LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

WOODLAND CIVILIZATION: AN ENVIRONMENTAL HISTORY OF THE SILA PLATEAU FROM ESSENTIALITY TO NEGLECT

Inaugural-Dissertation

zur Erlangung des Doktorgrades der Philosophie

an der Ludwig-Maximilians-Universität München

vorgelegt von

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geboren in Neapel, Italien

München, 2022

Doctoral Dissertation: “Woodland Civilisation: An Environmental History of the Sila Plateau from Essentiality to Neglect”

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Date of Oral Exam: 12/07/2022

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This research project was generously funded by the Andrea von Braun Stiftung for Interdisciplinary Studies, the Leibniz Institute of European History (IEG), the Federal Ministry of Education and Research (BMBF) and the Free State of Bavaria.

Munich, August 2022

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1. Mountains, Woodlands, and Human History: An Entangled Material Perspective

> *The practical need underlying any historical verdict bestows to every history the character of "contemporary history," because, no matter how chronologically remote its historical facts might seem, it is, in reality, history always refereed to the present need and situation, in which those facts propagate their vibrations* (Benedetto Croce).

Today the large Sila plateau, located in the heart of Calabria, only figures as a curious footnote in historical debates. It constitutes an unlikely example of a mountainous land in southern Italy, renowned today for its coastal territories. However, until less than two centuries ago, the uplands of Sila comprised an essential set of natural assets for the region's economy. For millennia, its ecosystem provided nurturing resources to the people who inhabited its valleys and surrounding piedmont territories (also known as *Presila*), constituting a primary subsistence tool.[1] Since ancient times, its distinctive arboreal species carved an ecological niche in the local woodland and formed the ground for basic material relations and industrial practices. This fertile organic meadow allowed other natural species to build their ecological niches, including humans. Throughout several millennia, different groups benefitted from this mosaic of biodiversity, shaping their social norms and governance systems around the most desirable resources.[2] By reshaping this ecosystem to their likings, they also modified it and created coevolutionary relationships with other natural species. In time, the awakening of diverging interests over the plateau's natural resources highly impacted local communities, leading to social conflicts between extractive and subsistence economies. This research effort aims to provide a *longue durèe* environmental history of this large bioregion, reconstructing the transformative interactions between humans and the other ecological actors that inhabited it. While the Sila plateau still constitutes one of the most bio-diverse regions of Mediterranean Europe, when analysing its history, one could imagine a much larger forest belt stretching beyond its current geographical borders. This research seeks to understand how the plateau's various ecological metabolisms shaped natural processes and anthropogenic cultural and material practices.[3] More specifically, it asks to what extent metabolic relations – the exchange of

[1] Some piedmont territories of *Presila*, such as the Reventino range, are actually an integral part of the Sila massif, both in ecological and geoglogical terms (Barbera 2013, 496-497).
[2] As argued by evolutionary biologists, niche construction processes mainly consist of repositiong resources and ensuring physical safety in a certain location (Scott 2017, 40; Jones 2007, 107).
[3] About the concept of metabolism and its relation to nature and culture see Hoffmann 2014, 5-8.

materials and nutritive substances between different actors – fostered hybrid socio-natural relations. How did the dynamic interaction between humans and other species shape patterns of existence and subsistence? How were these affected and modified by environmental transformations such as natural catastrophes and climate change?

In contrast to scholarly stereotypes often depicting southern Italian upland territories as places of idleness and isolation, an informed historical reconstruction of the Sila plateau seems to convey an overall image of mobility and dynamism, emerging from the intersection of human and natural factors.[4] Although such dynamism is primarily demonstrated by climatic imbalances and the rise and fall of different species, anthropogenic influences increase over time. As local communities improved their crafts through new practices and technologies, they significantly enhanced their livelihoods, becoming more emancipated from the arbiter of specific ecological dynamics. However, while each human group who inhabited the uplands of Sila could almost in every instance be considered a more skilled version of the previous one, their natural and cultural ethos continued to be shaped by coevolutionary interactions with the other species.

Over the last century, a radical energy transition and the rise of coastal settlements in an increasingly industrialised Italian peninsula have marginalised upland territories such as the Sila plateau. Nevertheless, current environmental challenges such as rising sea levels and heat waves might again turn these marginal areas into the new/old ecological frontiers of humankind, fostering new patterns of human-nature interaction. While a defined agenda capable of rescuing these territories from their peripheral socioeconomic condition is still missing, a growing number of scholars and policymakers have directed their attention towards the rugged core of the Italian peninsula – about one-third of the whole surface inhabited by about 12 per cent of the total population.[5] Such a discussion has gone hand in hand with historiographical debates analysing the changing coevolutionary relationship between human societies and mountainous environments – what Manlio Rossi Doria defined as the country's "backbone."[6]

[4] About this often-stereotypical depiction of Calabria see Teti 2015, 24-26.
[5] De Matteis 2020, 165.
[6] About scholarly debates on Italian upland environments see De Rossi 2018; Cerosimo and Donzelli 2020; Barbera and De Rossi 2021. About the idea of Italian upland environments as the peninsula's "backbone" see Rossi Doria 2005.

Hence, the timely need for a book retracing the historical trajectory of this natural formation in its constant interplay with the human groups that drew subsistence from its ecosystem and modified it.

Background and Methodology

The Sila plateau constitutes one of the most bio-diverse hotspots of Mediterranean Europe, an example of the encounter of temperate and alpine climatic patterns, composed by a multifaceted ecological network of fauna and flora species (more in the next chapter). Such eco-climatic patterns recall what Vito Teti defined as the "double-face" of Calabrian environments, where mild and temperate periods coexist with often neglected rainy and cold seasons.[7] Indeed, while environmental history has usually focused on the Mediterranean shrub environment of southern Europe, Alpine inland formations such as the Sila plateau have mostly been confined to micro-history and regional research.[8]

By attempting to rescue the Sila plateau from the restricted domain of local history, this research focuses on the co-constructive interactions between humans and other species over an extended timespan. From a methodological standpoint, it primarily adopts the framework pioneered by other researchers acting within environmental history. These are coevolutionary history and neo-materialism, two emerging perspectives. Coevolutionary history, a concept created by Edmund Russell, maintains that key historical processes emerge from the interconnections of nature and culture.[9] Russell ascribes historical transformations to the realm of ecological relations and vice versa, proposing a new understanding of evolution beyond being a mere reflection of genetic change. In this light, historical processes can be understood as evolutionary forces driving both societal changes and long-term genetic transformations.[10] Russell's work constitutes one of the primary references for Timothy J. LeCain's neo-materialist theory, incorporating non-human perspectives to environmental history. Neo-materialist history

[7] Teti 2015, 27.
[8] Braudel 1995, 25. For examples of environmental history of the Mediterranean see McNeill 1992 (with some information about Sila) and Hughes 2005.
[9] About coevolutionary history see Russell 2014 and 2018. Russell's concept is also linked to the field he inaugurated, known as evolutionary history. See Russell 2003 and 2011; White 2011; Gibson 2016; de Majo and Relly 2020.
[10] Russell draws this specific framework from the scientific concept of ecological niche, with particular attention for the *job-habitat dimension*, as different members of an ecological niche cover different tasks and are rewarded with different combinations of traits, either behavioural or physical. For further information see Russell 2018, 2-3.

demonstrates the centrality of creative material environments in historical processes by looking at the interrelations between humans and different species and objects. Ultimately, what LeCain defines "natural-born humans" result from complex coevolutionary processes that have led to "the changing and evolving amalgam that we call human."[11]

Following the critical perspective mentioned above, this study demonstrates how human societies modified the Sila plateau's ecologies while non-human actors shaped their material practices and cultural norms. The result was a tangled knot of mutually influencing relations. As I define it, this *woodland civilisation* primarily extracted subsistence and energy sources from local arboreal species and their ecological metabolism. Endemic and introduced arboreal species such as larch pines, oaks and chestnuts allowed the co-construction of subsistence practices such as animal farming and pitch production. They also provided shelter to different flora and fauna species – from pigs and sheep to silkworms – which shaped the destinies of various human societies. Increased anthropogenic pressures since the Modern Era also led to socio-environmental conflicts between different human groups that competed for access to these resources.

Overall, one could associate the historical trajectory of this plateau to the idea of "salvaging environments," originally coined by anthropologist Anna Lowenhaupt Tsing.[12] In different instances throughout the history of human-nature relations, other species contributed to rescuing or maintaining anthropogenic environments by allowing human societies to benefit from resources that they did not directly produce. These concerned the production and extraction of natural commodities typical of capitalist accumulation and the provision of scalable resources that humans could not replicate through industrial craft. Thus, to a certain extent, the fate of human societies has been tightly intertwined to material relations with other species through diverse systems of exchange, production, and consumption. From this combination of human culture and the characteristics of different species, collective ecological niches emerged.[13]

[11] LeCain 2017, 7. Some of LeCain's main influences include Edmund Russell's evolutionary history approach (2011), as a truly non-anthropocentric example of environmental history in which the agency of plants and animals was put on the same level with that of human beings, but also cutting-edge theories in evolutionary biology (e.g., Laland et al. 2000 and 2014; Wagner 2014) as well as neo-materialist political theory (Bennet 2004 and 2010).
[12] Tsing 2015.
[13] Kreiner 2020, 11 and 79.

The idea of interdependent human-nature efforts to salvage environments resonates with the basic ecological principle of density-dependent regulation – the principle that all species inhabiting our biosphere depend on the interaction with other species to survive in a specific ecological niche.[14] A group of evolutionary biologists recently argued that ecological niche construction should be considered "the forgotten process in human evolution." Ecological actors from different natural realms can co-construct an ecological niche to optimise the chances of survival. In line with this relational understanding of ecology, the theory of extended evolutionary synthesis (EES) explicitly questions Darwinian-inspired Standard Evolutionary Theory's genetic connotation, favouring a more plastic idea of organismal development. For EES, biological organisms evolve not only according to genetic heritage but also by various patterns of extra-genetic inheritance, often linked to the external environment.[15] While the evolutionary paradigm at the core of EES can completely reshape our current understanding of the evolutionary process, it also constitutes a landmark for several disciplines from both the natural and the social sciences.[16] EES has crucial implications for environmental history, especially concerning ecological niche construction. Members of a complex ecosystem can modify the ecological niche of their group, producing fitness benefits for all the member species.[17] Such interactions can significantly alter cultural and genetic traits, revealing complex coevolutionary processes at the core of the organic fabric of life.[18] While in several instances, these density-dependent relations can enhance diversity and lead to balance and prosperity, in other cases, they can wreak havoc and produce ecological disruption.

In order to understand the interplay between human societies and the changing ecologies of the Sila plateau across an extended period, I strive to analyse historical events at the intersection between dynamic environmental factors and the production of anthropogenic cultural norms. Such a research endeavour, equally informed by historical and scientific notions, requires various feasible

[14] Wilson 2016, 13-15.
[15] Laland et al. 2014, 162-163.
[16] In human psychology, this theory finds interesting correspondence in the concept of "prepared learning" according to which humankind can register and inherit behavioural patterns that are passed along to future generations, thus facilitating their ecological adaptation (see Wilson 2014, 139; Carey 2003, 257-272).
[17] A short introduction to ecological niche construction theory is provided by Laland et al. (2000). For a comprehensive overview see Odling-Smee et al. 2003.
[18] Laland et al. 2000, 143. Also see Boyd and Richerson 1985.

sources. As a field eminently interested in reconstructing human-nature relations, environmental history should strive to increasingly challenge traditional methodologies, integrating evidence provided by the hard sciences. According to John McNeill, scientific disciplines such as archaeology, archaeogenetic, palaeontology, biology will need to gradually flank traditional documentary evidence to make sense of complex socio-ecological phenomena.[19] Such an interdisciplinary drive should not be surprising, considering the somewhat innate tendency of history to be "open to all the lessons learned by its many neighbours."[20] Italian scholarship is not alien to similar endeavours. Since the early 1990s, a group of scholars led by Diego Moreno have carried out promising research efforts on woodlands environments. This approach, broadly known as historical ecology, strived to integrate archaeological sources into traditional historic-geographical methodologies, analysing the human-nature interactions that have shaped several traditional Italian environments.[21] However, although historical ecology has produced several sophisticated studies, it has not directly engaged with national and international environmental history, losing the chance to contribute to the field's methodological expansion.

Thus, in reconstructing the human interactions with the ecological system of the Sila plateau, this research draws from botanical, geological and bio-archaeological studies that have utilised technological measurement techniques. These include isotope detections and the analyses of organic fragments from the local flora (pollen, seeds, charcoal) and fauna (animal bones) that have helped acquire essential information on millennial patterns of deforestation, nutrition, and settlement.[22] These scientific insights have provided critical data for the reconstruction of historical junctures neglected by written documents, helping to understand the impact of epistemic political and economic transformations on the ecology of the Sila plateau. These primary sources are also complemented by a corpus of popular scientific literature describing the ecological metabolism of woodland ecosystems, focusing on the metabolic functioning of endemic arboreal species.[23] Such insights have helped better clarify the active role of the Sila

[19] See McNeill 2020.
[20] See Braudel 1980, 26.
[21] See for example Moreno 1989; 2001; 2018; Moreno and Montanari 2008; Moreno et al. 2019; Cevasco and Tigrino 2008; Cevasco and Moreno 2013; Montanari and Stagno 2015.
[22] See Ferrarini 1978; Dimase et al. 1996; Scarciglia et al. 2005; Marino and Grasso 2008; Scarciglia et al. 2008; Nicolaci et al. 2014; Moser et al. 2017; Lena and Pagano 2019; Scarciglia et al. 2020.
[23] See for example Tompkins and Bird 1976; Tudge 2005; Wohlleben 2016; Mancuso 2018.

plateau's ecology in shaping the material life of the different human groups that inhabited it. However, this is not to say that traditional sources do not figure in this research. Historical accounts drafted by explorers, state functionaries, botanists and intellectuals help understand the plateau's leading social and ecological characteristics at different historical junctures. Just as significantly, since the thirteenth century, official documents drafted by other governmental organs provide historical depth and significance to this case study, detailing social conflicts related to the access of local resources.[24]

Periodisation and Temporalities

As the previous paragraphs hint, this historical reconstruction adopts a *longue durée* approach. This methodology analyses historical events across different temporalities to understand complex phenomena and trends that have shaped the past and still permeate the present. Initially pioneered by the French school of the *Annales*, it reached its pinnacle with Fernand Braudel's nuanced analysis of Mediterranean history linking conventional human temporalities to other "ever-recurring cycles."[25] Braudel distinguished between three continuously intersected temporalities: the *quasi-immobile* one of long-term human-environment relations; the mid-term history of human institutions; the short-term history of specific events.[26] While his endeavour produced landmark works in economic and social history, the short-term approach has dominated historiographic tradition since the 1970s, as academics needed to fulfil an increasingly competitive job market through archival specialisation and microhistory.[27]

However, in recent times, the *longue durée* is regaining ground, stimulated by the need to respond to the thematic narrowness of short-term research and aided by new analytical tools allowing large-scale quantitative measures.[28] It has returned in a relatively different form than its economically-minded tradition,

[24] For official legal documents see *Privilegii et capitoli della citta de Cosenza et soi casali*, 1557 (accessed from Biblioteca del Senato). Other relevant sources are available in Barletta 1864 and Zurlo 1866. For archival sources see, ASC, *Demanio Silano*, fasc. 135, bus. 1006, a. 1842; ASN, *Sommaria*, *Diversi*, II Numerazione, vol. 204, c. 65; ASN, *Ministero delle Finanze*, fasc. 11706, vol. I-IV; ASN, *Ministero di Polizia*, fasc. n. 2298, a. 1840–1841 vol. IV; ASN, *Delegazione della Regia Sila*, bus. 1–25.
[25] Braudel 1995, 20.
[26] See Braudel 1995, xiii. About Braudel's main works adopting a *longue durée* perspective see 1981; 1983; 1984 and 1995.
[27] See Guldi and Armitage 2014, 20-30 and 224-231; Armitage and Guldi 2015, 237-238. About the *longue durée* also see Heffer 2001.
[28] About quantitative measures see Guldi 2012 and 2015; Graham et al. 2014.

influenced by the need to contextualise human actions within a broader conceptual and ecological framework.[29] Although still a "young" field, environmental history has similarly strived to situate historiography within broad geographical and chronological scales, exploring human-nature relations over several centuries or even millennia.[30]

Picking up the baton from previous long-term environmental history research, this study reconstructs human-nature relations in the Sila plateau across several millennia. The case study's relatively narrow geographical scope supports such a chronological endeavour. Analysing a micro-physical object within a macro-temporal scale allows it not to fall into what Braudel would define as the "geographical constraints" that can harm the *longue durèe* approach by posing rigid physical barriers to historical analysis.[31] By focusing on a period encompassing approximately two millennia of ecological and anthropogenic relations, this research aligns with what Jo Guldi and David Armitage have defined as the "history of the Anthropocene," analysing human-nature relations since the rise of *homo sapiens*.[32] However, while contemporary *longue durée* history essentially consists of quantitative analyses, by focusing on a micro-scalar geographical perspective, this research provides a qualitative analysis looking at specific local dynamics through punctual documentary evidence.[33] Such a perspective allows preserving the originality of the selected case study while at the same time providing insights on human-nature relations. While, as maintained

[29] The most notable example of this trend includes the so-called "Big History" and "Deep History" trends. The first one analyses the history of our planet from the Big Bang to present times, while the second one, encompasses the last 40,000 years of human history, overcoming the boundaries of prehistory and history. For examples of Big History see Brown 2007; Spier 2010; Zalasiewicz 2011; Christian 2011. About Deep History see Wade 2007; Smail 2008; Shryock and Smail 2011; Smail and Shryock 2013.

[30] Notable examples include the already-mentioned research efforts in evolutionary history (Russell 2011 and 2018; White 2011; Gibson 2016) and neo-materialism (LeCain 2017). Moreover, just like most historical research examining the impact of settler colonialism, several works in environmental history have examined environmental transformations in the colonial context over several centuries (see Crosby 1972 and 1997; Cronon 1983; Grove 1995 and 1997; Steinberg 2000; Richards 2003; McNeill 2010; Fiege 2013). Long-term environmental history has however also been complemented by short-term analyses addressing single environmental episodes (earthquakes, catastrophes, floods) and anthropogenic historical transformations within a circumscribed temporal and geographical realms. Some examples include Worster 2004; McNeill & Engelke 2014; Schleper 2019; Kalmbach 2020; Borwning and Silver 2020. About Italy see Armiero 2012; Parrinello 2015; Corona 2017 and Bonan 2019.

[31] Braudel 1980, 31.

[32] Guldi and Armitage (2014, 66-69). Also see Jonsson 2012 and Bashford 2013; Otter et al. 2018.

[33] For the archival sources at the core of this research see for example, ASC, *Demanio Silano*, fasc. 135, bus. 1006, a. 1842; ASN, *Sommaria*, *Diversi*, II Numerazione, vol. 204, c. 65; ASN, *Ministero delle Finanze*, fasc. 11706, vol. I-IV; ASN, *Ministero di Polizia*, fasc. n. 2298, a. 1840–1841 vol. IV; ASN, *Delegazione della Regia Sila*, bus. 1–25. For documentary sources see *Privilegii et capitoli della citta de Cosenza et soi casali*, 1557 (accessed from Biblioteca del Senato); Barletta 1864 and Zurlo 1866.

by Mark Bloch, historians should not obsessively dwell on the "myth of origins," this research uses the example of the Sila plateau as a litmus test to understand millennia of transformative interactions between humans and woodland environments.[34]

Such an endeavour entails first understanding this ecosystem's characteristics, endemic strengths and weaknesses. Second, it means assessing how these have interacted to shape material practices and cultural norms that have transformed the region over time. While this research focuses on socio-ecological relations, the *longue durée* is not new to studies of land property and agrarian reforms.[35] European woodland ecosystems have provided human societies with valuable natural resources for their daily subsistence and economic success for several centuries. However, for the most part, they have also been regarded as realms of stability, hosting long-lasting traditions and customs. This idea led to narratives in which natural actors figured as still lives, slow and stolid backgrounds intermittently animated by human actions.[36] However, as environmental history has recently demonstrated, endemic natural factors can influence human-nature relations. Perhaps the best example is the impact of climatic changes on human history, even when not caused by human actions.[37] However, this is just one example. As this study shows, several variables ignited environmental and societal transformations in the Sila plateau, demonstrating the nuanced complexity of human-nature ties and the emergent dynamism of material environments, in contrast with Braudel's "quasi-static" history.[38]

Structure and Themes

Each chapter focuses on a specific vegetal or animal species that carved their ecological niche in the plateau's ecosystem, shaping human livelihoods and culture. While in most cases, these species overlapped in time and space, each one shaped a particular moment of the Sila plateau's historical trajectory. Hence the idea to focus on a specific species for each historical caesura analysed in this text. Both endemic characteristics, adaptation capacity and coevolutionary

[34] See Bloch 1949.
[35] About Italy see Grossi 1981; Malanima 2009. For other examples see Orr 1922; Geiger 1936; Chandler 1945; Sakolski 1957; Tuma 1965; King 1977.
[36] See Hayman 2003, 5.
[37] About the impact of climatic imbalances on human history see Diamond 2005; Day et al. 2007; Fagan 2004, 2008 and 2019; Maslin 2014; Degroot et al. 2021.
[38] About non-equilibrium ecology see Norton 1996; Scoones 1999; Cuddington 2001; Rohde 2006; Botkin 2012.

interactions contributed to the fortune of these species, while the intersection of anthropogenic and climatic factors led to their demise. The first chapter looks at the mountain ecology of Sila, its geological development and its most distinctive ecological characteristics. Particularly central is the role of local arboreal species such as endemic larch pines, oaks, and chestnuts in constructing its woodland ecosystem. Although woodlands have been considered timeless entities reflecting seasonal circularity, a closer look at the forests of Sila reveals a picture of complex ecological dynamism. While constantly adapting to geological and climatic trends, its woodlands have hosted a changing set of silvicultural practices. As the second chapter demonstrates, several pre-Roman pastoral societies developed animal farming and forest management practices in coevolutionary interaction with the plateau's ecology. Moreover, since the Roman colonisation, the plateau also began to host proto-industrial activities that led to the consolidation of an anthropogenic landscape and the reduction of forested surfaces. These mainly consisted of logging for construction purposes and pitch production, both practices linked to local timbers' resinous and sturdy characteristics.

However, as I will discuss in the third chapter, the Roman Empire's decline, pestilence, and the onset of a colder climatic phase – the so-called Late Antique Little Ice Age – determined a progressive decrease in anthropogenic activities and a massive re-wilding of the plateau. With the forest surface's expansion, Sila became a geopolitical *limes* separating the Byzantine and the Lombard people. The decrease of anthropogenic activities also benefitted resilient animal species such as hogs and sheep, who fed on the forest canopy. The rise of hogs and sheep also helped the Lombard Germanic people, who carried out semi-feral animal farming. However, as demonstrated by the fourth chapter, the onset of a warmer climatic trend – the so-called Medieval Warm Period – created favourable conditions for demographic growth. Increased anthropogenic activities chimed with the decrease of feral animals and the expansion of coppiced trees such as chestnuts and oaks. These arboreal species provided a reliable source of nutrition for both people and their animals. Their timber was also used as construction material and for energy supply. Overall, their centrality for people's livelihoods led to the development of customary norms regulating conservation and access to woodlands. This social pact reflected a broader historical trend emerging all over

Western Europe: the birth of institutions for collective action, conceived to govern access to shared resources, also known as *commons*.[39]

However, as the fifth chapter demonstrates, these regulations did not prevent social conflicts. Specifically, the emergence of a new arboreal species, mulberry trees, allowed the thriving of silk production centres in the piedmont cities of Cosenza and Catanzaro. While the emergence of silk also benefitted local communities, it favoured the rise of wealthy landowners who seized common lands.[40] As large portions of the plateau's woodland environment were enclosed and deforested, local communities fought for their customary rights, inaugurating a long season of petitions, legal proceedings, and armed revolts – the so-called "Sila litigation." By the mid-seventeenth century, the region was again in social and economic decay due to the convergence of social issues, economic decline, and natural disasters. However, as the sixth chapter demonstrates, the Sila litigation continued until the mid-nineteenth century, as people opposed the modernising designs of intellectuals and landowners willing to exploit the plateau's natural wealth industrially. Such design would eventually be fulfilled after the 1861 national unification, with the end of customary norms and large-scale industrialisation. As industrial practices replaced the material and cultural practices that had characterised the Sila plateau, they allowed a more hierarchical relationship with its local ecosystem.[41] This epistemic transition led to the systematic domestication of nature and the development of agriculture with the introduction of sturdy crops. Although the plateau's natural species ceased to shape human livelihoods, its wooden resources became an asset for a developing nation that heavily relied on wood for energy supply and other industrial uses.

As shown in the conclusive chapter, for the first time in its history, the Sila plateau lost its pivotal role with the post-war oil energy transition. As the Anthropocene era moved its first steps, it became a reified natural monument, epitomised by the establishment of a national park in 1968. This trend was worsened by the progressive abandonment of upland territories, as the human settlements massively relocated to coastal areas. Although today woodland ecosystems such as the Sila plateau figure as the host setting of "natural monuments," pressing climate challenges such as global warming and rising sea

[39] For Further information on the definition of commons see Ostrom 1990, 13-15 and 90; Hess & Ostrom 2007, 4; Reynolds 1986, 339; Wall 2017, 6-7.
[40] See Ogilvie 1995; DuPlessis 2019.
[41] About this relation see McClellan III and Dorn 2015, 384; Headrick 2009, 91.

levels pose the need to rediscover their past centrality to imagine and devise future coping strategies.

Part I. Sustaining Life

2. A Giants' Haven: The Mountain Ecology of Sila

> *A Forest is a forest because it has trees in it, not because it may have sloths and toucans or squirrels or chimpanzees. The trees are the prime players, and the animals are the dependants* (Colin Tudge)

Unpacking the different material relations that have characterised the history of the Sila plateau over the long period that this study analyses requires first to understand its ecological strengths and weaknesses. The uplands of Sila stand out in the sky of one of the most environmentally unique regions of the Mediterranean world: Calabria. A mountainous region stretching 15,000 square kilometres to the southernmost tip of the Italian peninsula – the so-called *Mezzogiorno* – Calabria's roughed peaks and highland plains seal the region from neighbouring lands.[42] While the region stretches along 800 kilometres of coast, it is mainly mountainous, with almost 6500 square kilometres of uplands (about 91 per cent of its overall surface).[43] Of these lands, 59 per cent reach 300 meters of height, 36.9 per cent 600 meters, 21 per cent 900 and 9.2 per cent beyond 1,200.[44] Calabria is also one of the regions with the highest rate of forest cover in the Italian peninsula – about 612,931 hectares (about 41 per cent of its surface).[45] These peculiar environmental characteristics result from the region's rugged geography: mountainous peaks, crossed by riverine valleys and coastal plains, divide it into a typically alpine environment and a temperate Mediterranean one.[46] The geographic peculiarities of Calabria have historically impaired communications and transport in the region, creating stark differences between coastal and upland communities. While over the last fifty years, the combination between infrastructural progress and the reclamation of local swamps has turned its coastal plains into the region's most inhabited territory, in the past, mountain territories have shaped the livelihoods of local people. Predrag Matvejević resumed these peculiar geographical characteristics by defining Calabria as "an island without the sea."[47] Such a definition certainly epitomises the central role played by upland territories in the region's history, for better or for worse. On the one hand, its rugged conformation

[42] Sangiento 1994, 560.
[43] See Gambi 1978, 9; Bevilacqua 2020, 82.
[44] Versace 2020, 29.
[45] Pisani et al. 2016, 63.
[46] About 44 per cent of Calabria's mountain peaks has an average height of over 500 metres, while 22 per cent over 100 (see Sangiento 1994, 561).
[47] Mavejević 2006, 34.

has created a centreless and discontinuous landscape, with numerous territories periodically abandoned after a natural catastrophe and extreme weather events.[48] On the other hand, mountains have shaped the livelihoods of local inhabitants, who have coevolved a variegated set of sophisticated material practices in deep connection with the local environment. In particular, pastoralism has been a long-time productive activity in its rugged valleys and shores. At the same time, a diversified arboreal production – e.g., citrus trees, grapevines, and olives – has permeated the social and environmental history of Calabria, both at high and mid heights. These traditional activities constitute significant historical evidence of the tangled knot of material relations linking local Calabrian communities with their rugged territory. Customs and traditions have shaped centuries of deep interconnection with the local environment, regardless of centralised political planning and state impositions.[49]

The Sila plateau is undoubtedly a quintessential image of the centrality of upland territories in the material life of Calabria, a region geographically fragmented in several entities. Its mountainous landscape has hosted imperious primary forests for centuries, still partly surviving today.[50] The plateau is part of the transversal Apennine mountain chain stretching along the Italian peninsula for 120,000 square kilometres, about two-fifths of the total Italian land surface.[51] It is located at latitudes 16° 20' 9.5" – 16° 45' 44.4" E, 39° 00' 30.9" – 39° 33' 45.4" N and covers an area of approximately 1302 square kilometres.[52] Its shape roughly resembles a vast four-sided plateau stretching from the ancient provinces of Cosenza and Crati to those of Catanzaro and Crotone. It is known to the north as *Sila Greca* (Greek Sila), *Grande Sila* (Big Sila) to the centre, and *Piccola Sila* (Small Sila) to the south. This large upland biome represents one of the most bio-diverse territories of the Mediterranean environment, today the pounding heart of the National Park of Calabria, instituted in 1968. No wonder the etymology of the word Sila derives from the Greek term "ὕλη" – *silva* in Latin – meaning wild forest or woods. Uplands cover almost the park's total surface (about 12,000 hectares out of 13,452), crossed by several valleys and rivers that flow eastward along its steep

[48] About these issues see Teti 2015, 76 and 156.
[49] Placanica 1993, 8.
[50] Placanica 1985, 23.
[51] Vacchiano et al. 2017, 57.
[52] See Nicolaci et al. 2014, 497.

hills in direction to the Mediterranean.[53] These are mainly gneiss and granitic peaks, with an average altitude between 1,200 and 1,400 meters, reaching about 2,000 meters with the so-called *Botte Donato*. These imperious rocks are composed of volcanic granite and crystalline schist, Palaeozoic plutonic and metamorphic rocks, covered with Miocene sedimentary conformations.[54] The latter was formed between 8 and 7 million years ago from debris accumulation in the depths of the sea, lifted by endogenous forces.[55] Already during these times, the peaks of Sila began to be levelled up by meteorological agents, forming the rugged plains sitting around 1,300-1,350 meters of height that today space out the original rocky peaks.[56] While most of southern Italy was still underwater, the mountainous range of Sila must have appeared as a large rocky island in the middle of the sea, extensively covered by green patches that would later become its millennial forests.[57] The subsequent emergence of surrounding lands during the Quaternary period and the formation of pristine forests favoured the region's current morphological aspect.[58] Climatic variations (both cold and heat) fostered the emergence of lakes and entrenched river meanders, such as Tacina, Ampolina, Bufalo, Albo, Garga and Neto that today cross the plateau, climbing its steep uphill territories.[59]

Over time, these natural characteristics have interested numerous scholars and naturalists, especially during the nineteenth century when large-scale deforestation began. Writer Nicola Misasi defined Sila as "the great Italian woodland."[60] This southern Italian plateau's complex mosaic ecosystem emerged from specific geo-environmental factors. First, the region sits on the 39th parallel, famous for its bio-diverse worldwide territories. Its strategic position on the Mediterranean basin reinforces this climatic condition, exposing the plateau to blowing winds carrying ionised air and minerals.[61] Despite being an eminently dry territory, local precipitations in the Sila plateau can reach an average of 1400-

[53] See Gambi 1978, 23 and Ciolli 1982, 155-167.
[54] Scarciglia et al. 2008.
[55] In strict geological terms the Sila massif is composed of The Sila massif consists of a Paleozoic, high- to low-grade metamorphic basement (gneiss, amphibolite, schist and phyllite), intruded by a late Hercynian Sila batholith, and in places covered by Mesozoic and Miocene to Pleistocene sedimentary deposits (see Pelle et al. 2013b, 164).
[56] Lena and Pagano 2019, 58.
[57] Galli 1959, 13.
[58] Pratesi 2010, 13.
[59] Lena and Pagano 2019, 59. Also see Scariglia et al. 2005.
[60] Misasi, 1900, 171.
[61] Tallarico 1950, 19.

1500mm, against the region's modest standards of 600-700mm. Significant precipitation patterns contribute to the physiological porosity and fertility of local soils. While the Sila plateau has traditionally hosted pastoral and forestry activities, its well-watered grounds have provided optimal agriculture conditions up to 100-120 metres of height in more recent times.[62] Such a peculiar atmospheric condition is also responsible for oxidising air and a healthful light that improves local micro-biotic, vegetal and animal life, fostering the acceleration of reproductive cycles during the summer season.[63] Improved reproductive cycles have created the ideal conditions for animal farming since ancient times, as witnessed by fertile meadows and pasturelands. These are especially frequent in upland valleys at an average height between 800 and 1,200 metres, where mountainous vegetation such as dwarf shrubs form an ecological belt diving deciduous forests of oaks and chestnuts with larch pines.[64] Due to these unique characteristics, Sila can be considered a uniquely bio-diverse natural area and one of the most prosperous wooden patrimonies on earth.[65] Such natural features must have been even more pronounced in the past when the impact of anthropogenic activities was not as pronounced as today. In an exercise of historical imagination, one could picture the woodlands of Sila as a semi-pristine environment where different plants and animals could thrive, sheltered by the thick cover of its millennial arboreal species.[66] No wonder, since the classic age, historical records have referred to this upland region with adjectives conveying a sense of greatness, such as *magna* or *ingenti*.[67]

Arboreal Masters

The main arboreal species characterising the complex forest environment of Sila are beeches, pines, firs, oaks, and chestnuts. The union of these breeds, interacting and alternating at different heights, forms the bio-diverse wooded formations that

[62] The Mediterranean climatic patterns of Sila only present consistent alterations since 110-120 metres of height were temperatures decrease. See Blasi 2007. About the introduction of agriculture in Sila see Walker 1967.
[63] Tallarico 1950, 14-22.
[64] See Gambi 1978, 252 and Uznov et al. 2013, 120.
[65] The woods of Sila indeed occupy a third of the plateau's entire surface (Tallarico 1950, 5).
[66] Marino and Taliano Grasso 2008, 72-73.
[67] While several classic authors such as Cicero, Strabo and Horace mentioned and described the uplands of Sila in their writings, illustrious classic poet Virgil used the adjective *magna* to describe local pasture areas, in his *Georgics* (219-220): "pascitur in mangna Sila formosa juvenca: Illi alternantes multa vi proelia miscent," in English "See her browsing in the mighty woods of Sila, that handsome heifer. See them locked in battle taking turns to deal a deadly blow." For further information see Virgil 2006, 57.

characterise this upland region in its unique altitudinal zonation ecologies. At the highest peaks, until almost 1600 meters, pine trees form thick and nearly impenetrable groves, occasionally fragmented by cliffs, valleys and other arboreal species planted by humans such as white firs and beeches.[68] Pine groves are among the most ancient form of natural vegetation in the region, tracing back to the high Miocene period, when the uplands of Sila were still an island in the middle of the sea, sealed from the rest of the Apennines and free to develop its unique vegetation.[69] Particularly notable are black pines (*Pinus nigra*), a widespread Mediterranean species with an endemic variation – the Calabrian pine or larch pine (*Pinus nigra* ssp. *laricio*).[70] These conifers are certainly the most distinctive arboreal kinds characterising the local ecosystem, currently occupying almost 100,000 hectares in the whole region of Calabria, with particular prominence in Sila.[71] They have appeared since the Permian (roughly 300 million years ago), reaching their heyday about 50 million years ago.[72] Due to their capability to thrive and flourish in conditions usually adverse to flowering plants, one could imagine a capillary development of these pioneering species in the aftermath of particularly adverse climatic events. Pines progressively settled on drained soils and played a central role in restructuring the microbiological humus of depleted forests. Pines and other members of the Pinaceae family constitute a type of conifers privileging high peaks and colder habitats and capable of colonising poor or drained soils.[73] Specifically, larch pines are among the few deciduous trees shedding their needles in colder seasons. This characteristic allows them to fare better during wintertime, casting off their primary source of solar energy absorption in exchange for a more aerodynamic structure and fewer broken limbs from snowfalls.[74] Conifers can also thrive in difficult climatic circumstances due to their ability to establish a pioneering underground relationship with several fungi species that attach to their roots, creating a complex nutrient exchange and circulation network. These multi-species symbioses crucially enhance their absorptive capacities, allowing them to cope with low levels of essential soil

[68] See Iovino et al. 2014, 290.
[69] See Blasi et al. 2007, 10.
[70] Avolio 2013, 44.
[71] Iovino 2020, 70.
[72] Tudge 2006, 96-97.
[73] Tudge 2006, 112-113; Bechmann 1990, 4.
[74] See Archetti 2000.

minerals such as phosphorous and nitrogen.[75] Due to their resilience and adaptive capacities, larch pines have formed a unique woodland ecosystem in the rugged region of Sila, composed of sinuous trunks, measuring an average of two meters in diameter and stretching longitudinally between 45 to 50 meters. This life-breeding natural infrastructure provided the ideal ground for the other species that carved their ecological niche in the plateau's environment, including humankind. While coniferous forests constitute a memento to a past age of splendour, most of the pines groves today enriching the plateau's forests are the consequence of reforestation efforts carried out between the 1950s and 1980s.[76] However, the few secular pines still present in Sila – known as the "Giants of Sila" (*giganti della Sila*) – constitute today one of the main touristic attractions of the National Park of Calabria.[77] However, at least since the Roman Times, local conifers were regarded as a valuable resource for industrial use, given their high rate of resins, their essences, and the sturdy characteristics of their timber.[78]

As previously indicated, pine groves successfully intermingle at both high and intermediate levels with species that have gained prominence in Mediterranean environments following the Younger Dryas (10,800 – 10,000 BP). These mainly include beech trees (*Fagus sylvatica*) and silver firs (*Abies alba*). From a taxonomic perspective, firs belong to conifers (family of *Pinaceae*, just like pines), while beeches are deciduous angiosperms belonging to the eudicot orders (*Fagales*). Unlike pines, these species do not fare particularly well at high altitudes, as they are slower reproducing and need richer soils to thrive. Moreover, because they usually suffer the shade of pine groves, they have managed to spread both at higher and lower altitudes of the dominant local larch pine belt.[79] Therefore, they can also figure amid the deciduous arboreal species that occupy the plateau from 1000 meters downhill. Here, famous angiosperms, also known as broadleaf trees, such as oaks (*Quercus pubescens Willd.*, *Quercus cerrisi L.*, *Quercus conferta* Kit. and *Quercus farnetto* Ten.) and chestnuts (*Castanea sativa*) form mesophile

[75] According to recent estimates, without the collaboration of these fungi species, conifers would have been unable to leave lake and swamp environments in the first place, failing to adapt to drier land condition (see Farjon 2017, 25).
[76] See Iovino et al. 2014, 290.
[77] For further information see https://www.fondoambiente.it/luoghi/i-giganti-della-sila.
[78] Farjon 2017, 744-745.
[79] Bernando and Gangale 2008, 71-72.

forests.[80] These belong to the widespread order to the *Fagales*, tracing back to about 100 million years ago, mainly in the northern hemisphere. Although today both species have diminished in number, their physiological metabolism has played a central role in constructing some of the most typical forest ecosystems, largely thanks to the nourishing fruits that grow on their branches.[81] Both acorns and chestnuts present themselves in the form of a nut enclosed or sustained by spiny or scaly capsules. These are a natural reserve of health-benefitting nutrients, such as carbohydrates, vitamins, proteins, minerals, and essential fats. Moreover, their qualitative hardwood timber has turned them into ubiquitous industrial assets for construction and the combustion of charcoal.

