs" and "timbers" in an interchangeable way.

119 OA. C.BH 91/4369, 12 Recep 1235 (25 Apr. 1820).

120 *Kastamonu Salnamesi: 1321*, 377.

Ağa reported it accurately,[121] Memiş oğlu Eyüb had reason to underline in the eyes of the peasants the loading work on the riverside rather than the chopping work in the hills. Most peasants would prefer transferring logs on the collector's raft than dragging them on their own shoulders or on the shoulders of their own oxen.

The oxen constituted an indispensable part of the "specialized labor force"[122] that lumbering required. They offered the primary means of transport to carry logs.[123] These non-human workers could pull a cart (either called *öküz arabası* or *manda arabası*) or they could snake massive logs that woodcutters tied on them, a method called "*sürütme.*"[124] In steep slopes, carts would be useless, and non-human workers would appear as the sole option for woodcutters. The oxen were the most preferred non-human workers in the forests of Cide because they would remain "sure of foot"[125] even in rough, hilly, and rocky terrains. A twenty-first-century forestry survey in the Küre Mountains National Park noted that steep karstic slopes excellently preserved the old natural forests.[126] If nineteenth-century peasants sought columns as great as suitable for becoming ship masts, they might need to climb uphill to reach forests with relatively little human disturbance. However, the distance from the riverside increased as the altitude increased. Each step uphill further complicated the work for the woodcutting peasants and their oxen. The

121 I could not find a petition that Memiş oğlu Eyüb issued. So, my knowledge regarding this rivalry about ship mast collection in Cide is limited to Halil Ağa's narrative. As the representative of the wealthiest and most powerful family in Cide, Halil Ağa had the advantage of distorting allegations about himself in his own petition. It is intriguing that Halil Ağa reported his rival's allegations in detail.

122 Akgül Kovankaya, "Negotiating Nature," 57.

123 Seventeenth-century British colonies along the Atlantic coast also preferred teams of oxen to haul huge white pine logs reserved for the British Navy. See Conroy, "Oxen: Status," 139.

124 "Sürütme." In *Türkiye'de Halk Ağzından Derleme Sözlüğü*. Vol. 10. Türk Dil Kurumu, 1978. Accessed August 20, 2024. https://sozluk.gov.tr/.

125 Nineteenth-century North American loggers overwhelmingly preferred oxen for "snaking and hauling timber." See Garrett Jr., "Evidence on the Use," 230-31.

126 Aktaş, "Kastamonu-Bartın," 39.

rivalry between Halil Ağa and Memiş oğlu Eyüb points out that mountains, forests, rivers, and the sea around Cide had a strong connection in terms of ecology and economy. Peasants and their non-human companions played their particular roles on the entangled network that connected villages, forests, rivers, and the sea.

The tree species of beech (*Fagus*), alder (*Alnus*), linden (*Tilia*), and oak (*Quercus*) decorate the slopes of the North Anatolian Mountains. Above the altitude of a thousand meters, pines (*Pinus*) and firs (*Abies*) also grow in settings with lower temperatures and higher humidity.[127] The climax tree species in the north slopes and high plains of the İsfendiyar Mountains is the Oriental beech (*Fagus orientalis* in Latin and *kayın* in Turkish). In higher altitudes, the birch species *Carpinus betulus* (*gürgen*), the fir *Abies bornmuelleriana* (*göknar*), and the pine *Pinus sylvestris* (*sarıçam*) accompany the beech. In the south slopes, *Pinus nigra* (*karaçam*), oak (*meşe*), and *Pinus sylvestris* defined the main tree vegetation.[128] Various tree species had different functions in the human world. The Ottoman Navy generally expressed specific preferences regarding the species, diameter, form, and number of the required timbers, which needed to be "firm and solid enough" (*gayet metin ve sağlam olarak*).[129] Pinewood was a prominent material in Ottoman shipbuilding.[130] In the late-eighteenth century, the navy had demanded pine timbers (*çam ecnası kereste*) for the construction of a pool in the dockyard.[131] Yet, beech timbers could also serve the navy as potential ship parts. For instance, the centerboard of a sunken Ottoman ship, lying in the Mediterranean Sea today, was made from Oriental beech.[132] Apart from vessels and ship parts, Kastamonu's main exports included spoons carved from boxwood

127 Aktaş, "Kastamonu-Bartın," 29.

128 Öztekinci, "Küre Dağları," 249-50.

129 OA. BEO.AYN.d 955, 9 Safer 1295 (12 Feb. 1878): 70. For transcription, see Öztürk, "955 Numaralı", 99.

130 Husain, *Rivers of the Sultan,* 44.

131 OA. C.BH 188/8849, 15 Zilkade 1210 (22 May 1796) and C.BH 188/8850, 17 Zilkade 1210 (24 May 1796).

132 Mustafa Gürbüz Beydiz, "Osmanlı Dönemi Gemi Yapımında Ağaç Kullanımı," *Külliyat Osmanlı Araştırmaları Dergisi*, no. 2 (Aug. 2017): 8.

and lumber.[133] For many people in Cide, the forest meant a reliable source of income rather than an ecosystem. They would not be able to extract a noticeable economic profit from the forest without oxen. Oxen in Cide were elite forest workers who could haul the largest tree trunks down steep slopes until reaching the nearest river or market.

The consulted twelve temettuat registers from Cide recorded that 1025 households earned income from timber trade. They represented eighty-four percent of the whole sample. Without a single exception, they were all farmers who had some cultivated land and cereal tithe payments. Timber trade and cereal production were complementary occupations for peasants in Cide. Some households were more engaged in woodcutting and selling timber, while some concentrated more on the tiring demands of agricultural plots. A categorization based on the share of timber trade in households' total annual revenues can clarify the blurry identity of peasants of Cide, who were woodcutters and farmers at the same time. The timber trade's share could be as low as seven or eight percent of a household's yearly income. The same occupation could make more than eighty percent of the annual total revenues in another household. With the data registers provided, such a simple calculation can signal the degree of a peasant's involvement in log trade and farming.

Yedinci oğlu Osman from the Musa village in Asarcık Divanı earned 508 kuruş from trading timbers (*ticaret-i keresteden*), the biggest income that a household in the sample earned from this trade. It made seventy percent of the household's total annual revenues of 728.5 kuruş. Osman earned more than two hundred kuruş from his eight-dönüm-wide grain field. He also kept a pair of oxen, a dairy cow, a heifer, and a calf. Although the register recorded him as a farmer (*erbab-ı ziraatten*),[134] it was complicated to decide if this peasant's main occupation was woodcutting or farming. The sample had three farmers who received an annual income of between 538 and 651 kuruş and earned an income from timber trade between 300 and 352 kuruş. Apart from these exceptions, no other

133 *Kastamonu Salnamesi: 1321*. Kastamonu Vilayet Matbaası, 1903: 326.

134 OA. ML.VRD.TMT.d 3263: 15.

household received more than 252.5 kuruş from log trade. By cutting trees, carrying logs, and selling them in the market, farmers of Cide yearly received slightly above a hundred kuruş on average, a considerable sum in a sample with an average income of 234 kuruş. In eighty-three percent of woodcutting households, timber's share in total revenues was between twenty and sixty percent. Earning less than twenty or more than sixty percent of total revenues from log trade was a rarity that only 178 households shared. Ninety-eight households earned over sixty percent of their annual revenues from log trade. They would deserve the "woodcutter" identity more than any other segment in the sample. Meanwhile, there were eighty households for whom timbers represented only a marginal financial contribution (less than twenty percent) to their total yearly revenues. The remaining 847 households had found a relative financial balance between their earnings from farming and woodcutting. Variations in their engagement in log trade would mean immediate changes in their oxen's work agenda. Departing from home before dawn, the oxen of the woodcutter farmers in Cide would try to understand whether they were going to the field or forest that day.

The data points to a zero-sum equation between farming and woodcutting. The segment that concentrated on woodcutting the most had the smallest acreage of cultivated lands on average, with only 3.2 dönüm, the smallest average cereal tithe payment with less than eight kuruş, but the highest average income from log trade with 190 kuruş as well as the most significant average total annual income with 291 kuruş. As engagement in timber trade decreased among different segments of the sample, the average acreage of cultivated lands and the average grain tithe payment increased, and the average revenue from log trade decreased. The segment with the slightest interest in trading logs included committed farmers, who cultivated lands of the size of nearly seven dönüm (a relatively big acreage in comparison with the sample average of below five dönüm), had paid cereal tithes of as high as fifteen kuruş, and earned from log trade less than thirty-six kuruş on average. Although eighty farmer households in this segment earned 231 kuruş on average (just five kuruş below the sample average), they apparently devoted most of their time

and energy to taking care of their grain fields rather than chopping and carrying wood. So, oxen in the latter households would plow more frequently than haul timbers.