Deciduous species are also remarkably resilient. They can reproduce in multiple ways, even solely aided by the wind, bearing both male and female single-sex flowers on the same trunk.[82] Moreover, despite the high amounts of potential predators willingly to cut their share of the tree's nutrients – from wild mammal predators such as squirrels and deer to several leaf-eating insects, pests and pathogens – they can mount several defensive strategies. First, they can shed an entire complement of leaves replaced by a second spate during late summer, allowing the trees to photosynthesise and store food for the following winter. Other remarkable strategies include chemical trickeries such as deploying repellent substances, including the renowned tannins. This common secondary metabolite can disrupt parasitical feeding by making tree leaves indigestible and the wood tougher.[83] Because today most of the human practices associated with these species are either neglected or forgotten, both oaks and chestnuts occupy a minor surface than in the past, although their multi-functional timber continues to fill specific market niches, thus guaranteeing their survival.[84] Other trees also present less frequently in this lower vegetation belt include beeches, spruces, alders, maple trees, poplars and numerous shrubs.[85] Some of these, such as the

[80] Mesophile forests are woodland formations whose arboreal species and various microorganisms such as bacteria and fungi thrive in moderate temperatures, ranging from 20 to 45 °C. See Vacchiano et al. 2017, 59-60: Moser et al. 2017, 114.
[81] About their diminishment see Iovino et al. 2017, 289.
[82] Trees with such hermaphrodite characteristics are also known as monoecious (see Tudge 2006, 197-200).
[83] While these strategies tend to function, different species have developed mechanisms to digest and even appreciate high amounts of tannins, as caterpillars and humans. Today the high presence of tannins in common substances such as tea and red wine is associated with positive chemical reactions that block vessels to contract, preventing circulatory diseases. About the role of tannins for trees, humans and animals see Tudge 2006, 353-354, Lewis-Stempel 2018, 36-44 and Pyke 2019.
[84] Iovino 2020, 62-65.
[85] Ciolli 1982, 158.

Italian alder (*Alnus cordata*) and the pretty whin shrubs (*genista Anglica*), are also original species formed during the Miocene period.[86]

Underground Wealth

Such a complex mosaic of arboreal species intersecting at different heights results from millennia of coevolutionary patterns that have allowed coexistence strategies and the formation of a creative material environment with different ecological niches, human and non-human alike. However, as preached by modern botany, forests environments are far from idyllic heaven of cooperation and mutualism. Different arboreal species can take on a dominant attitude in multiple instances, actively curbing competition with other trees. These strategies can consist of the emission of chemical substances that prevent the germination of competing seeds and kill young rivals.[87] However, in other cases, different arboreal species can create meaningful coevolutionary patterns of interaction that allow them to coexist and even to favour each other's growth. The most well-known example of reciprocity mechanisms among trees in forest environments is the complex ecological network of subterranean interconnections that constitutes what ecologists have defined as the "wood wide web."[88] Like pine groves, mixed forest environments also owe their existence to symbiotic underground networks between roots, fungi and the billions of microbes that inhabit the underground (especially nitrogen-fixing bacteria). According to recent surveys, the woodlands of Calabria present over 338 species of fungi belonging to 60 different families, such as *Basidiomycetes* (50), *Ascomycetes* (9) and *Zygomycetes* (1). At least 182 among these form networks with local trees, even in mixed arboreal regimes, an evident sign of underground vitality and soil salubrity.[89] With its vast mixed forest environment, the Sila plateau can be rightfully considered a "mycological paradise," a leading hotspot for mycelia reproduction with over 3,000 different species enriching its soils and sustaining the various arboreal species that intersect in its rugged territory.[90] Aside from the multiple taxonomic and botanic profiles traced over the last decades, such an abundant fungal population has

[86] See Blasi et al. 2007, 10.
[87] Bechmann 1990, 5-6.
[88] About this definition see Simard et al. 1997.
[89] See Pisani et al. 2016.
[90] Contin 1997, 193.

contributed to the recent rise of a thriving mushroom industry and the proliferation of local research groups and conservation associations.[91]

Underground networks of microbial-packed fungal mycelium and tree roots are common patterns of multi-species mutualism that animate 90 per cent of physiological cycles. These are commonly known as "mycorrhiza" (literally, fungus-root), forming the fertile humus at the core of organic forest life. Although gathering reliable data on the complexity of this underground system is still an open challenge for forest scientists, this fascinating physical network presents thousands of interconnections in one single cubic centimetre of forest soil.[92] By exchanging chemical messages, roots negotiate trade terms for essential nutritional substances produced by fungi and bacteria, such as nitrogen and carbon, in exchange for sugars produced through photosynthesis.[93] These mutually-enriching relations favour patterns of cooperative interaction among different species.[94] Underground fungal networks also improve trees' efficiency and resilience. Attaching to their roots, they form a tangled web of mycorrhizal hairs that increase the underground breadth of trees. Mycorrhizal networks allow trees to reach for resources far underground and break down nourishing organic material while paving their way inside resistant surrounding matter and filtering out toxic heavy metals.[95] Growth patterns of mycorrhizal networks follow their capacity to detect gradients of water, oxygen, temperature and other nutrients, following these faint underground leads with extreme precision.[96] This adds to autotrophic photosynthesis a second essential metabolic mechanism in tree physiology: heterotrophic nutrition through underground mycorrhizal networks.[97] Heterotrophic metabolic cycles constitute a primary collaborative mechanism of forest ecosystems. They discipline cooperative feeding strategies between tree species from both the same and from different families, supporting shadowed or sick forest members.[98] Providing for weaker forest members helps trees preserve the ideal ecological and microclimatic conditions for survival.

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[91] Contin 2008, 99-100 and Librandi 2008, 145-146.
[92] Mancuso 2017, 77.
[93] See Haskell 2017, 38.
[94] See Perry 1998; Wilkinson 1998.
[95] The degree of entanglement of this relation is documented by archaeological evidence demonstrating the mycorrhizal relation between rootless archaic plants and ancient fungal species in ancient fossils since at least 400 million years ago. See Srtullu-Derrien and Strullu 2007; Strullu-Derrien et al. 2018.
[96] Mancuso 2018, 80.
[97] Tudge 2006, 258-262.
[98] Fraser et al. 2006.

Moreover, the chemical signals utilised by mycorrhizal networks to wire communication between tree species also warn individuals against predators' attacks and about possible water shortages.[99] Promiscuity and the potentially infinite set of relations in mycorrhizal networks constitute the key of these vast and complex collaborative systems at the core of forests' ecological metabolisms.[100] Assuming that plants and trees' underground processes mostly evade the naked eye, one could compare mycorrhizal networks as a decentralised brain governing the life of plants from the underground. In this decentralised form of swarm intelligence, the nerve cells that pervade branches and roots knit to the organic qualities of other species inhabiting the underground, optimising and memorising essential tasks to ensure subsistence.[101]

Thus, even a seeming individual tree is essentially a colony of decentralised systems that cooperate to solve problems related to subsistence through networks of distributed intelligence.[102] Adaptation strategies and competing attitudes are also evident on the topsoil level. For example, through the secretions of substances such as methyl salicylate, a modified form of salicylic acid, trees can ignite mutual warning processes against predators' attacks, such as aphids.[103] Communication between species, both through underground electrical signals and surface olfactory and visual inputs, is key to the survival of the woodland areas of Sila, a tangled knot of different species living in close relation, after centuries of coexistence and mutual adaptation.[104] Successful patterns of negotiation and coexistence are also evident in ordinary physiological functions, such as growth. As natural light lovers, conifers need to overshadow angiosperms to coexist with them. As a result, they devise strategies to grow both directionally and economically towards the light – a process also known as "positive phototropism." As a result, they tend to prioritise length over width, which explains their somehow thinner size at lower heights than their massive size in primaeval forests.[105]

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[99] Babikova et al. 2013; Wohlleben 2018, 84.
[100] Sheldrake 2020, 166-171. Also see Francis and Read 1984 and Simard et al. 1997; 2012; 2015; 2018.
[101] Mancuso 2018, 5-6 and 77. Also see Baluška et al. 2010; Ciszak et al 2012.
[102] Mancuso 2018, 178-179.
[103] See Scutarenau et al, 2003; Ranganathan and Borges 2010; Heil and Karban 2010; Farquharson 2017.
[104] Fungi and trees can coexist for a very long time, as witnessed by a 2,400-year-old species of *Armillaria ostoye* found in a Eastern Oregon Blue mountains, a large turf stretching over a total surface of 10 square kilometers. See Casselman 2007.
[105] About pines' growth see Tudge 2006, 97-98 and 266-267.

Spontaneous herbs, more than 50 per cent medicinal species helpful to humans, also sprout all over the Sila plateau, both in proximity to lakes and river flows and in former forest regions cleared by human intervention.[106] While the former still hosts some of the most characteristic native species, the latter can also create a highly bio-diverse floral complex, reaching up to 100 species within ten square meters, depending on its utilisation for pastoral purposes.[107] Like local trees, these floral species can potentially interact with each other through underground mycorrhizal networks, contributing to the resilience of this vibrant mountain ecosystem.[108]

The region also presents a significant wild fauna, gathering numerous rare species that carved their ecological niche in this complex woodland ecosystem. These include about twelve endemic amphibious species inhabiting the proximities of lakes and river flows and about seventeen small-sized reptiles.[109] Not least important are several bird species, such as royal eagles, sparrow hawks, woodpeckers, kestrels, buzzards, tawny and barn owls, rock partridges, Eurasian woodcocks, quails, common wood pigeons and other insectivore species. Medium-sized mammal predatory species such as the Apennine wolf and other omnivorous mammals include foxes, hares, lynxes, martens, and otters. The main herbivorous and omnivore species are agile and resilient animals such as boars, fallows, and roe deer.[110]

These flora and fauna species have coexisted for centuries in the dense woodland environment of Sila, whose rugged geographies and harsh climatic patterns allowed the plateau's highest portions with a good conservation state. However, whilst its thriving ecosystem favoured the creation of human settlements in piedmont areas, permanent human settlements in its highest parts have been somewhat seasonal and discontinuous. The lack of significant prehistoric artefacts confirms this historical information. While the plateau's piedmont territories present sparse traces of human settlements since the Lower Palaeolithic (700,000 – 50,000 years ago), the first relevant anthropogenic activities began to consolidate during the Late Neolithic (c. 3000 BC), in concurrence with

[106] Tallarico 1950, 68-69 and 105.
[107] Bernardo and Gangale 2008, 74.
[108] Pisani et al. 2016; Jersáková et al. 2015; Pellegrino and Belusci 2009.
[109] Bonacci et al. 2008, 83-88.
[110] Ciolli 1982, 161-164.

the emergence of complex agro-pastoral societies all over Eurasia.[111] These mainly consisted of nomadic pastoralism and wood logging, activities linked to the territory's natural characteristics and the relative scarcity of precious metals. As the following pages show, the Sila plateau's ecology provided vital resources for the human societies that settled on its piedmont territories. Their material life depended almost entirely on local natural species, whose interplay with human culture determined fruitful coevolutionary patterns of interaction, inaugurating the beginning of the woodland civilisation at the core of this narrative.

[111] For further information see Pelle et al. 2013a; Moser et al. 2017; Crudo 2018; Attema et al. 2019. For a chronological perspective on the occupation of Calabria since the Paleolithic see Russo Ermolli et al. 2018, 40-41. About the consolidation of agropastoral systems in Eurasia see Hoffmann 2014, 30.

3. Pastors, Pines and Pitch: The Development of Material Life in Ancient Sila

> *For much fir grows there, towering to the sky, much black poplar, much pitch pine, beech, stone pine, widespreading oak, ash trees enriched by the streams flowing through their midst, and every other kind of tree with densely intertwined branches that keep the mountain in shadow throughout the whole day* (Dionysius of Halicarnassus).

The ecology of the Sila plateau significantly shaped the material life of the human civilisations that occupied its territory. Over time, different human groups developed subsistence activities that relied on the local ecosystem for daily needs.[112] In ecological terms, one could say that these human civilisations carved up a coevolutionary niche by actively drawing from the thriving energy storehouse contained in local woodlands and their material properties. While they progressively modified the local ecosystem, their livelihoods were tied to the material potential of the plateau's woodlands. In particular, the early human groups that inhabited the plateau drew sustenance from the ecological metabolism of local arboreal species. The example of Sila is not an isolated one. Evolutionary biology has demonstrated how several crucial patterns of human evolution have been indissolubly related to the enriching relation with trees and particularly to the material characteristics of wood. From the capability to stand upright to toolmaking and building shelters as well as cooking food, *homo sapiens* has benefited from the sturdiness and energy supply provided by different arboreal formations.[113] In the Mediterranean context, uniquely characterised by Alpine forests and scrub vegetation intersecting at different heights, woodland formations have continued to uniquely shape human material culture up until the late nineteenth century. Italian historical tradition has broadly adopted the Greek word βοσκω (in Italian *bosco*, or woodland), to convey the relationship between anthropogenic activities such as pastoralism and agriculture and the ecological characteristics of these forested spaces. This term usually has replaced the Germanic expression *urwald*, describing a high trunk forest not domesticated by humans.[114] Archaeological studies conducted all over the peninsula have confirmed human settlements in several mountain regions since prehistoric times,

[112] About the role of Italian woods in the agrarian history of the peninsula see Agnoletti 2018, 3.
[113] About the role of wood in for human posture see Polvinelli and Cant 1995; Johannsen et al. 2017. About the role of wood for tool making and building shelters see Leakey 1971; Ennos and Oliveira 2017; Ennos 2020, 55-73. About the role of wood burning to cook food and its relation to human evolution see Wrangham 2009.
[114] About this difference, see Agnoletti 2018, 27.

a process favoured by mechanisms of natural soil fertilisation initiated by melting glaciers since the last Ice Age (c. 115000 to 11500 years ago). Semi-nomad pastoral settlements became particularly prominent in lower upland regions near alluvial fans and layer debris, a process going hand in hand with the advancement of coniferous and deciduous woodlands postglacial peninsula that entered the Holocene geological epoch.[115] However, the rugged geographies of the Sila plateau allowed the formation of a mixed forest environment, with the alternation of more preserved areas with secular trees and lands suitable for pastures. As previously observed, several studies have demonstrated sparse habitational patterns until the late Neolithic (c. 3000 BC), with the progressive occupation of the territory surrounding lake Cecita.[116]

The first people to establish a consolidated civilisation in the region of Sila were known as Oenotrians. This Indo-European tribe inhabited a territory stretching from the proximity of Salerno to the tip of Calabria. They were semi-nomad pastoral groups that would then change their name into Italic, after their king *Italus*, who also allegedly introduced agricultural practices, laying the foundations for a more nuanced civilisation. Since the eighth century BC, Italic people intermingled with the Greek populations who colonised Calabria's coastal regions. At the same time, this pressing presence on the coast forced them to further retreat in the inner areas of Calabria, especially in Sila, becoming the first ramified civilisation inhabiting its upland and piedmont territories.[117] As Greek coastal colonies progressively assimilated the Oenotrian/Italic civilisation, other Indo-European populations of nomadic pastoralists began to descend the Italian peninsula, eventually reaching the uplands of Calabria by the fifth century BC. These were known as Lucanians, a rural population who had first penetrated the south of Italy during the Iron Age (c. 1100 – 700 BC) and other Indo-European peoples such as the Apulian, the Samnites and the Osci. By the fourth century, the Lucanians ruled over an internal region corresponding to modern Basilicata and northern/central Calabria, forming more complex and stratified societies capable of challenging the hegemonic power of Greek coastal colonies. However, by 356

[115] For further information see Godefroy 1940; Barker 1975; Potter 1985; Guidetti 1998; Agnoletti 2018; Dolfini 2019.
[116] Early occupation settlements in the Sila plateau have been confirmed by recent charcoal soil analysis combined with radiocarbon dating and archaeological surveys. About radiocarbon dating in the region see Moser et al. 2017; Pelle et al. 2013a and 2013b. For archaeological surveys see Marino and Taliano Grasso 2008, 82.
[117] De Sensi Sestito 2020, 103-104.

BC, a subordinated tribe rebelled from their rule and gained territorial independence in northern Calabria. These people were known as Bruttians (in modern Italian *Bruzi*), from the Indo-European term *Brettii*, probably meaning fugitive slaves or simply rebels.[118] According to archaeological reconstructions, this population occupied a vast internal territory roughly coinciding with the inner region of Calabria, from north to south.[119] In this territory, they founded a confederacy formed of several independent cantons, a decentralised political system that reflected the fragmented geography of the region.[120] The core of their confederacy was the Sila plateau and its piedmont territories, in particular the city of *Cosentia* – today Cosenza – a name that sealed the consensus among shepherd tribes (κοινή πολιτεία).[121] Specifically, the town sat on the Pancrazio hill, nestled at the crossroads between the Mediterranean coast and the Sila plateau, a strategic position for trade.[122]

Material Mountain Life

Like the Italic people, the Bruttians mainly relied on pastoral activities upon the Sila plateau, managing local forests with fire. Harnessing heat to convert wildlife territories to farming has played a central role in the evolution of human societies since the Palaeolithic, allowing humans to outcompete other animal species and manage entire ecosystems.[123] Just as importantly, the controlled use of fire also led to enhanced dietary regimes, improving nutrients' supply and propelling

[118] De Sensi Sestito 1994, 282-289; Paoletti 1994, 469-471.
[119] The most precise historical coordinates were given by Strabo in his *Geography*. It is not a coincidence that the region of Calabria was known as "Brettia" (in Greek βρεττία) until the mid-seventh century AD. For further information see Guzzo 1994 and 2019, 158.
[120] These included both cities known today, such as *Veipon* (Vibo), *Taurianum* (Palmi), *Aufugum* (Montalto Uffugo), *Argentanum* (San Marco Argentano), and others that have not been identified yet such as *Calmpetia*, *Terina*, *Temposa*, *Bergae*, *Besidiae*, *Ocriculum*, *Lymphaeum* (see Costabile 1994, 443).
[121] Most information of this early history is reported by Greek and Roman intellectuals lived between the first century BC and the first century AD, such as Diodorus Siculus, Strabo and Gnaeus Pompeius Trogus. For further information see Cappelletti 1997 and Guzzo 2019, 48-49. The city of Cosenza was located few kilometers away from the Oenotrian main settlement, known as Pandosia (De Sensi Sestito 2020, 108).
[122] Burgarella 1992, 15.
[123] Recent radiocarbon analysis of charcoal fragments at the Cecita lake in Sila have detected the presence of anthropogenic fire management activities since the early Holocene (c. 13000 BC), in concurrence with climate variations. This growing millennial trend steeply increased during the Bruttians times (Moser et al. 2019, 124, 125). About similar practices in other regions of Italy see Valsecchi et al. 2014, Egli et al. 2012, Kaltenrieder 2010, Vescovi et al. 2010, Noti et al. 2009, Colombaroli et al. 2007. About other European regions see Feurdean et al. 2017, Robin et al. 2014, Robin et al. 2013, Robin et al. 2012, Moore 2000. For a longue durée history of fire see Pyne 1995, 1997 and 2001; Goudsblom 1986 and 1994.

cognitive evolutionary processes.[124] Drawing from these millennial practices, Bruttian pastoral societies developed forest management techniques relying on the controlled deforestation of some areas. They felled trees and selectively burned down entire woodlands to open space for farming. Fire-based forest control techniques (*debbio*) have characterised patterns of forest management for several millennia, contributing to the creation of fire-resistant vegetation.[125] Similar forest management practices on the Sila plateau, known as *cesina*, interested the region even before the Bruttians.[126] As demonstrated by radiocarbon dating on charcoal fragments present in the soils of the Cecita Lake (located at 1150 meters of height in the uplands of Sila), forest management practices consisting of the use of fire trace back to the beginning of the Holocene (c. 13000 BC). These mainly concerned deciduous oak-silver fir forests, a typical woodland species of the Italian Apennines.[127] The controlled burning of portions of the forest had a beneficial effect on local regeneration cycles, eliminating competing seeds, parasites, and other residual substances. Increased soil temperatures also favoured the mineralisation of underground organic matter and the release of fertilising nutrients such as nitrogen. Finally, they also neutralised soil acidity through potash, phosphate-abundant ashes and the forest humus.[128] These forest management practices particularly benefitted local pines, a species capable of confronting the environmental challenges posed by forest fires (hormesis), enhancing their germination and regeneration capacities.[129]

While these practices were present in Sila since the Early Bronze Age (c. 3300 – 2100 BC), they increased with the establishment of the Indo-European pastoral tribes, who also harvested wild flax and broom growing on the shores of

[124] About the evolutionary role of cooked food see Wrangham 2009.
[125] About the origins of the *debbio* in the Italian peninsula see Sereni 1981. About the regenerating effect of fire on the Italian forest landscape see Cevasco 2007. For specific studies on the regenerative capacity of tree species with controlled fire regimes see Romeo et al. 2020, Brazhnik et al. 2017; Maringer et al. 2016, Hernández-Serrano et al. 2014 and 2013, Marzano et al. 2012, Ascoli and Bovio 2010.
[126] According to agrarian historian Emilio Sereni, the expression *cesina* is allegedly an Indo-European word reminding to the first tribes who established these practices upon the plateau (1981). Also see Forni 2011, 43.
[127] As witnessed by a large-scale analysis of pollen records, these practices involved several areas of the Italian peninsula. About Sila see Moser et al. 2017, 121-122. For other areas of the Apennines see Di Pasquale et al. 2014; Joannin et al. 2012; Mercuri et al. 2012; Di Donato et al. 2008.
[128] About the beneficial uses of fire for forest reproduction in general see Bechmann 1990, 55-56. About the role of controlled fire in the regeneration of pine trees see Romeo et al. 2020.
[129] Several pine species are indeed able to grow in savannahs and northern forests prone to fires, adapting their reproductive cycles to local fire cycles (see Tudge 2006, 114). About the progressive emergence of pine trees in Sila see Pelle et al. 2013a, 212 and 2013b, 172-175.

the Mucone river.[130] Recent archaeological studies point at a steep increase in anthropogenic pressures in the plateau between the Late Bronze Age (c. 1550 – 1200 BC) and the Hellenic colonisation of the Calabrian coast (since 744 BC). This timespan also roughly coincides with the rise of Lucanian tribes and is confirmed by the significant differentiation of sediment samples, demonstrating a mixed regime of woodland management in comparison with the previous epochs. Such a radical transformation mostly involved native silver firs sitting at medium and lower heights, progressively replaced by larch pines, beech trees, and oaks. These were presumably transported from upper slopes both by natural and anthropogenic forces.[131] Among the anthropogenic factors able to radically modify the local environment, one should likely include the massive introduction of the domesticated animal species that coexisted with these pastoral tribes, such as cattle, sheep and hogs, a constant presence in the Neolithic.[132] Similarly, archaeological records demonstrate economic activities along the Valley of Crati, presumably related to the exploitation of timber resources, traded by the Oenotrians and the Bruttians with coastal Greek colonies.[133] Forest clearing also corresponded to soil degradation, as confirmed by growing geomorphologic instability in detrital deposition after 1,000 BC.[134]

Early forest management practices in the Sila plateau mainly served to sustain cattle farming, the most traditional subsistence activity carried out by Italic and Bruttian peoples, following the pastoral Indo-European custom.[135] While archaeological evidence allows us to retrace the early settlement period of this civilisation, the most reliable written records come from Roman sources several centuries later. Multiple historical accounts witness the presence of farming activities in Sila during the first century BC. For example, Roman author Varro (c. 116 – 27 BC) reported the presence of "noble herds" (*nobiles pecuariae*) in the lands of Bruttians. Julius Caesar's accounts confirm this information (100 – 44 BC), documenting the presence of shepherds (*pastores*) in the area of Sybaris.

Similarly, Latin poet Virgil (c. 70 BC – 19 BC) described the "mighty woods" of Sila as the ideal environment for livestock farming, "whether you're more

[130] Marino 2008, 151.
[131] Moser et al. 2017, 117 and 124; Sevink et al. 2019, 646.
[132] Pratesi 2010, 32.
[133] These included famous cities such as Locri, Reggio, Crotone, Sibari. See Paoletti 1994; De Sensi Sestito 1994; Guzzo 2019, 30.
[134] See Pelle et al. 2013b, 175.
[135] See De Sensi Sestito 2020, 107 and 117.

interested in cattle or horses."[136] Comparing these statements with farming patterns during Roman times, one could easily picture the presence of animals such as cattle, horses, sheep, goats and pigs roaming the uplands of Sila since the arrival of pastoral Indo-European tribes.[137] Archaeological records also confirm these historical accounts, unveiling traces of fortified walls surrounding the eastern borders of the Sila Massif, erected between the fourth and third century BC to enclose livestock and preserve water sources.[138] Just as importantly, several archaeological sites revealed bronze artefacts referring to religious cults related to pastoral Italic societies.[139]

The considerable evidence of a civilisation forming in the surroundings of the Sila plateau finds further confirmation in geographical factors. The plateau's proximity to both the Tyrrhenian and the Ionian coast favoured the farming practice known as vertical transhumance.[140] This tradition permeated farming patterns all over Mediterranean Europe, consisting of the seasonal movement of livestock between lowland winter pastures to upland summer ones.[141] The historical drives that propelled the rise of this seasonal pastoral activity are still partially unclear since transhumance is probably the result of a conjunction of factors. These presumably include anthropogenic causes, such as the political instability that characterised pre-modern times, forcing herders to move from plains to highlands for security reasons, and the economic advantage deriving from the commercialisation of specialised farming products to different habitats. Regional and ecological elements were probably also central co-factors in the development of transhumance. This process was favoured by the varied climatic patterns of the Mediterranean environment, able to potentially meet the physiological needs of cattle in different phases of the year through relatively short migratory efforts. These must have been complemented by the physiological need to ensure the subsistence of feral cattle after the invention of agriculture and the progressive conversion of plain woodland areas or pastures into cultivated

[136] This expression was adopted by Latin poet Virgil in his *Georgics* (210-220). See Virgil 2006, 57.
[137] Matkovic 2001, 188-189.
[138] See Oliviero 2017, 6.
[139] Cappelletti 2018, 328-329.
[140] About this practice in Calabria see Bevilacqua 1988a, 857. About the distinction between vertical and horizontal transhumance see Hoffmann 2014, 176-179.
[141] See the latest review study documenting traces of upstream pastoralism all over the Mediterranean basin (Ruiz and Sanz-Sánchez 2020). For historical studies about the Italian peninsula during ancient times see Sereni 1971; Pasquinucci 1979; Gabba 1994.

fields.[142] Palaeobotanical and archaeological records have recently demonstrated the remote origins of this activity and its relation to other anthropogenic environmental transformations also associated with farming. In particular, geochemical isotope detections on the bones of prehistoric animals have revealed the presence of seasonal cattle farming activities in several parts of Europe since prehistoric times (c. 6000 BC).[143] Although transhumance has not left evident signs in Calabria, palaeoecological studies have found traces of seasonal farming practices in several coastal areas between the mountains of Pollino and Sila, tracing back at least as far as the Middle Bronze Age (c. 2100 – 1550 BC). These significantly intensified in the following centuries, especially in the Sila plateau, demonstrating a substantial surge of anthropogenic activities in the region.[144]

Evident signs of seasonal farming still permeate several Italian mountains landscapes, as witnessed by the large grassland corridors that unite the peninsula's rugged peaks with coastal regions, allowing the transportation of cattle without damaging cultivated fields.[145] While agroforestry activities for sustainable farming increasingly permeate public debates, archaeology has demonstrated that ancient Italic and Bruttian civilisations pioneered these techniques in the Sila plateau.[146] Cattle farming activities primarily relied on the metabolic products of local trees, especially on valuable resources for both subsistence and grazing. By scattering their fruits on forest soils, spruces, beeches, oaks, and chestnuts refer to atmospheric events such as wind to carry their densely packed seeds as far as possible from their parents, multiplying their chances to fall upon a fertile ground.[147] In attempting to increase their reproduction chances by scattering their seeds simultaneously, these species ended up favouring hunter-gathering and pastoral activities essential for daily and long-term subsistence. Their fruits, broadly known as mast, constitute valuable

[142] Greenfield 1999, 17-18.
[143] See Barker 1991; Chang and Tourtellotte 1993; Halstead 1996; Kienlin and Valde-Nowak 2004; Bentley and Knipper 2005; Shishlina et al. 2008; Lévêque 2013; Balasse et al. 2013; Carrer 2015a and 2015b; Valenzuela-Lamas et al. 2016. For a general history of transhumance in Europe see Costello and Svensson 2018.
[144] See Sevink et al. 2019; Post 2014; van Leusen and Attema 2001/2002. For an historical overview of transhumance in Calabria see Bevilacqua 1988a; Givigliano 1987.
[145] See Pratesi 2010, 27-28.
[146] About agroforestry see Tudge 2006, 338-392. For archaeological evidence of transhumance in Sila see Guzzo 2019, 108.
[147] See Haskell 2012, 188-193. Also see Burrows 1986; Augspurger and Franson 1987.

storage of essential nutrients to sustain the staple of life, such as proteins, fats, carbohydrates, and vitamins.[148]

Slash and burn forest management practices also allowed rudimentary agricultural techniques, despite rigid climatic patterns. Traditional Eurasian crops such as wheat, barley, and rye were prevalent. Both the plateau's well-watered soils and its above-average rain patterns contributed to the rise of these anthropogenic activities and propelled the metabolic cycle of local woodlands. Due to the plateau proximity to the coast, local trees can capture rainfall in their canopy and release it into the atmosphere through transpiration. This adds to the numerous cubic meters of water they already absorb from solar energy sources for photosynthetic purposes.[149] Trees' water absorption capacity ensures that superficial ground layers do not get washed out by heavy rains, preventing soil erosion and slowly fertilising the terrain with the trapped moisture.[150] While contemporary anthropogenic issues such as climate change impair local forests' water absorption capacities, early human settlements greatly benefitted from a thriving forest environment.[151] Fostered by abundant rain patterns, these were able to engage in sustainable agricultural activities, complementing the diets of local human populations with crops grown in what we might think of as a "regime of non-separation" between forest environments and anthropogenic farming.[152]

The social ethos of the ancient civilisations inhabiting the Sila plateau mainly relied on pastoral activities close to agroforestry. Although historical evidence of the societal organisation left by the Italic and Bruttian civilisations are relatively scarce, recent reconstructions have hypothesised the presence of a capillary and decentralised system of different power clusters (or cantons) between the mid-fourth century and the mid-third century BC – the civilisation's peak.[153] Their rise in northern Calabria since the fourth century BC went hand in hand with the expansion of Mediterranean Aegean civilisations. As previously observed, since the eighth century BC, several Greek coastal colonies were

[148] For example, although a beech nuts wights only 0,02 grams, they are calorie bombs as they contain about 50% of fat. In contrast, acorns can weigh until 4 grams and contain 50% of carbohydrates. See Wohlleben 2018, 141-142. Haskell 2017, 112-113.
[149] About trees' transpiration in coastal environments see Wohlleben 2016, 106-107.
[150] Wohlleben 2018, 40-41.
[151] About the impacts of climate change on tree absorption in Sila see Scarascia-Mungozza et al. 2010; Mazza et al. 2018; Versace et al. 2020.
[152] This information is confirmed by field evidence of multi-story plough traces in several archaeological sites. See recent archaeological findings by Pelle et al. 2013b, 175. About the role of fire fertilization practices in history see Pyne 1995.
[153] See Guzzo 1989; Sangiento 2014, 479.

established in Calabria, linking the region to flourishing maritime trade routes.[154] These included Sybaris, Croton, Locri and Rhegium, today still among the main towns of Calabria. While relations with Greek colonies were not always peaceful, the constant interaction with this more cosmopolitan civilisation fostered fortified settlements overlooking the coast whose features are reminiscent of Greek architectural techniques.[155] These also protected the Bruttian confederacy's borders, especially along the mountain trails that led to the woodlands of Sila.[156] Perhaps the most tangible archaeological evidence of the Greek influence is the traces of grapevine cultivations on terraced hill slopes in proximity to the uplands of Sila and the production of Hellenistic amphorae.[157]

Roman Exploitation

The development of material life in the region favoured the emergence of a relatively balanced agroforestry regime, with the consolidation of coppicing (in Italian *ceduo*) as a woodland management practice complementing animal farming. Although in certain instances enhanced anthropogenic activities led to soil erosion and the expansion of pioneering larch pines, at lower heights, hardwood species such as oaks, beech trees and chestnuts replaced conifers such as pines, firs, and spruces.[158] Their success among human societies lies in their capacity to naturally regenerate after the cut, resprouting from the dormant buds in their trunks. This biological process, scientifically known as agamic reproduction or asexual vegetative propagation, is at the core of the advantageous forest management practice known as coppicing.[159] The main edge of coppicing consists of drastically reducing the time needed before maximising timber cutting down tree trunks before they reach full maturity. The new shoots formed after the cut are even sturdier than the original trunks, as they are better supplied with water and grow faster.[160] The inception of coppiced hardwood species in the Sila plateau allowed the development of silviculture practices involving cutting and

[154] Crudo 2018.
[155] See Matkovic 2001, 24-26.
[156] Guzzo 2019, 80-81.
[157] See Russo Ermolli 2018, 50-51. Also see Spadea 2009; Mollo 2003.
[158] See the pedological and anthracological study by Pelle et al. 2013a, 212.
[159] About vegetative reproduction see Buckley 1992.
[160] See Ozden and Ennos 2018.

re-growing.[161] Frequently coppiced species were utilised to gather firewood and as complementary construction material. At the same time, they could not be employed for grazing as feral animals would damage the tender wood of young trees.[162] In Roman times, these woodlands became renowned as *silva caedua*, or *silva minuta*, a term used to contrast with the so-called *silva glandifera*, or *silva saginacia*, primarily utilised for animal farming purposes.[163] The progressive increase of hardwood species in Italian woodlands was linked to expanding transhumance, creating seasonal sites to favour animal grazing.[164] While hardwood trees opened up significant spaces for bovine pasture, the acorn produced by oak trees also constituted an ideal source of nourishments for hogs.[165] In turn, the introduction of livestock in coppiced woodlands served the purpose of naturally fertilising local soils before planting season, further affecting and altering local environmental features.[166]

With the rise of the Roman civilisation all over the Italian peninsula, these spaces became renowned as *silva pascuaria* and *silva fructifera*, toponyms indicating the intensification of anthropogenic activities.[167] With coppicing becoming increasingly common, exceptionally sturdy hardwood species such as beech began to constitute valuable construction materials (together with conifer species).[168] On the other hand, "original" conifer species continued to thrive at higher altitude levels, becoming valuable resources and trade assets. While the Bruttians' lifestyle mainly relied on pastoral activities, the valuable timber of Sila began to be systematically exploited by the Romans with the conquest of the region after 272 BC. After defeating the Bruttians in an extended expansion war, the Romans incorporated about half of the woodlands of Sila.[169] In turn, the

[161] About the origins of coppicing see Buckley and Mills 2015; Rotherham 2013. For specific studies on the origin of coppicing on Italian mountains see Vacchiano et al. 2017; Cremaschi et al. 2016; Guido et al. 2013.
[162] Hoffmann 2014, 186.
[163] Bechmann 1990, 202.
[164] The meticulous agrarian inquiry conducted by Prof. Ernesto Marenghi in 1909 declared that although a classic rotation system had progressively been introduced in Sila, seasonal activities had been mostly prominent until few decades before (1909, 25).
[165] According to Arnold Jones, the well forested mountains of southern Italy such as Sila specialised in hog farming (1966, 300).
[166] Di Bérenger 1859, 447-448.
[167] About coppicing practices during ancient Rome see Gabbrielli 2002, 67-69. For a paleoenvironmental analysis on the impact of Roman civilization on the ecology of the Italian peninsula since 2010 BC see Guido et al. 2013 and Russo Ermolli et al. 2018.
[168] This is witnessed by the increase of beech-fir forests all over Mediterranean Europe since the third century BC (Allevato et al. 2010).
[169] The Bruttians allied with Pyrrhus during the Pyrrhic War (280-275 BC) against the Romans and were ultimately defeated. This eventually led the Roman colonization of the region between the

Romans assimilated this vast portion of the forest to the so-called *ager publicus* – the public lands acquired by confiscating estates belonging to local communities and assigning them to high-rank citizens.[170] As the concession was spontaneous (*foedus aequum*), it came with more advantageous conditions for the Bruttians than other instances. Initially, the Romans did not personally manage the woodlands of Sila, limiting themselves to charge a usufruct tax.[171] However, after the Bruttians sided with Carthaginian general and statesman Hannibal in a 216 BC war effort against the Roman Empire, they lost control of a large part of the plateau after defeat. Thus, the Romans began to directly control the Sila plateau, granting lands for usufruct to either wealthy individuals, military veterans or organised groups of people known as *societas*. These had to pay a year tax – known as *vectigal* – for the revenues of their activities, such as pitch production, wood logging and transhumant pastoralism.[172] Fiscal obligations led to the dissolution of the Bruttian confederacy and the breakdown of crucial strongholds such as Castiglione di Paludi, Tiriolo, and Temesa, replaced by luxurious Roman farms – the so-called *villae*.

Moreover, given the critical importance of local timber, between 204 and 190 BC, the Romans occupied key settlements between the plateau's woodlands and the coast, creating upland colonies linked by newly built roads and bridges.[173] This capillary regional expansion responded to the growing civilisation's need to allocate people to newly colonised territories to mitigate the effects of overpopulation at home.[174] While the Romans allowed the Bruttians to maintain their traditional customary practices, they imposed their currency and

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first and the second Punic Wars (respectively 264-241 BC and 241-218 BC) and in turn to the concession of about half of the plateau. About this historical episode see Guzzo 2019, 65.

[170] At the time the forest renown as Sila included both the current plateau area and other Apennine mountainous areas stretching southward, that were renamed as Serre and Aspormonte during the Middle Ages (see De Sensi Sestito 2017, 189). About the *ager publicus* during the Roman era see Gabba 1979, 39-41.

[171] Burgarella 1991, 23.

[172] About the functioning of the Roman *ager publicus* see Pugliese 1992; Roselaar 2010. During Roman times, several economic consortia were created, consisting of different people who joined forces to finance productive activities. These were known as *societas*. While these organizations were originally created by heirs to keep the family patrimony intact, they later became real economic associations between unrelated members. In Sila these were mainly known either as *societas picariae*, *societas lignarii* or *societas pecuarii* mainly delegated to the extraction of pitch and timber, or to pastoral activities. About the role of *societas* in the Roman world see Watson 1990, 507-508. About *societas* in Sila see De Sensi Sestito 2020, 120.

[173] About the occupation of key settlements see Costabile 1994, 442; De Sensi Sestito 2017, 204-208. About archaeological evidence of Roman infrastructures see Amministrazione Provinciale Cosenza 1997, 11.

[174] Between the late second century and the early first century BC the Romans sent about 7700 families in the region (see Sangiento 1994, 564).

progressively crushed their cantonal pastoral society, establishing a "service economy" based on agricultural production and slavery. Also, the creation of villas contributed to improving agricultural output together with smaller farms and transhumant animal farming.[175]

The occupation of Sila corresponded to a significant phase of expansion for the Roman civilisation that became consolidated as a transcontinental Empire. This process coincided with a favourable climate bonanza, today known as the Roman Climate Optimum (RCO), or the Roman Warm Period (c. 200 BC – 200 AD). The RCO was a pivotal phase of high and stable solar activity that favoured warmer seasons and the retreat of mountainous glaciers.[176] Enhanced temperatures also bolstered up atmospheric moisture and rain patterns, an unprecedented trend in temperate environments like the Mediterranean basin.[177] Just as importantly, no significant volcanic eruption could impair solar energy supply during this period.[178] Favourable environmental conditions, combined with the capillary trade networks built by the Romans, allowed several human groups to create stable livelihoods in more marginal environments, clearing woodlands for agriculture or energy supply.[179]

In the Sila plateau, the Romans utilised the local timber to construct naval assets and extract resins processed in a high-quality pitch – known as *pix bruttia*.[180] As Roman geographer Strabo (c. 64 BC – 24 AD) noticed in his work *Rerum Geographicarum*, the "fine trees" and the "well-watered" soils of Sila produced the best pitch quality available in the Roman Empire.[181] These natural assets incentivised the first large-scale deforestation activities in the region, as secular conifer forests were cut with iron hatches.[182] After cut, the timber was chopped in chunks and heated in coal-based kilns, transforming the trunk's resins into a pitch. The liquefied pitch was then poured into ceramic containers and cooled down.

[175] Archaeological research has found roughly 150 Roman villas in the region of Calabria. See Sangineto 1994 and 2014.
[176] About the Roman Climate Optimum in general see Harper and McCormick 2018; Marx et al. 2018; Manning 2013; McCormick et al. 2012.
[177] About weather patterns in the Mediterranean during this period see Magny et al. 2007; 2012a; 2012b.
[178] About volcanic eruption during and after the Roman period see Sigl et al. 2015.
[179] This is a trend that has characterised the Roman expansion in the Italian peninsula since 700 BC (see Pratesi 2010, 33).
[180] Information on these extractive activities is reported by illustrious Roman intellectuals such as Strabo, Plinius and Vitruvius (see Agnoletti 2018, 31-32).
[181] Strabo 1854, vol. I, 391.
[182] About the cutting of trees during Roman times see Mensing et al. 2018; Hughes 2014. About the utilization of iron hatches see Agnoletti 2018, 8-9.

Evidence of practices linked to pitch production has been present in the region of Lake Cecita since at least the third century BC.[183] The inestimable value of *pix bruttia* was naturally related to the construction of the Roman fleet, a rather strategic asset in the ancient Mediterranean context, essentially guaranteeing political stability by ensuring the supply of wheat from coastal colonies.[184] Roman historian Dionysius of Halicarnassus (c. 60 BC – 7 BC) described the woods of Sila as an essential resource for the construction of naval assets and houses, but also rows and other domestic objects. He defined local conifers as "suitable for building houses and ships and every other kind of construction," such as "oars, poles and all kinds of domestic implements and equipment." According to Dionysius, the thick pine groves forming "densely-intertwined branches that keep the mountain in shadow throughout the day" were sufficient to supply the entire Italian peninsula. These included conifer and hardwood species such as "black poplars, pitch pines, beech, stone pines, wide-spreading oak, ash trees." The Roman historian also described the processes of wood logging and felling of local trees that were cut "at the root and taken down in full lengths to the nearest harbours" and carried to port areas by enslaved people and loggers. Naturally, the presence of rivers and streams "flowing through their midst" added up a strategic asset for the transportation of woods to the central harbour of *Valentia*.[185] Aside from constituting an essential asset for naval equipment, Bruttian pitch also had valuable medical and pharmaceutical uses. Several Roman doctors considered it a versatile medicine for treating different illnesses. These included soothing bruises and bumps, treating muscular lesions, disinfecting wounds, and curing alopecia.[186]

To these functions, Pliny the Elder (c. AD 23/24 – 79) added the upholstering of wine jars, sealing its lids with either mastic or Bruttian pitch.[187] While praising its qualities, the Roman naturalist also described more in-depth the extraction

[183] About the early extraction of pitch see Guzzo 2019, 112. Also see the recent archaeological findings in Campo S. Lorenzo by Pelle et al. 2013b, 166.
[184] The Roman example is just one of the many instances where shipbuilding played a central role for ancient Mediterranean societies (see Ennos 2020, 108-109).
[185] This information is reported in Dionysius main work, *Roman Antiquities* (XX. 15, 1-16, 1). See Dionysius of Halicarnassus 1950, 427. Among the many functions described by the historian, the construction of naval assets played a strategic role for the Roman civilization ever since its annexation of Sila after 272 BC. For further information see Toynbee 1965; De Sensi Sestito 2017. About the other uses of the timber from Sila see Cornell 1995. About the commercialization of timber in the harbor of *Valentia*, today Vibo Valentia, see Tibiletti 2007; and Sogliani 2012.
[186] Aside from Pliny the Elder, other Roman intellectuals who described the potential uses of local pitch included Juvenal (1st century AD – 2nd century AD) and Vegetius (late 4th century AD) (see De Rose 2013, 26-27 and Cosco 2010, 54).
[187] See Pliny's *Natural History* (XV. XXVII. 133-136) 1950, 275.

process and its devastating impact on local arboreal species that were fleshed out, felled, and burned:

> An opening is made in a pitch-tree on the side towards the sun, not by means of an incision but by a wound made by removing the bark, making an aperture at most two feet long, so as to be at least eighteen inches from the ground [...] Afterwards all the moisture from the whole tree flows together into the wound; and so also in the case of the torch-tree. When the liquid stops flowing, an opening is made in a similar manner out of another part of the tree and then another. Afterwards the whole tree is felled, and the pith of the timber is burnt.[188]

Resinous trees and pitch business also led to social conflicts, opposing Roman manufacturers eager to exploit timber resources and native pastoral communities who drew sustenance from agroforestry.[189] As reported by Roman statesman Marcus Tullius Cicero (c. 106 BC – 43 BC), in 138 BC, the uplands of Sila hosted a harsh confrontation involving a group of enslaved people working on behalf of a *societas picaria* that had obtained a pitch concession and local farmers who lived off silviculture.[190]

Natural Assets and Anthropogenic Decline

As the Roman Empire strived to satisfy its endogenous appetite for wood-based construction materials and energy sources, the arboreal species of the Sila plateau became an increasingly valuable resource. Their strategic importance spared the region from systematic deforestation that occurred in other areas in the same period. The high-quality pitch and the sturdy local timbers constituted essential resources for the Romans, who strived to guarantee their exclusive access.[191] While historical witnesses from the time provide an extensive account of these activities, a closer look into forest science might help to clarify further why the timbers of Sila constituted such an asset.

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[188] According to Pliny, Similar extractive processes were also practiced in other parts of the Mediterranean, such as Syria, where "they strip the bark off the turpentine-tree, there indeed stripping it from the branches and roots as well," and Macedonia, where "they bum the whole of the male larch but only the roots of the female tree." (XVI. XXII. 56-59) 1950, 425.

[189] See Giardina 1989, 88-89.

[190] This episode is accounted in Cicero's famous work *For Brutus, a short history of Roman rhetoric and orators dedicated to Marcus Junius Brutus* (85), written in 46 BC. See Marcus Tullius Cicero (85) 2014, 2188. Also see Giardina 1981, 100-101 and Cordiano 2017. About the role of *societas picariae* in Sila see Sangiento 1994, 584.

[191] With the progressive consolidation of the Roman dominance on the Italian peninsula, several pristine areas were cleared for agriculture or animal pasture. These became part of the *ager publicus* and were mainly assigned wither to wealthy aristocrats, or to war veterans, who paid little attention to the natural conservation (see Pratesi 2010, 37-38 and 46-50).

Tree trunks are a condensed pack of five layers bound tightly together to form the stem and axis. Apart from comprising the basic structure of the trees, these layers communicate through medullary rays connecting different tissues from the core to the outside. First from outside-in is the bark, the sturdiest and protective layer of the tree, shielding it from external predators and weather agents. Second, the inner bark facilitates organic compounds' circulation during photosynthesis through a connective tissue known as phloem. The inner bark is supplied by the cambium, a thin layer of cells that replenish both the trunk's outside and inside layers and a thick vascular tissue of active xylem cells known as sapwood. The sapwood has the crucial function of acting as pipelines, silently lifting water and other nutrients from roots through the trunk, reaching stems and leaves. These hydraulic mechanisms constitute an essential feature of plant life, as they allow critical growth and seasonal movements. Pushing their cell membranes against the walls by flooding them with water, trees can move their branches towards the light, allowing seasonal activities based on photosynthesis to happen. Photosynthesis also propels reproductive mechanisms like opening cones in hardwood species and flowering reproductive cycles in angiosperms.[192] Finally, the heartwood constitutes the core of trees' axial infrastructure, composed of dead xylem cells wrapped around resins and minerals deposited as the tree grows, preserving its stability. This complex structure is formed with decades of patient and systematic physiological growth, as nutrients are retrieved underground and transformed into calories through photosynthesis. The older the tree, the more productive and enhanced its physiological activities and energy supply.[193] The result of such a growth cycle is a sturdy and compact trunk with tiny and tough rings. These are an excellent natural protection against fungal attacks, as their cells are difficult to penetrate. Moreover, such individuals also constitute high-quality timber for extraction to humans. In contrast, trees planted through anthropogenic forestry techniques for commercial reasons possess larger growth rings, which expose them much more to fungal attacks and provide an overall inferior timber quality.[194]

As the millennial forests of Sila emerged through spontaneous growth patterns that allowed natural physiological consolidation, their trees must have

[192] About water circulation in trees see Hacke and Sperry 2001; Tyree and Zimmermann 2002. Also see Mancuso 2018, 25.
[193] Wohlleben 2016, 97.
[194] See Wohlleben 2016, 124.

possessed extremely sturdy timber, especially those occupying high altitudes such as larch pines. While all the classic authors referenced above agreed on their high-quality wood, archaeological evidence also demonstrates their prime role during Roman times. Although hardwood coppicing allowed agricultural and pastoral practices at lower heights, these arboreal species were also progressively replaced by pines in certain areas.[195] While this constituted an evident sign of the strategic role played by larch pines for pitch production, it was also evidence of the increasingly pervasive human impact on low-lying deciduous forests, progressively eroded by intensive fires, logging and coppicing.[196] The biological characteristics of heliophilous larch pines, an invasive and pioneering species able to thrive on depleted soils, favoured their progressive colonisation of the Sila plateau as woodcutting and pitch production intensified.[197] No wonder pine groves form the core of the so-called Mediterranean scrub ecosystem and the most distinctive species in Sila.[198]

In short, the Roman occupation of the Sila plateau determined increased anthropogenic pressures in local woodlands, with the intensification of coppicing practices and the first large-scale extractive practices. Once again, local arboreal species were at the core of this coevolutionary construction. While local forests initially hosted the Bruttians' pastoral practices, they later allowed them to enter the target of Greek and Roman colonisers. They also played a central role in expanding the Roman Empire along the Mediterranean, providing high-quality woods to construct their naval fleet and satisfy the thirst for energy supply and building materials.[199] Although local woodlands constituted one the most qualitative timber sources in the Italian peninsula, massive forest clearing and wood felling processes interested the whole country, especially since the second century BC. This process was equivalent to the progressive reduction of forest areas over the Italian peninsula, causing deforestation and environmental depletion in the following centuries. While several upland forests and coastal swamp environments survived the Roman colonisation, this was primarily due to the strategic importance of their timber resources. Wood constituted an essential

[195] See Allevato et al. 2011.
[196] See Nicolaci et al. 2014, 504-505.
[197] See Pelle et al. 2013a 212 and 2013b, 172-175.
[198] About this eco-system see Agnoletti 2018, 16-19.
[199] See Bonino 2004, 128-129.

asset for the expanding Roman civilisation, with about 90 per cent of its produces utilised as an energy source (fuelwood), mainly for heating purposes.

Moreover, the need to feed a growing population led to the creation of vast estates (also known as *latifundia*) either destined for cattle farming or cereal growing.[200] Evidence from the time documents a steep increase in floods and landslides due to reduced forest covers and the arrival of endemic diseases typical of wasteland environments such as malaria.[201] While the physical qualities of local arboreal species constituted the core of the coevolutionary environment that germinated in Sila, anthropogenic pressure began to pay a toll on the local ecosystem at the peak of the Roman colonisation. Although agroforestry still constituted the core of material life, growing demographic pressure and the extractive policies promoted by the Romans could not guarantee the persistence of balanced practices. Archaeological evidence confirms this trend, demonstrating patterns of continuous pitch production during the Roman domination, a process that accelerated deforestation rates.[202]

Overall, the insatiable appetite for natural resources of the Roman Empire was among the main factors that provoked the plateau's progressive decline, a process epitomising their historically controversial relationship with nature. While on the one hand, Romans broadly regarded the natural resources of forests and other environments as divine gifts, on the other hand, they also systematically exploited entire ecosystems and celebrated their victories over nature.[203] In time, this ambivalent attitude fuelled a deadly combination of environmental and economic issues. In relentlessly striving to manage and exploit the many environments they had tamed, the Romans established a thriving economy, knitting together world regions through capillary networks of goods, people, and natural species. However, they also laid the primary conditions for a disease ecology where several zoonotic pathogens could freely roam across climates and continents.[204] Aside from endemic malaria caused by deforestation and other intestinal diseases linked to rudimentary sewage systems in urban centres, three

[200] Pratesi 2010, 52.
[201] Malaria became endemic on the piedmont territories of Crotone, to the plateau's Ionian flanks (see Placanica 1985b, 29-30; Calvani and Giardina 1986, 52-58 and Hughes 2014, 68-87).
[202] See Guzzo 2019, 164.
[203] See Thommen 2012, 76-78.
[204] Harper 2017, 5-17.

major infectious epidemics rocked the Roman Empire between the second and fourth century AD.[205]

The two most devastating episodes were presumably a smallpox epidemic between 165 to 172 AD (aka the "Antonine Plague") and an allegedly Ebola outbreak (to the records known as the "Cyprian Plague") that began around 249 and lasted until about 270 AD.[206] These two pandemics episodes were followed by a climatic event known as the Late Roman Transition (240s AD), characterised by significant solar variability, in contrast to the relatively hot and damp climate of the Optimum phase. The Late Roman Transition re-ignited typically Mediterranean patterns of piercing aridity and drought in southern regions and cooling weather in the north, expanding mountainous glaciers.[207] As winter became colder and summers drier, the agricultural surplus that had characterised the previous centuries of Roman expansion began to dwindle, igniting a generalised food security crisis manifested in localised famine episodes.[208] The scourge of two pandemics, crop failure and climatic imbalances, led to a generalised loosening of territorial control and a progressive re-wilding of the landscape all over Western Europe.[209] As urban centres shrank and rural settlements crumbled, the Empire strived to recover its original demographic numbers despite the political efforts to encourage farming activities.[210] Decreased demographic volumes caused a monetary crisis as the Empire struggled to sustain its giant army.[211] Perhaps more importantly, unbalanced climatic patterns in the Asian steppe generated an unnatural drought that led Hun tribes to cross the Volga river since 370 AD. Massive Huns migrations destabilised the trans-Danuban plains, a region inhabited by Germanic tribes that had been at peace with the Romans for over a century, leading local inhabitants to flee across the border in search of asylum. As the Empire's economy struggled to recover, tribes from northern Europe such as the Vandals, the Alans and the Goths began to increasingly push on the borders of the Roman Empire, forming threatening

[205] About illness in ancient Rome see Shaw 1996. About endemic malaria see Sallares 2002; 2004 Sallares et al. 2004. About intestinal diseases see Du Pont 1993; Ferrari and Livi Bacci 1985.
[206] See Harper 2017, 106-110 and 136-137.
[207] About the Late Roman Transition see Marx et al. 2018; Haper 2017, 131; Elliot 2016.
[208] Harper 2017, 170. Also see Stathakopoulos 2004.
[209] Pratesi 2010, 58-59.
[210] Harper 2017, 129 and 159.
[211] By the fourth century AD, the Roman army consisted of about 600,000 salaried soldiers, whose sustenance and equipment expenses heavily relied on local taxpayers (see Ward-Perkins 2005, 41-46).

military alliances. While the already distressed Roman Empire failed to take conclusive actions, Germanic tribes coalesced and would confer the worst military defeat in Roman history, outside the walls of Adrianople, on August 9, 378 AD.[212] Although the Empire managed to reunite and restore the order, its political unity was shaken. This process was also exacerbated by the division of the Roman Empire into a Western and Eastern part in 395 AD, further fragmenting this crumbling political entity and weakening the Italian peninsula against foreign invasions.[213] While endemic malaria prevented the Huns' dreaded commander Attila from seizing Rome, retreating across the Alps into the Hungarian plain, the Western Roman Empire crumbled under military expenditures by the fifth century AD famines and epidemics.

As witnessed by the lack of documentary evidence related to crucial productive activities such as pitch extraction after Pliny's account, the woodlands of Sila were part and parcel of this declentionist historical trajectory. As productive activities declined, local forest cover regained ground against human pressure. However, the vanishing presence of human groups from the Sila plateau did not mean the destruction of the anthropogenic ecological niche that Bruttian and Roman people had constructed after millennia of coevolutionary interactions. Conversely, the feral version of traditionally domesticated animals such as hogs and sheep climbed up the ecological food chain, expanding their ecological niche in the untamed local forests. In enlarging their niche, they also salvaged their millennial human allies, creating the material premises for the survival of a human niche around the Sila plateau, whose broadleaf species would further nurture in the following centuries.

[212] See Heather 2010 and 2015.
[213] Ward-Perkins 2005, 61-62.

Part II. Non-human Allies

4. Hogs and Sheep:
Feral Farming in the Cold Late Antiquity

> *The region abounds in various herds of animals, but it especially glories in droves of horses, and understandably, when the woodlands are so springlike in the season of heat that animals are not vexed by the stings of flies and they are fully fed on the ever-green grasses. You would see among the mountain summits the purest running streams and, as though flowing out of the very heights, they rush down from the highest places of the Alps* (Cassiodorus).

The fall of the Roman Empire (476 AD) inaugurated a season of unprecedented decay for the Sila plateau and for the whole Italian peninsula. Archaeological evidence provides overwhelming evidence that the dissolution of the Western Roman Empire was tantamount to declining living standards and the disappearance of material sophistication. These led to a sensible reduction in the scale of European trade networks between the fifth and the seventh century, as food production regimes shifted from specialised agriculture to a mixed regime, ensuring sovereignty and specialised ecologies.[214] In the Sila plateau, such a radical transformation was aided by the emergence of traditionally domesticated mammals initially introduced by humans that turned themselves into endemic feral species. In particular, feral hogs and sheep played a central role in shaping new ecological relations in the Sila plateau. The new human groups that settled in the region, especially the Lombard people, actively benefitted and incentivised these relations, drawing sustenance from this emerging material environment and shaping their cultural customs upon these species.

Such a fateful combination of animal and human agency was not simply engendered by the decline of the Roman Empire but emerged from the deadly combination of infectious diseases and the penetration of Barbarian tribes since the sixth century.[215] These included the Gothic Wars (535-554 AD), the Lombard invasion (from 568 AD) and a massive epidemic of black plague (also known as Justinianic plague) presumably coming from Egypt in 543. [216] Historian Paul the Deacon described the plague's catastrophic impact, which "brought back to its

[214] About the fragmentation of the post-Roman world see Ward-Perkins 2005, 138-145 and 165. About the construction of alternative political and economic models see Pohl et al. 2018; 2013; 2012; 1998 and Escalona and Reynolds 2011. The simplification of material standards of life was mainly witnessed by the changing architectural style in dwellings, reverting from rocks to simpler perishable materials, and by the scarcer use of metal currency, such as copper coins (Ward-Perkins 2005, 101-117; Wickham 2005; Brogiolo et al. 1994).

[215] About Calabria see Arthur 1989; Di Muro 954-955.

[216] Ward-Perkins 2005, 130-131. About Barbarian invasions and the abandonment of urban centres in Calabria since the fifth century see Noyé 1999, 600 and 605. About the Justinanic plague see Harper 2017, 200-206.

ancient silence" the whole Italian peninsula.[217] While traditional trade routes disappeared in the aftermath of the Roman Empire, traditional farming activities continued to characterise the Italian peninsula.[218] This phenomenon figures in two letters written during the 520s by statesman and scholar Cassiodorus. A native of Squillace, a small town sitting on the southern flanks of the Sila plateau, he described this widespread phenomenon of urban abandonment and the resilience of rural settlements sustained by traditional farming activities.[219] Although he hypocritically built his residence in the farmland of *Vivarium*, Cassiodorus considered rural life against nature, especially in a region such as the Sila plateau "where luxuries arrive abundantly without labour."[220] In a historical moment of low demographic numbers, the region's "springlike" woodlands crossed by "the purest running streams" constituted vital storage of nurturing resources.[221] The statesman still considered traditional transhumant farming practices the most distinguishing features of the plateau and an essential source of sustenance for rural and urban centres.[222] In particular, he praised local sweet cheese, "which, by benefit of the grasses there, is produced with such natural pleasantness that you would not believe a flavour that you observe as unmixed with any substance should lack honey."[223]

However, aside from vividly depicting the agro-pastoral regime characterising the region, Cassiodorus' letters also reported the onset of a climate phenomenon that would radically alter the plateau's ecological balance and pose the condition for the emergence of the distinctive material relations characterising the region during late antiquity. This transition, commonly defined as the Late Antique Little Ice Age (LALIA), determined significant wetter and colder atmospheric conditions. According to ice core dating, two volcanic eruptions in the Northern Hemisphere between 533-534 AD and 539–40 led to the onset of LALIA.[224] These were responsible for the ejection of megatons of sulphate aerosols in the atmosphere, creating a staggering "dry fog" phenomenon that lowered the atmospheric temperature by 2.5 degrees Celsius.

[217] Paul the Deacon (II.4) 1907, 57-58.
[218] About the Barbarian lifestyle see Hoffmann 2014, 44.
[219] See Cassiodorus' *Variae* (8.31 and 9.3) 2019, 349-350 and 358-360.
[220] Cassiodorus (8.31) 2019, 349.
[221] Cassiodorus (8.31) 2019, 349-350.
[222] See Noyé 1999, 583-584.
[223] Cassiodorus (12.12) 2019, 478.
[224] See Aberth 2012, 4.

Moreover, volcanic eruptions fatally combined with a negative trend in the North Atlantic Oscillation (NAO), a meteorological phenomenon associated with lower air pressure and more robust cold-air outbreaks.[225] The Late Antique Ice Age, lasting until approximately 660 AD, determined above average rain patterns in the Mediterranean region, leading to floods and lower temperatures during the winter season, which propelled frosts and hailstorms and wheat failure.[226] Cassiodorus described these events in a letter dating 536 AD – aka "year without summer" – where he asked for the shipment of extra food supplies due to the drastic shortages experienced in the seasonal harvest. Although, as a neo-Platonic thinker, he considered environmental and climatic signs to reflect the cosmos' moral order, Cassiodours ventured in describing the main features of this sudden climatic imbalance.[227] He noticed that the main distinctive features of what climate scientists would later term LALIA manifested in the unusual lack of brilliance in solar light that led the sun to resemble "a sea-coloured sun." This determined lower temperatures, what he defined "the dullness of a cooling tepidness."[228] According to Cassiodorus, this phenomenon had begun with a cold winter that had filled the air with dense snow, forming a "taught membrane" that did not allow the sunlight to filter through the atmosphere.[229]

The onset of LALIA added another factor to existing environmental pressures, fatefully combining with political unrest and epidemic outbreaks. Decreasing temperatures, natural hazards, infectious plagues, and political instability meant a radical transformation of the socio-natural systems of life. Such a process involved several spheres of life, such as nutritional regimes, land and forest management patterns, and human settlements.[230] The Sila plateau was part and parcel of this historical shift. As climatic challenges questioned the survival of humankind in the region, the alliance with two resilient animal species and the emergence of Germanic silviculture customs allowed the establishment of a pastoral lifestyle based on mixed farming regimes in its untamed and cold forests.

[225] About the consequences of negative NAO in Europe see Trigo et al. 2002.
[226] For a general analysis on the environmental consequences of this phenomenon see Harper 2017, 255-256. Also see Haldon et al. 2014; Izdebski 2013.
[227] See Bjornlie 2013, 254-282.
[228] Cassiodorus (12.25) 2019, 494.
[229] Cassiodorus (12.25) 2019, 494.
[230] While in the Italian peninsula this process was particularly prominent, it virtually involved the whole European continent (Hoffmann 2014, 57-63).

Re-wilding

As Cassiodorus' hopeful letters demonstrated, the fateful combination of climate and epidemic issues favoured the abandonment of coastal areas and the occupation of internal regions.[231] About fifty per cent of the urban centres disappeared in southern Italy since the sixth century AD. This process particularly invested coastal areas that receded to their pre-Roman swampy ecosystems, experiencing rewilding. In his account of the pestilence, Paul the Deacon observed how the absence of human beings "no voice in the field; no whistling of shepherds," left room for other species to thrive: "no lying in wait of wild beasts among the cattle; no harm to domestic fowls. The crops, outliving the harvest time, awaited the reaper untouched; the vineyard with its fallen leaves and its shining grapes remained undisturbed [...] human habitations had become places of refuge for wild beasts."[232] In the Sila plateau, people built fortified settlements in piedmont territories. These were known as *castra* (in Greek κάστρα) and *castellia* (κκστέλλια) and included the Byzantine strongholds of Rossano (to the north) and Santa Severina (to the south), that became pivotal administrative centres.[233] Their strategic location between the coast and the Sila plateau also turned them into essential market knots for commercialising local resources.[234]

The untamed forests of Sila became the most valuable assets for the meagre human groups who inhabited their surroundings. The radical shrinkage of anthropogenic activities favoured a process of massive rewilding.[235] After centuries of pestilence and economic instability, one could observe a contraction of traditional settlements. The forest claimed back classic Roman *villae*, occasionally replaced by more rudimentary wooden settlements.[236] These were inhabited mainly by pastors and farmers that led a lifestyle of isolation and repentance in the wild.[237] Archaeological records confirm this trend, demonstrating a lack of consistent layers relating to human presence all over the Italian peninsula, allegedly reflecting the drastic demographic shrinkage that

[231] See Givigliano 2003, 23-26; Zinzi 1999, 39.
[232] Paul the Deacon (II.4) 1907, 57-58.
[233] Other strongholds created in the area during these times included Cerenzia, Umbriatico and Nicastro (see Zinzi 1999, 28-37; See von Falkenhausen 1982, 90).
[234] Cuteri 2020, 132-134.
[235] About this phenomenon all over the Italian peninsula see Corrao 1989, 138 and Pratesi 2010, 57-58.
[236] See Sangiento 2014, 482; Roma 2010, 405; Noyé 1999, 618-619. About the general features of this process in the Italian peninsula see Rao 2015, 65-66.
[237] Vacchiano et al. 2017, 60.

reduced the country's population by at least one quarter during these times.[238] The return of the wild in Sila was a cascade effect. As the plateau and its piedmont territories turned into an increasingly bleak region, precipitation surpluses and reduced evapotranspiration boosted scrub vegetation. They favoured a massive reforestation phenomenon that would uniquely shape the region's destiny in the following centuries.[239]

The positive impact on ecosystems untouched by human activities is today universally acknowledged by natural scientists. Many species from both the animal and the vegetal world seem to fare much better without humans. Biologist and philosopher E. O. Wilson has provocatively proposed to leave half of our planet's surface free from human influence to preserve the future of endangered wildlife species and mitigate climate change. Conservation biologists often defend this "land-sparing" approach, emphasising the tremendous resilience of wildlife species and their resilience even in rather precarious or allegedly compromised ecosystems. As Wilson emphasised, wildlife thrives whenever it can still be self-willed, meaning that different species are allowed to build their ecological niches "in the absence of deliberate human intervention."[240] Although land-sparing has often by labelled as the reflection of a persisting imperialist mindset by defenders of a land-sharing approach, its potential positive outcomes are tremendous.[241]

A mind-blowing example is the prodigious flora and fauna species that have been recently re-discovered in the contaminated site of Chernobyl, despite high radiation levels.[242] Like Chernobyl, during the High Middle Ages, several forest areas of the Italian peninsula re-grew their original forest canopy returning to the pristine characteristics before the Neolithic revolution.[243] Aided by climate change, epidemic disease, and political turmoil, the upland forests of Sila were covered in thick forest groves, reaching their most considerable extension ever.[244] Resorting their multiple reproduction strategies, arboreal organisms spread their seeds in the wind and hitched a ride in the guts of other animals – mainly insects,

[238] See Christie 2006; Ward-Perkins 2005; Ward-Perkins 2000; Barker et al. 1995.
[239] About the impact of the Late Antique Ice Age in Europe see Büntgen et al. 2016.
[240] For further information see Wilson 2016, 77-78. See also Hiss 2014.
[241] About the relationship between the land-sparring approach and imperialism Wright 2020.
[242] About the adaptation of animal species to radiation see Møller et al. 2016, and Møller and Mousseau 2016. About the resurgence of endangered species in the area see Wendle 2016.
[243] Pratesi 1985, 69.
[244] According to Lucio Gambi, the surface of forest areas in Calabria must have reached half the extension of the overall territory, reaching over 15.000 square kilometres. See Gambi 1978, 77.

feral hogs, sheep and humans.[245] Although historical evidence lacks comprehensive data on the state of local forests, recent radiocarbon dating on soil and mineral fragments has confirmed a relative condition of ecological stability from the fall of the Roman Empire until at least the eleventh century.[246] Such a trend is also in line with the rest of the European continent, where stationary demographic numbers and economic stagnation favoured the improvement of forest covers with rare massive clearings.[247]

The advancement of the Germanic people known as the Lombards, who occupied the northern part of Calabria towards the end of the sixth century, also favoured the rewilding of local forests. After looting and destroying several settlements, the Lombards transformed a vast portion of the Sila plateau into the natural border of a large political *limes* stretching from the fortified northeastern settlement of Rossano. They crossed the plateau by cutting through the Crati Valley and reaching the western coastal city of Amantea.[248] This further weakened seaport connections, sealing Sila from the region's southern territories under Byzantine influence.[249] However, the plateau's thick forests also served the ambitious geopolitical aim of the Lombards, who hoped to expand their impact on the Italian peninsula after establishing a Ducat in Benevento in 571.[250] They also became perfect hosts for their traditional feral animal farming practices.