The number of oxen among different segments of log trading households bears indirect indications about the role of these non-human workers in this peculiar occupation that went hand in hand with agriculture for most peasants in Cide. The segment with the most marginal income from timber was the segment with the highest concentration in agricultural production. Yet, they kept only 1.38 oxen on average. As long as the financial contribution of log trade remained below forty percent of their yearly income, no household segment had an average ox presence higher than 1.4. Household segments earning more than forty percent of their total revenues from timber had higher oxen per farmer ratios. There were 1.75 oxen on average for the 502 households concerned. The average was as high as 1.82 for farmers who earned forty to fifty percent of their income from log trade. Households with income from timber trade kept thirty-one mares. In the barns of the households where log trade made more than forty percent of the total revenues, there were only eight mares. In conclusion, household segments with higher concentration in log trade showed a quasi-absence of alternative non-human animals and a considerably high oxen per farmer ratio. Fields as small as five dönüm might not always require the work of a pair of oxen. Meanwhile, oxen played a decisive role in the trade of timber around Cide. The categorization among woodcutting farmers indirectly indicates that the oxen's role in log trade was as essential as their contribution to grain production.

TABLE 5.10 Log trading households in Cide

log trade's financial contribution to household revenues (percentage)	number of households	number of oxen	oxen per farmer	total revenue from log trade (kuruş)	average revenue from log trade (kuruş)	average acreage under cultivation (dönüm)	average cereal tithe payment (kuruş)	average annual revenue (kuruş)
above 60	98	170	1.73	18,628	190.08	3.2	7.65	290.95
50-60	202	339	1.68	30,490.5	150.94	4.07	9.41	276.39
40-50	202	367	1.82	22,996	113.84	5	10.64	255.72
30-40	218	303	1.39	16,982.5	77.9	4.62	10.62	223.94
20-30	225	294	1.31	12,138.5	53.95	5.36	12	214.43
below 20	80	110	1.38	2860.5	35.76	6.78	14.94	231
overall	1025	1583	1.54	104,096	101.56	4.73	10.74	245.41
the whole sample	1218	1712	1.45			4.63	11.03	236

Trees with wide trunks, such as oaks, pines, and beeches, were among the trees that nineteenth-century peasants in Cide chopped down and hauled. The Oriental beech, which is the most populous tree species in the north slopes and high plains of the Küre Mountains, may grow up to a meter in diameter and forty meters in height.[135] According to the findings of an investigation in the primary forests of twenty-first-century Cide, many beech trees are taller than twenty meters in height and wider than a meter in diameter at breast height.[136] The data in the temettuat registers suggest that nineteenth-century peasants preferred forcing their oxen to drag the massive logs they chopped from trees with such wide trunks. More than a thousand farmers in the sample chopped down giant trees and turned their dead parts into a considerable revenue. Their total record from log trade in a single year was 104 thousand kuruş. Meanwhile, it was probably the same farmers who would occasionally undertake the same job as a corvée to meet the demands of the Imperial Navy.

135 Merve N. Karaosmanoğlu, "Kastamonu Cide Kayın Ormanlarında Bonitetin Yapacak Odun Üzerindeki Etkisi" (M.A. Thesis, Istanbul, İstanbul Üniversitesi, 2011): 17.

136 Karaosmanoğlu, "Kastamonu Cide," 48.

They could not do it without bovine workers. No human or donkey could drag the parts of a giant dead tree better than an ox.

§ 5.8 Fruit Trees and Vineyards

Kastamonu's yearbook of 1903 indicated that there were more than eight thousand dönüm of gardens and orchards in Cide.[137] The prominent fruit types that grew in Kastamonu were the plum called *üryani eriği* and the apple called *misket elması*. The province also produced pears, but the latter fruit did not share the "fame and demand" (*şöhret ü rağbet*) that plums and apples enjoyed.[138] Today, grapes continue to grow both in the humid climate on the Black Sea coast and in the inner parts of Kastamonu.[139] In addition to orchards, nineteenth-century farmers of Cide also had vineyards. A few fruit trees or a little vineyard that a peasant household owned would bring a secondary source of income. In total, it constituted a considerable economy.

The temettuat registers of the twelve village groups from Cide that formed the sample recorded more than five thousand fruit trees. According to the data, farmers of Cide received more than twelve thousand kuruş annually from fruits and nearly a thousand kuruş from grapes. The revenues from fruit trees and vineyards were comparable to the total grain tithe payment of thirteen thousand kuruş. If cereal tithes represented ten percent of the harvest, the fruit harvest remained around a tenth of the cereal harvest, offering a secondary source of income for farmers in Cide. Fruit trees and vineyards generated nearly five percent of the whole annual household revenues in the entire sample. The registers recorded that 872 households had a fruit tree. Without exception, they were all farmers with at least two dönüm of cultivated land, with an average of 5.11 dönüm. Their average annual revenues were 254 kuruş. The 14.47 kuruş that fruits brought made up less than six percent of these

137 *Kastamonu Salnamesi: 1321*, 326.

138 *Kastamonu Salnamesi: 1321*, 310.

139 Akbaş, "Tarımsal Klimatoloji," 182.

fruit-growing households' yearly revenues. The average produce of the cereal fields these households cultivated was 124 kuruş, which meant a much higher financial contribution than the fifteen kuruş that fruits brought.

TABLE 5.11 Fruit trees and vineyards in Cide

register no	settlement name	number of households	households with fruit trees or vineyards	number of fruit trees	income from fruits (kuruş)	income from vineyards (kuruş)	grain tithe payments (kuruş)	total revenues (kuruş)
3256	Kayadibi	200	136	704	1705.5	9	1701	42,011.6
3257	Erküd	152	131	691	1741.5	139.5	1827.5	39,749.5
3258	Derebucağı	150	59	289	693	-	1654	38,120.5
3259	Ova	96	86	527	1323.5	207	842	19,885.5
3260	Osmanlı	66	47	253	648	72	700.5	16,117
3261	Kuraçlı	44	39	214	535	18	430	9263.5
3262	Bedi	58	54	319	888	40.5	445	12,718
3263	Asarcık	58	50	305	756.5	-	546.5	13,192.5
3264	Üreğil	141	53	366	742.5	35	1995.5	35,947.5
3265	Irmak	63	55	278	661.5	229.5	675	16,694.5
3266	Sökü	127	123	790	2223.5	-	1571	31,179
3267	Altıntaş	63	50	293	702	216	575.5	12,565.5
TOTAL		1218	883	5029	12,620.5	966.5	12,963.5	287,444.6

Fruit-growing farmers kept 1.48 oxen per household, which was slightly higher than the sample average. There were 229 households that had fruit trees but no oxen. Their average yearly income was as low as 154 kuruş, so most did not have the financial means to feed an ox. However, the

absence of oxen could also point to a preference. Register no. 3256 recorded that a certain Osman's household had as many as thirty fruit trees that supposedly brought forty-five kuruş. As the sample had 5.77 trees per fruit-growing household, Osman had an excessive investment in fruits. With a field of three dönüm and thirty-kuruş-worth log trade, his total annual income was 156.5 kuruş. Plums or apples formed almost thirty percent of this modest budget. He did not keep a single non-human animal.[140] This committed fruit grower apparently did not need the assistance of oxen. Fruit trees would demand a deep plowing with a pair of oxen only to prepare the ground before their planting. From the first year on, the most significant contribution of a non-human agricultural worker in a fruit orchard would be to carry the fruits harvested in baskets.

The case of two peasants from Irmak Divanı exposes how farmers with agricultural activities at a modest level could carry out their production with less aid from oxen. By 1845, Müezzin oğlu Mehmed bin Hasan was a forty-nine-year-old farmer with a black beard. Mehmed had a brother called Müezzin oğlu Ali bin Hasan, a forty-four-year-old man with a brown mustache, who had a five-year-old son named after his grandfather, Hasan.[141] According to the temettuat register, the inventory of each brother included a three-dönüm grain field under cultivation, a single-dönüm land at fallow, a stirk, and a single ox. Both brothers had revenues from log trade, Mehmed earning 156 kuruş and Ali earning only thirty kuruş, which noticeably contributed to the elder brother's 246-kuruş and the younger brother's 127-kuruş total annual revenues. Other apparent differences among their possessions were Ali's dairy cow and Mehmed's five fruit trees.[142] It calls for only a little imagination to guess that the Müezzin oğlu brothers yoked their two oxen together to plow their fields, thresh their wheat and corn harvest, and haul timbers in the forest collectively. Despite Ali's smaller revenues from log trade and therefore low overall income, Mehmed's moderate income suggests that the two households could handle all their burdensome rural tasks with a single pair of

140 OA. ML.VRD.TMT.d 3256: 17.

141 See household no. 8 in OA. NFS 865, 29 Zilhicce 1256 (21 Feb. 1841): 167.

142 OA. ML.VRD.TMT.d 3265: 18.

oxen. By the time Ali passed away at the age of seventy-one, he would have left behind the economic burdens he experienced in the 1840s. The variety of agricultural tools in Ali's household indicates that Ali had become an experienced and specialized farmer by the 1870s.[143] Alongside the standard farming instruments like a sickle, a pickaxe, and an ox cart, he had three iron plowshares, one of which was designed in the form of a fork (*çatal saban demiri*). Among Ali's possessions, there was a considerable variety and volume of agricultural produce such as wheat, barley, corn, cornstalk, hay, flax, and walnuts, totally estimated at higher than three hundred kuruş. The farmer's total wealth reached 3570 kuruş, indicating that he had long ago left behind the times of poverty. If Ali left a considerable wealth to his wife Fatma and their four children, the three oxen who appear in the inheritance record may explain the reason behind the household's evident enrichment. Even though the inventory does not refer to grain fields,[144] relatively big wealth and crowded inventory indicate that Ali had significantly developed his grain production in the meantime. While he used to share a single pair of oxen with his elder brother in the 1840s, Ali owned three non-human agricultural laborers by 1872. He held spare iron plowshares and an extra ox in reserve, a luxury of which he would not have imagined thirty years ago. He also had a fifty-percent share in a vegetable garden in the same village group and fruit trees estimated at fifty-kuruş of value, which he might have inherited from Mehmed a while ago. If Ali had no grain fields[145] but only these fruit trees and the little garden, he would not need a massive workforce

143 See verdict no. 290 in OA. MŞH.ŞSC.d 3420, 29 Zilhicce 1289 (27 Feb. 1873).

144 Any land under the plow was considered as *miri* and it belonged to the state. It was forbidden for the peasant to sell, give away, leave, or divide the *miri* land. The peasant's position was of a tenant, who would hold a "permanent" (*daimi*) and "tacit" (*zımni*) rent contract (*kira mukavelesi*) for the land and who would pay the rent in the form of the *çift* tax. See Ömer Lütfi Barkan, *Türkiye'de Toprak Meselesi 1* (Gözlem Yayınları, 1980), 127-28. On the other hand, orchards and gardens were seen as private property. Therefore, unlike gardens, grain fields do not appear in sharia court inventories. See Tabak, *The Waning,* 267.

145 As the land under the plow was not seen as a private property, inventories in sharia court records do not give any information about grain fields.

including three oxen. A peasant's involvement in fruit production would rarely require buying oxen, but an increased engagement in grain farming would strictly require having a bigger and stronger non-human workforce for plowing and threshing.

The idleness of oxen in fruit production persisted in vineyards, too. Twentieth-century producers in Kastamonu's Tosya would either use a hoe or a plow to till the soil of a plot meant to become a vineyard. For existing vineyards, they preferred to hoe the soil (*belleme*) with hand tools.[146] There was no need for oxen in vineyards after opening the plot for the first time. Unlike in Mount Lebanon, where vineyards were cultivated with oxen,[147] plowing vineyards was not a widespread practice in Anatolia.[148] Fourteen households in the sample had vineyards but no oxen. Five of them had neighboring family members with oxen. If Zaim oğlu Mustafa,[149] Kürt oğlu Halil,[150] İmam oğlu Ali,[151] Kasım oğlu Ali,[152] or Divanecik oğlu İbrahim[153] needed the assistance of a pair of oxen, they would knock on the door of their neighbors who kept oxen and with whom they shared the same family names. The remaining nine households did not have such an apparent source of assistance. Despite their agricultural activities in cultivated fields of at least three dönüm, they could earn only 182 kuruş on average yearly. Eight of these households had thirty-eight fruit trees in total and seven households had revenues from log trade. Under the shadow of their alternative economic activities and visible poverty, it is impossible to isolate the agricultural work in the

146 Hüseyin Çelik, "Kastamonu İli Bağcılığı ve Burada Yetiştirilen Bazı Üzüm Çeşitlerinin Ampelografik Özellikleri Üzerinde Bir Araştırma" (M.A. Thesis, Samsun, Ondokuz Mayıs Üniversitesi, 1990): 28-30.

147 Tabak, *The Waning,* 266.

148 In sixteenth-century Bursa, most villages on the coast of the Marmara Sea were engaged in viticulture and had no plows but only picks as agricultural instruments. See İnalcık, "A Case Study," 172.

149 OA. ML.VRD.TMT.d 3259: 7.

150 OA. ML.VRD.TMT.d 3259: 29.

151 OA. ML.VRD.TMT.d 3259: 31.

152 OA. ML.VRD.TMT.d 3260: 4.

153 OA. ML.VRD.TMT.d 3261: 5.

vineyards of the households that did not keep oxen. Nevertheless, departing from twentieth-century observations, the oxen's role in cultivating grapes worth 966.5 kuruş could only be marginal in nineteenth-century Cide. They would not be plowing the vineyard but might carry the produce in baskets at the time of harvest.

Fruit and grape cultivation was a secondary source of income for the farmers in the sample, who mainly concentrated their limited time, space, and energy on cereal production. In the eyes of the oxen they kept, carrying fruit and grape baskets must be a trivial job compared to plowing a grain field. They were associated with the most physically demanding work in cereal fields and the forest. Still, they would adore the cheerful moments of a fruit harvest since they presumably enjoyed eating up the fresh and ripe fruits they found on the ground. Such short moments would relieve these non-human workers from the exhaustion of the recently passed threshing season and prepare them for the upcoming plowing season.

§ 5.9 Conclusion

The villages of Cide were situated at the meeting point of the Black Sea's humid climate and the hilly terrain of the İsfendiyar Mountains. If the harsh topography posed a natural limit to arable lands for the region's farmers, the humidity further consolidated this natural borderline by feeding dense forests. By the nineteenth century, some peasants had found the solution by leaving their hometown once and for all and starting a new life in the imperial capital. They became master carpenters or gunsmiths. In the meantime, the peasants who remained in Cide mastered their survival under the shadow of an environmental blockade. The socio-political realm further consolidated the blockade that surrounded the peasants of Cide. Corvée work often interrupted their already-difficult economic survival. The money they earned from collecting and hauling large timbers from forests to the coast would rarely ensure their subsistence, only if it was paid on time. Peasants needed to undertake multiple tasks simultaneously to guarantee the subsistence of their

families. They relied on oxen in the endless and exhausting endeavors of rural Cide.

People who lived in the villages around Cide in the nineteenth century devoted much of their energy to cereal production. Like the rest of Anatolia, they cultivated wheat and barley, constituting a considerable share of their overall earnings. However, a peasant household would hardly survive with the harvest from a few acres of land. If the total acreage of cultivated lands was divided by the number of peasant households in the sample, there would be a plot of 4.88 dönüm for each farmer. If the average gross yield per dönüm in the sample was around twenty-four kuruş, a five-dönüm field would only bring 120 kuruş at each harvest. Costs like seed, fodder, and taxes would further reduce the hardly-earned 120 kuruş. Farmers of Cide also collected fruits and raised grapes to create additional income sources, but these options would barely bring financial relief.

The majority of the peasants in Cide took to the forest to engender alternative sources of income. Total log trade revenues in the sample reached 104 thousand kuruş, making up thirty-six percent of all revenues in total. Whereas the total annual revenues of all households in the sample were 287,444.6 kuruş, the total score from cereal production lay between 130[154] and 140[155] kuruş. The income from log trade would easily compete with the income from grain production in many households. Since most peasants simultaneously practiced two different occupations, the share of their revenues from these trades can only give an idea about which peasants of Cide were more engaged in farming and which in woodcutting. They toiled as either farmers or woodcutters throughout the different seasons of the year. The combination of grain production with timber trade mainly constituted the annual income of peasants in Cide. The result of this combination led to an average as modest as 236 kuruş. In fact, both occupations were driven by oxen. Human arms and legs alone would not be able to extract 236 kuruş from Cide's humid soil

154 Total grain tithe payments (12,963.5 kuruş) multiplied by ten.

155 Total bi-annual average yields per field (280,843.5 kuruş) divided by two.

and steep forests. The oxen had their bold marks on this average amount that fed a mid-nineteenth-century household throughout the whole year.

The little notes on household entries within the registers point to a veritable human mobility around different stations of this nineteenth-century network that connected different parts of Cide and Istanbul. Did all deserters from Cide cut their ties with their hometown? Kara Halil oğlu Ali Osman the gunsmith would reply no. Temettuat registers expose that some people worked in the docks, on ships, or in Istanbul and still kept fields and livestock in their villages. There was a vivid network between the villages of Cide, the forest, the dockyard, and the imperial capital. People usually did not travel by themselves but often had company. Human mobility was a marker of non-human mobility and the transfer of goods along the same line. In the absence of a concurrent alternative non-human worker in Cide, one can safely assume that the oxen connected forests, villages, and the sea. Oxen pulled carts loaded with hay, dragged heavy sacks of grains, or hauled enormous logs from the hilly parts of Cide to the coast. Some peasants might reduce the oxen's work by loading the stuff onto a raft if the riverside was close enough, or some might carry the pack on their own shoulders if it was light enough. Yet, there is reason to consider that oxen played a major role in connecting the trade network between forests around the İsfendiyar Mountains, villages of Cide, and the Black Sea coast.