Feral Farming

Since the late sixth century, the Lombard's occupation accelerated the region's rewilding process. As the territory became a natural military barrier with its connecting paths controlled by fortified outposts, pine tree groves thrived at the expense of hardwood species previously introduced by the Romans, such as chestnut and oak trees.[251] Just as significantly, wild animals multiplied, reclaiming their lost role in the local ecological food chain. Genetic research has recently demonstrated that domestic animals have an endemic capacity to return to the wild if necessary. Some of the most renowned domesticated animal species, such

[245] Pratesi 2010, 57.
[246] About the hagiographies see Noyé 1999, 582. About recent radiocarbon dating see Scarciglia et al. 2020.
[247] See Bechmann 1990, 76-78.
[248] Martin 1999, 490.
[249] Dalena 2015, 92-94 and 159.
[250] Roma 2010, 409; De Presbiteris 2010, 448.
[251] This is mainly witnessed by the used of Germanic toponyms such as *Sulca*, *Sulco*, *Perticara*, *Perticaro*, *Perticoso*. For further information see Bulotta 1999 and Roma 2010, 416.

as dogs, horses, cows, and hogs, are endemically hybrid. Their genetic inheritance tells a story of interbreeding with their feral relatives and alliances with the *homo sapiens* to increase their survival chances. This continuous impulse towards "the wild" mirrors the complex network of physio-ecological relations with blurred borders between domesticated and wild.[252] Thus, it might not surprise that in the aftermath of the Roman domination, several animal species that had co-existed with human farmers for millennia returned to a feral condition of life. Drawing sustenance from the ecological metabolisms of local woodlands and pasturelands, traditionally tamed animals such as hogs and sheep exponentially grew in number together with feral species such as bears, deer, and wolves. The Lombard people incentivised traditional subsistence activities in untamed environments, such as hunting and cattle farming in the forest.[253] Paleonutritional studies carried out between Sila and Pollino point at an increased incidence of meat intake in human nutritional patterns at the time. Animal sources of proteins mainly correspond to species inhabiting local forests and feeding off plants from cold or temperate environments.[254] The combination of Lombard traditions, climatic harshness, social decay, and political instability gave local human groups little choice but to entrust their subsistence efforts on species more suitable to local circumstances.[255] Reduced options redirected human preferences away from large herbivore livestock, such as cows and horses, favouring smaller and omnivore species that had perfectly adapted to the local environment, such as hogs and sheep.[256]

Initially domesticated in Asia, both hogs and sheep reached the Italian peninsula in concurrence with the onset of a warmer climatic period – between 5000 and 3000 BC – at the peak of the Neolithic revolution that transformed the wet forests of the Italian peninsula into a drier environment suitable for animal farming.[257] The sheep (*Ovis aries*) was perhaps the first successful example of animal domestication as a two-way process, a covenant between animals and humans for mutual survival. As witnessed by a combination of genetic studies and

[252] For further information see Roberts 2017, 328-329; Safina 2020.
[253] Pratesi 1985, 72.
[254] See Ruffo 2010, 433. About C3 plants see Tykot 2004, 434-435.
[255] Unlike what traditional studied of the High Middle Ages maintained for a long time (e.g., Duby 1990; Slicher van Bath 1963; Cosgrove 1998; 2004), the establishment of a dynamic socio-ecological equilibrium through species selection and competition between different human societies, is perhaps the main feature characterizing the whole Italian peninsula during these times (see Rao 2015, 30-31).
[256] About this transition in Italy see Montanari 1988, 37. Specifically about Calabria see Noyé 1999, 584.
[257] Pratesi 1985, 58.

archaeological evidence, sheep descend from a species of Asian mouflon (*O. Orientalis*) domesticated 11,000 ago in the Fertile Crescent as a way to prevent their extinction.[258] Despite their early domestication, these ruminant species have demonstrated the capability to adapt to several climatic and nutrition regimes, providing a source of dairy products, meat and wool.[259] Sheep are highly responsive to human domestication efforts, given their socially gregarious characteristics, lack of aggressivity and somewhat restricted home range.[260] At the same time, they have proven their capacity to survive in semi-feral conditions at multiple historical junctures, adapting to harsh environmental and climatic circumstances.[261] Although sheep farming had been quintessential for the Bruttians, they had experienced numerous anthropogenic pressures and ecological competition from more extensive cattle during the Roman occupation. The Romans had famously imposed a canon tax on sheep farming after annexing the plateau to the *ager publicus*.[262] In the depopulated Sila plateau of Late Antiquity, these resilient animals reproduced extensively, becoming one of the most dominant animal species in the region.[263] They played an essential role in sustaining the local population's biological and economic life, not only for the meat intake but also for their nutritious milk, resulting in dairy products.[264] They also produced valuable wool to face the cold winters of the Late Antique Little Ice Age, and their meat was often equated to wine for the payment of their annual silo tax.[265] Finally, in contrast to other species such as horses or goats, sheep neither compete with hogs for the edible fruits of local arboreal species nor did their grazing damage young shoots or small tree branches. As an eminently herbivorous species, they preferred to graze on open transition zones at the edge of forests whilst not requiring extensive open grasslands for pasture.[266] So widespread was the presence of sheep on the Sila plateau that archaeologists and historians have even used them to estimate the number of people populating local settlements.[267]

[258] See Chessa et al. 2009; Atavliyeva and Tarlykov 2018; Mukhametzharova et al. 2018.
[259] See Meadows 2014.
[260] Aberth 2012, 148.
[261] See Anderson 2006, 147-148.
[262] See Andreotti 1869 vol. I, 168-169.
[263] Cherubini 1999, 434.
[264] Montanari 1988, 37.
[265] See Andreotti 1869 vol. I, 286-287.
[266] Bechmann 1990, 134.
[267] In the case of the Jure Vetere Abbey, archaeologists have estimated that the initial community inhabiting the monastery must have ranged between 12 and 15, considering that they had received 300 heads of sheep for their survival (Roubis 2007, 403).

As for hogs, while one could hardly picture a modern pig thriving in a wildlife environment, the hogs that roamed the woodlands of the Sila plateau did not look exactly like the tamed species that today dominate the global food chain. The co-evolutionary history of pigs is indeed quite exceptional. Eurasian wild boars (*Sus Scrofa*) were simultaneously domesticated in eastern Anatolia and east-central China, respectively, about 10,000 and 9,000 years ago. However, the domestication of *sus scrofa* in China followed a steadier pattern. They became the primary farmed livestock and endured less environmental pressures favouring the development of tamed evolutionary traits, most notably their endemic capacity to gain weight. In contrast, Eurasian pigs were herded in woodland territories, a seasonal farming technique known as pannage, fattening on the fruits produced by trees, such as acorn and nuts – the already-mentioned mast. This substantially feral condition allowed them to interbreed with wild boars.[268] While archaeological evidence has demonstrated that Romans also began to breed fatter and pinkish hog species destined for domestic farming, the demise of the Empire led to the return of the semi-feral and smaller livestock breeds.[269] Leaner and wilder compared to their Chinese counterparts, European-borne hogs were free to range in forests and reproduce independently, subsisting on any source of food that the forest could offer.[270] In particular, the mast provided by the arboreal species such as oaks, beech trees and chestnuts constituted one of the privileged nutriments of European pigs, who thrived in the untamed forests of the High Middle Ages during the fattening season – the autumnal months.[271] However, because mast production only reaches significant indexes every second or third year or after a scorching summer, medieval feral hogs scavenged for underground food such as roots, rhizomes, sedges and mushrooms. They also hunted for other animals, including worms, birds, amphibians, and small mammals, and even chewed the bones from dead livestock's carcasses.[272]

Just like with sheep, the woodlands of Sila had hosted semi-feral hogs since the first Indo-European tribes who had inhabited the region, thanks to the temperate climatic patterns, which enhanced the fruit production of local forests. Before the Roman occupation, hogs had become one of the primary economic

[268] Montanari 1988, 42-43.
[269] Kreiner 2020, 27. About archaeological evidence of different pig species in Roman times see MacKinnon 2001. About livestock changes during the Roman Empire see Rizzetto et al.
[270] See White 2011 and Gibson 2016, 24-25.
[271] About the ubiquitous presence of pigs during the High Middle Ages see Kreiner 2020, 4.
[272] Kreiner 2020, 28; Hoffmann 2014, 180.

tokens for the Bruttians to establish commercial relations.[273] Not even the Empire's decay in the following century had hindered rearing practices, as Calabria and Lucania still provided hog meat to the city of Rome during the fifth century.[274] The rewilding process that invested the plateau during the Lombard occupation accelerated the proliferation of feral hogs. Cured pork from hogs tended on the spot and transported through local road networks was substituted with hogs directly "driven on the hoof." [275] Lean and resilient hogs presumably crossed local forests. They strolled down to local settlements to be sold in city markets, as witnessed by the mark of swine paw prints on the walls of Cassiodorus' hometown, Squillace.[276] Although hogs did not produce wool or any edible secondary product like milk, they became the most valuable commodity of the time: an omnivore species, capable of reproducing at a high pace and very economical to breed.[277]

Thus, while most southern Italy followed the Roman ovine farming legacy, hogs featured prominently in the Sila plateau, living in a semi-feral life in local forests. Aside from historical sources, evidence of this process is witnessed by the abundant presence of an endemic wildlife species still actively roaming the National Park of Sila today.[278]

The proliferation of semi-feral hogs usually went hand in hand with plantation forestry – mostly hardwood arboreal species such as oaks and chestnut trees (the already mentioned *silva glandifera*).[279] Unlike other livestock such as cattle, horses and deer, hogs did not pose a danger for the growth of coppiced trees and could roam in woodlands. They constituted a valuable ally for young trees. While hogs could not eat their fruits, they fed on superficial vegetation and roots, clearing out competition from foreign species. Moreover, their trampling could help sink the big seeds into the ground favouring tree rooting and, in turn, forest reproduction cycles.[280] Multiple sources document the presence of oak trees stretching in the proximity of Cosenza during these times. While this deciduous species would rise to prominence in the following centuries with a temperature increase, their presence in the piedmont forests of the Sila plateau was

[273] Andreotti 1869 vol. I, 196.
[274] Barnish 1987, 171.
[275] Barnish 1987, 173.
[276] Noyé 1999, 583.
[277] Kreiner 2020, 4.
[278] Aside from being considered one of the plateau's most characteristics endemic species, it is also probably the most widespread (see Bonacci et al. 2008, 95).
[279] Montanari 1988, 38; Wickham 2005, 76.
[280] Bechmann 1990, 127-128.

indissolubly associated with feral hogs.[281] Oaks also featured animal farming in several hagiographies, witnessing their central function in physiological and reproductive life cycles.[282]

Hog farming also increased in concurrence with the decline of maritime trade networks, which led to a radical shift in food habits. With a limited possibility for cereal intake, meat-based diets became more common among the local population, with hogs constituting the most reliable protein source. Their omnivore appetite and sturdiness guaranteed food security during the harshest seasons of the year in times of environmental and political instability.[283] Reared in semi-feral conditions, hogs lived a much longer and healthier life compared to their modern peers, experiencing a balanced fattening process that typically lasted between three and four years and produced lean and sharp breeds.[284] Moreover, given their social intelligence and capacity to selectively acquire behavioural patterns, the semi-feral hogs that dominated early medieval nutrition regimes enjoyed a state of law almost comparable to that of human beings.[285] This led to the rise of legislation explicitly addressing and regulating these emerging nutrition habits. Perhaps the best example is King Rothari's legal code – also known as *Edictum Rothari* – a set of laws regulating hog farming and setting rules for legal liability, especially concerning controversies caused by hog herds.[286] Rothari's code also conferred special social status to swineherds – the so-called *magister porcarius* – for processing their meat.[287] Just as importantly, multiple cases of trials all over western Europe involved semi-feral hogs and their owners, who were judged and sanctioned for their actions, such as devastating local crops or harming human beings.[288] So essential was the role of hogs to the Lombard people that they measured the woodlands under their control by the number of animals they could host – the so-called *silva ad sanginandum porcus*.[289] In a time

[281] See Rugolo 1995, 265.
[282] See Noyé 1999, 583.
[283] About dietary regimes during the High Middle Ages see Montanari 1979 and 1985. The autumnal fattening period of pigs, coinciding with tree fruits ripening season, was indeed perfectly calibrated to human needs, as it provided an essential source of meat intake during winter months (Bechmann 1990, 127).
[284] Montanari 1988, 44.
[285] About feral hog' self-consciousness see Kirchner et al. 2012. About their capacity to learn from each other see Reimert et al. 2014.
[286] For a discussion of these rules in their historical context see Kreiner 2020, 98.
[287] About the *Edictum Rothari* see at Azzara and Gasparri 1992.
[288] About trials to animals in the Middle Ages see Aberth 2012, 217-224. Specifically, about Lombard Italy during the High Middle Ages see Kreiner 2020, 41.42.
[289] Montanari 1988, 37-38.

of dire living conditions and weak interregional trade knots, pigs could convert over 80 per cent of their weight into edible meat and other valuable by-products – almost nothing went to waste.[290] Even religious orders traditionally adverse to meat-eating tolerated hog meat in emergencies, and swineherds worked even on holy days to tend to the most valuable source of nutrition of the time.

Moreover, with colder temperatures and the generalised decline of olive trees, swine and ovine fat played a key role as seasonings and cooking bases in preparing almost any food.[291] They also provided important surrogates such as soaps, lubricants, and sealing materials.[292] Culinary practices involving sheep and hogs are still evident today in the region, as witnessed by a thriving industry of ovine dairy products (still based on transhumance) and pork.[293]

Feral or semi-feral hogs were not the sole concern of the Lombards, whose legal codes aimed at preserving the silvopastoral lifestyle embodied by local people. While the *Edictum Rothari* has often been considered backward legislation, this legal code also attempted to protect woodland and pastureland territories and their distinctive arboreal and animal species deemed valuable for subsistence.[294] Lombard legislations led to the creation of customs among the local population that would later consolidate with the Norman domination since the late eleventh century.[295] The encounter between the emerging Lombard practices and the thriving forests of the Sila plateau produced a material environment shaped by feral patterns of animal farming.[296] As the people that continued to sparsely inhabit the plateau's piedmont territory progressively resorted to this way of life, their cultural perception of wildlife territories also radically changed. These ceased to be seen as a setting of chaos and disorder like in the classic view, becoming nurturing environments filled with life-breeding resources harvested by taming the wilderness and silvopastoral practices.[297]

Only a major historical event could revert this rather stable socio-ecological trend in this scenario of political fragmentation, depopulation, and

[290] Kreiner 2020, 78.
[291] Montanari 1988, 40.
[292] Pratesi 2010, 69.
[293] Librandi 2008, 144-145.
[294] About this interpretation of Rotarus' legal code see Rao 2015, 49-50. About the preservation of species see Montanari 1988, Moreno 2001; Azzara 2003.
[295] De Presbiteris 2010, 449.
[296] Montanari 1988, 14-15.
[297] About this changing perception in Europe see Hoffmann 2014, 101-103. About the Italian peninsula see Rao 2015 and Montanari 1988, 16. More specifically about the Italian South see Di Muro 2013.

diffused rewilding. While Cassiodorus' wishful purposes remained unattended for several centuries, a new combination of climatic and anthropogenic forces would provide the ideal backdrop for the repopulation of the region beginning in the mid-tenth century. However, in contrast to the maritime trade networks characterising the golden age of the Roman Empire, the late medieval repopulation of the Italian peninsula was centred on upland territories such as the Sila plateau. Such a phenomenon went hand in hand with the development of silvicultural practices revolving around hardwood species such as chestnuts and oaks, whose material characteristics significantly shaped the customs of the human groups who drew sustenance from these species.

5. Oaks and Chestnuts: Natural Customs During the Medieval Warm Period

> *In the same way, the people of Cosenza and its hamlets will be able to enjoy the lands of Sila following their privileges and the norms indicated above* (Historical document: *Rights and Privileges of the City of Cosenza and its Hamlets*).

Like the fatal combination of climatic and infective factors had led to the dramatic decay of human societies in the Italian peninsula, the onset of a favourable climatic trend and the temporary absence of major plagues led to a new human development phase around the mid-tenth century. Climate scientists have renamed this trend the Medieval Climate Optimum, or Medieval Warm Period (MWP), which dominated the North Atlantic region between 950 and 1250. This phenomenon resulted from increased atmospheric temperatures due to solar radiation, the absence of significant volcanic eruptions and warmer oceanic temperatures.[298] Overall, the MWP is considered one of the hottest periods in the Northern Hemisphere's climatic history, at least since the Roman climate anomaly, with temperatures approaching present time average levels. Moreover, hotter weather, rising water flows and less erratic climatic patterns allowed better overall conditions for agriculture, even at higher latitudes and altitudes.[299] Such a trend also invested the Sila plateau, with warmer temperatures between 800 and 1200 AD.[300]

In practical terms, warmer climatic patterns increased ecological pressures, leading to the emergence of traditional medieval socio-environmental features: population increase and an anthropogenic landscape shaped by situated agricultural and silvopastoral activities in some cases still observable today.[301] Although silviculture had not compromised local ecological balances during the previous centuries, the MWP determined a steep increase of forest management practices centred upon broadleaf trees such as chestnuts and oaks, whose biological characteristics uniquely shaped human material life and customs.[302] The anthropogenic inception of these arboreal species went hand in hand with the expansion of lowland farming resulting from a multi-faceted set of minor

[298] See Mann et al. 2009; Grove and Switsur 1994.
[299] Mann 2002, 514.
[300] For climatological records of the MWP in the Italian peninsula see Serre-Bachet 1994; Mercuri et al. 2013; Sadori et al. 2016. About pollen records in the Sila plateau see Ferrarini 1978.
[301] European population tripled from about 25 million to about 70 million people (from about 5.2 to 8.5 million in the Italian peninsula). About population estimates in Europe and in Italy see Hoffmann (2014, 116) and Pratesi (1985, 76).
[302] Rao 2015, 15 and 85-87.

agricultural improvements. This was a slow process of diffusion and adaptation through selected crop cultivation and grazing, combined with farm rotation and soil improvement techniques.[303] In the Italian *Mezzogiorno,* this process became more pronounced since the millennia, with a vigorous economic and demographic recovery, epitomised by new settlement and the capillary expansion of trade networks.[304]

In this generalised human development scenario, uphill woodlands such as the Sila plateau became increasingly central hubs of agroforestry and pastoral practices shaped upon coppiced broadleaf species. As several lowland territories were hastily cleared for agriculture, brackish waters invaded and made them infertile.[305] Other forests gave room to expanding urban settlements such as Cosenza and Catanzaro – respectively sitting at the centre-west and south-east flanks of the Sila plateau – perhaps the main sign of increased anthropogenic pressure in the region.[306] The creation and expansion of these towns were directly associated with establishing several monasteries in the area since the early 1000s. These included Rossano's *Patirion*, Caccuri's *Tre Fanciulli*, the Abbey of *Matina*, the Cistercians *Sambucina* and *Calabromaria*. Monastic orders ventured in the deepest meanders of the forest, creating ecological niches by reclaiming several wastelands.[307] They also received lands in usufruct and pioneered agroforestry techniques revolving around deciduous arboreal species such as chestnuts and oaks. This process was accompanied by the expansion of road networks, creating a ramified local market.[308] Civic unions followed monastic orders, claiming portions of the plateau and developing customs based on silvicultural techniques. As many actors progressively colonised Sila's rugged environments, overlapping interests required the creation of complex legal corpora governing access to these eco-material resources. In practical terms, this meant the emergence of customs

[303] See Aberth 2012, 30 and Mineo 2007.
[304] About the difference between different Italian regions see Rao 2015, 95-96. About the progressive anthropization of southern Italy since the turn of the Millennia see Martin 1990.
[305] Novembre 1989, 24-25.
[306] See Dalena 1996, 69-70; Zinzi 1999, 31.
[307] See Porsia 1999, 141-142; Pispisa 1999, 367. The Cistercian order was one of the main actors promoting the anthropization of European forests in the Middle Ages, creating irrigation channels, draining wasteland, developing agriculture, and mastering stockbreeding techniques. Cistercians also experimented animal interbreeding and sold new species to Italian merchants in auctions (Bechmann 1990, 115-116; Hoffmann 2014, 176).
[308] About Calabria in general see Guillou 1975, 28; Burgarella 1993, 66 and Dalena 2015, 58. More specifically about Sila see Cosco 2010, 24.

shaped upon the ecological metabolism of these arboreal species as a governance tool guaranteeing collective access.[309]

Assimilation and Domestication

While feudalism had been introduced in northern and central Italy by the Lombards, in the south, it only stably consolidated with the rise of the Norman dynasty (1054-1060).[310] The Norman's feudal assimilation of Calabria and the rest of the southern Italian peninsula meant introducing a unified governance system for managing natural resources, which determined a dramatic cultural shift in human-nature relations over the following centuries. In northern and central Italy, the Lombards had stably ruled since the late sixth century AD, imposing patterns of territorial organisation that transformed private and public lands destined for farming into the hunting playground of influential lords. These rather drastic measures progressively forbade any traditional activities, transforming anthropised woodlands – the already-mentioned *bosco* – into de facto "forests," an expression unknown to Roman and Byzantine societies that became increasingly widespread in the post-Roman West. Deriving from the Latin expression *foris stare* – literally, "to stay outside" – the word *foresta* indicated territories set aside by special use restrictions.[311] Their legal status was reinforced by principles of Germanic jurisprudence, turning ancient customary rights into universally recognised legal practices.[312] The need to sanction transgressors pushed the elaboration of written rules to regulate access to increasingly restricted forest areas, also known as *bandite*.[313] As a result, Lombard forests received different denominations according to their legal status. Whilst wildlife areas were traditionally defined as *silva* or *silva nigra*; they could also be named *gualdum* and *gaio*. Probably deriving from the Germanic term *wald*, the first one commonly indicated a vast and scarcely inhabited territory linked to the state's

[309] Di Muro 2013, 962 and 975.
[310] See Brown 1984, 102-103.
[311] See Hoffmann 2014, 253 and Agnoletti 2018, 46-47.
[312] See Marinelli 2000, 26–27.
[313] For a broader picture of the role of *bandite* in the Italian peninsula see Agnoletti 2018, 47. Perhaps the best example is the so-called *Capitulare de Villis*, an edict formulated by Carolingian Emperor Charlemagne between the late seventh and early eight centuries, producing a set of rules and regulations encompassing several spheres of life, including the management of forests and animals. Indeed, it officially maintained that woods and forests should "be well kept; and where there is a place to be cleared, they should clear it and not allow the woodland pasture to increase; and where there ought to be woods, they should not allow them to be cut down or damaged excessively" (see Boretius 1883, 86 *Capitulare de Villis* n. 32, c. 36). For English translation see Aberth 2012, 90. Also see the already mentioned *Edictum Rothari* in Azzara and Gasparri 1992.

apparatus or a monastic organ. Conversely, the second one, allegedly deriving from the term *gahgium* described in the *Edictrum Rothari*, referred to a more densely inhabited territory with complex usufruct arrangements between several social groups.[314] In southern Italy, the coronation of Roger I as the king of the Sicilian Kingdom in 1130 inaugurated the beginning of feudal assimilation and state centralisation, emulating the Lombard model.[315]

The Normans' institutional reforms in Calabria were also accompanied by substantial jurisdictional assimilation of local natural environments, creating norms and practices tailored to contextual factors.[316] In practice, this meant exploring the region's remotest and wildest territories and expanding local agricultural activities through feudal concessions to local lords and monastic orders.[317] In accounting Norman expeditions to Calabria, Norman Benedectine monk and historian Gaufredo Malatesta described the rugged geography of Sila, with its "deep valleys" and "high mountains," underscoring the difficulty that his people encountered in the settlement process.[318] Malatesta's description of the problematic occupation of the Sila plateau did not simply reflect the typically medieval trend to occupy inland regions for safety reasons. It also mirrored the Normans' institutional design to centralise their rule by reducing the political influence of larger urban settlements. Such a process meant creating smaller inland settlements, known as *casali* (hamlets), a relatively homogenous phenomenon characterising all continental Europe as living conditions became stabler and unfortified rural centres rose in the surroundings of castles and fortresses.[319]

The inhabitants of southern Italian hamlets lived an eminently agro-pastoral lifestyle and managed their communities through collective governance systems. These usually gravitated around a church and served to regulate customary practices, guaranteeing public order, and organising defence systems from external attacks. Norman-borne hamlets constituted the primary economic basis for constructing the southern Italian monarchy.[320] They also confirmed the

[314] See Di Muro 2013, 975-976. Also see Azzara and Gasparri 1992, 86.
[315] Dalena 2006, 397-398.
[316] About the Normans' reforms in Europe see Bechmann 1990, 158. About the Normans' contextual in southern Italy see Di Muro 2013, 978.
[317] Caridi 2009, 14.
[318] Malatesta (1.16) 2005, 63. See also Rugolo 1995, 258.
[319] About Europe see Bechmann 1990, 48-49. About Italy in general see Rao 2015, 142-143. About Calabria see Zinzi 1999, 39 and Martin 1999, 498.
[320] Dalena 2006, 397-401.

centrality of monastic orders in the region's progressive judicial assimilation, as epitomised by the concession of territories containing valuable natural resources such as pasturelands and water flows and untamed forest (*silvae nigrae*).[321] This settlement process went hand in hand with the formulation of the first legal statutes that officialised the legal assimilation of the plateau. Official legislation guaranteed access to local woodlands and their strategic timber resources, essential for construction and pitch production. Several woodlands of the Sila plateau and other piedmont territories were legally designated as forests (*forestae*) to serve royal purposes exclusively.[322]

The Crown also conceded several privileges to the first monastic hamlets that became one of the main protagonists of the plateau's progressive anthropisation.[323] Royal concessions legitimised agro-pastoral and productive activities related to silviculture, favouring rural settlements. Geopedological and pollen detections in the region have confirmed a prevalence of woodlands with coppiced hardwood species during these times, mainly chestnuts and oaks.[324] Traces of these arboreal species' expansion through plantation forestry practices are also detectable in the present-time landscape of Sila until about 1300 meters of height.[325] This process transformed several wildlife territories (*silva nigra*, or *silva infructuosa*) into hotspots for arboriculture and animal farming (*silva fructifera* and *silva arborea*), as well as into coppiced woodlands for wood logging (*silva caedua*). The latter process was favoured by the shorter growth periods given the overall better climatic conditions of the time.[326] Finally, these arboreal species also inspired the denomination of several territories, such as *cerretum*, *castanetum*, *quercetum, fraxinetum, cannetum, suveretum.*[327]

Legal documents from the time allow a more specific chronological reconstruction of territorial concessions. The first one, drafted from the city of Tropea on 31 May 1099, granted the lands of *Sanduka* to the Cistercian Monastery of *Calabromaria*, meticulously describing the borders of this territory along the

[321] Dalena 2015, 53.
[322] Some examples include Moccone, Acri, Bisignano, Regina and San Basile (see Pratesi 1958, 32, 49 and 54; De Leo 1984 25, 131 and 206).
[323] Bechmann 1990, 82-83.
[324] See Roubis et al. 2010, 121.
[325] Dentici Buccellato 1993, 4; Cortonesi 2003, 23.
[326] See Corrao 1989, 141. Pietro de' Crescenzi advised trimming woodland coppices destined for construction and fuel every five or six years, a rather short timespan (1805 vol. II, 321).
[327] Salerno 2013, 33.

Ampollino river.[328] The second one, dating 1 June 1115, confirmed these concessions, demanding a usufruct tax of three *Libras*. The third one (18 October 1149) granted the utilisation of the waters from the Neto river and the pastures of the Corio hamlet for animal farming.[329] Other sources from the time indicate that the church of *Sancto Donato*, located in the piedmont territory of Serra Pedace, received three woodlands (two chestnuts and an oak one) for its subsistence.[330] The Abbey of *Sambucina* also owned a large area enclosing the city of Cosenza and its northern territories, protected by royal decrees that prohibited modifying its intended use.[331] These legal efforts secured subsistence for the monastic order while guaranteeing a certain degree of environmental conservation. Silvicultural activities constituted a key source of nourishments indeed. By 1200, the Abbey of Sambucina received an oak forest in the northern piedmont area of the Sila plateau as a royal gift that enlarged its possessions and increased its wealth.[332]

The creation of monastic hamlets culminated in the concession of a large portion of the plateau to the Joachimite order with the establishment of the Jure Vetere abbey (1189–1214).[333] Located at over 1,000 metres above sea level, this territory, later known as *Sila Badiale*, became the highest settlement. Its perimeter included all the "working lands, waters and woods adjacent to the Monastery," roughly stretching northward following the upstream flow of the river Neto. The monastery was also granted the right to freely pasture (*libera pastures*) in the neighbouring valley of *Fluca* and its surroundings.[334] However, the rise of the Joachimites exercised unprecedented anthropogenic pressures in the plateau, epitomised by increased deforestation, animal farming and crop growing. As witnessed by recent pollen analyses in the region, native conifer forest groves dominated by pines and firs appeared in conjunction with hardwood species such

[328] "Sic incipit a Vallone quod dicitur de Graecis et vadit ad flumen Ampulini, et ascendit de ipso vallone Tassiti, et vadit ad locum, quod dicitur Arenosa, et deinde vadit ad locum quod dicitur Aqua frigida, et dat ad vallonem de Miliareto, et deinde descendit a vallone quod dicitur de Nucelletta, et vadit inde recte per costeram, et esit ad flumen Ampulini, et deinde ascendit de ipso flumine Ampulini, et concludit faciem esitus." (See Barletta 1864, vol. I, 4).
[329] See Barletta, 1864 vol. I, 7-9.
[330] See Martin 2009, 57.
[331] As an example, a 1194 decree from William III of Sicily conferred some lands of the Sila plateau to the monastery exclusively destined to animal farming (*pro pascius animalium*), prohibiting any conversion of these lands to other uses (Pratesi 1958, 102). About the territories granted to the Abbey of *Sambucina* see Rugolo 2009, 110.
[332] See Pratesi 1958, 135, 159 and 386.
[333] Ceravolo 2020, 166-168.
[334] These rights were later confirmed and expanded by a 1198 decree from Constance of Sicily, who also aggrandised the monastery's right to animal pasture to all the lands Calabria (Barletta 1864, vol. I, 11-15).

as chestnut and hazelnut trees (*Corylus*), lime trees (*Tilia*), elms (*Ulmus*) and junipers (*Junipers*). Just as importantly, invasive weeds probably associated with animal pasture and cultivated grains such as wheat, barley, rye, and legumes were also present.[335] Since 1196 the Joachimite monastery was also connected by a road network involving Cosenza, Carmigliati, Cerezia and Longobucco that gravitated to trade local timbers, pitch, and livestock.

Moreover, it received several other privileges, such as the permission to build other districts, such as Capalbo in 1200 and Sanduka in 1212, which also came with tax-free usufruct rights for pasture.[336] Finally, the monastery could autonomously grant customary rights for animal pasture on its territory, either by charging a concession tax or exchanging precious goods such as olive oil.[337] With their concessions untouched and confirmed in several instances during the 1220s, the order possessed all the necessary conditions to build a thriving monastic society.[338] However, annexing the Sila plateau and harnessing its natural resources was not confined to the Joachimite order.

Natural Customs

Since the eleventh century, the progressive anthropisation of the Sila plateau led to the development of civic unions whose wealth relied on ancient customary norms institutionalised by Norman feudalism in the form of usufruct.[339] While local customs possessed specificities linked to localised social and environmental factors, granting usufruct rights to lords and communities was part of a broader tendency involving all Western Europe.[340] Whilst customary rural communities

[335] See Roubis et al. 2010, 121-123; Mercuri et al. 2007, 251.
[336] Barletta 1864 vol. I, 25-32. To these were added in 1218 the monastery of Cabria and the Monte Marco Abbey (see Barletta 1864 vol. I, 39-40).
[337] An example are the trade relations between the *Patir* monastery in Rossano, that provided the Joachimites with their locally produced olive oil in exchange for the right to pasture their cattle in the area. While this was probably the sign of a constant internal trade, it also led to conflicts between the two monastic organizations during the first half of the thirteenth century, which required legal settlements under the direct intermediation of Emperor Frederick II. The first legal dispute between the two monasteries concerned the usufruct of pastureland territories in exchange for olive oil. About usufruct rights see Barletta 1864 vol. I, 11-12 and 33-38. About the details of this contention see Huillard-Bréholles 1855 vol. II part 1, 361-363: and Barletta 1864 vol. I, 41-44. A second legal dispute took place between the same monasteries in 1246, this time concerning the right to access a local aqueduct (see Barletta 1864 vol. I, 45-51).
[338] About the confirmation of their privileges see Meluso 1997, 20-42.
[339] Sereni 1997, 202–203; Rao 2015, 111.
[340] Some examples of historical studies include Thompson (1991), Yelling (1977) and Neeson (1993) for England; De Moor (2008 and 2017) for the Netherlands; Zückert (2001 and 2003) for Germany; Lidestav, et al. (2013) and Berge & Haugset (2015) for Scandinavia; Jiménez-Blanco (1996), Curtis (2013) and Serrano Alvarez (2014) for Spain; Corona (2009 and 2017), Bonan (2016) and de Majo (2019) for Italy.

had tacitly exercised usufruct rights for several centuries, with the intensification of anthropogenic pressure, written norms began to figure in local statutes and legal regulations.[341] In northern and central Italy, civic organisations progressively detached from the rule of feudal lords, establishing settlements built around collective governance arrangements – the so-called *comuni*.[342] Conversely, southern Italian collective customs emerged from intermingling between feudal and customary rights.[343] The Crown retained exclusive sovereignty of every territory that acquired the legal status of "domain land," which the king could choose to distribute among his subjects.[344] Domain lands mainly included royal lands (*demani regi*), universal domain lands (*demani universali*), feudal domain lands (*demani feudali*) and ecclesiastical domain lands (*demani ecclesiastici*). Upon most domain lands, the payment of a canon tax, or *bagliva*, ensured customary rights. Canon taxes were paid either to the Crown, monastics orders, or feudal lords who subcontracted tax collection rights from the crown (also known as *baglivi*).

Universal domain lands were entirely open for local communities, who could access their natural resources and directly govern them through a local municipal organ known as *universitas*. These were independent civic unions with moral and legal personhood which strived to guarantee the preservation of the natural assets and the traditional customary norms.[345] In the Sila plateau, a bottom-up system of social organisation emerged to regulate and ensure ancient subsistence activities in close relation to the conventional silviculture practices – the so-called *Universitas Casalium*. Officially recognised since the reign of Roger II of Sicily (1130–1154), this municipal organ comprised the geographical area of Cosenza and its surrounding hamlets (also known as *Casali*).[346] During Germanic

[341] The conjunction of a specific common-pool resource and the norms defining the rules to access became renown as *bene collettivo*, a term equalling the Anglo-Saxon commons (Rao 2015, 161-162).
[342] The northern and central Italian legal systems governing access to customary rights were called *vicinie* in the east-central Alps, *communaglie* in Liguria, *comunanze* in the Apennines of Umbria and Marche, and *regole* in the Cadore region of alpine Veneto (see Rao 2015, 170-171; Mocarelli 2015, 65 and Corona 2009, 91–93).
[343] Corona 2009, 368.
[344] This was based on the legal principle that *Omnia Rex imperio possidet; singuli dominio* – literally "the king has sovereignty over every domain land" (see Lombardi 1885, 32–33).
[345] Galasso 2005, 433. Also see Corrao 1995. About the historical function of *universitas* see See Raffaglio 1939, 22–40; Bulgarelli Lukacs 2015, 122–126.
[346] Placanica 1999, 166; Cozzetto 2005, 266.

Emperor Frederick II (1198–1250), the institution gained further legitimacy, becoming part and parcel of the *bagliva* tax system.[347]

Institutional recognition meant the official marriage between royal interests and the resilience of traditional customary norms. As local animal farming activities gained importance among the growing population, they played a significant role in the plateau's economy. In this context, regulating access and maintenance of woodland environments was essential to preserve the metabolic entanglements between animal and arboreal species. Hogs relied on coppiced trees, just as much as cows and sheep on fertile meadows. While different forms of arboriculture had already existed in Sila since ancient times, their expansion during the Medieval Warm Period constituted a true agricultural revolution.[348] Customary norms and ecological cycles were also indissolubly interrelated. Trees' mast integrated animal farming, becoming the basis of the custom known as *glandaticum*, as deciduous trees massively replaced coniferous ones.[349] Calabria became one of the Italian regions hosting the most significant number of oak and chestnut trees between the tenth and fourteenth centuries, with silvicultural practices explicitly tailored to their management.[350] Their expansion was not only related to animal farming. Especially in the case of chestnuts, animal feeding (*rumo*) came after local communities had harvested the fruits for personal sustenance, which repeatedly took place during autumnal months. Gathering chestnuts and rummaging for leftovers (*ruspo*) played an essential role in feeding local communities, who ground the nuts with mills to make a nourishing bread – also known as "tree bread."[351] Perhaps the primary evidence on the proliferation of chestnut farming in the region is Pietro de' Crescenzi's essay *On the Benefits of Agriculture* (*Liber ruralium commodorum*), where the agronomist meticulously illustrated woodland management practices linked to oaks and chestnuts. These included instructions on clearing the ground to reduce competition from other species and planting the trees destined to *glandaticum* to allow their trunks to

[347] In Calabria, the so-called *baglivo* descended directly from the Byzantine *magister iuratos*, also broadly known as *strategos*, originally delegated to several judicial and administrative tasks (see Martin 1999, 513-514).
[348] Conversely, lowland territories mainly opted for viticulture and olive growing (see Montanari 1989, 96-97 and 120).
[349] Rao 2015, 120-121.
[350] Agnoletti 2018, 234.
[351] About the use of chestnuts for hogs feeding see Dentici Buccellato 1993, 11. About the gathering of chestnuts and their importance for human diet during the Middle Ages see Cherubini 1981, 276-278 and Cortonesi 2003, 49-50.

stretch and "produce fruits without impediments."[352] Given its significant versatility and adaptability at different altitudes, chestnuts constituted a substantial protein intake for mountainous communities and farmers in lowland territories, as witnessed by the commercialisation of derived flours all over the Italian peninsula.[353] This arboreal species' versatility and highly nutritive impact explain its progressive advancement on the Sila plateau.[354] Chestnut trees used for primary subsistence and animal farming were not coppiced species but secular individuals that constituted thriving examples of *silva fructifera*.