Despite their crucial role in different economic activities around Cide, the oxen's presence was as low as 1.45 per farmer household. Impasses in the main specialization field of these non-human workers resulted in such a ratio far behind a pair. The vicious cycle between small acreages and low returns made it impossible for many peasants in Cide to match the cost of feeding non-human workers as strong as a pair of oxen. Peasants without oxen could try borrowing a pair of non-human workers from their neighbors or relatives in case they planned to plow their fields or transport logs from the forest. As scribes did not leave any mark about such transactions, most oxless peasants presumably tried to hoe their five-dönüm-large fields by themselves. Yet, the registers do not answer if the latter also carried logs on their own shoulders or if they went to the

forest together with their neighbors who kept oxen. Details on log trade may remain in shadow, but it was a job as crucial as grain farming for most oxen in Cide. These incredibly powerful non-human workers had a central role in all physically challenging work. Yet, the traditional specialization field of oxen was cereal production. If the sample from Kastamonu showed a relatively low ratio of oxen per farmer, it only reveals the strong connection between these agricultural laborers and the land. The deficit in land had narrowed access to oxen. The necessity for the labor of oxen always persisted, but fewer households could afford to buy and keep them. If a farmer had a full plowing team including a pair of healthy oxen and a plow with an iron share, his household was more likely to ensure its subsistence and the farmer could even think about investing in other non-human animals, especially cows and heifers, to receive regular returns in the form of milk or meat.

TABLE 5.12 General data from the sample of Kastamonu

settlement name	register no.	house holds	farmer house-holds	cultivated land size per farmer (dönüm)	annual gross grain product per farmer (kuruş)	annual grain yield per dönüm (kuruş)	oxen	oxen per farmer	annual income per resident (kuruş)	annual yield per pair of oxen (kuruş)	cultivated land size per pair of oxen (dönüm)
Kayadibi	3256	200	189	3.80	90.00	24.80	233	1.23	210.06	149.51	6.17
Erküd	3257	152	149	5.63	122.65	24.52	249	1.67	261.51	160.17	6.74
Derebucağı	3258	150	149	4.72	111.01	25.73	267	1.79	254.14	133.88	5.27
Ova	3259	96	88	4.27	95.68	24.91	116	1.32	207.14	158.32	6.48
Osmanlı	3260	66	65	4.86	107.77	24.23	101	1.55	244.20	150.44	6.26
Kuraçlı	3261	44	44	4.41	97.73	24.88	44	1.00	210.53	216.24	8.82
Bedi	3262	58	55	3.55	80.91	25.12	92	1.67	219.28	105.30	4.24
Asarcık	3263	58	55	4.42	99.36	25.06	65	1.18	227.46	183.39	7.48
Üreğil	3264	141	136	6.35	146.73	25.72	197	1.45	254.95	222.86	8.77
Irmak	3265	63	62	4.73	108.87	25.14	101	1.63	264.99	145.09	5.80
Sökü	3266	127	126	5.87	124.68	23.64	167	1.33	245.50	204.69	8.86

Altıntaş	3267	63	59	4.42	97.54	24.23	80	1.36	199.45	161.96	6.53
SUM		1218	1177				1712				
SAMPLE AVERAGE		101.5	98.08	4.88	110.14	24.45		1.45	236	151.44	6.71

6

Conclusion

The research data presented in the three previous chapters will be juxtaposed and compared in this chapter. The quantitative data includes trends that support the crucial role of oxen in the sample's agricultural production. The findings from the three provinces will be compared in terms of environmental conditions and oxen's possible roles in acquiring different levels of grain yields in different geographic conditions. The chapter ends with a brief overview of the twentieth-century developments that resulted in the draft ox's disappearance in Turkey.



FIGURE 6.1 Satellite view of the greater region. The pointers mark the location of the Ottoman villages covered in this chapter. SOURCE: Prepared on ArcGIS Online.

A quantitative analysis of the data[1] points to the indispensable economic role of oxen for the grain producers within the chosen sample.[2] An original model[3] tried to isolate the marginal effect of the factors of cultivated plot acreage and non-human workers on the yearly income of households from Konya, Edirne, and Kastamonu. As expected, owning cultivated lands and non-human workers had a clear positive contribution to the annual household income. The analysis calculated that each dönüm of cultivated grain field brought an additional 2.7 percent to household revenues. The contribution of each non-human worker (other than oxen) in the whole sample was as considerable as 10.3 percent. As to the contribution of oxen, each bovine worker meant a rise of 34.2 percent in annual household revenues. So, the number of oxen was an expression of household wealth. A quick analysis of an AI model verified the results of the quantitative analysis. Analyzing the data I provided, the AI model detected a moderate positive correlation between the number of oxen and both household income and the amount of cultivated land. Accordingly, households with more oxen in my sample tend to have higher annual incomes and larger plots of land.[4] As the number of oxen increased, it brought an increase also in income and cultivated acreage. All in all, oxen traced the line between poverty and abundance for nineteenth-century Ottoman peasants.

The three chosen provinces stand for three distinct ecological and agricultural patterns that flourished in the nineteenth-century Ottoman Empire. The semiarid climate of the Province of Konya would harden the soil and demand a greater performance from human and non-human agricultural laborers to work the land. The irrigation was a constant need

1 You can access the simplified version of the whole numerical data of the current research via the following link: https://docs.google.com/spreadsheets/d/1FCdOSDMDgu1CiKNpNC05iHmLF4y1ZPfMLSPXXYh7NKE/edit?usp=sharing

2 I cannot find words to express my gratitude for the meticulous work Kasım Burak Çavuşoğlu has done for pure intellectual curiosity. It was my dear friend Burak who employed the quantitative analysis of the research data I provided and who extracted the conclusions below from the original model he developed in the R program.

3 For the analysis report, see the appendix section.

4 Gemini, response to author, August 19, 2025.

to soften the soil before or during the plowing operation in Konya. However, temettuat registers did not leave any marks regarding this point. The abundance of rivers and lakes in the Lakes Region, one of the pilot regions in the current research, offers a sufficient explanation for the water sources in this area. Besides, the Mediterranean humidity infiltrating through the Taurus Mountains well into the Hamid district protected the area from the harsh continental climate that prevailed over the rest of the Konya province. The general aridity of central Anatolia and a vast plain terrain characterized the environmental setting of nineteenth-century Konya. With these distinctive traits, the villages of Konya strictly followed the widespread pattern of grain production with pairs of oxen. The Province of Edirne had different ecological features. Edirne stood at the meeting point of the Rhodope highlands and Thracian plains. The varying topography was watered by rich river systems, and the humidity was fed by coasts to the seas on both sides of the Thracian peninsula. The soil was relatively fertile in the nineteenth-century Edirne province, and farmers contended with raising cereals with plows that pairs of oxen dragged, just like in Konya and elsewhere. On the coast to the Black Sea and surrounded by mountains and forests in the inner areas, the Province of Kastamonu had no substantial humidity problem in agriculture. Instead, the main problem for nineteenth-century Kastamonu's peasants should be the limited availability of arable land. The relatively humid climate might ease the plowing task. Moreover, forests and hills had already shortened the acreage that the plow team had to cover in each field. However, such distinctive ecological traits hardly modified farmers' engagement in grain farming with their ox pairs. The Ottoman provinces of Konya, Edirne, and Kastamonu showed considerable diversity in terms of environmental conditions, but the majority of their villages were characterized by the same agrarian system of cereal production in which pairs of oxen were indispensable. Despite serious differences in humidity, acreage, and topography, most rural settlements in nineteenth-century Konya, Edirne, and Kastamonu relied on wheat and barley cultivation. Ox pairs had a prominent role in plowing the soil, threshing the harvest, and

carrying the produce in particular ecological conditions around the Ottoman Empire.