In contrast, although the oaks' acorn was not particularly nourishing for humans, it was credited with medical properties. Pietro de' Crescenzi described acorn as a food prone to cause intestinal disturbs ("belly stiffeners"), such as dysentery and ulcers. However, he also remarked that cooked acorns could be convenient to treat "gut soreness" as they were functional to "drain" the "putrid humour" accumulated in peoples' bodies.[355] De' Crescenzi also attributed prodigious medical properties to chestnuts mixed with barley and vinegar. These included healing inflamed breasts and treating youngsters with alopecia.[356]

Just as crucial as *glandaticum* was the so-called *herbaticum*, a customary practice that allowed several cattle species to feed in local fields and valleys. It also permitted grass cutting to keep it in shape for seasonal ruminant livestock allowed to pasture in shared and private lands under different legal arrangements.[357] As Mediterranean market knots strengthened in the southern Italian peninsula, the local increase of ovine and bovine vertical transhumant pasture fed the significant demand for meat and dairy products.[358] Overall, Calabria's proliferation of farming activities led to two annual fairs since 1234, one in Cosenza between 21 September and 9 October. Royal registers provide evidence of the expansion of animal farming. As an example, in a 1239 letter to the governor of Messina, Maiore de Plancatone, Frederick II demanded the selling of all the well-fattened male heads of hogs possessed by the Crown both in Calabria and in Sicily to produce needed monetary revenues for the court.[359] Similarly, in 1240, he requested feudal lord

[352] De Crescenzi 1805 vol. II, 323.
[353] Agnoletti 2018, 240.
[354] Rao 2015, 128-129.
[355] De Crescenzi 1805 vol. I, 115.
[356] De Crescenzi 1805 vol. II, 33.
[357] The latter was allowed by the payment of a canon tax known as *fida* (see Zurlo 1866 vol. I, 5).
[358] About this phenomenon in southern Italy see Porsia 1987; Martin 2002, 42-44. About northern Italy see Comba and Dal Verme 1996; Varanini and Demo 2012.
[359] Huillard-Bréholles 1857, vol. V, part I, 590.

Pietro Ruffo to sell several heads of livestock, in particular donkeys, horses, cows and hogs, for replenishing the Crown's finances.[360]

A rather latecomer with an increasingly important economic role was the so-called *jus seminandum*, mainly a usufruct system that granted lands to landless peasants for a limited amount of time.[361] Agricultural techniques typically consisted of triennial crop rotation systems. While one land was usually planted with nutrient-demanding grains, another was destined to nitrogen-fixing legumes, and the third was left fallow. After clearing the forest, farmers burned residual organic matter to fertilise local grounds. Later, these were planted with legumes to increase nitrogen in the underground humus. Such a practice prepared the land for nutrients-demanding cereal crops such as wheat, barley and rye, initiating a rotation system.[362] Usually, these lands were also made available to animal pasture after yield season, as cattle cleared the land from the rapidly-growing weeds that formed during the fallow season or after the harvest.[363] Seasonal patterns of grass growth shaped animal farming, establishing fallow periods from spring to winter.[364] When sowed with oxen, private lands destined to individual tillage also required the payment of the already mentioned *fida* tax.[365] Naturally, this practice mainly involved low altitude piedmont territories more suitable for seasonal agriculture, especially in the open fields cleared for animal pasture and logging.

The final set of material practices associated with local arboreal species concerned the multiple utilisation purposes of local timber. The custom known as *leganticum* allowed the local population a portion of the plateau's timber resources, essential for various uses.[366] While local people were not allowed intensive logging, they devised material practices that directly drew from the metabolism of local trees. They cut small dry branches and gathered fallen timbers utilised according to their qualities. Dry wood – also known as *linga sicca* – was customarily used to produce the most efficient energy source derived from wood:

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[360] Huillard-Bréholles 1859, vol. V, part II, 692-693.
[361] This practice presumably derived from the open field system developed in north-western Europe since the ninth century (see Rao 2015, 160; Carocci 2010, 452). About the origins and characteristics of the open field system see Yielling 1977; Dahlman 1980; Rowley 1981; Hopcroft 1999.
[362] About agricultural rotation system in medieval Europe see Bechmann 1990, 62-66; about southern Italy see Montanari 1989, 97.
[363] Rao 2015, 160.
[364] See Bechmann 1990, 121.
[365] Zurlo 1866 vol. I, 5.
[366] Galetti 2004, 12.

charcoal. This material, obtained by heating wood at temperatures between 600 and 900°F in conditions of limited air supply, constituted the dominant energy source available to medieval people, aside from solar power. Charcoal's capacity to produce lumps of pure carbon with twice the energy density of dried wood allowed to fulfil vital human needs until the second half of the twentieth century.[367] These included domestic heating and food cooking, allowed by its regular combustion cycles, the absence of smoke and a superior caloric power compared to conventional wood. In addition, due to its endurance to heat, charcoal was the only fuel to reach the high temperatures needed for fusing and crafting metals.

Conversely, fresher timber from high or medium-density wood – *ligna virida* – was adopted to construct essential tools for daily uses, such as carts, ploughs, harrows and barrels.[368] Particularly requested for domestic utensils was the timber of the ubiquitous chestnut tree, leading to the development of coppicing practices for construction purposes.[369] In an era of relative scarce circulation of scientific knowledge, De' Crescenzi explained how to go about the coppicing of chestnut trees, the best months of the years for sowing (ideally between November and February), the type of fruits to choose for sowing (ideally fresh ones) and their preferred types of soil (either soft or humid ones).[370] The "marvellous solidity" of chestnut timber, with unique compact and elastic qualities, made it a perfect material for domestic uses, such as tools and constructions, depending on the timber's age.[371] Local wood artisans became famous all over the Italian peninsula, as demonstrated by their employment in other regions since the thirteenth century.[372] Despite their lower caloric power, chestnuts were are also valuable sources of carbon fuels for domestic consumption (*ligna sicca*), given their natural combustion capacities which led them to burn "with little flames and many ashes."[373]

Timber utilisation also meant processing the resins of local larch pines into a pitch. This practice involved specialised artisans (known as *stellatori*), who

[367] About the qualities of charcoal see Ennos 2020, 102-103.
[368] Salerno 2013, 35-36.
[369] Bernando and Gangale 2008, 67-68.
[370] De' Crescenzi 1805 vol. II, 29-30-
[371] About this definition see De Crescenzi 1805 vol. I, 48. About the multiple uses of chestnut timber for construction purposes see Cortonesi 2003, 53.
[372] Dentici Buccellato 1993, 4.
[373] Fenaroli 1984, 106.

retained access to local resinous trees through the customary norm known as *jus picis*, which established the need to pay a tax on the production of pitch equalling a quarter of its value.[374] The right to pitch extraction could also be allowed in exchange for favours and services to royal authorities. For example, a document dating 1223 compelled the church of Cosenza to aid the transportation of local timber for construction purposes in exchange for access to local woodlands.[375] In a similar way, other local monastic orders inhabiting the plateau (*San Giovanni in fiore*), or its piedmont territories (*Sambucina, Santa Maria di Corazzo* and *Sant'Angelo de Frigilio*) engaged in pitch production.[376] Granting legal protection to monasteries extracting arboreal resin meant securing the Crown's inalienable right to access this resource.[377] For example, in a 1240 letter to a local functionary Frederick II demanded priority for his emissary Riccardo de Polcaro, who purchased pitch *pro servitiis nostris* ("for our service").[378]

Forest Management

The presence of natural essentials for daily material life led to the proliferation of customs linked to agroforestry practices determining the region's progressive increase of anthropogenic activities. According to historical estimates, within approximately four decades (1238–76), Calabria experienced a steep demographic increase (at least 35 per cent). Increased demographic numbers are mainly witnessed by the growth of local fiscal capacity, as local inhabitants paid about 130,000 *onze* to the Crown.[379] A physiological consequence of increased woodland utilisation was the progressive anthropisation of the region. As demonstrated by pedostratigraphic findings, deforestation trends have affected the plateau since the twelfth century, leading to intense grazing and agriculture periods.[380] Although centuries of depopulation had fostered rewilding of woodland ecosystems, the proliferation of arboriculture and silvicultural activities meant a

[374] As maintained by Andrea d'Isernia (1579), Frederick created the *jus picis*, together with other norms, as a complement to previous Norman legislation in to secure a source of stable income for the crown and to monitor production. About Frederick's tax on pitch production (see Huillard-Bréholles 1855, vol. IV, part I, 253). About the so-called *stellatori* see Cosco 2010, 68-69.
[375] See Cuozzo 2009, 70-71; Caridi 2009, 19.
[376] Dalena 2015, 206.
[377] Rugolo 1995, 260.
[378] Huillard-Bréholles 1859, vol. V, part II, 962.
[379] The *onza* (pl. *onze*) was a currency utilised during the Middle Ages in southern Italy, the Spanish Empire and Malta. In southern Italy, it was equivalent to 6 ducats, 30 *tarì* (ancient Arab currency), 600 *grani* (smaller currency utilised in the same territories) and 3600 *denari* (equivalent of a British silver penny) (see Caridi 2009, 20).
[380] Dimase et al. 1996.

reduction of forest groves favouring planted woods and pasturelands. On the other hand, a pedographic gap between the thirteenth and the fifteenth centuries hints at a new generalised moment of demographic and economic decadence. This process approximately coincided with the Germanic Empire's demise, replaced by the Angevine dynasty since the late thirteenth century.[381] Although the Angevine dynasty strived to guarantee access to its strategic natural resources during its rule, political instability favoured decentralisation and increased autonomy for local entities.[382] As a result, people coalesced around the safest fortified centres, creating rural hamlets that became increasingly independent in their institutional structure, delegated in governing customary norms. As a result, the *Universitas Casalium* rose to prominence as an increasingly autonomous institution, becoming one of the most significant examples of an increasingly independent civic institution in southern Italy.

By 1324, despite worsening climatic conditions, the diocese of Cosenza already included several fortified settlements such as Guarano, Fuscaldo, Montalto, Rende, Roggiano and San Lucido, the lands of Paola, and the hamlets of San Lorenzo di Lappano, Spezzano Grande, Spezzano Piccolo and the so-called "casalis Roberti."[383] Most of these settlements sat at the foothills of the Sila plateau

[381] Dalena 2015, 25 and 48.

[382] As an example, another a decree from Angevin king Robert (1277–1343), formulated on 24 December 1333, explicitly defined Sila it as *nostro demanio* – literally, "our domain land," once again describing its geographical borders (Barletta 1864 vol. 1, 55). While the geopolitical importance of the plateau's natural resources had been officially recognised by previous ruling dynasties, the Angevines lost no time in remarking their exclusive rights to access and dispose of the plateau's natural resources through a detailed set of written laws (Rugolo 1995, 261). Such a policy was part of an institutional effort, initiated since 1275 by Charles I, with the aim to guarantee the control of Calabria's resourceful forest areas, both for economic reasons and for recreational purposes. This meant the appointment of state functionaries known as *magistri forestarii*, delegated to monitor the region's royal forests from possible attempts to illegally enclose the lands and unauthorised hunting. Aside from recreational purposes, forest controllers were also delegated to regulate the access to timber resources, both for construction and fuel. Charles' decree was a sombre reflection of these tumultuous times, in which the sturdy timber of Sila certainly came at hand as a valuable and versatile asset. Indeed, such a legal measure happened to be just before the onset of the so-called War of the Sicilian Vespers (1282–1302), with the insurrection of Sicily – supported by the Spanish Aragonese crown – against the Angevine rule. This twenty-year conflict also consisted of several naval confrontations in the Mediterranean, requiring a massive shipbuilding investment to create fleets and war machines able to confront the enemy (see Salerno 2013, 36; Dentici Buccellato 1993, 3; Minieri Riccio 1999, 33-36). Such an endeavour required great quantities of timber and especially big pieces of high-quality wood, a large part of which came from woodland territories such as the Sila plateau. However, in contrast to the classic age where the resinous timber of coniferous arboreal species constituted the main infrastructure for the construction of shell ships, medieval vessels generally preferred the driest timber of hardwood species such as oaks and elms for the construction of their wooden frames. The secular larch pines that had successfully colonised the Sila plateau over centuries were however an exception among coniferous trees, considering their overall sturdiness and greater resistance to humidity (Bonino 2004, 130-131 and Agnoletti 2004, 146).

[383] See Vendola 1939, 313-328. Also see Dalena 2006, 415.

and relied on its woodland ecosystem for subsistence. Each possessed different feudal privileges that allowed local inhabitants to exercise their customary norms on these lands, although several transformations presumably altered their borders over time.[384] The same 1333 decree formulated by King Robert already explicitly mentioned this institution and the Joachimite order, reiterating their privileges to access the natural resources of the Sila plateau, upon which their daily material practices relied. These included customs such as *herbaticum*, *glandaticum* and *jus picus*, allowed on different territories under the Crown's protection, which committed to prosecuting trespassers and sanctioning abuses.[385] The most widespread type of juridical land classification in Sila was known as *comuni*, universal domain lands where several traditional activities were allowed, depending on the territory's characteristics. Overall, the Sila plateau accounted for at least 148 *comuni*, with well-defined borders and a detailed legal status.[386] For instance, in the territory known as *Cocciolo* members of the *universitas* could freely sow and plough (the already mentioned practices known as *seminandum* and *cesina*) and had to pay the Crown a tenth of their harvest. Other customary rights included the already mentioned *glandaticum* – the right to gather fruits from hardwood trees such as oaks and chestnuts to feed the local population and the animals they brought to pasture. Taxes on pasturage varied according to the type of animal: for sheep, the tax amounted to ten silver coins (*carlini*) for every hundred animals, while for cattle, the arrangement depended on the economic activity of the farmer, totalling a maximum of five coins per animal. This tax was usually collected five months of the year, given the seasonal nature of animal grazing on the mountains of Sila during late spring and summer – the already mentioned transhumance.[387] The presence of a taxation system was not necessarily a detriment to the liberties of local commoners, as it worked against free-riding and illegal occupation.

Nevertheless, there were also tax-free common lands in Sila, where customary rights did not require payment. A good example is the territories surrounding Longobucco, whose pasture lands were open to all the herders who inhabited the *Universitas Casalium*, allowing their animals to pasture on local

[384] Galasso 2005, 881.
[385] Barletta 1864 vol. I, 56.
[386] This estimate is based on the inquiry carried out by Giuseppe Zurlo in 1791 (1866 vol. I, 185).
[387] Zurlo 1866 vol. I, 135–136.

grasslands and feed on wild nuts.[388] On the other hand, there were different types of customary rights and property forms in other feudal enclaves of the Sila plateau.[389] For example, only pastoral activities were allowed within the borders of partially private lands, known as *terre corse*. Other customary practices such as sowing and ploughing were the landowner's exclusive right.[390] The third type of territorial division was the so-called *camere chiuse* (closed chambers) woodland areas containing the most precious trees – mainly pines, beech and spruces – that the royal navy exclusively utilised for construction purposes. While these territories enjoyed the status of royal domain lands, they could be located inside both common lands, feudal domain lands and private properties (known as *difese*). Such a mixed legal status allowed essential customary practices for subsistence, such as cooking food and heating. Moreover, just as in *terre corse*, animal pasture was an unalienable right for local commoners, even on private lands.[391]

Although popular sovereignty incentivised the economic expansion of the *Universitas Casalium*, their customary rights were increasingly threatened by the rise of wealthy feudal families, such as Ruffo, Sanseverino, Sangiento, Spinelli, Del Balzo and Carracciolo. In some instances, these families opposed local commoners, accusing them of damaging their estates with their transhumant animals and other violations. In other cases, they deliberately set them against the monarchy, persuading them to quit paying taxes and exercise their customary norms on their feudal domain lands to increase their economic revenues.[392] These forms of social contentions initiated during the Middle Ages would culminate in a protracted legal litigation during the following decades, as the European colonisation of the Americas accelerated international trades and created better conditions to improve wealth. In the Sila plateau, this meant the progressive demise of traditional customs, as affluent emerging families increasingly privatised collective woodlands under the connivant eye of the new monarchy. Indeed, such a period broadly coincided with the rise of the Aragonese dynasty, which took control of southern Italy in 1442.[393] Their rise corresponded to a phase of demographic and economic expansion that invested the whole European

[388] Zurlo 1866 vol. 1, 139–142.
[389] About feudal enclaves see Cherubini 1999, 449.
[390] Privilegii 1557, 48.
[391] Zurlo 1866 vol. 1, 167–168.
[392] Dalena 2015, 242.
[393] This historical episode is documented by the 1509 historical chronicle *De Bello Napolitano*, written by Giovanni Giovano Pontano. For further information see Gravier 1769, 69.

continent since the fifteenth century. While this period has been broadly considered a crucial historical transition, demographic growth and increased anthropogenic pressures also meant the inauguration of a long season of institutional reforms and socio-environmental struggles on the woodlands of the Sila plateau. Such a process was not the sole reflection of anthropogenic drives; it also emerged from the rise of a new arboreal species, mulberries, whose coevolutionary relation with silkworms revolutionised forest farming in the region. The emergence of a thriving sericulture business on the lower flanks of the Sila plateau also radically modified material life. Although on the one hand it created economic wealth, on the other hand, it accelerated the dissolution of traditional customs. More specifically, it ignited a series of socio-environmental transformations that would accelerate deforestation and popular unrest. However, this was not a one-sided process of anthropogenic annihilation. Once again, humans harnessed the material potential of other species, whose biological characteristics helped transform human livelihoods and the plateau's ecology. Indeed, mulberries and silkworms were just the initial protagonists of a long process of multi-species destruction that will invest the Sila plateau and other forested areas for the following centuries.

Part III. Multispecies Destruction

6. Mulberries and Silkworms: Textile Industries and Seized Lands During the Columbian Exchange

> *Still in Calabria, if superfluity did not forbid it, and if common humility allowed it, without wool, anyone could sumptuously dress in silk, because anyone, no matter how poor, produces every year in his own house, so much silk, that he could comfortably dress in it* (Girolamo Marafioti).

The rise of mulberry farming in the Sila plateau approximately corresponded to a new era in world history, epitomised by the colonisation of the Americas and the unprecedented circulation of people, species, and goods across the Atlantic – what Alfred Crosby has defined as the "Columbian Exchange."[394] Although Calabria occupied a relatively marginal position in the transatlantic trade networks stimulated by this process, the de-Mediterraneization of the European economy spurred commercial enterprises with a global outreach.[395] While this global process would only lead to the introduction of American species in the plateau since the eighteenth century (see next chapter), since its inception, it stimulated the expansion of productive efforts linked to external demand and foreign actors. This process was led by the emergence of a new arboreal species, mulberry trees, and the rise of a valuable commodity, silk. Mulberry trees' adaptative capacity and the development of a thriving silk industry led to new socio-material entanglements and an unprecedented capital accumulation process. While silk manufacturing benefitted every social layer, the development of a prestigious regional proto industry particularly favoured an ambitious renter class on the rise that progressively seized political control of the significant portions of the Sila plateau.[396] As a result, local communities and monastic orders lost political influence and jurisdictional power, as traditional customary norms and municipal organs such as the *Universitas Casalium* unravelled.[397] The Aragonese monarchy incentivised these phenomena of agricultural expansion through ambitious top-down modernising plans and officially opened up royal domain lands to private farming initiatives.[398] The enclosure of common lands went hand in hand with the beginning of a large-scale deforestation process which exacerbated ecological

[394] See Crosby 1972.
[395] Cardini 1989, 18-19.
[396] About economic dependence in Europe see Hoffmann 2014, 250. About Italy see Rao 2015, 233-234. About Aragonese policies in southern Italy see Galasso 1980, 62-63.
[397] See Placanica 1970, 11-12 and Pispisa 1999, 388.
[398] Galasso 1980, 97-98.

issues and social conflicts. The result was the so-called Sila litigation, a socio-environmental conflict that inflamed the plateau for the following centuries, pari passu with the success of mulberries and silkworms in the region.

Landscapes of Silk Spinning

The economic growth of Calabria epitomised by sericulture fit into the rise of the so-called *masserie* – large domain farms specialised in producing specific crops and promoting agricultural innovations.[399] This process was indissolubly associated with a steep demographic recovery: a growing population meant an increased food demand and a labour force surplus to cultivate the fields. As measured by the familiar nuclei (known as *fuochi*) that contributed to local taxation regimes – about five people per figure – the population of Calabria increased from 21,387 *fuochi* in 1505 to 59,778 in 1595.[400] In terms of actual people, this meant a population increase from 225-250 thousand inhabitants to 500-550. Of the latter, 13,395 *fuochi* belonged to Cosenza and its hamlets – the second largest municipal entity in southern Italy after Naples. Other municipal areas located to the south of the Sila plateau, such as Crotone (5,114), Catanzaro (5,540) and Squillace (2,939), also significantly increased their populations.[401] As a result, new settlements also arose in northern Calabria due to economic growth and the establishment of Greek Albanian colonies created by refugees of the Ottoman invasions.[402] By 1543, for example, the territory stretching between the Crati Valley and the north-eastern flank of the Sila plateau accounted for 45 hamlets inhabited by about 6,000 inhabitants.[403] Demographic growth meant the progressive abandonment of polyculture and agro-forestry in favour of specialised agrarian landscapes.

Two were the main characteristics of this transition. The first one was the intensification of transhumant ovine farming, with breeds coming from surrounding coastal settlements during the summer season. These mirrored the stark social divisions characterising the times. Small farmers owning small livestock could pasture on collective domain lands, while affluent landowners could graze their large herds on privately-owned lands – the already-mentioned

[399] See Rao 2015, 215 and Rapetti 2012.
[400] Galasso 1980, 99.
[401] By the sixteenth century, Cosenza was the city in the region with the largest number of hamlets (84). About demographic data see Galasso 1980 110-112; about the hamlets see Galasso 2012, 124.
[402] Cozzetto 1987, 58-61.
[403] See Zinzi 1999, 73; Cuteri 2020, 148; Caridi 2020, 178-179.

defensae.[404] Perhaps more importantly, the production of valuable commodities such as grain and silk skyrocketed, determining the emergence of a social group of specialised farmers and ambitious landowners. The financial revenues brought by this emerging polyculture regime led to the progressive anthropisation of the region. By the mid-sixteenth century, Dominican historian Leandro Alberti observed the presence of cultivated fields on the southern flanks of the Sila plateau in the surroundings of Catanzaro. These were also present at relatively high heights and alternated with "beautiful pasturelands" and woodlands "full of large and high holm oaks."[405]

However, mulberry trees and silkworms led this ecological transition in the Sila plateau's more temperate regions. This arboreal species came along with the silkworm rearing and silk spinning, which became the region's most characteristic economic activity. Originally from Asia, mulberry trees spread worldwide, acquiring different biological characteristics, adapted to specific climatic conditions – deciduous in temperate regions such as the Mediterranean and evergreen in the tropics.[406] Given their capacity to grow tall and sturdy trunks reaching almost twenty metres and their wide range of pollination capacities, mulberries can spread and thrive across different territories, both in dry and moist climates.[407] In the well-watered soils at the flanks of the Sila plateau, two mulberry varieties found ideal ground for growth, expanding at a steady pace.[408] These were the white (*Morus alba*) and black (*Morus nigra*) mulberries, initially domesticated in the Middle East (Iran) and northern and central Asia (China), respectively.[409] While black mulberries were traditionally more widespread than white ones, one could hypothesise the progressive turnover of these two species in the region, considering their centrality for the thriving local sericulture business.[410] Although black mulberries possess larger leaves and juicer fruits, white mulberries can grow leaves twice within one season, thus offering the possibility to boost silkworm breeding.

[404] About the widening agrarian gap all over the Italian peninsula during these times see Salvemini 2002, 267-269.
[405] Alberti 1551, 174.
[406] Hobbs and West 2020, 52.
[407] Mulberry trees' trunks can grow up to 30 centimetres and 12 inches per year, and the stamens that produce their pollen can act as real catapults, shooting the pollen out at 350 mph, about half the speed of sound (Hobbs and West 2020, 52).
[408] See D'Amato 1670, 18.
[409] Vijayan et al. 2011.
[410] See Galanti 1792, 262.

Moreover, *Morus alba* usually grows its leaves by the end of March, about twenty days earlier than *Morus nigra*, reaching its full bloom by May. This allowed silkworm breeders to begin their silk production activities between the spring and summer, generally between May and June, thus maximising leaf growth patterns with silkworm development season.[411] The latter usually lasted for about fifty days, between the last ten days of March and the first week of May, when female silkworms typically lay their eggs.[412] On the other hand, black mulberries usually fare better at higher elevations. Therefore, despite their less advantageous vegetative cycles, they continued to be extensively employed in more rugged territories. As reminded by Domenico Grimaldi, they could be spotted in several uplands, even on the slopes of Sila. They also needed less care than *Morus alba* and were less prone to contract plagues.[413] Albeit mulberry trees initially coalesced in the surroundings of Cosenza, they later expanded to the north, reaching the towns of Castrovillari, Acri, Bisignano, Morano, Altomonte and S. Marco, located in between the Sila and the Pollino plateaus. However, it was in settlements to the western side of Cosenza, such as Montalto and Rende, where production reached its peak. On the plateau's Ionian side, they condensed in the area between Catanzaro and Squillace.[414]

While mulberry fruits are a superfood containing proteins and other nutrients beneficial to human health, their fibrous leaves allowed the development of an essential activity for several human groups: silkworm rearing.[415] Measuring between 5 to 7.5 centimetres in length and 6-10 in width, mulberry tree leaves grow perennially in various soils and climates. In terms of nutrition, they are highly digestible to silkworms and possess high contents of proteins and energy and an adequate balance of amino acids.[416] The nutritional characteristics of mulberry leaves have tied this arboreal species to silkworms, who feasted on its leaves, creating a coevolutionary entanglement that began in the far East almost 5,000 years ago.[417] Initially domesticated in China, silkworms (*Bombyx mori*) are a Lepidoptera species that parted ways with its wild ancestors

[411] Ciccolella 2003, 25.
[412] See Iorio 1988, 7-8; Hills 1993, 60.
[413] Grimaldi 1845, 53.
[414] See Di Vasto 2007, 10; Miceli 1975, 127-128.
[415] It could be thanks to the tree's multiple beneficial uses that the silkworms who fed on them attracted human attention in the first place (LeCain 2017, 213).
[416] See Garcez et al. 2017. About the biological characteristics of mulberry leaves see Jan et al. 2021.
[417] Vainker 2004, 17-20.

under human input. Although in situations of hardship silkworms can feed off other species, between their life stage in between larvae and chrysalis, they prefer to draw nutrition exclusively on mulberry leaves (about 25-30 grams of leaves per worm).[418] Such an exclusive nutritional choice results from a millennial adaptation process that has led silkworms to develop metabolic enzymes capable of digesting the toxic chemical protectants of mulberry leaves and absorbing their nutrients.[419]

The coevolutionary bond between silkworms and mulberries started much before humans began to master the art of silk spinning. Nevertheless, seconding silkworms in their exclusive diet by planting mulberry trees has revealed a successful choice for the human societies who decided to embrace sericulture. As they feed themselves, silkworms produce silk filaments through their glands running along the sides of their bodies. This filamented drool is skilfully spun and stretched to form a resistant cocoon, the biological basis for a complex biochemical metamorphosis that allows silkworms to essentially replicate a new egg to grow into a new body. Whilst such a radical transformation enables moths to feed off different nutrients (mostly flower nectars), thus maximising survival chances, this miraculous incubator of change also constitutes the basis of unbleached silk yarns much pleasant to human touch and sight.[420] In chemical terms, these are wrapped around a gummy cover known as sericin (20-30 per cent), a rigid shell aimed to protect the cocoon from animal attacks by making it less palatable and protecting its tastier insight. Indeed, sericin coating encloses a sturdier and elastic substance known as fibroin (60-70 per cent), the material at the core of silk textiles.[421] These two substances instantly thicken in contact with air, becoming a thin and resistant filament, sturdier under tension than a steel wire of the equivalent size.[422] Each cocoon encapsulates about 2,500 to 3,000 metres of silk, although only about 25 per cent can be wound on a reel with other filaments (about 200-300 metres). As each female silkworm lies between 300 to 500 eggs during its brief lifetime, silkworm breeding can easily reach high numbers within a couple of generations, and silk production can expand rapidly.[423] Since about 1,600 eggs weigh about one gram, these were commercialised in ounces,

[418] While there are other moth species surrounding their chrysalis with a cocoon, *bombyx mori* produce the best filaments (Hills 1993, 60). About their nutrition see Vassallo 2004, 37.
[419] See Hirayama et al. 2007.
[420] Hills 1993, 62.
[421] Vassallo 2004, 35.
[422] Fiorenzi 2004, 41.
[423] Female silkworms die shortly after laying their eggs (Hills 1993, 60).

improperly known as "silkworm seeds." During the incubation time, these need to be stored at high temperatures ranging between 20-30° C until they hatch, producing voracious silkworms measuring about 3 millimetres.[424] As a result, each silkworm seed requires over fifty kilograms of leaves to be adequately fed during the different life stages preceding the secretion of saliva filaments.[425]

Being composed of many thin filaments stretched in parallel to each other, silk garments breathe easily while at the same time conveying a sense of warmth on the skin and a pleasure to touch. Moreover, each filament also reflects sunlight, providing fibres with a shiny look.[426] These unique material characteristics created a shared sense of appeal among different human cultures, who showed their appreciation for silk-based fabrics wherever silk reached them.[427] While the secrets of silk farming were forcefully concealed for centuries by the Han dynasty, silkworms eventually reached Europe travelling along with the silk. They reached the Byzantine Empire allegedly in 563 AD, creating global commercial corridors between Europe, Asia and Africa.[428] However, while Chinese silk was traditionally white, yellow silk varieties initially developed in India were the most successful in Europe.[429] This varied silk-spinning landscape reflected the genetic plasticity and variability that can emerge within silkworm colonies in response to specific environmental challenges. The recombination of amino-acid chains at the core of silk thread mirrored processes genetic mutation and diversification among silkworms and their ability to carve ecological niches in different circumstances.[430] In Calabria, yellow silk variety became a distinctive production, boosted by the use of a dyeing plant growing in the area of Tropea, known as "yellow grass."[431] In this context, while the art of silk-spinning was introduced in Catanzaro at least since the eleventh century, growing market demand contributed to its massive expansion by the mid-fifteenth century, leading to economic and demographic growth.[432] This significant expansion resulted from an expanding fashion trend

[424] Hills 1993, 60.
[425] Vassallo 2004, 36.
[426] Hills 1993, 65.
[427] Abut the appreciation of silk as a material across different human cultures see LeCain 2017, 188-206. About the importance of touch in human history see Classen 2012.
[428] Fiorenzi 2004, 43; Kokovic et al. 2018, 156.
[429] See Good et al. 2009.
[430] About the genetic variation and diversification of silkworms and silk varieties see Sutherland 2010 and Craig 2003.
[431] See Iorio 1988, 6.
[432] It was presumably the local Jewish community that immigrated massively in the area to introduce the art of silk yarning since 1073. This process was especially propelled by the commercial agreements between the Kingdom of Naples with merchants from Florence and Genoa

privileging silk garments and decorations all over the Italian peninsula throughout the Renaissance.[433]

A result of the growing economic momentum of silk since the late fifteenth century was the conversion of several lands of the Sila plateau's piedmont territories into hubs for mulberry farming and silkworm rearing – known as *u siricu*. Mulberry farmers commercialised sacks of leaves to silkworm breeders, creating a profitable business as about 60 pounds of leaves could reach the prize of 6-7 *tarì*.[434] They could also be directly involved in silkworm rearing, purchasing silkworm larvae (also known as "seeds") from merchants to get started and devoting their lives and health to the cause.[435] They then sold cocoons to specialised manufacturers – known as *mastri patellari* (literally, "skillet masters") – who boiled them in copper basins. This was a particularly delicate process, considering that silk cocoons can be used as textiles only before the moths emerge from it. To exit the cocoons, moths secrete an acid that breaks silk filaments, leaving shorter fibres that cannot be twisted together to make a thread.[436] Sericulture is entirely built on this mutual yet fateful covenant between silkworms, mulberries, and humans. As domesticated silkworms emerged through their millennial interactions with mulberries, their filamentous secretions of relatively fragile protein chains uniquely shaped human culture. Over many centuries different human groups, including the inhabitants of Cosenza and Catanzaro, lived off this coevolutionary covenant, planting and adapting mulberries in different ecological contexts and breeding silkworms in optimal conditions, often to the expense of their health. Although silkworms maximised their chance of survival by tolerating human domestication much better than other insect species, this relatively comfortable lifestyle also meant a shorter and incomplete life cycle and the inability to survive without meticulous human care.[437] Because silkworm rearing usually ended up with the death of the moth

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after the rise of the Ottoman Empire (see Procopio 2020, 5-9; Jacoby 2004; Tognetti 2002, 91-93; Nencioni 1997). However, historical reconstructions have also hypothesised that silk manufacturing might have started in the same city already since the early ninth century, introduced by Byzantine functionaries (Matarese 2002, 72).

[433] Orsi Landini 2003, 379-384.

[434] The *tarì* was a traditional golden currency first introduced by the Arabs in the Mediterranean during the early tenth century AD. Each coin weighted approximately one gram. About the value of silk leaves see Laudani 1996, 31.

[435] Because silkworm rearing needed to be carried out in optimal environmental conditions, these normally happened in narrow and unhealthy places, enhancing the risks of respiratory diseases such as tuberculosis (Ramazzini 1844, 101-102).

[436] See LeCain 2017, 212-213.

[437] About silkworms and the covenant of domestication see LeCain 2017, 220-221 and 235.

inhabiting the cocoon, enough of them were spared to complete their reproductive cycle and guarantee species reproduction for the next harvest.[438]

Skillet masters were also in charge of the reeling process, usually carried out through a machine with winders placed on boards detached from each other by a distance ranging between 78 centimetres to 1.115 metres.[439] First, raw silk cocoons were immersed in warm water (about 90° C) to separate silk fibres (fibroin) from its glue (sericin). Floating filaments were then loosened through small wooden pokes and aligned on a reel in groups of five to seven threads. They were finally further rinsed to eliminate sericin leftovers and dried.[440] While the same farmers typically carried out these first steps, raw silk filaments were then sewn together into a fabric by specialised artisans who worked with spinning machines.[441] Although Calabrian silk was not the most refined kind available on the market, its sturdy quality made it a valuable and popular product in the Italian peninsula.[442] By 1601, Girolamo Marafioti argued that silk production was so prominent in Calabria that "anyone, no matter how poor [...] could comfortably dress with it."[443] According to historical estimates, by the mid-sixteenth century, raw silk exported from the whole region of Calabria amounted to 400,000 pounds (excluding smuggled items). By the end of the century, more than 11,000 active spinners lived in the area.[444] Overall, during the sixteenth century, each family produced an average of one kilogram of silk per year out of 150 tons.[445] A record number of at least 255 silk manufacturers and merchants declared themselves involved in the art of silk between 1591 and 1605.[446] In this context, northern Calabria kept the highest production rates, creating a sizeable silk-spinning enterprise involving many female and male workers (mainly the former).[447]

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[438] See Hills 1993, 63.
[439] Matarese 2002, 74-77.
[440] Matarese 2002, 73-74.
[441] Silk spinners from Catanzaro allegedly invented a special wheel loom machine made with buttons which allowed weavers to tailor refined fabrics with a smaller number of assistants, thus optimizing labour force (Matarese 2002, 82). About this process in general see Iorio 1988, 8-10.
[442] Galanti 1794 vol. III, 222.
[443] Marafioti 1601, 301.
[444] D'Amato 1670, 18; Grimaldi 1834, 334.
[445] It goes without saying that production rates were unevenly distributed at the time, with affluent landowners concentrating all production in their hands (see Malanima 2004, 60).
[446] This number is approximate given the registers' precarious state of conservation (Musto 1963, 4-5).
[447] Because silkworm rearing mostly happened during the spring season, it coincided with other essential farming activities (hoeing the ground, gathering citrus fruits) women normally took charge of the former, while men worked the fields (see Laudani 1996, 43-49; Guarasci 2004). Silk spinning also developed to a lesser extent in southern Calabria, most notably in the triangle Monteleone-Rosarno-Tropea (Capalbo 2004, 51).

The city of Catanzaro was particularly renowned for its more refined garments – known as *catanzarito*. While the Kingdom strategically confined silk processing to the capital city of Naples, Catanzaro constituted the first exception to the rule.[448] The local art of silk employed up to 7,000 people, who tailored luxurious drapes commercialised all over Europe (from Venice to Spain, from England to France).[449] Between 1514 and 1592, at least nine silk masters were operating in the city, in contrast to only three in Cosenza and one in Reggio.[450] Silk fabrics tailored in the town included velvet and damask and various kinds of decorative fringes.[451]

This thriving silk industry led to several legislative acts between the late fifteenth and the early sixteenth century to control and regulate local production and ensure political representation for local silk spinners. These included the formulation of laws preserving the "Art of Silk" and were followed by the establishment of a consulate in 1519.[452]

Such a legal effort favoured the creation of an *universitas* led by a municipal council where thirty out of frothy representatives belonged to the popular classes.[453] To avoid corruption, all council members needed to come from a silk-spinning family, and citizens not holding a council matriculation number could practice the art of silk.[454] By the time Emperor Charles V passed these laws, there were about 500 textile looms in the city.[455] Naturally, institutional efforts aimed at preserving the city's excellent silk fabrics also propelled the creation of specialised textile factories in the piedmont territories surrounding Catanzaro, with the creation of specialised districts localised at the foot of the Sila plateau such as

[448] See Ragosta 2009, 23.
[449] See the descriptions provided by D'Amato 1670, 19. About the various processes of silk spinning carried out in Catanzaro and for some examples of its most prestigious produces see Musella Guida 2004, 228-229 and 241-253. Silk spinners from Catanzaro allegedly brought their art to France during the late fourteenth century, leading to the creation of cutting-edge centres in Lyon and Tours (Miceli 1975, 125-126; Matarese 2002, 81).
[450] See Musto 1964.
[451] Di Vasto 2007, 13.
[452] At the time, sericulture was considered as a key productive activity for Naples, which as the Kingdom's capital city received a privileged legal treatment. Thus, the consulate of Catanzaro was the first one conceded in the Kingdom of Naples outside the capital city, given its prestigious tradition (see Musella Guida 2004, 230; See Sergi 2010, 22).
[453] See Galasso 1980, 188-189 and Solferino 2020, 229
[454] Pontieri 1963, 340; Sergi 2010, 24. Catanzaro was such a prestigious hub for silk production that when in 1647 the crown temporarily prohibited spinning activities, Catanzaro was spared (Galanti 1794 vol. I, 203).
[455] Capalbo 2004, 52.

Policastro, Zagarise, Taverna, Mesoraca, Tiriolo, Serrastretta, Cigale, Gimigliano, Carlopoli, Miglierina, Amato and Settigliano.[456]

Conversely, Cosenza and its hamlets led the silk market in quantity, producing the highest number of raw yarns (40-50 per cent of the total production) shipped in large numbers all over northern Italian textile centres.[457] This remunerating productive sector had been encouraged by the Kingdom of Naples since 1464, when it granted the city the right to export local silk produces to other territories. This privilege was confirmed in 1486, given its "economic success."[458] Such legislative efforts allowed the city to expand production in the following decades. While the town could not boast the precious textiles produced in Catanzaro, the large amount of raw silk production allowed economic growth and wealth. By the mid-sixteenth century, Cosenza and its hamlets continued to be the central spinning hub in Calabria, producing almost fifty per cent of the total regional production.[459] By 1572, Cosenza's silk production peaked, with the city exporting 561,659 pounds of silk.[460] Overall, throughout the sixteenth century, the city hosted 132 officially matriculated silk merchants, in contrast to the 29 of Catanzaro and 13 in Reggio.[461] The production of raw silk became so essential for the survival of local citizens to be associated with the religious cult of Saint Giobbe.[462]

As silk production gained prominence in the region's economic life, mulberry trees' versatile physiological characteristics allowed them to thrive at different heights and in several ecological contexts. Moreover, their deep roots contributed to soil stability and could reach deep aquifers, not needing irrigation once they reached full maturity.[463] As a result, they could push themselves beyond enclosed cultivations, carving new ecological niches in untamed woodland territories, even on slippery slopes.[464] While mulberry trees increasingly dominated the local landscape, they could also successfully coexist with other fruit species such as figs, chestnuts, olives, citruses, and vines.[465] Together, these

[456] Cozzetto 2001, 249; Di Vasto 2007, 13.
[457] At its production peak, between 1546 and 1588, Cosenza and its most productive hamlet of Montalto recorded an average 400,000 pounds of silk (see Iorio 1988, 16; Ragosta 2009, 39-46).
[458] See Di Vasto 2007, 8.
[459] Galasso 1980, 148-150.
[460] ASN, *Sommaria. Arrendamenti*, fasc. 176.
[461] See Musto 1964.
[462] Miceli 1975, 128.
[463] See Laudani 1996, 25-30.
[464] Cazzola 2002, 242; Rombai and Boncompagni 2002, 179-180.
[465] See Cazzola 2002, 240.

arboreal kinds constituted the most distinctive species of the emerging Mediterranean "gardens." These cultivated woodlands replaced the largely untamed forests that had characterised medieval times.[466] Although this process diminished the surface of forested areas, it also generated a virtuous circle. Improved agricultural output fuelled population growth, which produced more labour to cultivate the expanding fields that gained political and administrative centrality.[467] Leandro Alberti described the "beautiful gardens" of Calabria, with particular attention for those located in the surroundings of Cosenza and its hamlets. Through his account, one learns that, aside from "beautiful pastures," the lower territories of the Sila plateau, both on the Tyrrhenian and the Ionian side, possessed multiple types of fruits (from various citruses to olives and figs) as well as a significant number of mulberry trees, essential to feed "the little silkworms."[468]

Because silk constituted the region's most reliable source of economic revenue, a thriving spinning industry in the plateau's surroundings was tantamount to the augmentation of a local fair system. Five annual rendezvous were instituted in Catanzaro, three in Cosenza as well as local events both in the Crati Valley (Castrovillari, Laino and Bisignano) and at the feet of the Sila plateau

[466] About this phenomenon in Calabria see Caridi 2020, 187; Galasso 1980, 139-143 and 202-203. For a broader Italian overview see Salvemini 2002, 258 and Barbera 2021. The expansion of large agricultural estates did not however mean the complete dissolution of medieval agroforestry traditions. Given their multiple usages, chestnuts continued to expand at lower altitudes to the expense of other traditional arboreal species such oaks and beeches (Cherubini 1981, 257; Dentici Buccellato 1993, 9). The capillary diffusion of chestnut orchards determined a progressive transformation of local forest management practices, with the dismantlement of slash and burn agricultural practices in favour of grove management and coppicing for pole production (Vacchiano et al. 2017, 60-61). By 1601, Girolamo Marafioti described "marvellous" local deciduous species, able to produce chestnuts and acorns "in such quantity to provide comfortable pastures to pigs and wild animals." (Marafioti 1601, 310). By 1644 the region of Cosenza and its hamlets produced more chestnuts and acorn (about 40,000 *tomoli*) than wheat (30,000) and any other agricultural products. The *tomolo* was a local unit of measurement roughly amounting to 50,5 litres – that is, the volume of wheat needed to sow a *tomolata* of land. Chestnuts were once again associated to hog farming, as the region accounted for at least 1,800 breeds, which continued to thrive in the local *silvae glandiferae*, perhaps the only sign of continuity with the vanishing medieval traditions (About the production data see Galasso 1980, 182 and Dentici Buccellato 1993, 11).

[467] Galasso 2012, 37.

[468] About the pastures see Alberti 1551, 182. About Mediterranean gardens, 167; 173-174; 184. Documentary evidence also provides detailed information on patterns of land utilization in the feudal lands of Aiello, a territory sitting on the north-western flanks of the Sila plateau. By the early eighteenth century, more than half of the territory was still occupied by either native (41%) or planted woodlands (16%), while the rest was mostly occupied either by mulberries (14%) olive and vine trees (almost 17%) as well as cultivated lands (7%) (see Cozzetto 1987, 168).

(Paterno and Bocchigliero).[469] These merchants from the most affluent northern and central Italian towns – e.g., Venice, Genoa, Lucca and Florence – dominated peninsular silk trade networks.[470] The development of fairs for silk commercialisation also propelled other manufacturing efforts. Activities such as metal smelting, timber cutting, and manufacturing fictile utensils and recipients were directly linked to raw silk yarning. As a result, iron and wood craftmanship significantly developed around Cosenza and its hamlets, with Cosenza, Aprigliano and Bisignano leading the former and Fagnano the latter.[471]

Since the sixteenth century, the landscapes of silk colonising the Sila plateau also radically altered land ownership and distribution patterns. While these activities involved a large part of society, the value of silk as a global commodity incentivised economic investments aimed at maximising profits.[472] Intensive silk production increasingly required more significant portions of lands and a structured labour force able to fulfil the multiple production steps: farming mulberries, breeding silkworm, boiling and rinsing cocoons, reeling and weaving silk, and in certain instances, sewing various fabrics together. As a result, affluent landowners could use their economic power to develop large-scale manufactures employing a considerable amount of people. Harnessing the economic potential of silk through cheap labour meant to maximise revenues, generating a positive feedback loop. In addition, the material power of silk enhanced silk entrepreneurs' social and economic primacy, increasing political influence. Political influence allowed them to perform the employers' tasks simultaneously and be the sole market link for local producers.

Conversely, small producers were constantly indebted. Their capacity to invest in the local silk enterprise, both for raw textiles and processing machinery, heavily relied on credit granted by foreign merchants.[473] This fateful combination transformed the local sericulture enterprise into a quasi-monopolistic business, almost entirely controlled by rich people willing to bet their capital.[474]

[469] About the fair system see Zinzi 1999, 76-77; Iorio 1988, 33. According to evidence provided by Cozzetto (1986, 73) the Maddalena fair, the largest summer market in Cosenza for the exportation of local produces was directly handled by the local Mastrogiurato.
[470] See Iorio 1988, 31-32 and 40-52. For a specific case-study on Florentine silk merchants in Calabria see Nencioni 1997.
[471] See Galasso 1980, 191 and Solferino 2020, 225-227.
[472] Miceli 1975, 127.
[473] See Gambi 1978, 162.
[474] Iorio 1988, 32. This was not only the case in Calabria, but also in other northern and central Italian cities such as Genoa, Milan, Bologna and Lucca, where silk spinners acted de facto as wage

Advantageous economic dynamics ignited a process of primitive accumulation, which led to the amassment of considerable fortunes.[475] Perhaps the best example is the *gabella* tax, amounting to one *granum* per five pounds of silk produced in Calabria.[476] In 1483, the right to collect this profitable duty was entirely subcontracted to the Sanseverino di Bisignano family for 18,000 ducats, officially turning this wealthy local family into the silk tycoons of Calabria.[477] Overall, the emergence of affluent silk farmers mirrored a significant social transformation phenomenon: an emerging class of agricultural renters – broadly known as *massari* – who either rented from feudal estates or circumscribed entire portions of domain lands.[478] They were both traditional feudal families who had reinvented themselves in the expanding business or a burgeoning middle class – known as "third state" – formed by professionals such as merchants, lawmen, muleteers or artisans. By either purchasing portions of large feudal estates or acquiring collective domain lands through honest and fraudulent means, the third state propelled the development of a farming sector emerging from direct land purchase (*latifundia*).[479]

In several instances, increased economic power equalled enhanced political influence and the possibility of acquiring domain lands. Seizing control and claiming jurisdiction of upland territories allowed landowners to reinvest the capital accumulated with the silk business in the other enterprise that allowed increased economic revenues: animal farming. An example is the Ruffo's family, originally from Scilla, southern Calabria, who heavily invested in sericulture during the late sixteenth century. Borrowing money from affluent Genoese merchants, they acquired locally produced silk garments and sold them inside and outside the Kingdom, thus speculating on foreign demand. They also reinvested their revenues in mulberries and lands that they rented to local farmers for animal pasture, such as in the Pietrapaola feud, sitting at the northeastern flanks of the Sila plateau.[480]

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earners, as in most cases they did not even own production tools which they rented from local entrepreneurs (Massa 1993, 212).

[475] Kokovic 2018, 165.

[476] The *grana* was the lowest currency in the Kingdom of Naples.

[477] About the silk production tender see Ragosta 2009, 42. According to a 1545 notary act, the family earned an average of about 25,000 ducats per year by collecting this tax (Di Vasto 2007, 9).

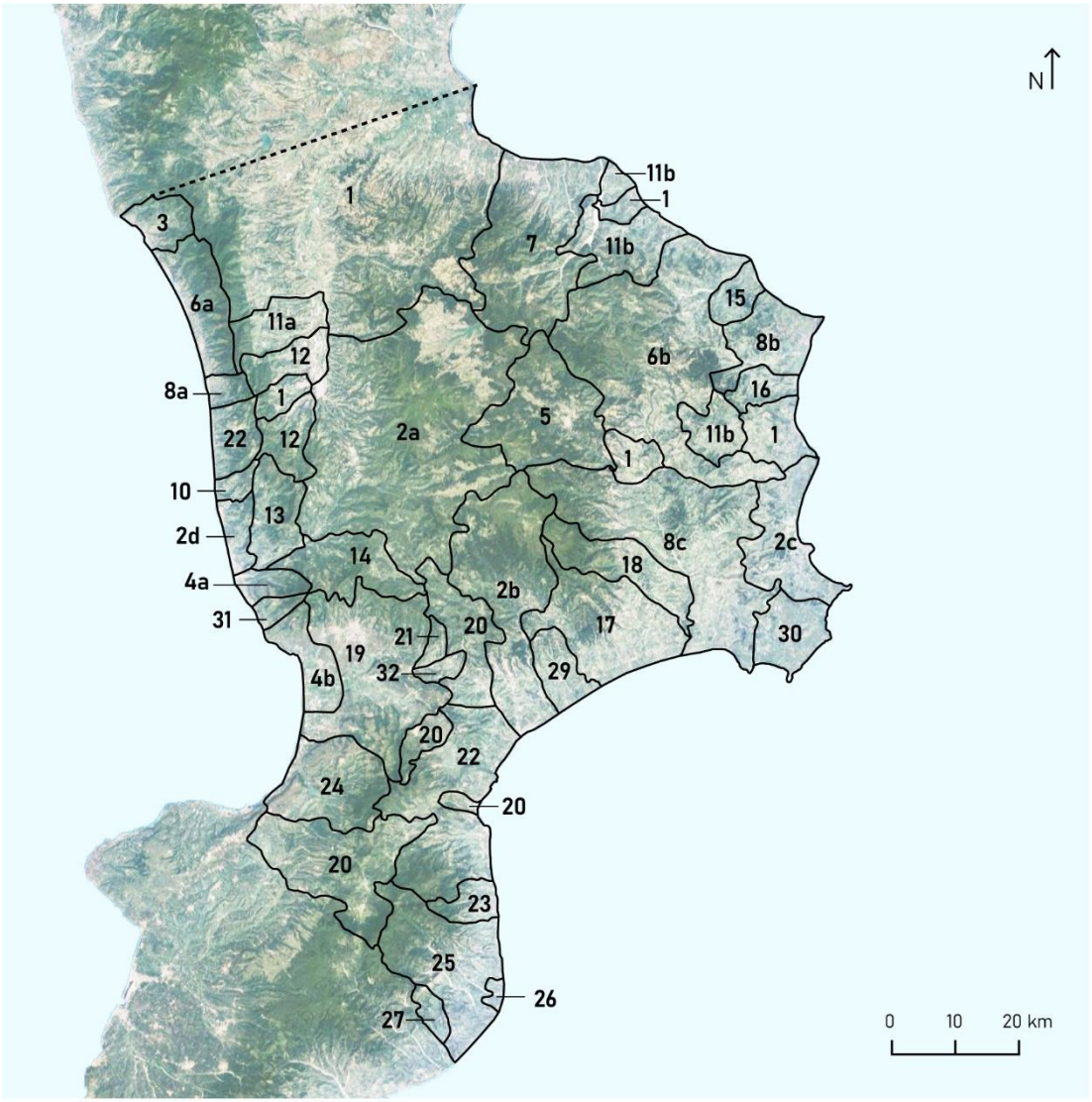
[478] Galasso 1980, 74-75 and 125-126.

[479] Iorio 1988, 32.

[480] See Caridi 1995, 95-137.

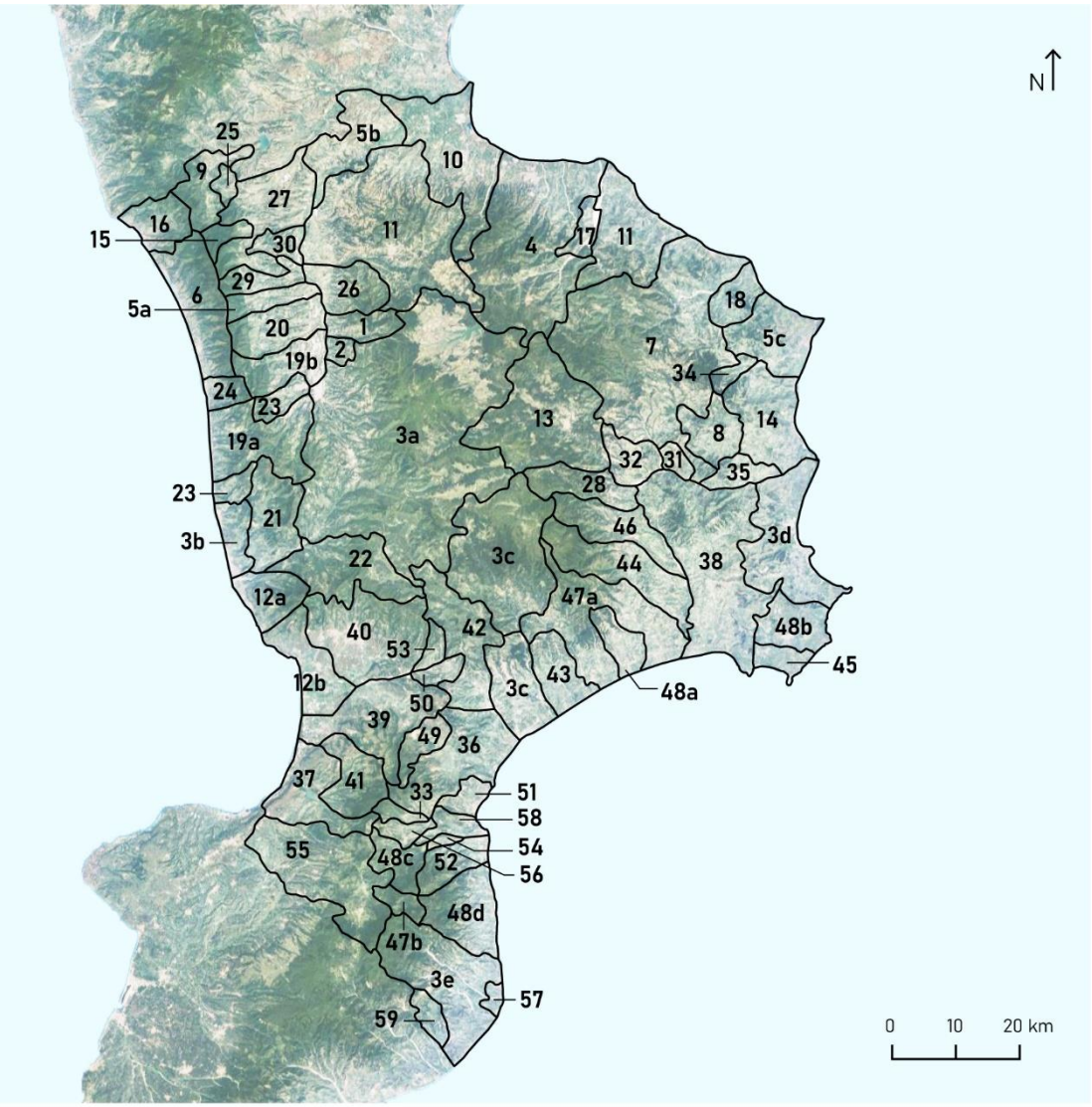
As shown in the maps below, between 1510 and 1650, the domain lands of Cosenza and Catanzaro were increasingly surrounded by large estates. Some of the feuds also included lands belonging to the Sila plateau, which could be granted in usufruct to local populations through private contracts.[481] Over time, some of the most extensive feudal possessions fragmented into smaller portions, a coming-of-age sign. Traditionally hegemonic families sold their lands to the emerging third state.[482] This new feudal system posed unprecedented pressure on domain lands, accelerating deforestation trends, and developing specialised landscapes.[483]

[481] About these arrangements see for example Caridi 2020, 176-178.
[482] Galasso 1980, 8.
[483] Historian Giuseppe Galasso has described this process with the terms "feudalism in transformation" and "new feudal equilibrium" (1980, 44-45 and 54-55). About processes of enclosure and cultivation of domain lands see Galasso 1980, 52 and 120. Such a process of land conversion to agriculture to the expense of forested areas was not solely confined to the region of Calabria, but it involved the whole Italian peninsula between the fifteenth and sixteenth century, leading to the overall conversion to agriculture of about 40 percent of total forested areas (Pratesi 1985, 86).



1. Sanseverino of Bisignano / **2a.** Domain Lands (Cosenza and hamlets) / **2b.** Domain Lands (Catanzaro and Taverna) / **2c.** Domain Lands (Crotone) / **2d.** Domain Lands (Castrovillari) / **3.** Montecassino's Monastery (Cetraro) / **4a.** Order of Malta (Nocera Terinese) / **4b.** Order of Malta (Sant'Eufemia) / **5.** St. Joachim of Flower's Abbey / **6a.** Spinelli (Paola and Fuscaldo) / **6b.** Spinelli (Cariati) / **7.** Isabella d'Aragona (Rossano) / **8a.** Carafa of Santa Severina (San Lucido) / **8b.** Carafa of Santa Severina (Cirò) / **8c.** Carafa of Santa Severina / **9.** Claver (Fiumefreddo, Falconara, Longobardi) / **10.** di Tarsia (Belmonte) / **11a.** Argaona of Montalto (Montalto) / **11b.** Argaona of Montalto (Pietrapaola) / **12.** Adorno (Rende) / **13.** Siscar (Aiello) / 14. de Gennaro (Martirano) / **15.** d'Acquino (Crucoli) / **16.** Campitelli (Melissa) / **17.** d'Avalos d'Acquino / **18.** Caracciolo of Scalea (Mesuraca) / **19.** Caracciolo of Feroleto (Nicastro and Maida) / **20.** Carafa di Nocera (Tirolo, Grifalco, Mpntepaone, Chiaravalle, Soriano) / **21.** Rodio (Amato) / **22.** Borgia (Squillace, San Vito, Satriano, Soverato, Cardinale) / **23.** Toraldo (Badolato) / **24.** Mendoza (Castel Menardo, Pizzo) / **25.** Concublet (Santa Caterina, Stilo) / **26.** Galeota (Monasterace) / **27.** Caracciolo di Oppido (Placanica) / **28.** Sersale (Sellia) / **29.** de Ayerbo (Simeri) / **30.** Ricca (Isola) / **31.** d'Acquino (Castiglione Marittimo) / **32.** Sanseverino from Catanzaro (Marcellinara).

Map 1. Land distribution in the Sila Plateau and surroundings in 1510. Map by Vitória Fank Spohr. Source: Galasso 1980.



1. Salerno (Rose) / **2.** Cornelia d'Acquino (Castiglione Cosentino) / **3a.** Domain Lands (Cosenza and hamlets) / **3b.** Domain Lands (Amantea) / **3c.** Domain Lands (Catanzaro and Taverna) / **3d.** Domain Lands (Crotone) / **3e.** Domain Lands (Stilo) / **4.** Aldobrandini (Rossano) / **5a.** Spinelli (S. Benedetto) / **5b.** Spinelli (Tarsia) / **5c.** Spinelli (Cirò) / **6.** Spinelli (Fuscaldo) / **7.** Spinelli (Cariati) / **8.** Pisciotta (Casabona) / **9.** Bernardino Sanseverino (Fagnano and Malvito) / **10.** Saluzzo (Corigliano) / **11.** Sanseverino of Bisignano / **12a.** Order of Malta (Nocera Terinese) / **12b.** Order of Malta (Sant'Eufemia) / **13.** St. Joachim of Flower's Abbey / **14.** Camptelli (Melissa and Strongoli) / **15.** San Marco's Ecclesiastical Assets (Mongrassano) / **16.** Montecassino's Monastery (Cetraro) / **17.** Marcello Carafa (Cropalati) / **18.** Malfitano (Crucoli) / **19.** Alarcon de Mendoza (Rende, Fiumefreddo, Carolei, Domanico) / **20.** Aragona of Montalto (Montalto) / **21.** Cybo (Aiello) / **22.** d'Aquino (Martirano and Savutiello) / **23.** Ravaschieri (Belmonte) / **24.** de Sangro (San Lucido) / **25.** Maiorana (Sangiento) / **26.** Marcello Firrao (Luzzi) / **27.** Caetani of Sermoneta (S. Marco) / **28.** Moles (Cotronei) / **29.** Isabella Concublet, Marquise of Fuscaldo (Lattarico) / **30.** Cavalcante (Torrano) / **31.** Rota (Belvedere Malapezza) / **32.** Cimmino (Caccuri) / **33.** Lucio Caracciolo (San Vito) / **34.** Moles (Cafizzi) / **35.** Lucifero (Rocca di Nieto) / **36.** Borgia (Squillace) / **37.** Gomez de Silva y Mendoza (Francavilla, Pizzo, Caridà) / **38.** Ruffo (Santa Severina, Cutro, Le Castella) / **39.** de Loffredo (Maida) / **40.** d'Acquino (Castiglione Marittimo, Nicastro, Feroleto) / **41.** Pignatelli of Monteleone (Polia and Monterosso) / **42.** Cicala (Gimigliano and Tiriolo) / **43.** Spinelli of Scalea (Mesuraca) / **44.** Sergio (Simeri) / **45.** Ricca (Torre di Isola) / **46.** Spinelli of Castrovillari (Policastro) / **47a.** Sersale (Belcastro, Sellia, Zagarise) / **47b.** Sersale (Brognaturo) / **48a.** Ravaschieri of Belmonte (Cropani) / **48b.** Ravaschieri of Belmonte (Isola) / **48c.** Ravaschieri of Belmonte (Cardinale) / **48d.** Ravaschieri of Belmonte (Badolato, Santa Caterina) / **49.** Caracciolo (Girifalco)/ **50.** Sanseverino from Catanzaro (Marcellinara) / **51.** Santo Stefano del Bosco (Montauro, Gasperina, Montepaone)/ **52.** Brancaccio (Satriano) / **53.** Amato (Mottola) / **54.** Sances (Gagliato)/ **55.** Carafa from Nocera (Soriano and Filogaso) / **56.** Capece Piscicelli (Chiaravale) / **57.** Galeota (Monasterace) / **58.** Marincola (Petrizzi, Soverato, Augusto) / **59.** de Licandro (Placanica)

Map 2. Land distribution in the Sila Plateau and surroundings in 1650. Map by Vitória Fank Spohr. Source: Galasso 1980.

As the next two paragraphs demonstrate, the socioeconomic transition propelled by the expansion of silk-spinning also modified the plateau's landscape and affected the region's ecological and political equilibriums.

Disaster Ecologies, Climatic Hazards

Overall, the conversion of forest lands to agriculture between the sixteenth and the seventeenth centuries initiated a massive dismantlement of local forest covers that would peak in the following centuries.[484] To maximise silk production, mulberry trees needed to be exploited to their full potential through land fertilisation techniques and forest clearing. By 1587, Calabrian silk producers expressed doubts on the possibility to increase production rates further as mulberry farming seemed to have reached its limit in terms of geographical reach.[485] Just as importantly, the revenues generated by sericulture incentivised other land-intensive activities such as animal and grain farming needed to feed an increasingly growing population. Perhaps the best example in Sila is constituted by livestock farming. Some documented examples of increased pastoralism and its related activities include the settlements of Cariati, Rossano, Corigliano, Melissa and Santa Severina, sitting on the plateau's north and centre-eastern flanks.[486] However, the most significant consequence was a growing deforestation threat. As intensive farming put a strain on the plateau's rugged valleys, local forest covers shrank, and less nutritious gramineous plants that withered more easily covered its grasslands.[487]

It is no coincidence that, since the sixteenth century, the region registered the first cases of hydrogeological disorders. Such natural calamities consist of a comprehensive set of geomorphological issues that degrade soils. These can range from superficial soil erosion phenomena to catastrophic floods and landslides. The Italian peninsula is particularly prone to such extreme events, given its climate patterns, alternating hot-dry and wet-humid weather conditions, and its rugged orographic conformation. Such risks are particularly enhanced in deforested areas.[488] Episodes of hydrogeological disorders began to figure more prominently in the history of the Italian peninsula since the mid-sixteenth century as a direct

[484] See Iovino and Nicolaci 2016.
[485] See ASN, *Sommaria*, *Diversi*, II num., vol. 63.
[486] Sirago 1992, 269.
[487] See Placanica 1985a, 285.
[488] About the risk of hydrogeological disorders in the Italian peninsula see Corona 2017, 9-10. About current threats in the Italian peninsula see ISPRA 2018.

result of demographic increase, deforestation, and expanding human settlements on upland territories. Leandro Alberti explicitly linked them to these processes and described their ecological consequences:

> It seems, among other reasons, that having Italian peoples multiplied and being the usual flat lands insufficient to cultivate and produce the necessary things to live, it was essential to develop high and fallow mountains. Being these cultivated, rain episodes can swell local small creeks, flowing downstream unrestrained and carrying along large portions of crimped earth.[489]

Such episodes intensified all over Calabria beginning in the early sixteenth century, as the anthropisation of the region progressed, and agricultural activities expanded. Common hydrogeological disorders in the area consisted of river floods generated by severe rain patterns that washed out cultivated gardens in territories previously shielded by woodlands.[490] The Sila plateau's formations, characterised by steep hills intersecting with plains crossed by downstream river flows, were susceptible to the potential hydraulic disorders posed by deforestation. These became particularly severe during the winter season. Increased rainfalls led to frequent river overflows, which resulted in landslides and avalanches dragging various debris and sediments downslope to inhabited centres.[491] Piedmont territories were particularly stricken by these extreme flood events, especially in Catanzaro's thriving silk farming districts of Simeri, Squillace and Nicastro.[492] The province of Cosenza was also presumably hit by similar disorders as witnessed by two petitions written respectively in 1555 and 1574 where the *Universitas Casalium* denounced the indiscriminate logging of local woodlands, which "ruined mountains and pine trees."[493] Another legendary flood allegedly happened in 1590 when an entire hamlet, known as *Pignataro*, was destroyed by the river Crati.[494] Facing what was presumably an unprecedented risk of hydrogeological disorders, local communities of the time seemed to have made the connection between the expansion of logging activities and the ever-increasing threats of soil depletion in

[489] Alberti 1551, 387. Also see Pratesi 1985, 87.
[490] For a comprehensive list of hydrogeological disorders in the region between the sixteenth and seventeenth century see Galasso 1980, 103-104 (footnote n. 11) and Cozzetto 1987, 152. For a specific case-study in the seventeenth century see Cozzetto 2001, 180-181.
[491] About the plateau's rivers natural predisposition to overflows during winter times, with one of the most severe flood rates in Europe see Gambi 1978, 84-85; Travaglini 1985, 706-708.
[492] In some instances, these disorders damaged planted mulberry trees, such as in the case of Seminara in 1555 (ASN *Relevii*, vol. 349, c. 246 r.).
[493] See *Pirivilegii et capitoli* 1555, 109; ASN, *Collaterale. Memorialium*, vol. 2, c. 72 r.
[494] See Gambi 1978, 104-105.

deforested areas, as well as landslides and other forms of natural disaster.[495] In 1614, a royal decree explicitly opposed cutting local pine groves, condemning possible violators to three to five years in prison and a 50 *onze* fine.[496]

Despite the tangible consequences of intensive forest clearing, the plateau continued to be regarded as a critical territory for the region's economic development. For example, in 1571 and 1601, Gabriele Barrio and Girolamo Marafioti described its biodiverse environment in enthusiastic terms, reiterating its centrality for the livelihoods of local inhabitants. These included animal farming, the various uses of local timbers, and the production of valuable commodities such as silk and pitch.[497] Some years later, an anonymous report compiled presumably between 1654 and 1659 described the plateau as a flourishing ecosystem, perfectly suitable for "nourishing herds" and cultivating various grains.[498] However, intensive forest clearing and its related environmental consequences were only the tip of the iceberg in terms of ecological damages. Extreme rain events exacerbated anthropogenic ecological disorders, leading to several flood episodes with river overflows that swallowed entire households (1621, 1638, 1659 and 1672), killed animals (1581) and damaged pastures (1559) and crops (1600).[499] These ecological issues were part of a general stiffening of climate conditions that enveloped the European continent since the early sixteenth century: the so-called Little Ice Age (LIA).[500] Allegedly caused by a massive volcanic eruption close to the Equator, which partially blocked sunlight, LIA caused an overall temperature drop of 2.5° C.[501] However, in contrast to the stable warmer climatic patterns of the already-mentioned MWP, LIA was characterised by paradoxical climate instability, alternating cold and warm temperature peaks, usually inaugurated by extreme weather events.[502]

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[495] About the presumably unprecedented degree of these overflow events see Gambi 1978, 88-91.
[496] Barletta 1806 vol. I, 94-97.
[497] See Barrio 1571, 113; Marafioti 1601, 301.
[498] This anonymous relation, entitled *Relazione delle provincie di Calabria e dello stato di esse così nel temporale come nello spirituale*, is currently stored in the Vatican archives (see Meluso 1997, 2-3).
[499] See the accounts by Giovanni Fiore da Cropani (1691, 287-288). Also see Gambi 1978, 174-175 and Galasso 2012, 34-35. Adverse rain events are also documented since the late fifteenth century, when Florentine ambassador Giovanni Lanfredini, who described rain episodes that could last for up to four months (see Rugolo 2009, 104).
[500] About the origins of the Little Ice Age see Mann et al. 2009. For a broad explanation of this event and its historical repercussions see for example Degroot 2018 and Fagan 2019.
[501] The volcanic eruptions' effects were allegedly worsened by the reflective properties of expanding ice glaciers that intensified cooling effects (see Miller et al. 2012).
[502] About the Little Ice Age paradox see Hoffmann 2014, 320.

As a result, intense rain patterns chimed with extreme cold peaks that affected the whole Italian peninsula between the sixteenth and seventeenth centuries, with occasional heat waves and severe droughts in the middle.[503] In the Sila plateau's area, while local arboreal species could resiliently adjust to this climatic transition as in other parts of Europe, a cold peak between 1600 and 1625 led to crop failure, contributing to economic and demographic decline.[504] Giovanni da Fiore documented some of these events, describing "freezing winters" in 1609 and 1612, leading to the icing of even large rivers. These were accompanied by extreme precipitations, with heavy rain (1616) and snow (1600 and 1618) episodes that dragged to coastal lands.[505] After over a century of uninterrupted growth, this climatic phenomenon was one of the several cold waves that characterised LIA's discontinuous climatic patterns.

Climate imbalances worsened the anthropogenic ecological issues propelled by deforestation and the expansion of agricultural production. As previously mentioned, an ambitious class of landowners on the rise driven by the economic strength of silk was at the core of this transition. The proliferation of environmental catastrophes, united with the emergence of affluent landowners, would lead to the progressive enclosing of common lands and several episodes of popular upheavals in the region. Enclosing common grounds did not just imply major ecological setbacks but also deprived local communities of valuable resources for daily subsistence and delegitimised their political power.