§ 6.1 Yields

Ottoman agriculture might not have gone through such an extensive process as the agricultural revolution in eighteenth-century Britain. The technical improvements in British agriculture only partially visited the Ottoman Empire through agricultural machines that a few big farms received towards the end of the nineteenth century. Extensive farming with traditional methods held a vast dominance throughout Ottoman provinces. Nevertheless, an increase in productivity had always guided Ottoman agricultural policies. To reach this target, the Ottoman government aspired to control agricultural production and channel it into the state treasury in the form of fiscal revenues.[5] The temettuat surveys can be seen as a noticeable step in increasing agricultural productivity. First, the central administration needed a precise knowledge of the actual productive capacity of the Ottoman countryside before turning it into tax revenues. The surveys were held in the middle of a vast drought that significantly affected a considerable part of Anatolia, and a few years (if not months) turned out to be enough for the whole fiscal project to end and remain as a failed attempt. The Tanzimat process might not have stimulated an evident increase in agricultural productivity; nevertheless, it led to the preparation of thousands of temettuat registers, which took unique photographs of mid-nineteenth-century Ottoman agriculture.

The first information in temettuat registers regarding yields is Ottoman farmers' incomparable preference for cereals. Whereas varieties of wheat (*hınta, siyez, burçak, kokoroz,* etc.) occupy the first place in tithe payments that temettuat registers recorded, barley (*şair*) comes the second, and other cereals such as the rye (*çavdar*) and corn (*mısır* or *darı*) represent the remaining popular grain products in the mid-nineteenth-

5 Zeynep Akçakaya, "Agricultural Knowledge, Local Environment, and the Experts: Silkworm Production in Nineteenth-Century Bursa," *Turkish Historical Review* 11 (2020): 97.

century Ottoman Empire. The proverb associated with Konya, "Only wheat and sheep, the rest is a game,"[6] is a marker of central Anatolian farmers' reliance on wheat as a source of material sustenance and food security. In this logic, any occupation apart from grain farming and sheep husbandry will appear as a fruitless distraction. The preference for cereals was not an Anatolian exception. When the end of the Napoleonic wars brought a considerable fall in cereal prices, many British farmers could not move away from wheat in the early nineteenth century. For a long time, the wheat harvest had been their chief source of revenue. A mid-nineteenth-century observer reported the small farmer's dependence on grains for a livelihood: "His corn pays his rent - his corn feeds his family - his corn pays his interest - his corn is his mainstay."[7]

The research data represent the dominance of the rural typology of small peasant households who produced grains with oxen primarily for their own subsistence. Farmer households' revenues, production scale, available arable acreages, yields, and number of oxen show substantial coherence for each province. If the estimated annual grain production per farmer decreased from 845 kuruş in Konya to 526 kuruş in Edirne and as low as 110 kuruş in Kastamonu, it is due to the average available arable acreage, which shows a strong parallel decrease from Konya to Edirne, and lastly Kastamonu. The size of the cultivated land largely determined the yield a farmer could obtain from it. However, a glance at revenues will resonate with productivity, another crucial determinant of yields. Even though revenues also included income from non-farming activities, particular conditions that shaped grain farming in the three provinces chiefly explain the annual income average of 1014 kuruş in Konya, 1030 kuruş in Edirne, and 236 kuruş in Kastamonu. The fact that farmers from Edirne annually earned slightly more than their fellows in Konya despite the huge acreage difference in favor of the latter is primarily due to the high productivity levels in Edirne's fields. In the time of harvest, the

6 In Turkish, it is "*Buğday ile koyun gerisi oyun*." See Necmettin Aygün, "Osmanlı Devleti Kırsalında İktisadi Örüntüler ve Trabzon'da Koyun (Sürü) Sahipleri (1722)," *Karadeniz İncelemeleri Dergisi*, no. 25 (Fall 2018): 22.

7 Sturgess, "The Agricultural Revolution," 114-115.

worth of the grains farmers in Konya would obtain from each dönüm would be around twenty-one kuruş, whereas their fellows in Edirne would harvest almost fifty-three kuruş. Meanwhile, the unfortunate farmers of Kastamonu had to earn a living from a few acres of land. The moderate productivity of twenty-four kuruş per dönüm could not bring great richness due to the limited availability of arable terrains. In spite of their high involvement in various secondary occupations, peasants in Kastamonu would earn less than a quarter of the average annual income of their fellows from the two other provinces.

The presence of alternative water sources and less exposure to aridity or excessive humidity may partially explain the fertility of soils in Edirne. Farming methods and the usage of fertilizers, two important issues regarding productivity, remained outside the scope of Edirne's temettuat registers. Ottoman agriculture resembled agriculture in early-nineteenth-century France, where small landholders formed the majority and where the lack of manure, lack of food for cattle, and lack of cattle created a vicious cycle.[8] Most Ottoman farmers did not have a suitable place to stock animal dung, and some preferred to simply burn it for heat as a substitute for firewood. If a farmer stacked manure in a field, a sufficient level of precipitation was still needed to decompose it so that the natural fertilizer actually worked.[9] Some farmers would allow pastoralists to graze their herds on their fallow fields as a natural way of clearing and fertilizing the land.[10] In Konya, sheep and goat herds were abundant, but the region's aridity would largely leave the non-human efforts to increase land productivity resultless unless it rained. The ox, whose plowing efforts marked the essential step in agricultural production, further

8 Jean Molinier, "L'Evolution de l'agriculture en Angleterre et en France au XVIIIe siècle et au début du XIXe siècle," *Revue d'économie politique* 88, no. 3 (1978): 451-52.

9 Güran, *19. Yüzyılda Osmanlı Ekonomisi,* 99-100.

10 Chris Gratien, *The Unsettled Plain: An Environmental History of the Late Ottoman Frontier* (Stanford University Press, 2022), 53. Le Roy Ladurie defines the interaction between sheep breeders and grain producers as an "unexpected alliance" since sheep troops are generally known for their transgressions into cultivated fields. See Emmanuel Le Roy Ladurie, "Voies nouvelles pour l'histoire rurale (XVIe-XVIIIe siècles)," *Études rurales* 13, no. 14 (1964): 88-89.

increased productivity with the fecal traces he left on the field. If the number of oxen per farmer significantly differed among provinces in the sample, the ox manure could also be taken as a marker of soil fertility. However, the indifference of temettuat scribes regarding farming methods does not allow us to deduce such a conclusion.

§ 6.2 Land

The topographic features of the three provinces left a bold mark in the consulted registers. Konya's flat and semiarid landscape gave its farmers an average of forty dönüm of grain fields. Edirne had a moderate average of twelve dönüm per farmer household. In Kastamonu, the rugged terrain limited the arable land for farmers to as little as 4.6 dönüm. The İsfendiyar Mountains allowed peasants to earn a living from grain production only if they also undertook non-agricultural occupations like logging and shipbuilding. In the late eighteenth-century, the British agriculturist Arthur Young was surprised by the degree of the division of the land in France, which had passed beyond a reasonable level for him.[11] What kind of a shock would British physiocrats have if they visited Kastamonu's Cide or the Ottoman districts in the southeastern coasts of the Black Sea? The average acreage of land per farmer household in Trabzon was even narrower than in Cide, around two dönüm. Men in the southeastern coasts of the Black Sea sought professional jobs abroad because such a limited acreage was not sufficient to feed their households. Meanwhile, women and children carried out agricultural production in their little plots. The limited acreage and the steep topography would not support hiring non-human workers. So, most Anatolian women and children used their bare hands and short hand tools for tilling the soil in the eastern Black Sea coast.[12] All in all, the physical geography of a region was an essential determinant in agricultural activities and the labor the latter demanded.

11 Molinier, "L'Evolution de l'agriculture," 450.

12 Karaçavuş, "XIX. Yüzyıl Sonu," 53-54.

Land, humans, and oxen were inseparable from each other. When farmers on English clays debated over the prospects of farming in the mid-nineteenth century, they were also debating the function of their livestock. In the second half of the century, most of them started to consider their non-human animals as earners of revenue rather than providers of manure, which was in line with the farmers' preference for stock farming instead of wheat cultivation on the clays.[13] In the Ottoman Empire, farmers did not turn away from cereal farming and the ox labor it required. They had to embrace the decision with the limitations and complications it brought. For instance, due to the limited availability of human and non-human workforce to collect and thresh the harvest before the rainy season, most Ottoman farmers would not sow the whole acreage under their usufruct.[14] If leaving a portion of land unseeded to restore the soil fertility was a reason for the abundance of fallow fields, labor deficit was another one. The percentage of fallow fields in Konya attained nearly half the whole available acreage (48 percent), whereas it remained around forty-two percent in the sample for Edirne. In the middle of vast fields, farmers in Konya chose to limit themselves to sowing forty dönüm because they would not be able to afford the seeding costs, and if they could, they would not be able to complete the harvest before autumn. If there were a noticeably larger bovine workforce in mid-nineteenth-century Konya, probably more peasants would consider seeding a larger portion of the plain terrain left under their usufruct.

The question of land usage followed the question of land availability. In medieval Egypt, there were more than a dozen types of cultivated and uncultivated land. The variables of the categorization included the last type of plants (it might be cereal crops, clover, legumes, or unwanted weeds) that grew on the concerned piece of land, the preparedness of the land for wheat or flax cultivation in the next season, opportunities and conditions of irrigation, and its usage as a pasture or fallow. The land with the highest value and highest tax was the soil with clover, legumes,

13 Sturgess, "The Agricultural Revolution," 119-120.

14 Güran, *19. Yüzyılda Osmanlı Ekonomisi,* 98.

gourds, or beans. This type of soil (called *baq*) would give an excellent wheat and flax harvest in the next season. Fields that had given wheat and barley harvest in the preceding year (called *barubiya*) had a smaller value than the latter because of soil exhaustion. Pasturelands with unwanted plants or inundated lowlands were considered even worse for farming. Lands with an excessive salt content (called *sibakh*) represented the lowest land category in this classification. Farmers could cultivate only asparagus or eggplants on such plots or take their soil as fertilizer.[15] The temettuat registers followed a much simpler method by categorizing the land as "cultivated plot" (*mezru tarla*) and "uncultivated plot" (*gayrımezru tarla*). These two categories indicated state-owned (*miri*) arable plots suitable for grain farming, which had a noticeable potential to create a taxable surplus value.

Apart from grain fields, temettuat scribes also noted smaller plots reserved for different uses. For most peasants, cultivating fruits in an orchard (*bahçe*) or vineyard (*bağ*) and vegetables in a kitchen garden (*bostan*) near their home enriched their diet and brought them an additional income. Farmers earned much of their revenue from grain fields outside the village. Meanwhile, peasants who practiced another occupation would still cultivate some products primarily for their self-consumption in a single-dönüm garden. Unlike grain fields, orchards, kitchen gardens, and vineyards were generally close to peasants' houses. Furthermore, unlike the latter, these little plots did not require a heavy tilling or carrying work that would call for the labor of an ox. Most peasants probably enjoyed the labor of a non-human worker to carry stuff on the relatively short distance between their houses and their little plots. Nevertheless, the few details regarding gardens or vineyards in temettuat registers are limited to the numerical data about their acreage and estimated returns. Vineyards were for grapes, orchards were for fruits, and kitchen gardens were for vegetables. Temettuat scribes must have relied on this general knowledge as they left minimal clues about the products grown in a plot.

15 Hassanein Rabie, "Some Technical Aspects of Agriculture in Medieval Egypt," in *The Islamic Middle East, 700-1900: Studies in Economic and Social History*, ed. A. L. Udovitch (Princeton: The Darwin Press, 1981), 65-67.

At least, they recorded tithe payments at the top of the entries for each household.

Knowledge about the type of product raised in a plot is crucial. The product could designate the quality and even value of a field. For example, a seventeenth-century post-mortem inventory from northern France described agricultural plots by estimating the volume of the product raised on them.[16] Product choices implied various geographic conditions or agrarian strategies. A geographer's research on temettuat registers from the Province of Aydın points out that in mid-nineteenth-century Lower Akçay Basin in southwestern Anatolia, farmers living on the Yaykın plateau and hilly terrain exclusively preferred raising grains and earned nearly their whole income from grain production. However, the product preference of farmers who lived on the lowland showed variety, including cotton, tobacco, sesame seeds, olives, grapes, and figs.[17] Different geographic conditions encouraged different agricultural strategies. Market prices could also come into play. In times of agricultural expansion, eighteenth-century French peasants had to choose whether the new land would be reserved for grain fields or vineyards. Thus, the price of wine and wheat varied in the opposite sense due to the inverted proportion of land usage required for producing cereals or grapes.[18] It is important to know about farmers' choices between grain fields, vineyards, and other kinds of plots because each product indicates different labor requirements. Whereas little plots demanded delicate handwork with shorter tools, grain fields would call for oxen's arduous labor for an efficient plowing operation. A bigger acreage devoted to grain farming in a region meant a greater dependence on non-human plowers.

16 Goubert, "Les techniques agricoles," 35-37.

17 Işık, "Tarihsel Coğrafya Açısından," 248-51.

18 Le Roy Ladurie, "Voies nouvelles," 85.

§ 6.3 Oxen

The research data verifies the strong relationship between grain farming and oxen keeping in Anatolia. Most Ottoman farmers cultivated grains, and they kept their oxen in pairs. If people did not need a draft animal, they kept no oxen. There is nothing but coherence in the absence of oxen in the barns of households that did not grow cereals. Even if the profession of a household representative was recorded as a farmer, if he did not have grain fields but only small plots such as a vineyard or an orchard, it was less likely for this household to keep a pair of oxen. The average number of oxen per grain-producing household for the whole sample is 1.73. With 1.45 oxen per farmer, the sample of Kastamonu has a negative contribution to the averages that approximate a pair in the Konya (2.05) and Edirne (1.95) samples.

The plows used in Anatolia were designed for two oxen. Although some farmers might keep a spare plow or plowshare in reserve, most farmers did not have the economic capacity to hire another pair of non-human plowers. So, it is expected that the ox number averages in such a sample vary around two. The harsh topography of Cide explains the noticeably low average in the Kastamonu sample. The extremely limited portions of the available land decreased the demand for non-human labor. Moreover, it also discouraged peasants from grain farming. At the same time, the modest level of economic expectations from farming encouraged peasants of Kastamonu to engage in non-farming occupations. The limitations of agriculture in Cide were translated into low records in the average acreage of cultivated land and annual yield per pair of oxen, 6.7 dönüm and 151 kuruş per pair. In Konya, each pair of oxen would plow almost thirty-eight dönüm on average and lead to a yield of 779 kuruş. In Edirne, the averages are slightly more than eleven dönüm and 540 kuruş per pair of oxen. Even though the numbers look high for Konya, it is due to the abundance of fields. The productivity per dönüm in the calculation per pair of oxen is less than twenty-one kuruş per dönüm for Konya, almost twenty-three kuruş for Kastamonu, and as high as forty-eight kuruş for Edirne. Since most farmers had a pair of oxen, the calculations per

pair of non-human workers look consistent and do not show a great deviation from sample averages regarding land, yields, and productivity.

A pair of oxen in a peasant's barn represented not only engagement in cereal production but also pointed to the minimum means to afford their maintenance. Oxen were the "social arbiter" of a household. In Medieval Britain, owning and using plow-oxen or working with bare hands was a clear social marker for farmers.[19] In the nineteenth-century Ottoman countryside, the distribution of oxen among farmer households was relatively even, as the average number of oxen per farmer generally varied around a pair. Yet, the oxen still played their role of social arbiters. Whereas the majority of farmers kept a pair of oxen, only wealthier households had more than a pair. An extra pair of non-human plowers meant spending a shorter time to plow greater acreages. Since wealthier farmers usually had larger fields, they also enjoyed some operational advantages. At the end of plow strips, oxen needed a large turning space to turn at the headlands. In large fields, less time was lost to "negotiate" the turns with non-human plowers,[20] which was a technical but considerable advantage in favor of large landholders. An extra pair of oxen would always be helpful. They might carry goods, water, or people while the other pair plowed the field. Or they might work in another farmer's field and bring a considerable extra income in the form of their daily rent. A household with four or more oxen would know how to profit from the extra pairs of worker bovines.

The burdensome tasks of grain farming largely explain Ottoman rural life and the economic contribution of oxen to it. Nevertheless, peasants and their fellow bovines were engaged in other rural occupations, too. This was not an Ottoman exception. For example, the "resourcefulness of the Italian peasant" in the age of Virgil made use of wild plants and hunting as alternative sources of sustenance to supplement cultivated crops in times of shortage.[21] In Picardy, in the northern part of early-modern France, most peasants did not possess enough land for feeding their

19 Moore, "The Ox in the Middle Ages," 92.

20 Collins, "The Latter-Day," 205, 214.

21 Spurr, "Agriculture and the 'Georgics,'" 176.

families and resorted to "complementary activities" such as working as daily agricultural workers (*journaliers*) or weavers (*tisserands*).[22] In the consulted mid-nineteenth-century registers, log trade, charcoal transfer, and the cultivation of a number of non-cereal agricultural products appear among the popular complementary activities of the resourceful Ottoman peasants. In most of these alternative occupations, oxen assisted their human owners. Worker bovines specialized in jobs that demanded great strength but not rapid motion, such as hauling wood and moving stone.[23] Their short legs made it easier for them to work around stumps, in swamps, and on rocky terrains.[24] All in all, oxen significantly contributed to rural life and labor in various economic activities. They hauled logs in the forests of Cide, moved charcoal in Midye, and transported all sort of goods to the nearest market all around the Ottoman Empire. Oxen not only powered agriculture but also fed industrial production and construction works with the raw materials they carried in all Ottoman provinces.