The Sila Litigation

The sixteenth century's economic growth was also at the core of the generalised scenario of political pressures that would eventually erupt with the so-called Sila litigation.[506] This multi-century socio-environmental conflict opposed local communities and emerging landowners. As the progressive anthropisation of the local forests determined ecological disorders, the land-grabbing campaigns promoted by emerging landowners caused widespread unrest and social turmoil. In Northern and Central Italy, both local inhabitants and, in many cases, local institutions protected common lands. Conversely, in Southern Italy, overlapping

[503] The worst documented cold peaks in Italy took place in the years the years 1510-11, 1547-48, 1607-08, 1655-56, 1675-84 (Galasso 2012, 32-33).
[504] About the impact of cold peaks in Sila see Cozzetto 1987, 134. About trees' adaptation to climate change during the Little Ice Age see Wohlleben 2018, 183.
[505] See Fiore 1691, 288-289. Also see Galasso 2012, 142-144.
[506] Zurlo 1866 vol. III, 371.

governance systems and land ownership patterns could hardly accommodate the diverging interests of a multi-layered society in the making.[507] As a result, wealthy feudal families and merchants on the rise deliberately bypassed legal dispositions, privatising common lands.[508] Although royal authorities remarked their jurisdictional power on these territories, they could not stop these processes. In some cases, they even deliberately chose to avert their eyes to preserve economic interests and political stability.[509]

On the northern flank of the Sila plateau, the *Universitas Casalium* had enjoyed a steep growth up until the second half of the fifteenth century, becoming one of the most developed institutions of Southern Italy, with a population of over 25,000 people and 69 hamlets in total – second only to the municipal area of Naples.[510] This was mainly due to the municipal organisation's administrative autonomy and the multiple institutional efforts promoted all over the region to contain feudal abuses.[511] However, by the early 1460s, the monarchy's authoritarian reforms favoured the progressive weakening of local institutions, paving the way to litigation. In particular, after an armed revolt due to the lack of local representation in fiscal governance, the newly elected King Ferdinand II of Aragon (1423–94) started a reformist campaign to reorganise local institutions.[512] These legislative measures radically reformed the *universitas casalium*, initiating its gradual yet inexorable decline, despite official pleas by local representatives, who asked for the restoration of their rights.[513] No wonder the weakening of

[507] For further information see de Majo 2019.
[508] About the disempowerment of local farmers see Galasso 1980, 293-294.
[509] Villani 1977, 221–222.
[510] Cozzetto 2009, 69.
[511] The *Universitas Casalium* administrative autonomy is witnessed by a document dated 15 June 1422, in which numerous customary rights were renewed, determining the moment of greatest autonomy for this institution These were also confirmed in another decree dating 1450 in which the crown also explicitly prohibited the privatization of local domain lands. For further information see Cozzetto 1987, 76 and Barletta 1806 vol. I, 71. About the general efforts promoted in the region see Colapietra 1992, 145.
[512] See Cozzetto 2001, 228 and Cozzetto 2005, 283.
[513] A decree promulgated on 22 November 1472 relegated local functionaries to marginal representative roles and the institution was subjected to Crown rule. Moreover, the king stripped the *universitas* of free association rights, threatening transgressors with expulsion from the organization. The institution was also deprived of its parliamentary autonomy, as an appointed royal representative had to convene council members and attend every official meeting. The appointed representative also held veto power in every deliberation of the assembly. Perhaps more importantly, the king reserved the right to have the final word on the election of both local *sindaci* and *mastrogiurati*, who could not make any decision without publicly submitting it to parliament's approval (see *Privilegii et capitoli* 1557, 24-28). About popular please see *Privilegii et capitoli* 1557, 33-41.

traditional customary norms opened the door to the emergence of feudal lords who slowly penetrated upland territories and gained political influence.[514]

The loss of political power did mean the increasing threat of enclosures and a new fiscal regime on goods production. Overall, the Sila litigation emerged from the demise of traditional agro-forestry practices favouring specialised agriculture. This socioeconomic trend generated social agitation, with the first examples of social mobilisations against customary norms and illegal trespassing violations since the early sixteenth century.[515] However, the conflict officially erupted from the second half of the century after increasing the already-mentioned *gabella* tax on silk (from 1 *granum* per 5 pounds to 2 *grana* per pound in 1555).[516] While most of this income went to improve coastal settlements against Saracen invasions, it inferred a significant economic blow on the wealth of small producers.[517] Financial hardships went hand in hand with losing political influence and social legitimacy. As a result, complaints against land grabbing and the illegal occupations of common lands increased between the end of the fifteenth and the beginning of the sixteenth centuries.[518] However, they were increasingly fragmented and multifaceted. As reported by an anonymous document written by a forest inspector operating in northern Calabria, roughly between 1501 and 1662, 227 trials for illegal land-grabbing were registered – of which at least 145 took place after 1577, a clear sign of an increasingly heated social context.[519] Popular upheavals pushed the formulation of royal decrees to preserve customary norms against the deliberate occupation of domain lands by local barons, who were also explicitly ordered to return them (1520 and 1533). Moreover, investigations carried out by lawmen Antonio Gerace (1570), Angelo Lauria (1572), and Bernardo Montalvo (1609) verified the status of local domain lands, proposing multiple

[514] This is witnessed by a 1497 constitutional reform, dividing the local council according to three different social classes: eight representatives were assigned to the nobility, four to the emerging middle class and four to local commoners (see *Privilegii et capitoli* 1557, 57 and Cozzetto 2005, 266). Such a measure would be later reiterated in 1565 through a decree that destined governmental representation to the sole nobility and to social layers devoted to "civil" tasks rather than to "mechanic" ones (see Galasso 2012, 64-65).
[515] See *Pivilegii et capitoli* 1557, 89-98. Also see Colapietra 1992, 149.
[516] See *Privilegii et capitoli* 1557, 136. The tax would be further increased to 15 *grana* per pound in 1605 and would keep increasing to the record peak of 48 *grana* by the mid-1640s (then reduced to 38 since 1646), creating even more dissatisfaction (Sirago 1992, 216 and 228).
[517] Miceli 1975, 129.
[518] The first documentary evidence is indeed contained in the municipal statutes of the *universitas casalium*, when local people protesting the privatization of lands in Sila respectively in 1487, 1501, 1507 and 1532 (see *Privilegii et capitoli* 1557, 55-102).
[519] Barletta 1806 vol. I, 143. Also see Lefosse 1997, 103-124.

solutions to improve monitoring and jurisdictional control.[520] The same Gerace also published a 1618 report where he estimated that illegally enclosed land had reached 250,000 *tomoli*, an economic damage of about 1 million ducats. Moreover, it also attempted to define the border of local domain lands through the apposition of pillars.[521]

Although the newly ruling Augsburg dynasty (1503-1713) promoted some legal effort to solve illegal land grabbing, it also chose to deliberately ignore some issues to preserve its economic interests in the region.[522] In a 1608 report written by Giacomo Saluzzo, president of the administrative organ in charge of royal finances – known as *Regia Camera della Sommaria*. Saluzzo warned about the growing tensions between farmers and pastors, proposing a local livestock custom house that never came into being.[523] In a different correspondence, he also urged local lawyer Simone De Mazzei to "defend yourselves, because in the future you might not be able to undertake such a relevant affair; be committed to looking for evidence in your defence; exhibit your privileges, documents, tools and witnesses."[524] Saluzzo's suggestions were timely. In two instances (1596 and 1631), the Augsburg attempted to sell altogether the domain lands belonging to Cosenza and its 85 hamlets to replenish its finances.[525] As a result, the *universitas* had to deposit 40,000 and 50,000 ducats to the monarchy. While the privatisation threat was, in most cases, a royal gimmick to collect an extra tax in times of hardship, it dramatically weakened the city's economic power.[526] However, in 1644, Cosenza and its hamlets were sold to the Grand Duchy of Tuscany and taken back three years later with a popular revolt.[527] Just as the *unviersitas casalium* fought for its institutional and physical survival between the late 1550s and the early 1620s,

[520] See Galasso 1980, 167 and Barletta 1806 vol. I, 93 and 179-180.
[521] This was part of a wider institutional effort against local phenomena of land grabbing, initiated in a 1613 mapping of illegal enclosures carried out by Michele Cartaro (see Barletta 1806 vol. I, 180; Galli 1959, 37; Galasso 1980, 167-168).
[522] Such a political line reflected on extractive practices in Sila, incentivizing logging for the construction of naval equipment and to expand internal markets and regional seaports (Dalena 2015, 79). Perhaps the main evidence of this political line is the 1536 pragmatic sanction *De Incisione Arborum*, where emperor Charles V officially forbid logging arboreal species destined to naval constructions. This was followed by a second sanction which also secured the monarchy's tar extraction right and access to local pine trees (Bisceglia 1791, 147; Pratesi 1985, 92). Just as much as these activities contributed to the economic growth of the region, they also threatened essential arboreal resources for pastoral activities, such as chestnuts and pines.
[523] A similar report already expressing concerns over territorial conflict had already been drafted in 1532 by fiscal lawyer Marino Mastrogiudice (see Galasso 1980, 162-169).
[524] Andreotti 1869 vol. II, 358.
[525] See Almagiore 1675, 54.
[526] Sirago 1992, 224; Valente 1991, 99; Galasso 1980, 297-298.
[527] Rovito 1989.

Catanzaro and Crotone also saw institutional reforms limiting political autonomy and customary rights.[528] While popular pressure led to institutional initiatives aimed at mapping local domain lands' borders and charging illegal land grabs, they also ended up officially legalising illegal enclosures through financial settlements.[529] Perhaps the best example is Spanish viceroy Gaspar Méndez de Haro's 1687 decree, which legalised at least 155 illegally enclosed territories, officially absolving criminal occupiers, "their predecessors and successors *in futurum*, for all their violations concerning occupied lands, until the year 1664."[530] Such legal acquittals also included crimes of environmental devastation such as illegal woodcutting and arsons to local arboreal species, which were frequent during illegal enclosing operations. Méndez de Haro also exempted landowners from most "fiscal obligations" while allowing them to freely cut and incinerate the arboreal species present in their newly acquired lands and to build private sawmills.[531] Thus, although the decree formally championed customary norms such as *legnaticum* and *herbaticum*, landowners became more oppressive, and the borders of enclosed lands continued to expand regardless of the settlement's terms.[532]

In some instances, the combination of natural hazards and socio-environmental injustices exacerbated popular malaise and conflict. The first consequence was an overseas diaspora. Several people crossed the Mediterranean Sea and created Calabrian clusters in the Islamic cities of Constantinople, Algieri, Tripoli and Tunis, only returning to their lands as Barbaresque pirates to seek revenge from Spanish troops and local barons.[533] However, the most extreme

[528] See Galasso 1980, 320-322.
[529] The first investigation was led by engineer Antonio Galluccio in 1663, who verified the borders of domain lands and confined them with landmarks. This information is reported both by lawmen Nicola Venusio in 1773 and by Giuseppe Zurlo in his renown 1791 inquiry (see Parco Nazionale della Sila 2008, 38 and Zurlo 1866, 12-13). Later, president of the *Sommaria* Antonio Galluccio led another inquiry where the domain lands of Sila were once again confined with 87 pillars. This put on alert hundreds of families responsible for illegal enclosures who drafted a plead in 1664 which estimated their economic revenues to a rather low amount of 24,000 ducats compared to the 70,000 total income of the region (Cozzetto 2001, 251-252). Local inquiries were also compensated by economic actions, such as the 7,813 ducats fine that in 1686 the usurpers of local domain lands were condemned to pay for the lands that they had illegally occupied and to return the lands immediately (de Rivera 1828, 12 and Barletta 1806 vol. I, 124-125).
[530] Barletta 1806 vol. I, 129-135.
[531] Barletta 1806 vol. I, 137-138.
[532] As a matter of fact, in a 1723 decree, thee *Sommaria* implicitly declared the failure of the previous reforms by maintaining the need to restore the dimension of local enclosures to their 1687 size. Moreover, it also established the payment of a fine amounting to three extra annuities (Barletta 1806 vol. I, 178-186 and Meluso 1997, 93-94).
[533] See Teti 2015, 178-179.

symptom of this generalised illness was organised banditry, a form of civic rebellion that became endemic in Sila and other upland areas in the sixteenth century. Brigands always found refuge in the plateau's upland forests, which they considered a natural shelter that guaranteed safety and subsistence.[534] Moreover, their actions explicitly opposed royal or feudal authorities' demands for usufruct taxes, as witnessed by the 1558 action led by Epaminonda Ferrero.[535] However, the most famous example was the revolt led by Marco Berardi – also known as King Marcone – during the late sixteenth century. A brigand from the piedmont hamlet of Mangone (Cosenza), King Marcone self-proclaimed himself as the "king of Sila" and planned on creating an independent state inside the plateau.[536] While a local baron crushed his ambitious plans, he never officially surrendered and died as a fugitive in a mountain cave.[537]

Although different in their intentions and outcomes, migration, piracy, and brigandage were all acts of civic resistance and social redemption against the injustice of the time.[538] They clearly illustrate the vitality of local populations during the second half of the seventeenth century. However, these were just the beginning of a long struggle. Although the development of a thriving silk-spinning industry had helped ignite the litigation in the first place, its decline paradoxically worsened the region's socioeconomic decay.[539] As other Italian cities heavily invested in sericulture, the Calabrian sector weaned under the competition of emerging new markets (e.g. northern Italy and France) and lack of economic planning.[540] The decline of silk production, hydrogeological disasters worsened by a 1638 earthquake, and a great plague epidemic in 1656 contributed to a stark demographic drop and economic stagnation during the second half of the seventeenth century.[541] In this declentionist context, although this silk-spinning

[534] About the idea of mountains as a Cockaigne land see Teti 2015, 174-175.
[535] ASN, *Collaterale. Curiae* v. 16, c. 148 v.
[536] Arnoni 1875 vol. II, 268-273. Also see Colapietra 1992, 23 and Galasso 2012, 132.
[537] Palange 2008, 135.
[538] Teti 2015, 183.
[539] According to a fiscal estimate carried out by the Kingdom of Naples in 1647, the city of Cosenza's overall contribution amounted to only 1,500 *fuochi*, a figure roughly corresponding to 6,000 people (Cozzetto 2001, 13-14).
[540] The Augsburg Empire favoured raw silk production, rather than the development of specialised manufacturing hotspots, to compensate for the decline of the Spanish sector (see Capalbo 2004, 52; Braudel 1995, 434).
[541] At the peak of the demographic crisis, between 1648 and 1669, northern Calabria (Calabria Citra) lost about 25 per cent of its population (from 56,850 to 46,851 *fuochi*) while southern Calabria (Calabria Ultra) 21 per cent (from 46,636 to 34, 791) (see Beloch 1937, vol. I, 215). Overall, between 1595 and 1669, northern Calabria lost over 30 per cent of its total population (see estimates by Placanica 1985, 125-126) By the end of the seventeenth century, the population of Cosenza had

would continue to characterise the region's economic life until the nineteenth century, it lost its economic importance after the mid-seventeenth century's crisis.[542] The decadence of silk farming due to growing competition, fiscal pressure, lack of technological innovation, ecological disasters and social issues meant the decline of a "golden capitalist dream," which had temporarily led the region to unprecedented economic growth.[543]

While silk production increasingly permeated the economy of several northern-central Italian cities and other European regions throughout the seventeenth century, production rates shrank in Calabria.[544] By 1650, there were only 121 enrolled silk workers in the whole Calabria.[545] Concurrently, raw silk shipments from the two main ports of Reggio and Paola steeply declined in the same period. Specifically, exports from Reggio diminished from the record peak of 104,123 pounds in 1615 to the meagre amount of 36,924 pounds by 1656. Similarly, in Paola, they dwindled from a record peak of 80,000 pounds in 1606 to 8,000 in 1655.[546] Although the decline of silk went hand in hand with the expansion of subsistence agriculture, deforestation and land grabbing intensified in the following century. As wealth increasingly concentrated in the hands of a few barons, popular power and customary norms lost their influence together, and universal domain lands were threatened. Moreover, due to the lack of human labour from demographic decline, other lands were left fallow and became easy prey for feudal families.[547] Just as importantly, mulberry trees began to be cleared in several territories to give way to more profitable vine trees or gain fields, where possible.[548]

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further declined to about 1,050 *fuochi* (see Cozzetto 2001, 16-17). About the economic decay of the region during these times see Galasso 1980, 338-343 and 361-366. About the worsening effects of the 1638 earthquake see Galasso 2011, 79-80.

[542] See the economic estimates on per capita silk production by Malanima 2004, 63.

[543] Filippo 2004, 30. About the modernisation of sericulture in other areas of Europe since the late Eighteenth century see Cafagna and Federico 1993.

[544] According to Adam Manikowski, due to its unprecedented commercial expansion, the seventeenth century can be considered as "the century of silk" (Manikowski 1993, 840). However, silk trade reached its peak between the nineteenth and twentieth centuries when it became de fact a global commodity (Federico 1997). As for Calabria, despite of this sudden decline, silk manufacturing recovered since the eighteenth century and continued to constitute an important productive sector in the region up until the late nineteenth century, although it never reached the economic prominence and excellence level of the sixteenth century (see Fusco 2004).

[545] Musto 1963.

[546] This number would later further decline to 18,211 pounds in 1686 (see Calabria 2001, 5-6).

[547] Sirago 1992, 236.

[548] Sirago 1992, 228.

By the end of the seventeenth century, many people still relied upon traditional customary practices to survive. However, access to the plateau had become increasingly restricted, as affluent landowners had expanded their property to the expanse of public lands.[549] As such social transformations generated unrest and malaise, part of high society began to advocate the complete privatisation of universal domain lands to modernise the region and maximise economic growth. It was the beginning of a discussion that opposed advocates of the traditional lifestyle that had characterised the region for several centuries and proponents of development policies aimed at bringing modernisation and economic development through the rationalisation of local woodlands and their endemic natural resources. In this context of developmentalism, the Sila plateau's ecological wealth was up for grabs. However, while its massive embezzlement in the following centuries determined the end of many human-environment relations that had characterised its long history and the destruction of large forest covers, it also propelled new eco-material relations. These were centred upon a handful of trailblazing crops whose biological characteristics fostered upland agriculture. This process went hand in hand with extractive practices such as pitch distillation and intensive logging for energy supply.

[549] See Cozzetto 2001, 250-251.

7. Chopped Forests, Carved Trunks, Trailblazing Crops: Forest Depletion in a Vanishing Woodland Civilisation

> *Reaching the peak of the Sila plateau, we realised that the woods had been destroyed [...] A lot of pine timber was rotting on the ground: many places bore the signs of attempted arsons. These pine forests suffer continuous disruptions because subsistence needs push people to neglect laws and punishments. After extracting pitch from a tree, its roots are uprooted, and the soils cultivated* (Giuseppe Maria Galanti).

The eighteenth century marked an unprecedented historical turn in the trajectory of the Sila plateau, initiating the systematic exploitation of its material potential and the massive clearing of several forest areas that had remained untouched during the previous centuries. While such a process granted new centrality to the plateau in southern Italy's geoeconomic chessboard, it also meant radical transformations in human-nature relations. In practical terms, its timber resources were exploited for economic purposes with unprecedented vigour. At the same time, a growing landless population cleared vast portions of the local forest to implement subsistence agriculture. As the Sila plateau became Calabria's most exploited upland environment due to its unique natural wealth, the ecological niches that humans, trees, and mammals had co-constructed after millennia of interactions quickly unravelled.[550] A first consequence was the lessening of transhumant cattle farming activities that had characterised the region's life for millennia. This process naturally led to the stark diminishment of some animal species that had successfully coexisted with local populations. Perhaps more importantly, local arboreal species began to be massively exploited. In this context, endemic larch pines became the primary target for extractive policies to produce valuable market commodities such as timber and pitch.

However, the development of the plateau did not bring economic benefit to all the local inhabitants. Far from relieving the humblest layers of society, the demise of traditional customs brought further misery and discontent. The combination between modernisation, institutional ambivalence, and political reformism that had favoured the further rise of the affluent landowner class in the previous centuries would eventually lead to the consolidation of large private estates deployed to intensive agriculture. Simultaneously, social unrest and

[550] About the Sila plateau as Calabria's most exploited environment see Placanica 1985b, 79-2.

misery led local people to clear portions of the forest to plant crops in the hope to accomplish subsistence. Such a trend inaugurated the development of mixed subsistence agriculture dominated by emerging crops such as rye, maize, and potatoes.[551] This process undermined traditional customs, as human actors exploited the material potential of the Sila plateau for economic purposes to an unprecedented degree. However, it also led to new materialities, as imported crop breeds apt to grow at higher peaks became endemic, radically transforming the local landscape.

Although the example of Sila constitutes a micro-geographical example, it appropriately epitomises an epistemic historical transformation in human-nature relations from which the modern world as we know it today emerged. This chapter retraces some of the most specific critical points of this transition, up until the unification of Italy in 1861 and the increasingly marginal role attributed to upland areas in the following decades. The main factors that underpinned these transformations included the combination of transnational trade networks and an increasingly liberal ideology that considered the exploitation and privatisation of natural resources as the gateway to modernisation and wealth. While these developmental perspectives provided a reasonable justification for deforestation and land privatisation, bottom-up initiatives to implement subsistence agriculture in the region ensued. Ultimately, both modernisation ideology and popular misery found the perfect material ally in foreign and endemic crops.[552] Predictably, this process was unequal in its deployment and its outcomes calamitous. As the Italian peninsula found political unity for the first time since the Roman Empire, the material potential of territories such as the Sila plateau had already been wholly harnessed by dominant social classes. In this context, its forest covers experienced severe ecological distress. The combination between political reforms, socioeconomic transformation and ecological devastation led to the dissolution of the ecological niches and the customary practices that had characterised the woodland civilisation inhabiting the Sila plateau.

[551] About the development of this farming system see Rossi Doria 1950 and Piselli and Arrighi 1985, 371-372.
[552] For a general discussion on the success of these crops in the region see Arnoni 1875 vol. II, 121.

Sturdy Crops and Agricultural Expansion

While the decay of the silk industry towards the mid-seventeenth century was the result of political and natural factors, the first half of the eighteenth century seemed to confirm a condition of generalised decay in the region. Moreover, such a negative trend was exacerbated by the fatal combination of climatic hazards and environmental catastrophes, as multiple earthquakes and cold waves struck the region during the first decades of the eighteenth century, provoking famines as the result of crop failures and cattle diminishment.[553]

As the Bourbon dynasty (1734-1860) seized control of southern Italy, a new cold wave struck Calabria between 1715 and 1770 as part of the already mentioned Little Ice Age. While this atmospheric phenomenon mainly led to a substantial temperature decrease, it was occasionally compensated by heatwaves and draughts – most notably in the two years between 1760 and 1761. The result was a widespread agrarian crisis with multiple episodes of crop failure increased grain prices. Agricultural hardships also hindered demographic recovery. By the turn of the century, the region's total population had still not managed to match the sixteenth century's numbers.[554] The already decaying silk industry was also significantly affected, as most mulberry trees froze to death, depriving silkworms of their only subsistence.[555] Particularly central to the destiny of several southern Italian upland territories was the significant rise of wheat prices after the 1763-64 famine stroke the peninsula.[556] In the Sila plateau, increased grain prices also paired up with the so-called *terratico*, a new tax on crop farming passed by local *baglivo* Giovan Battista Vigna to take advantage of expanding farming lands. This tax corresponded to about 20-25 per cent of the annual harvest, a relatively high number considering the still low productivity indexes of local agricultural outputs.[557] These environmental and socioeconomic pressures pushed farmers and landlords all over southern Italy to replace cereal crops such as rye and maize with wheat in lowland territories, shifting the latter to upland areas. In general, crop diversification and the expansion of arable lands to the expanse of domain lands

[553] For a synthesis of these events see Rao 1992, 322-323. For a detailed reconstruction of climate imbalances in the region throughout the eighteenth century see Placanica 1985a, 21-47.
[554] About the agrarian crisis in the region see Placanica 1976, 23-35 and 81-85. About demographic numbers see Cozzetto 2001, 17-19.
[555] Placanica 1976, 34-35.
[556] Placanica 1985a. About this famine episode see Campagna 1764.
[557] According to local estimates, productivity indexes in the region were never beyond 1:4 (Ostuni 2004, 14-15 and 90-91).

constituted a strategy employed by local landowners, mainly farmed uplands.[558] The expansion of large estates relying on crops that could thrive in "dry" arable lands also determined an unprecedented increase in deforestation rates (see following paragraphs) and a diversification of the agricultural landscape, which brought southern Italy from a long agrarian standstill.

Moreover, the agricultural labour force grew in size and variety with new professions – from the already-mentioned *massari* to pieceworkers, animal farmers to gardeners, specialising in tending vines and olive trees.[559] In this context, the Sila plateau experienced an exponential increase in rye fields, which, together with maize and chestnuts, constituted the basis of the everyday nutrition of local people.[560] Although with the decadence of the local silk industry, the region still struggled to recover its demographic, social and economic vitality, the biological characteristics of these crops, pushed uphill by the expansion of lowland wheat monocultures, allowed the spread of upland agriculture for subsistence purposes.[561] Agricultural growth, in turn, propelled the development of new material relations between humans and newcomer species that carved a new ecological niche in the plateaus' local ecosystem.

In itself, rye (*Secale cereale* subsp. *cereale*) is an extraordinary example of a resilient weed "impostor" that forced its way into the human food chain following a rather unorthodox path. Although archaeogenetic evidence points at early rye cultivation experiences tracing back 12,000 years, it was not one of the main cereal crops leading the Neolithic agricultural revolution.[562] Since the Bronze Age, it emerged in the Fertile Crescent as an edible weed due to its capacity to "mimic" the aesthetic features of noble grain crops such as barley and wheat.[563] This extraordinary quality allowed it to enjoy the advantages of human domestication, travelling alongside other grains, extending its reach in European and Asian fields. In time, its endemic characteristics allowed rye to become an even more successful crop than wheat and barley, especially in harsher climates and

[558] See Rao 1992, 351.
[559] See Mafrici 1986, 143.
[560] About rye expansion in southern Italian uplands see Tino 1989, 677. About rye, maize, and potatoes in Sila see Placanica 1985b, 79 and Assante 1988, 61.
[561] About the expansion of upland crops such as rye, maize, and potatoes in southern Italy for subsistence purposes see Galasso 1981, 171.
[562] See Marques et al. 2013; Willcox and Stordeur 2012; Salamini et al. 2002; Hillman 2001.
[563] This characteristic is also known as "Vavilovian mimicry" after the Russian scientist Nikolai Ivanovich Vavilov (1887-1439), who first noticed these characteristics in several plants. About Vaviloviam mimicry in general see McElroy 2017; about this process in rye see Mancuso 2018, 39-66.

upland regions. Such qualities made the crop extremely successful among Germanic and Celtic people. The crop progressively became an essential element of their diets and successfully spread all over the European continent during the Late Middle Ages.[564] Rye is a more accessible cereal to thresh in its wild stage, as its mature grains can be separated from the glume with a single winnowing. At a nutritional level, it is mainly composed of carbohydrates and fibres. It can be prepared in multiple ways compared to other grains – from roasting to boiling or simply mashing and grinding.[565] Rye is also more advantageous than wheat for human nutrition at a purely metabolic level: its starch is processed into sugar more slowly, producing a lower insulin response and sustaining human activities for a longer time. Perhaps more importantly, its remarkable adaptability to harsher climates, drought and parasite resistance, and capacity to grow on poor soils make it an even more successful crop than wheat and barley in specific contexts.[566] While today worldwide rye production is about 35 times less than wheat, before the inception of agricultural techniques such as artificial crossbreeding and herbicides, rye constituted an essential nutrition source for human societies inhabiting colder upland environments. As a result, after entering human nutrition through the backdoor, rye became a reliable source of calories intake in harsh environmental circumstances, either cooked or fermented to make beverages. Moreover, its versatility made it a reliable livestock plant for fodder and hay, an excellent green manure crop to improve soil quality and an ideal material for thatching thanks to its rigid fibrous straw.[567]

In the Sila plateau and other upland territories, rye crops, also known as *germanico*, had become a popular crop since the sixteenth century, given their capacity to grow in colder climates and poorer soils. After proving its reliability for daily subsistence, its territorial reach grew concurrently with the expansion of cultivated fields and the deforestation of local woodlands in the plateau's rugged plains, becoming the region's staple crop par excellence.[568] Moreover, thanks to its resistance to harsh weather conditions, rye could be planted between the end of September and the beginning of October, when other crops would probably freeze

[564] Wacker 2020, 7-9.
[565] Bushuk 2004.
[566] About rye's adaptability in extreme circumstances see Schreiber et al. 2021; Wringley and Bushuk 2017, 158.
[567] Wringley and Bushuk 2017, 167.
[568] See Galanti 1982, 269-272 and Arnoni 1875 vol. II, 149. Also see Placanica 1985a, 119-120.

to death and germinate by the end of the autumnal season.[569] In 1767, the Supreme Magistrate to the Chamber of Commerce, Giovan Battista Maria Jannucci, declared rather bluntly that the crop "produces marvellously in the Sila plateau."[570] By the late nineteenth century, an estimated average of over 540,000 hectolitres of rye were produced locally.[571] Even wheat farmers tended to prefer eating rye, given its better energy intake and sustaining capacity. Thus, whereas wheat farming was mainly a market-oriented activity and was only consumed on special occasions, rye constituted an essential grain for daily consumption.[572] Moreover, thanks to its pioneering characteristics, it reached the impressive altitudes of 1,600 metres, thriving in tilled lands and on pasture soils naturally fertilised by animal manure. Overall, the crop's resilience and self-reproducing characteristics turned it into an endemic species that thrived in the local ecosystem, displaying wilder traits than its farmed counterparts.[573]

Conversely, maize is an American crop first domesticated in modern Mexico that later arrived in Europe during the Columbian Exchange. Maize (*Zea mays*) was originally domesticated about 9,000 years ago in the Balsar-River Valley of today's south-central Mexico, mainly in highland territories, where it initially diversified in several breeds.[574] Following its domestication, it descended southwards to other lands of Latin America, including modern Peru, Chile and Argentina, spreading in different climates and possessing the necessary bio-genetic properties to become the most adaptable and geographically ubiquitous grain in the world.[575] After reaching the European continent a few decades since Columbus' first journey, European varieties acclimatised by longer winters popped up in several regions. By the second half of the sixteenth century, the crop also reached the Italian Alps, becoming a staple food in several countries by the turn of the century.[576] This process led to the emergence of local breeds selected according to the peninsula's multiple territorial conformations and climatic patterns, yet another example of the crop's genetic creativity. Southern Italy was

[569] Arnoni 1875 vol. II, 150.
[570] Jannucci 1981 vol. IV, 865.
[571] Arnoni 1875 vol. I, 47-48; vol. II, 150.
[572] Bevilacqua 1981, 524.
[573] See Scapratti 1959, 189.
[574] About the domestication of maize see Matsuoka et al. 2002; Piperno 2011.
[575] About maize's impressively diverse genetic variety see Rebourg et al. 2003. About its diffusion over South America see Roney 2009; Dillehay et al. 2007; Pérez and Erra 2011. About its diffusion worldwide see Mir et al. 2013.
[576] Maize is a densely caloric food (0.13 cal/oz), rich in essential nutrients such as vitamins, minerals, proteins, fibres and carbohydrates (FAO 1992).

no exception to the rule, considering the crop's massive expansion between the eighteenth and the nineteenth centuries, both in coastal plains and upland territories. It even reached peaks of about two-thirds of the total farmed surface in certain regions.[577] Its capacity to grow in rugged environments and endure colder seasons led agronomist Luigi Granata to define its cultivation as "universal on our mountains."[578] In the Sila plateau, just like in other mountainous areas of the Italian peninsula, maize was commonly cultivated at lower heights and piedmont territories, up until 500 metres.[579] By the late eighteenth century, its presence was already so widespread in the plateau's surroundings that a local observer described local farmers as "obsessed" with it.[580] Its over-farming by the inhabitants of Cosenza had produced sterility in several cultivated lands, given the crop's high demand for soil nutrients such as nitrogen and phosphorous.[581] However, adverse environmental impacts did not halt production rates, which averaged over 412,000 hectolitres per year by the late nineteenth century.[582] Although it is virtually impossible to determine the specific breeds cultivated in the region, the most common maize variety was probably the so-called *quarantino* (*Z.m. amilacea*), a breed known for growing its spike just eighty days after planting.[583] Such a short maturation period allowed it to succeed in rotation regimes swiftly. The crop was planted in late July and harvested by October, just before winter.[584] The union of these two species with chestnut flour constituted the primary source of nourishment for the inhabitants of local piedmont territories. Thanks to the glutinous characteristics of rye, the two grains were ground and baked into a black bread, often mixed with leguminous flours, mainly chestnut, but also chickpeas, lentils, and lupins, if available.[585]

As agriculture expanded in the region through the diffusion of these two crops, it was also progressively joined by another New World crop: potatoes (*Solanum tuberosum*). Initially domesticated over 10,000 years ago by Amerindian people inhabiting the Andean highlands between modern Peru and Bolivia,

[577] See Massafra 1984, 53.
[578] Granata 1830 vol. II, 193.
[579] See Gambi 1978, 303.
[580] See Galanti 1982, 103.
[581] See Galanti 1982, 262.
[582] Arnoni 1875 vol. II, 151.
[583] About this breed in Calabrian uplands see Granata 1830 vol. I, 180. About the *quarantino* species see Bardolini and Bardolini 2009.
[584] See Canevari 1884, 57.
[585] About the preparation of this type of bread in Calabria see Bevilacqua 1981, 526; Gangemi 2007, 42. For evidence of its production in Sila during the eighteenth century see Galanti 1982, 279.

potatoes presumably reached the European continent at the turn of the sixteenth century during the Spanish colonisation of the Americas.[586] While different varieties were successfully adapted in the European context, according to recent archaeogenetic findings, white potatoes, known today as "European potatoes," emerged from the admixing with Chilean genotypes during the nineteenth century.[587] This period corresponded to the massive adoption of potatoes in the European continent as a source of daily subsistence, especially in Ireland, after centuries of marginal utilisation as food for outcasts and animal fodder.[588] As a low-cost energy crop, potatoes required moderate human effort and yielded abundantly in cool and moist weather conditions, growing underground even in the cold climates of northern Europe. Thanks to these unique physiological characteristics and their adaptability to the diverse environments, potatoes soon spread throughout the continent, becoming vital crops for daily diet. Their exceptionally balanced nutritional qualities, combining "biologically valuable" proteins and carbohydrates with essential vitamins, minerals and antioxidants, allowed entire families to feed almost exclusively on potatoes and healthily ensure food security.[589] After becoming indispensable for European nutrition regimes, potatoes contributed to demographic growth and sustained rapidly expanding populations. They also allowed the switch to more intensive agriculture and the reclamation of unproductive territories and the wastelands resulting from growing deforestation trends all over Europe.[590] Just as importantly, potatoes sustained the colonial efforts of countries such as the United Kingdom, the Netherlands and France for two centuries (between 1750 and 1950). They provided essential nutrition to a growing urban population, who could shift to various forms of urban industrial life and engross their countries' military ranks.[591]

[586] About potatoes early domestication see Ugent et al. 1982; Spooner et al. 2005 and 2014.
[587] See Gutaker et al. 2019.
[588] According to the herbalists' "Doctrine of Signatures" the non-uniform and unfamiliar shape of early potatoes, their variegated colours, their nodules and protuberances resembled the deformed hands and feet of lepers, which made them allegedly a vector of the disease that had terrorised Europeans throughout the Middle Ages. These theories influenced the early diffusion of potatoes, up until French pharmacist Antoine-Augustin Parmenter studied the crop's beneficial characteristics and heavily campaigned in favour of its adoption. Following his efforts, Frederick the Great in Germany and Catherine the Great in Russia also began to champion the consumption of potatoes (see Reader 2008 112-122; Roberts 2017, 158-163).
[589] About potatoes' nutritional value see Naeem et al. 2021; Reader 2008, 21-22.
[590] See McNeill 1999, 77-78; Reader 2008, 144-160.
[591] See McNeill 1999, 81.