§ 6.4 The Ox's Extinction in Anatolia

An excellent video footage from Cide's Derebucak village depicts a contemporary dairy farm. Water buffaloes act in front of a fantastic natural scene of huge mountains under snow. The footage shows how curious but at the same time timid bovines are. They will not take their eyes off the cameraman but will also get rapidly frightened at his slightest gesture.[25] These buffaloes in the Derebucak village will never know about plowing or threshing because none of them will become an ox. Today, the draft ox can be seen as an extinct animal in Turkey. It has been a few decades since he disappeared in Anatolia along with the wooden plow he used to work with.

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22 Goubert, "Les techniques agricoles," 32.

23 Little, "Harnessing (and Yoking)," 22.

24 Garrett Jr., "Evidence on the Use," 230-231.

25 Video footage by Mesut Hurma, *Manda Çiftliği - Cide Derebucak Köyü*, 2023, https://youtu.be/9300PoL3Arw?si=3lyTajvlJpYKgh59.

The humble ox, who is generally associated with stupidity, outlived complex political entities like the Roman Empire or the Ottoman Empire. For centuries, he continued to drag the same plow while tax systems around him drastically changed. Ox traction in Anatolian agriculture showed a solid continuity throughout a long period that prolonged well into the twentieth century. Humans would select, train, and castrate maturing bullocks to become oxen. The ox, who was designed for human needs, persisted for millennia, unlike human institutions.

The number and efficiency of the agricultural machines that began to enter the Ottoman Empire towards the end of the nineteenth century were far from triggering an "Ottoman" agricultural mechanization. As long as they were required to be fed with the water and coal that oxen carried, steam-powered agricultural machines would hardly take the oxen's job. The change gained pace in the second half of the twentieth century. Yaşar Kemal vividly depicted the troubles the last nomadic communities in southern Anatolia experienced in the mid-twentieth century. In the eyes of Süleyman Kahya, "iron insects" (*demir böcekler*) had not spared an inch in Çukurova. They would "eat, swallow, and turn over" the soil on a huge area of land in a single day.[26]

The replacement of oxen by tractors developed gradually. They represented two different worlds. The ox belonged to the bygone era of kingdoms and agrarian empires. He had an organic relationship with his work. He would eat the parts of the product he cultivated and feed the land with his manure. On the other hand, the tractor belongs to the era of nature's wholesale plunder to feed multinational firms. The farmer is henceforth not only a producer but also a customer who will buy seeds, fertilizers, pesticides, and fuel. In this new world, there is no need for ox carts or draft oxen. If a huge bovine population continues to massively breed under human captivity, it is to serve humans with their flesh and milk. Agricultural mechanization resulted in the disappearance of the ox as well as the concept of "worker bovine" with him. If cattle are

[26] Yaşar Kemal, *Binboğalar Efsanesi* (Yapı Kredi Yayınları, 2009), 46.

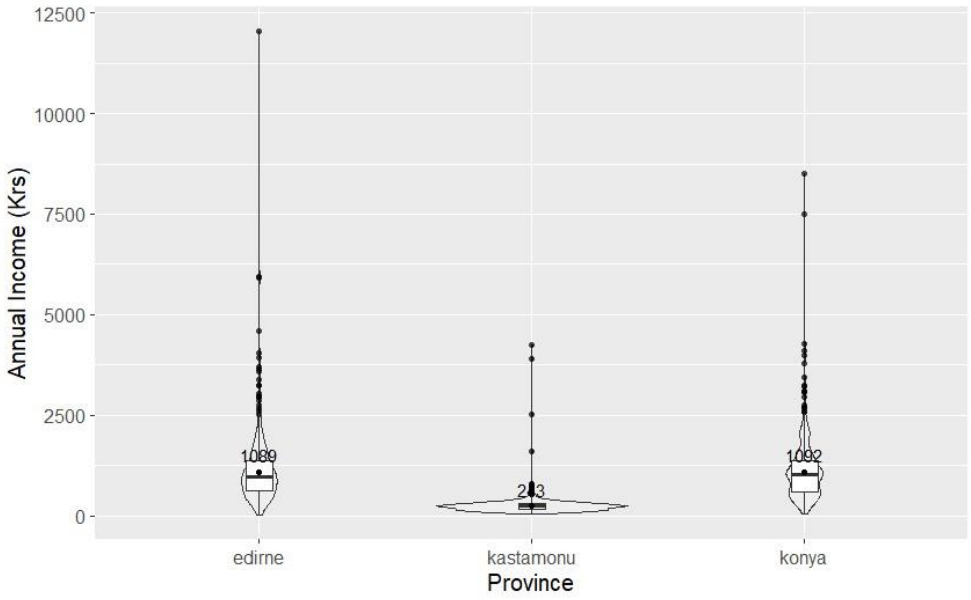
associated with milk and meat today, it marks the disruption of human-bovine relations, which had an immemorial past in Anatolia.

TABLE 6.1 Data comparison from three provinces

Registers chosen from		Total households	Farmer households	Estimated annual grain production per farmer (kuruş)	Annual revenue	Number of oxen	Oxen per farmer household	Plot size under cultivation (dönüm)	Cultivated field size per farmer (dönüm)	Annual harvest per dönüm (kuruş)	Cultivated land size per pair of oxen (in dönüm)	Annual yield per pair of oxen (in kuruş)
Konya	SUM	777	620		835,755	1273		24,060				
	AVERAGE			845.39	1014.16		2.05	40.26	39.86	21.36	37.80	779.37
Edirne	SUM	697	585		753,610.95	1141		6774.5				
	AVERAGE			487.78	1029.87		1.95	12.32	11.79	52.90	11.23	539.66
Kastamonu	SUM	1218	1177		287,444.6	1712		5743				
	AVERAGE			106.91	233.267		1.45	4.62	4.75	24.83	6.71	151.44
	SUM	2692	2382		1,876,811	4126		36,578				
	AVERAGE			480.03	759.10		1.73	19.07	18.80	33.03	18.58	490.16

Appendix Data Analysis Report

The statistical analysis of the data was carried out using R.[1] Each household annual income measurement was labelled based on the factors; province (Edirne, Kastamonu, Konya), number of oxen, number of other domestic animals, and acreage of cultivated fields. There were 2689 data points in the initial data set, sixty of which were removed due to having no annual income, resulting in 2629 data points being used in the analysis. Most of the households in the data set had incomes lower than 2000 kuruş (Krs), with only 137 data points falling above that threshold. Similarly, only 22 households owned more than four oxen, 28 households owned cultivated fields larger than 80 dönüm, and 30 households owned more than five other draft animals. Therefore, it can be said that the data is strongly right skewed for all factors used in the analysis. The distributions of the household income measurements for each province are illustrated in Figure 1.



[1] R Core Team. 2021. *R: A language and environment for statistical computing.* R Foundation for Statistical Computing Vienna, Austria. https://www.R-project.org/.

FIGURE 1 Annual household income by province. Numbers indicate the mean household income.

To meet the assumptions of linear regression, particularly normality of residuals and homoscedasticity, a logarithmic transformation was applied to the variable annual income, as per this variable's strong right-skewedness. No independent variables were transformed. Figure 2 shows the density of the log-transformed annual income values for each province.

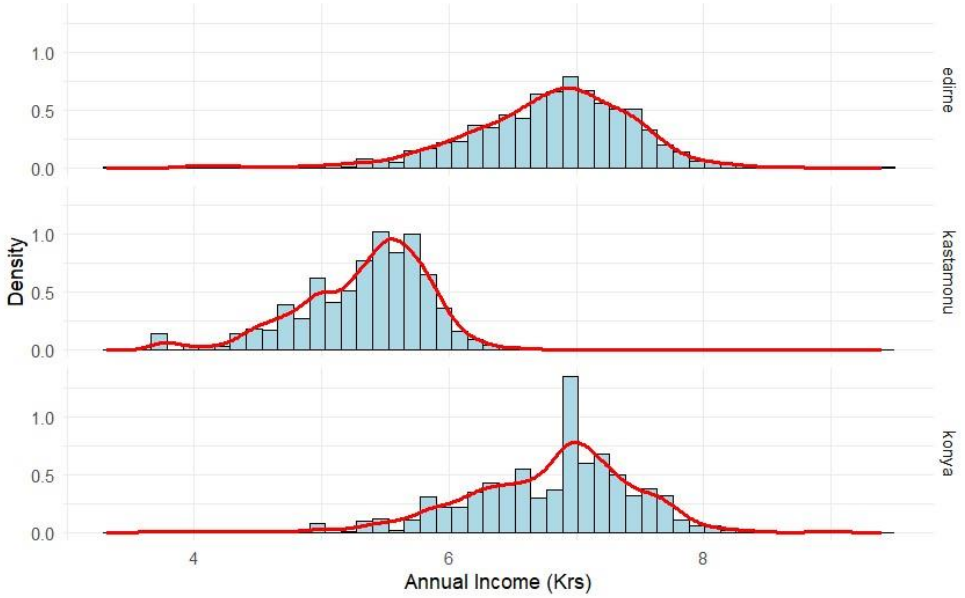


FIGURE 2 Histogram of annual income values with density curve by province.

To test whether annual income increased with the number of oxen, the two variables were plotted against each other with a linear trend line. As can be seen in Figure 3, annual income seems to increase with the

number of oxen, even when the outlying households that own more than four oxen are disregarded.

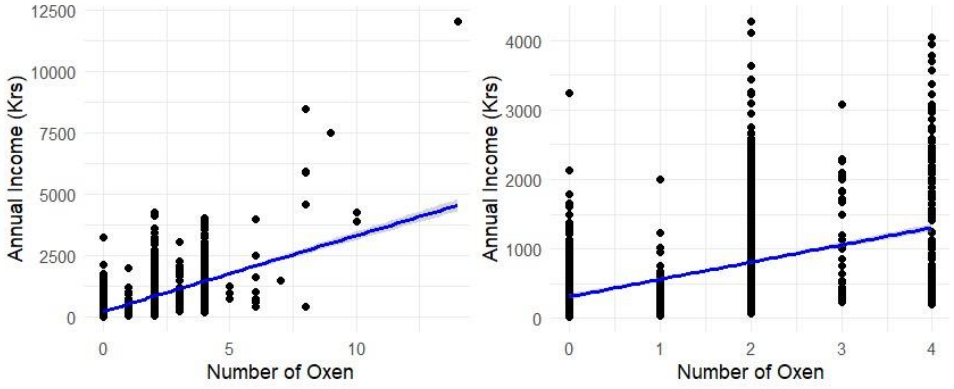


FIGURE 3 Scatterplots of annual income by number of oxen with linear trend lines. The plot on the left includes all the data, while the one on the right considers only households that own fewer than five oxen.

To test the statistical significance of the changes in annual income with changes in the number of oxen, the number of other animals, and the acreage of cultivated fields, multiple linear models were fitted, and the best fitting one was selected using the glmulti package in R.[2] For the factor province which has three levels, dummy variables with treatment contrast were defined for Konya and Kastamonu, where a zero value in both variables indicated that the measurement was from Edirne. The best fit was selected based on the AIC criterion.[3] Table 1 shows the formula for the final model selected.

2 Vincent Calcagno and Claire de Mazancourt, "Glmulti: An R Package for Easy Automated Model Selection with (Generalized) Linear Models," *Journal of Statistical Software* 34 (May 31, 2010): 1–29.

3 H. Akaike, "A New Look at the Statistical Model Identification," *IEEE Transactions on Automatic Control* 19, no. 6 (Dec. 1974): 716–23.

TABLE 1 The final model of annual household income.

Dependent Variable	Model Formula
Annual Income (Log)	1 + Province + Number of Oxen + Acreage of Cultivated Fields + Number of other Animals + Province:Number of Oxen + Province:Acreage of Cultivated Fields + Acreage of Cultivated Fields:Number of Oxen + Acreage of Cultivated Fields:Number of other Animals

However, an Anderson-Darling test[4] indicated that the residuals of the model significantly deviated from normality ($A = 22$, $p < .001$), and a Studentized Breusch-Pagan test[5] revealed significant evidence of heteroscedasticity ($\chi 2(11) = 213$, $p < .001$). Figure 4 shows the residuals of the final model plotted against the fitted values.

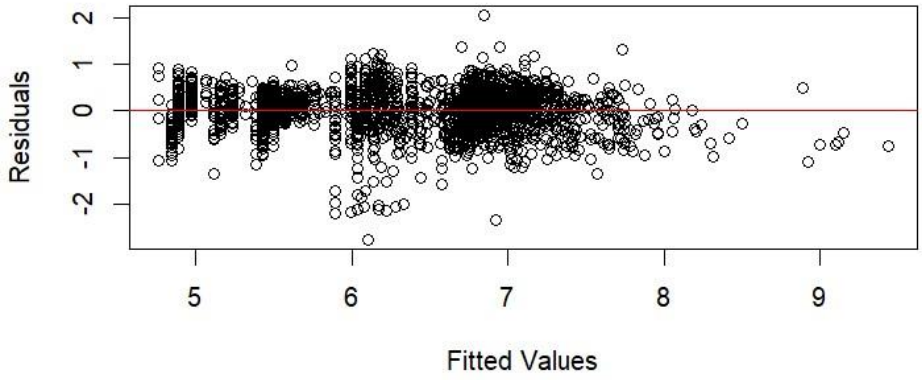


FIGURE 4 Scatter plot of residuals of the final model against the fitted values.

4 T. W. Anderson and D. A. Darling, "Asymptotic Theory of Certain 'Goodness of Fit' Criteria Based on Stochastic Processes," *The Annals of Mathematical Statistics* 23, no. 2 (1952): 193–212.

5 T. S. Breusch and A. R. Pagan, "A Simple Test for Heteroscedasticity and Random Coefficient Variation," *Econometrica* 47, no. 5 (1979): 1287–94.

To adjust for heteroskedasticity, robust standard errors were computed using the sandwich package in R.[6] The HC2 estimator was used to adjust for the outliers with extreme annual income values.[7] The results of the regression analysis, with robust standard errors, are presented in Table 2.

TABLE 2 Coefficient estimates, standard errors, t-values, and p-values of the predictors from the final model of annual household income, with robust standard errors.

Variable	Coefficient Estimate	Standard Error (SE)	t-value	p-value
Intercept	6.036854	0.049545	121.85	**< 0.001**
Province (Kastamonu)	-1.272084	0.052694	-24.14	**< 0.001**
Province (Konya)	-0.143921	0.063601	-2.26	**0.024**
Number of Oxen	0.294269	0.024169	12.18	**< 0.001**
Acreage of Cultivated Fields	0.027013	0.003883	6.96	**< 0.001**
Number of other Animals	0.098520	0.015625	6.31	**< 0.001**
Province (Kastamonu):Number of Oxen	-0.017821	0.027462	-0.65	0.514
Province (Konya):Number of Oxen	-0.098760	0.040718	-2.43	**0.015**
Province (Kastamonu):Acreage of Cultivated Fields	0.015710	0.006134	2.56	**0.010**
Province (Konya):Acreage of Cultivated Fields	-0.006458	0.003472	-1.86	0.063
Number of Oxen:Acreage of Cultivated Fields	-0.002960	0.000597	-4.95	**< 0.001**
Acreage of Cultivated Fields:Number of other Animals	-0.000475	0.000274	-1.73	0.083

As can be seen in Table 2, the main effects of all predictors are statistically significant, showing that annual income changes significantly when (1) the province changes from Edirne to the other two provinces, (2) the number of oxen owned by the household changes, (3) the acreage of

6 Achim Zeileis, Susanne Köll, and Nathaniel Graham, "Various Versatile Variances: An Object-Oriented Implementation of Clustered Covariances in R," *Journal of Statistical Software* 95 (2020): 1–36.

7 Y Hochberg, "A Sharper Bonferroni Procedure for Multiple Tests of Significance," *Biometrika* 75, no. 4 (1988): 800–802.

cultivated fields changes, (4) the number of other animals owned by the household changes. Moreover, oxen, other animals, and cultivated fields all positively affect the annual income, as indicated by the coefficient estimates. Furthermore, the significant interaction effects, along with the associated coefficient estimates, indicate that the value of having an additional ox in terms of annual income gains is significantly less for Konya than Edirne, and the value of having an additional dönüm of cultivated fields in the same terms is significantly less for Kastamonu than Edirne. Finally, as indicated by the significant interaction of the number of oxen and the acreage of cultivated fields, the value of having an additional ox becomes significantly lower with each additional dönüm of cultivated fields owned by a household.

However, it should be noted that statistical significance does not necessarily indicate that the effects have a large magnitude. Converting the estimates into percentage changes in annual income reveals that some of the effects, albeit systematic, are too small to considerably affect the theoretical analysis in this study.[8] Starting with the effects of large magnitude, the conversion process revealed that, on average, an additional ox increases annual income by roughly 34%, an additional dönüm of cultivated fields increases annual income by roughly 2.7%, and an additional other work animal increases annual income by approximately 10%. On the other hand, the value that is brought in terms of annual income by one additional ox is only roughly 9.4% less in Konya than in Edirne, and the value that is brought in terms of annual income by one additional dönüm of cultivated fields is only roughly 1.58% higher in Kastamonu than in Edirne. Moreover, with each additional dönüm of cultivated fields, the value that is brought in terms of annual income by one additional ox decreased by roughly 0.29%. Therefore, when the magnitude of the main effects is considered when evaluating the magnitude of the interaction effects, the interaction effects seem to be negligible in the theoretical analysis in this study.

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[8] The conversion formula used to transform coefficient estimates into percentage changes: $\text{Percentage Change} = 100 \times (\exp(\beta) - 1)$

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