Although the first breeds reached the Po valley around 1560, so-called "European potatoes" were "absolutely unknown" in northern Calabria.[592] They were indeed successfully introduced in the Sila plateau only in 1818, as part of a food security plan to provide alternatives to crops such as rye and maize to prevent famines, pioneered by the Economic Society of Calabria Citra.[593] The introduction of potato crops in the plateau was one of the first efforts of this institution, created in 1810 to promote agricultural and animal farming reforms by experimenting with new crops and breeds and designing specific training programs.[594] One of the best examples of the Society's activities was the publication of an informative treaty written by its first secretary, Gabriele Silvagni, detailing the qualities, cultivation techniques and possible uses of potatoes (from bread-making to animal fodder).[595] Two other members of the Society, Tommaso Cosentini and Gaetano Spiriti, actively promoted potatoes in the region, planting varieties from northern Europe in their possessions on the Sila plateau and its surroundings.[596] Due to its remarkable resilience and capacity to grow in colder weather, cultivated fields were most concentrated on mountain flanks between 500 and 1,350 metres.[597] By the mid-nineteenth century, most of the farmed lands of Sila were planted either with rye or potatoes, with the latter already more present than other traditional crops, given its suitability for both human and livestock consumption.[598] The timely rise of potatoes in local nutrition regimes accelerated with the 1816-17 crop failure and the onset of a famine episode, making them a "great and precious resource to keep poor people away from hunger."[599] Local farmers found in potatoes a highly nutritive and adaptive crop. By selecting varieties capable of growing as high as 1,000 metres, they created endemic breeds that still characterise local production today. An above-average starch content constitutes the bio-genetic secret allowing these breeds to thrive in cold conditions and enrichens their taste. Moreover, their sturdy skin confers a better resistance to

[592] About the first introduction of potatoes in Italy see McNeill 1999, 71. About potatoes unknown in Calabria see Galanti 1982, 279.
[593] See Colosimo 1818.
[594] The Economic Society of Calabria Citra lasted until 1865, shortly after the Italian national unification. For an historical overview on this institution see Marcelli 2007 and 2009.
[595] Silvagni 1817.
[596] ASN, *Ministero Affari Interni*, II Inventario, bus. 2576. See also Marcelli 2006, 83 and 2007, 52.
[597] Gentile and Martini 1974, 117-120; Gambi 1978, 302.
[598] See the survey carried out by Luigi Grimaldi (1845 vol. II, 84 and 110).
[599] Tarantino 1868, 28; Assante 1988, 63.

pests to these breeds. Today six potato varieties are still harvested and commercialised under the EU banner of protected geographical indication (PGI).[600]

The arising agricultural trend propelled by these trailblazing crops' endemic qualities constituted a perfect incentive for local landowners to seize and enclose contested territories and clear significant portions of the local forests to pursue their dreams of wealth. Regional ambitions and national plans coalesced into developmental agendas that saw relatively unexploited woodlands as potential hubs of economic growth. In this context, the wealthiest social classes monopolised the plateau's territorial and natural wealth, worsening socioeconomic disparities.[601] With a clear-cut illuminist matrix, these debates mainly involved intellectuals and state functionaries of the time. Influential political economists saluted development and modernisation policies as both a moral necessity and an occasion to produce wealth for the state's finances and alleviate the misery of backward populations.[602] In this context, although these thinkers fought against feudal abuses and related ecological damages, they also advocated the rationalisation of local domain lands through an agriculture-intensive economic model based on private property.[603] Thus, the manipulation of natural environments was justified by the need to produce valuable market commodities for international trade and agricultural produce for internal consumption. Ancient customary practices and their eco-material relations were regarded as the leading cause of the Kingdom's economic backwardness and social malaise, given their coexistence with monopolistic privileges and the obsolete feudal system.[604] The dismantling of this system would stimulate economic development by promoting free trade, individual freedom, and social mobility.[605]

Extractive Reformism

Although agricultural debates perfectly epitomised the modernising ethos of the time, reformist agendas promoting the development of several regions of Calabria

[600] Potato varieties cultivated in Sila include Agria, Dèsirée, Ditta, Majestic, Marabel and Nicola (see Cerrato 1993). About the centrality of potatoes for agriculture in Sila see Teti 2020a, 312; Librandi 2008, 143-144.
[601] Mafrici, 1986, 151.
[602] Given his economic ideas preceded those of Adam Smith, Genovesi can be considered a full-fledged early physiocrat thinker and a political economist ante-litteram (Barca 2010, 159).
[603] See Corona 1995, 82-95.
[604] Such a statement makes sense especially considering that by 1782 1616 out of 2000 inland municipalities belonged to feuds, in the face of just 346 domain and 38 royal lands (see Ciasca 1933, 440).
[605] See for example Corona 1995; and Barca 2010, 22.

were at the core of political debates at least since the mid-eighteenth century. These represented the culmination of an economic trend initiated in the late 1730s which aimed to spur material and economic development all over the Kingdom's provinces, complementing maritime mercantilism centred in the port of Naples.[606] In 1754, Finance Minister, Antonio Genovesi, inquired on the state of agricultural and economic development in the region, receiving confirmation on its overall state of decay and the lack of financial planning.[607] He also advocated dismantling the feudal system that forced many people into social misery and economic backwardness.[608] It was the beginning of a new season of debates and reforms aimed at tracking down current and potential productive activities and devising strategies and techniques to maximise the exploitation of local natural resources. By the mid-eighteenth century, intellectual Domenico Grimaldi attributed Calabria's overall state of decay to the relatively backwards state of local agriculture. Grimaldi listed social issues such as "feudal anarchy, to the changes of a confused vacillating govern, to the fury of local bandits, to public oppressions, to private vengeance, to corsairs' invasions" as well as to "an immense number of eternal families."[609] However, he also complained about the lack of specialised environmental and territorial knowledge, which impaired improvement measures. As a result, both agriculture and animal farming did not fulfil their full potential.[610] While his plans for its native region did not come true, Grimaldi's commitment to modernisation policies would help him earn the role of state functionary in the newly formed Supreme Council of Finances, created in 1782 to promote state development.[611]

Grimaldi's nomination reflected a broader national interest towards seizing natural resources and turning them into profitable assets. These drew from the growing physiocratic movement, which considered the maximisation of farming outputs as the primary potential source of national wealth and incentivised agricultural modernisation policies and land reforms.[612] The Sila plateau's natural

[606] Salvemini 2000, 44.
[607] See Grimaldi 1770, 11.
[608] See Genovesi's preface in Trinci 1769, 165-166.
[609] Grimaldi 1770, 9-11.
[610] See Grimaldi 1770, 11-12.
[611] This was not the only acknowledgment that the intellectual received during his lifetime. His essay on agricultural development was greatly appreciated by the Bern Physiocratic Economic Society that nominated him honorary member (see Rao 1992, 359-362; Luciano 1974, xxii).
[612] The physiocratic movement, inaugurated in France by François Quesnay (1694-1774), comprised a group of eighteen-century economists who opposed the broad principles of mercantilism. It contrasted the notion of nature as a set of commodities to export on foreign market, considering

wealth did not go unnoticed. In 1767, the already-mentioned Jannucci attempted to trace some guidelines of its potential development. However, while reiterating the plateau's unique natural wealth and its potential for economic growth, Jannucci also considered it the leading cause of decay. In his opinion, considering the region's natural wealth, local inhabitants had not managed to profit from "all that they could possibly benefit."[613] Although the region's lack of social mobility, land grabbing and top-down taxation regimes were also considered to justify such a state of economic decay, seizing better control of the plateau's natural wealth still seemed like the most reasonable development plan.

Genovesi's disciple, Giuseppe Maria Galanti, also visited the region in 1792 as part of a large project aimed at acquiring detailed information on all the Kingdom's regions and to map its potential resources, producing a detailed yet disenchanted analysis.[614] In Sila, he documented the overall environmental devastation created by the progressive conversion of local forests to agriculture. According to Galanti, several woodlands bore the marks of "continuous damages," mainly dictated by the "subsistence needs" of an increasing population.[615] As a matter of fact, by 1788, Cosenza and its hamlets accounted for 53,254 people while Catanzaro and Crotone respectively 12,296 and 17,271.[616] The most tangible signs of environmental devastation were epitomised by pine trees' carcasses rotting on the plateau's grounds to convert the land to agriculture.[617] According to Galanti, the increase of extractive activities such as pitch production and logging were also responsible for the progressive decrease of animal farming in the region, still essential in upland territories.[618] This fatal combination had led to the "misery of

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agriculture and its outputs as the sole wealth of nations through the production of surplus – the so-called "net product." In this context, the preservation of ecological forces of reproduction was essential, as demonstrated by the role of physiocratic thought in stimulating ecological conservation. However, the physiocrats also strongly opposed ancient collective customs based on silviculture and agroforestry as a synonym of backwardness and misery, promoting an enlightened agrarian individualism based on individual initiative and private property. Although in southern Italy the physiocratic movement aroused suspicion because of their claim to turn economic into science, the image of the owner-producer at the heart of the physiocratic system was successful among Neapolitan intellectual and inspired Genovesi's idea of "rustic philosopher." Other physiocratic thinkers also included Carlo Antonio Broggia, Gaetano Filangieri and Giuseppe Palmieri. For a general understanding of this position see Bloch 1966. About the role of physiocratic thought in environmental conservation see Grove 1995. About southern Italy see Valassina 1970; Corona 1995; Salvemini 2000; Imbruglia 2000. About Calabria see Luciano 1974.

[613] Jannucci 1981, vol. IV, 867.

[614] About Galanti's mission as "Kingdom Visitator" see Mastroberti 2018, 147-148; Placanica 1992, 77-78.

[615] Galanti 1982, 267-268.

[616] Galanti 1794 vol. III, 34.

[617] Galanti 1982, 267-268.

[618] See Agnoletti 2018, 71; Zanzi Sulli e Di Pasquale 1993.

local inhabitants," generating internal conflicts and the desperate trade of "all the livestock to Neapolitan butchers, to avoid further hurdles."[619] However, like other enlightened contemporaries, Galanti opposed restoring the customary rights among local communities and protecting domain lands. The illuminist thinker described domain lands as the heritage of the barbarian tribes and the epitome of non-remunerating activities such as transhumant animal farming and lowly productive cultures. Aside from constituting a backward form of production, the uncertain jurisdictional status of domain lands was among the leading causes of the social conflicts that continued to permeate the Italian *Mezzogiorno*. As a result, he explicitly wished to abolish domain lands and develop local manufactures following the economic model of England, the most industrialised country in Europe at the time, which he considered "superior to all the people on earth."[620]

While documenting the environmental damages produced by intensified logging activities, Galanti continued to advocate exploiting the plateau's natural resources as a vehicle to accomplish modernisation and economic development. He maintained that the region still possessed "extremely vast forests," measuring about 170 square miles. Such a large forest territory could potentially benefit the region's economic needs, especially since its slow yet progressive demographic recovery during the second half of the eighteenth century.[621] He also declared the possibility to populate the plateau's inhabited uplands further, which he considered as "suitable to sustain [settlements]," and expressed frustration on the abandonment of several piedmont territories such as Rossano and Cirò.[622] These were described as eminently wild territories, alternating woodlands or "barely cultivated or deserted" fields. The scarcity of horticultural products was not the only issue in a land that needed careful tending and fertilisation to produce a decent harvest.[623] According to Galanti, all sorts of feral animals inhabited these territories. These included the mammal species that had uniquely shaped the livelihoods of local human groups such as hogs and sheep and predators such as wolves that often decimated local livestock.[624] Galanti's remarks were timely,

[619] Galanti 1794 vol. III, 232.
[620] Galanti 1794 vol. II 174-175 and vol. III, 262-263.
[621] Galanti 1794 vol. III, 34. About the region's slow yet progressive demographic recovery see Galasso 2011, 146-151.
[622] Galanti 1982, 267-268.
[623] Galanti 1981, 269.
[624] Galanti 1981, 115 and 139.

pointing at the main ambivalence in developmental discourses of the time. As the Kingdom's market relation became increasingly associated with the destiny of distant foreign markets, the timber and pitch produced in the Sila plateau constituted valuable market commodities for domestic use and maritime export abroad.[625] However, such economic interest strongly contrasted with the growing physiocratic ideas that advocated agricultural development as the only possible source of wealth production. In the Sila plateau, these ideals were epitomised by an increasing class of agrarian monopolists, who occupied several domain lands, taking advantage of the state's exploitative policies and lack of effective territorial control.

Not by chance, Galanti continued to remark the centrality of endemic larch pines for naval equipment, indissolubly linked to the expanding Royal fleet to strengthen maritime trade routes.[626] Enhanced attention towards these endemic species' industrial potential was meant to radically alter the plateau's ecological foundations, which had sustained multiple human groups. During the sixteenth century's economic expansion, logging activities led to hydrogeological disorders and widespread complaints.[627] However, over a century of misery seemed to justify the intensification of these activities for economic development, not only in Sila but all over southern Italy.[628] In this context, the creation of an Executive Committee for Sila (1783), controlled by Secretary of State John Acton, aimed at guaranteeing the state's control of local timber resources.[629] This meant utilising the local woodlands to construct naval equipment to defend the region's coastal lands, increasingly threatened by piracy and foreign invasions in the continuous Spanish-Augsburg contention for the Kingdom of Naples.[630]

Export-oriented logging enterprises expanded the domestic artisanal sector and enhanced domestic use and consumption patterns. Since the mid-eighteenth century, documentary evidence demonstrates dynamic domestic sales

[625] During the eighteenth century, despite its mercantilistic ambitions, the Kingdom of Naples usually exported commodities and raw materials such as olive oil and timber and imported intermediate and finished goods such as wrought iron and steel as well as luxury items such as glasses and silver. See Salvemini 2000; De Matteo and Ciccolella 2021, 12; Ciccolella and Guenzi 2012, 73; Mafrici 2010, 457-458. About the exportation of products from the Sila plateau see Di Vittorio 1969, vol. I, 18, 24, 67 and 279.
[626] About timber exploitation see Galanti 1794 vol. III, 225 and 330 and Fiore da Cropani 1691 vol. I, 281. About the fleet's strategic commercial role see Mafrici 2010, 451-452.
[627] See Galasso 1980, 198-201. Also see the information reported in the previous chapter.
[628] Russo 2013.
[629] Pezzi 1991, 15.
[630] Rao 1992, 310.

and raw and fabricated timber purchases. These were primarily utilised for construction purposes, public works (e.g., public buildings, bridges) and domestic housing, using the insulating quality of wood for wall cladding.[631] Handcrafted wood planks were in exceptionally high demand by the local construction sector, a trend that steeply increased after the devastating earthquakes of 1767 and 1783.[632] A second essential use of local timber was the construction of small boats – known as *feluche* – suitable for the region's precarious harbour infrastructures, such as the ports of Amantea and Crotone.[633] Finally, the construction of a hydraulic sawmill in 1791 accelerated timber exploitation in the region, with productive ups and downs.[634] Although different types of locally-handcrafted wood utensils were present in any household, the eighteenth century saw a proliferation of luxurious items such as religious statues and altars as well as musical instruments.[635]

Naturally, the intensive utilisation of local timber was indissolubly linked to pitch extraction from larch pines, a fruitful business for the state, which taxed both the rights of incision as well as its commercialisation. By 1691 at least 25 ovens were processing the resins extracted from larch pines into pitch – twenty producing black pitch and five white pitch, respectively.[636] Both varieties could be simultaneously extracted through a practice known as *abauzare*. The white pitch was obtained by notching tree trunks at 6 or 7 palms of height (known as *intaccatura*) and letting the trees resins flow down the notch after carving a smaller incision above it. This latter process was also known as "refreshing" (*rinfrescare*) as the resins solidified and thickened in contact with air.

This process was carried out between the spring and the summer season and lasted for two years. The solid white pitch was used for pharmaceutical purposes or the crafting of soaps, while the liquid pitch was distilled in an alembic still and turned into a white spirit useful for the paint industry. Conversely, the black pitch was obtained by carving a ten palms deeper hole in the tree trunk and

[631] See Altomare 2013, 63-67. About the architectural trends utilizing wood as a natural insulator see Ennos 2020, 164.
[632] About these two earthquake episodes see Galasso 2011, 82. About the utilisation of local timber after the earthquakes see Valensise 2003, 126-127.
[633] About the construction of *feluche* see Altomare 2013, 64-65. About the precarious port connections see Mafrici 2010, 458.
[634] About the construction of the hydraulic saw see ASN, *Delegazione della Regia Sila*, bus. 21, fasc. 79. About wood production indexes see ASN, *Delegazione della Regia Sila*, bus. 21, fasc. 79 and 146.
[635] About domestic utensils see Altomare 2013, 67-69. About luxury items see Altomare 2013, 70-72; Borsetta 2013.
[636] Fiore da Cropani 1691 vol. I, 280.

extracting resinous pieces of timber that were later processed in ovens to separate the resin.[637] Despite being a secondary product of local arboreal species, the black pitch was essential for military and commercial shipbuilding, especially after admiral John Acton's mid-eighteenth century expansion of the Kingdom's fleet.[638]

Just like during Roman times, these processes could permanently harm or annihilate local arboreal species, heavily contributing to deforestation and woodland clearing. In 1695, abbot Giovan Battista Pacichelli described cleared portions of the plateau's woodlands as trees were chopped and burned down for pitch extraction.[639] However, as demonstrated by the expansion of this activity in the following century, the potential economic revenues and developmental promises deriving by pitch extraction seemed good enough reasons to pursue intensive exploitation. According to estimates, these generated average revenues of 3,000 ducats during the last two decades of the eighteenth century.[640] The local sector was particularly active in Policastro, headquarter of a factory active at least since the seventeenth century, producing about 1,219 quintals per year, a large portion of the plateau's total production.[641] By 1798, bark etcher Giuseppe Maria Alfano confirmed the relatively thriving production of pitch, reporting the extraction of almost 10,000 quintals from the plateau's woodlands.[642] The processed pitch was then sold domestically for 11 *carlini* per *cantàio*, while between 13 to 14.5 abroad, generating a total revenue of over 3,000 ducats per year.[643]

The combination of intensive agriculture and extractivism did not necessarily fulfil the development dream envisioned by enlightened thinkers. The main issue was the lack of appropriate socioeconomic reforms, as wealth concentrated in a few affluent landowners who expanded their political influence. They justified their privileged conditions by pleading allegiance to the national common good and appropriating some of the reformist discourses of state functionaries such as Grimaldi and Galanti.[644] As both new and old feudal families continued to control the region, lack of social mobility curbed demographic

[637] See Nicola Venusio's remarks in Parco Nazionale 2008, 34 and Gangemi 2007, 41.
[638] Romano 1962.
[639] Pacichelli 1695 vol. II, 249.
[640] See Ostuni 2004, 18; Galanti 1786 vol. II, 283.
[641] Cosco 2010, 71.
[642] Alfano 1823, 178.
[643] A *cantàio* was a measurement unit roughly equalling a hundred kilograms. About pitch prices see Ostuni 2004, 18-19.
[644] See Pignatelli 1782, 23, 76-81 and 106-110.

growth and disincentivised productive innovations.[645] On the other hand, such a monolithic social scenario favoured feudal landowners, who continued to increase their profits by speculating on the fluctuating price of goods. Paradoxically, environmental and climatic disasters boosted internal demand for primary products, turning stasis and lack of dynamism into essential requirements for profit.[646] By 1796 northern Calabria was the most economically and socially polarised region in southern Italy, with almost fifty per cent of its income deposited as feudal tax, a clear sign of unbalanced power dynamics.[647] It is presumably such a worrying figure that led Galanti to pessimistically describe local productive activities as "society's childhood."[648] However, although institutional designs went unfulfilled, wealth and land concentration enhanced socio-environmental pressures in the region. Such a pattern of economic decay and appropriation of public lands meant the worsening of the Sila litigation, as ecological devastation and the dissolution of traditional material relations marked the plateau's transition towards modernity.

Chopped Forest, Arsons, and the Sila Litigation

The massive exploitation of the plateau's natural wealth initiated during the eighteenth century was responsible for significant increases in ecological pressures. Although developmental debates promised economic fulfilment to everyone willing to embrace modernisation, unfavourable climatic conditions and constant land conflicts displayed a society still dominated by the fatal combination of natural forces and feudal privileges.[649] As local farmers strived to guarantee daily subsistence, environmental hazards such as fires and deforestation increased outreach and intensity.[650] As observed by recent analyses, more than reducing the total surface of local woodlands, deforestation trends involving the whole south of Italy during this period mostly carved gaps within dense woodland environments or disrupted marginal areas. Thus, while these processes rarely destroyed entire forest environments, they dramatically weakened the ecological balance of several

[645] While the Kingdom's overall population more than double throughout the eighteenth century, the total population of Calabria grew by just 30 per cent, reaching less than 800,000 inhabitants by the turn of the century (see Rao 1992, 330).
[646] About this pattern see Placanica 1985a, 71.
[647] See Pellicano Castagna 1978, 11-14.
[648] Galanti 1794 vol. II, 575.
[649] About the concept of a society still dominated by natural forces see Lepre 1981, 40.
[650] See Placanica 1985a, 79.

regions, heightening the risks of soil erosion and natural catastrophes.[651] Such a trend meant the progressive decline of customary practices and traditional usufruct concessions, further accelerating the enclosure of domain lands. Furthermore, as wealthy landowners claimed the largest share of Sila's natural wealth, social oppression and economic hardship led local commoners to abandon their traditional sources of livelihood, pursuing the dream of land ownership and intensive farming instead. While such attempts usually did not improve their livelihoods, they certainly accelerated forest clearing processes through the proliferation of arsons.

Aside from the description of the chopped trees left by Galanti and other observers, documentary evidence demonstrates a total of 138 trials in Sila between 1721 and 1805 related to illegal arson in local woodlands.[652] These mainly included local citizens and religious institutions accused of using fire to clear portions of the forest. Such a task served to either illegally enclose common lands or expand existing *defesae*. The combination of misery and institutional corruption increasingly pushed people to clear the forest to guarantee daily subsistence. Arson and forest clearing significantly intensified after the 1763-64 wheat shortage and introduced the already mentioned *terratico* tax. Both measures led local inhabitants to push themselves beyond the borders of traditional arable lands.[653] The result was a gradual occupation of lands usually deployed to animal farming and other traditional customs, which contributed to the clearing of woodlands and the growth of the local timber industry.[654] In particular, the geo-strategic piedmont position of Cosenza and a weekly grain market made local inhabitants the main protagonists of deforestation episodes.[655] Given the intricate overlap of personal and social reasons, institutions usually overlook these processes. Instead of implementing the prescribed punishment, they usually agreed on symbolic penalties that could not compensate for the actual damage.[656]

In 1773, canon Nicola Venusio demonstrated the complex interplay between arson, deforestation, pitch production, and regional agriculture

[651] Galasso 2011, 63.
[652] About htese tials see ASN, *Delegazione della Regia Sila* bus. 14-22.
[653] Ostuni 2004, 46.
[654] About this process see Placanica 1985b.
[655] See Gimaldi 1785, 30.
[656] According to a 1735 decree promulgated by Giovanni Brancaccio, illegal arsons in domain lands should have been punished with 1,000 ducats fine and five years reclusion (ASN, *Delegazione della Regia Sila*, bus. 19, fasc. 5). About this process see Ostuni 2004, 30-37.

expansion. According to Venusio, the people willing to seize control of the plateau's woodland territories for agricultural purposes often justified their actions as a practice to favour forest regeneration in territories where local arboreal species had been carved for the extraction of their resins. As a result, instead of waiting for the tree trunks to dry and slowly die – a process that generally took about a decade – they indiscriminately cleared these lands with fire. Decomposed tree trunks and arboreal ashes were utilised to fertilise the ground and plant crops. Thus, the forceful enclosure of domain lands produced social and ecological implications, damaging surrounding arboreal species and impairing proper fertilisation processes.[657] Venusio's statement echoed judge Giuseppe Zurlo's preoccupation with the endogenous pitch production system's role in the spoliation of the local forest. Zurlo described these issues in a detailed report to John Acton. Pitch producers were renters that received state concessions during public auctions. They secured benefits for five to six years and sublet them to local contractors, who should return a fixed number of barrels (800 to 1,000 per year).

Due to the high competition rates of this enterprise, tenants could set very advantageous conditions, forcing contractors to vigorously notch a significant number of old trees to extract the precious material. In many cases, tenants carved many secular pines without meeting the agreed imports and went out of business before the end of the contract. Among the causes of premature business interruption Zurlo also detected the lack of sufficient know-how of local workers who notched incisions in higher parts of the trees, neglecting resins lying in the lower parts of the trunks.[658] This information is also confirmed by the lack of specialised entrepreneurs in the local pitch business and a relatively rudimentary division of labour between tree etchers and oven workers.[659] No wonder that by the 1770s, the Kingdom of Naples imported pitch from Russia and the Americas, preferring it to Sila's endogenous production. Volatile production rates and the complex bureaucratic infrastructure where private interests and state protectionist policies dramatically overlapped justified such a preference.[660] The inefficiency of local transportation networks also contributed to increasing the prices.[661] All these reasons led Zurlo to call for the reduction of taxation and the

[657] Quoted in Parco Nazionale 2008, 38-39.
[658] See ASN, *Delegazione della Regia Sila*, bus. 8, fasc. 15.
[659] Ovens' owners were normally local farmers who launched themselves in the pitch business on a seasonal basis (Placanica 1985a, 348-350).
[660] Placanica 1985a, 354-355.
[661] Gangemi 2007, 42.

better involvement of the plateau's inhabitants in the industry. These were essential to creating more substantial incomes for the local population to stimulate a rationalisation of fire regimes and forest clearing, which destroyed the woodlands "with almost no profit."

In many cases, tenants were indeed pushed by local landowners to cut down non-resinous trees to accelerate forest clearing. In other instances, local tenants renounced extracting pitch from gnarled old trees, geographically expanding their reach to find easy to extract resins and simply cutting down unexploited individuals. During his investigation, Zurlo found that over 1.8 million tree trunks remained, half of them not necessarily linked to processes of pitch extraction. This indicated a generalised will to quickly clear the forest to open new agricultural fields, even beyond woodlands destined for pitch extraction. As the state-enforced coercive measures to guarantee control over local tree species for industrial purposes, farmers and land tenants increasingly grew to regard woodlands as a hindrance to daily subsistence, favouring intensive agriculture. According to Zurlo's calculations, if such intensive yet low-profit activities progressed in full speed and capacity, they would lead to the extinction of the local forest within less than half a century, considering that each functioning oven could process the pitch extracted from between 13 and 14 thousand trees.[662] Zurlo's fears linked to the destruction of local forests echoed widespread concerns all over the European continent. Policymakers and economic elites expressed fears over the energy supply needed to sustain increased population rates and attempted to adjust their bureaucracies according to these needs.[663] While in some instances, such discourses epitomised either miscalculation or deliberate manipulation of public discourse, they also resulted from increased deforestation trends in the whole European continent.[664] However, while other energy sources progressively replaced wood in industrialising countries, in economically marginal regions such as the Sila plateau, deforestation increased proportionally to the need to convert new lands to subsistence agriculture and exploit local timbers.[665]

[662] See ASN, *Delegazione della Regia Sila*, bus. 8, fasc. 15.
[663] See for example Warde 2006 and 2007; Knoll 2006.
[664] About the utilization of this argument for political purposes see the great *Holzmangel* or *Holznot* debate in Germany (Radkau 1983, 1986 and 1996).
[665] About the progressive demise of wood for energy and construction in industrializing European countries see Malanima 2009, 56-63 and Ennos 2020, 187-2003. About the utilization of timber in Calabria after the industrial revolution see D'Alfonso 1913.

As a result, the massive increase of illegal arson aimed at privatising domain lands marked a significant watershed in the environmental history of the Sila plateau. During the previous centuries, intermittent demographic strains and forest clearings had caused localised ecological damage. However, detrimental impacts had been contained by ecological self-remediations propelled by periodical climate change and human decay. Just like in other parts of the world, forest clearings had primarily involved lower vegetation belts mostly covered by coppiced broadleaf trees, renowned for their capacity to improve soil fertility and regrow sturdier seedlings after the cut.[666] Thus, although pollen records demonstrate that European forest covers still shrank considerably since the Early Bronze Age, one could realistically maintain that the combination of climatic changes, epidemics, forest management, and broadleaf trees' resilience had mitigated the impacts of deforestation.[667] Conversely, despoliations initiated during the eighteenth century ignited a process of systematic anthropisation even in higher forest belts that would only be interrupted after the abandonment of internal areas in the mid-twentieth century.[668] This statement also finds confirmation in recent geoenvironmental models, documenting unprecedented deforestation rates since the mid-eighteenth century.[669]

Enhanced anthropogenic pressures naturally coincided with a generalised worsening of the Sila litigation. The reason lay in timely historical transitions and the monarchy's ambiguous institutional design. While the access to customary norms was increasingly restricted, the low-income regime destined to pieceworkers toiling on feudal lands did not stimulate in any way economic and demographic growth, creating a vicious downward cycle.[670] Once again, such a process reflected the ambivalence of national policies and their controversial relation with powerful landowners, a complex entanglement of extractive and agricultural interests.

On the one hand, the Bourbons attempted to legally prosecute illegal arsonists and carving of local arboreal species, as witnessed by the proliferation of trials. This was part of a state strategy to strengthen the Crown's jurisdictional grip over its territories. On the other hand, they often overlooked illegal

[666] Ennos 2020, 246-253.
[667] About deforestation trends in Europe see Roberts et al. 2018.
[668] About this process in Sila see Ostuni 2004, 49.
[669] See Iovino and Nicolaci 2016, 282.
[670] See Cozzetto 2001, 90-91.

enclosures of common lands and woodland arsons, primarily when carried out by affluent local landowners. While this class embodied the liberal doctrine of free markets and privatisation, its rise to prominence was also endorsed by the monarchy that since the 1750s conferred the title of nobility to several emerging families.[671] These measures also mirrored physiocratic ideas that equalled woodlands to underdevelopment, encouraging their conversion to agriculture as in developed countries such as England, France, Germany, Holland, Spain, and Portugal. In Sila, Gregorio Lamanna epitomised such ideals. He considered the development of a modern agricultural sector as "the only tool to sustain and increase [the local population]."[672] Thus, despite the negative demographic trend that invested the plateau until the late eighteenth century, expanding agriculture and the social conflict between landowners and farmers increased deforestation trends significantly.[673]

A crucial episode was the large-scale expropriation of ecclesiastic lands and the creation of the so-called Sacred Fund in 1784. This measure allegedly aimed at reducing widespread misery by fragmenting ecclesiastic lands into smaller possessions while also replenishing national accounts with retail revenues.[674] However, while feudal barons were excluded from the possibility to ransom these lands, they could still use their inheritance to rent them in the absence of higher bidders perpetually. Moreover, most of the grounds were depreciated by the monopolistic pressures of affluent urban families, who often purchased them for less than their original price. For example, in Catanzaro, about sixty-five per cent of the available territories were purchased by the top ten per cent of total buyers, all from the city's patrician class. Both in the surroundings of Catanzaro and Crotone, acquiring ecclesiastic lands usually coincided with the expansion of wheat crops.[675] As summarised by Giuseppe Spiriti, "this operation, in itself potentially very useful for our people, has become the source of their miseries and will soon become the instrument of their complete ruin."[676]

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[671] Rao 1992, 327-328.
[672] See Lamanna 1783, 18-22. About the rise of physiocratic ideals in the Neapolitan Kingdom see Oldrini 1970.
[673] About the negative demographic trend see Placanica 1976, 103-114.
[674] See Placanica 1970.
[675] About irregularities in the purchase of lands from the Sacred Fund see Placanica 1970, 150-167; Puca 1992 414-415. About land divisions see Placanica 1979.
[676] Spiriti 1793, 96.

Just like the Sacred Fund did not manage to curb land grabbing and environmental devastations, often-inconsistent institutional behaviour weakened other similar institutional initiatives. For example, in 1791, the monarchy appointed the already-mentioned Giuseppe Zurlo to produce an inquiry on land distribution in Sila. Zurlo's meticulous work constituted the most detailed mapping of local domain lands and the different types of customary norms that local communities could exercise.[677] The inquiry – also known as the *Sila Code* – drew a dramatic picture of the plateau's multiplying land grabbing and deforestation phenomena. According to his findings, the various legal measures promulgated to contain abuses had essentially nullified each other, turning the plateau into an "inexplicable mystery."[678] Predatory landowners and corrupted local controllers – the already-mentioned *baglivi* – were responsible. These were substantially uninterested in stopping the illegal enclosing of common domain lands, as long as trespassers continued to pay an annual usufruct tax to them and a wood logging tax to the state.[679] Local corruption and the lack of appropriate developmental plans were responsible for the plateau's economic unproductivity. The result was a dynamic where "local citizens would have already abandoned these lands if the lack of any other territory had not forced them to make the best of them."[680] In this context, echoing the modernising ambitions of the time, Zurlo proposed the abolition of domain lands and their allotment according to their aptness for agriculture.[681] A better territorial rationalisation would, in turn, allow human settlement on the plateau's unhospitable uplands, spurring economic development.[682] Such a proposition echoed the main concerns of several state functionaries who had strived to solve the conundrum of land distribution and forest management in Sila during the late eighteenth century.

Zurlo's declarations picked up the baton from inquiries of openly Jacobine influence.[683] In line with the progressive claims of reformist members of the

[677] Two other efforts were carried out by Giovanni Danero (1782) and Vincenzo Dentice (1789). These were all commissioned by Secretary of State John Acton who aimed at exploiting the woods of Sila in order to re-construct the Kingdom's fleet (see Ostuni 2004, 57-58; Cosco 2010, 25-26).
[678] See ASN, *Delegazione della Regia Sila*, bus. 8, fasc. 15.
[679] See Ostuni 2004, 27-28.
[680] Zurlo 1866 vol. I, 250.
[681] See ASN, *Delegazione della Regia Sila*, bus. 8, fasc. 15.
[682] About the association of feudal social structures and demographic patterns see Ciasca 1933, 454.
[683] Jacobins were a political movement which primarily led the French Revolution (1789-1799), but also inspired intellectuals and lawmakers all over Europe, Russia, and the United States. In broad terms, Jacobins advocated interventionist liberal policies to dismantle traditional feudal societies (e.g., secularism, landownership reforms, social mobility, economic modernisations). See Furet 1989.

European burgeueoise, he saluted the abolition of customary practices as an essential step to accomplish economic development through agriculture and private property. However, unlike intellectuals such as Giuseppe Spiriti and Domenico Bisceglia, Zurlo did not champion local landowners' rights to privately own portions of the plateau – the already-mentioned *defesae* – but instead questioned the truthfulness of usufruct concessions. Conversely, he maintained that the wisdom of stimulating the local economy through modern practices seemed a judgement call. The main reformist challenge lay in devising strategies to develop small land ownership. In practical terms, this meant redesigning the borders of domain lands and then redistributing smaller land plots among the local population. Such a set of measures would curb agrarian monopolies on the rise and allow the development of local agriculture. Moreover, granting a small share of local timber resources to the local population would also preserve the state's interests.[684]

Zurlo's wishes seemed to be fulfilled one year later, with the promulgation of *Praxis XXIV: De Administratione Universitatum*, a set of laws formally abolishing universal domain lands all over the Kingdom of Naples to encourage the "better flourishment" of local agriculture.[685] However, legislative actions were not followed by appropriate implementation measures, demonstrating the inefficacy of formal legal provisions in contrasting the territorial control of local landowners.[686] Such a dynamic exacerbated regional jurisdictional conflicts, depriving local communities of their primary means of sustenance. As traditional customary practices such as cattle farming and wood gathering vanished, national and local institutions did not provide viable alternatives, fuelling economic misery and social discontent.[687] In contrast to Zurlo's hopeful designs, the lack of institutional control further incentivised the illegal occupation of domain lands, demonstrating the naivete of the reformist plans proposed by state intellectuals.[688] As the *Sila Code* disappeared in the meanders of local archives, agrarian monopolies expanded propelled by the material power of crops such as rye, maize and later on potatoes. By the turn of the century, a widespread food crisis in the Kingdom of Naples turned the region into one of the critical hotspots for crops

[684] About these challenges see Ostuni 2004, 57-64.
[685] Zaccagnini and Palatiello 1984, 15.
[686] See the reconstruction of Environmental Minister Carlo Afan de Rivera in 1828 (17-19).
[687] About this issue see Rao 1992, 384-385.
[688] See Villani 1962, 277.

supply. Although these historical convergences spurred the development of the local agricultural sector, increased food prices primarily benefitted large landowners.[689] The rebellious instances promoted by the French revolution all over Western Europe further compelled the state to abandon reformist designs and nurture local elites' consensus.[690] The result was a steep intensification of banditry in the region during the late eighteenth century, a phenomenon that led to a dramatic average of 890 murders per year.[691] Naturally, the combination of increased crop prices and banditry also contributed to accelerating deforestation trends. Aside from clearing portions of the forest for farming, institutions justified deforestations to drive bandits out of their hideouts and enhance the safety of travels across the region.[692]

While the impacts of the French Revolution were not particularly tangible in the region, the subsequent French occupation in the early nineteenth century (1805–15) played a significant role in exacerbating local socio-environmental issues. From a material and institutional level, the so-called 'Napoleonic decade' accelerated the demise of traditional customs, leading to the dissolution of millennial-old ecological niches built through the mutual interaction of humans and nature. As its political reforms formally abolished the feudal system all over the Kingdom of Naples – the so-called *eversione della feudalità* – feudal domain lands were officially abolished and sold to the highest bidders in public auctions.[693] While this design strived to allow the whole population to own portions of the plateau, it exacerbated existing social tensions and accelerated environmental devastation.[694] As wealthy landowners quickly bought back their lands, intensive extractive activities and traditional customs clashed in the context of lands destined to municipalities.

Conversely, small land portions assigned to local farmers were often clayish territories that could not be adapted to agricultural production without expensive hydro-engineering work. These unfavourable conditions forced them to sell to

[689] Caldora 1960, 14-19.
[690] Pezzi 1991, 16.
[691] See Rao 1992, 386-395.
[692] Gangemi 1997, 74-75. For documentary evidence of this process see official documents from the municipality of Caloveto, province of Cosenza, which explicitly requested to diminish its neighbouring forest covers, as they were used as "shelter by all the wrongdoers and raiders" (ASC, *Affari Interni – II Ufficio, Affari Forestali*, bus. 1, fasc. 7). About organised banditry in the whole region of Calabria throughout the nineteenth century see Scirocco 1991.
[693] Lombardi 1885, 84.
[694] About these effects see Petrusewicz 1996; Cappelli 2020, 240-241.

wealthy landowners after a couple of meagre harvests.[695] Moreover, the attempt to populate the plateau's highest peaks with the creation of five villages ended up with the sale of a vast portion of these lands to nobles, as peasant families were discouraged by the lack of infrastructures and the harsh environmental conditions during winter times.[696] Families such as Campagna and Barracco implemented intensive agriculture and animal farming and built patrolling posts to protect their newly acquired *latifundia*.[697] While such an enterprise created a profitable proto-industry in the region, it aggravated socio-environmental issues.[698]

Such a condition created a generalised sense of social dissatisfaction epitomised in the dramatic conditions of a large portion of the local population. According to historical estimates, over ninety per cent of local inhabitants lived precariously and well below the national average.[699] The decline of the local pitch industry by the early 1810s also contributed to the disappearance of another reliable income source, despite its already-mentioned inefficiency.[700] This generalised misery resulted from the violent anti-French widespread reactions and social conflicts opposing Masonic landowners and the local population led by the first revolutionaries members of the so-called *Carboneria*.[701] In some instances, these social issues again culminated in brigandage actions, headquartered in the plateau's remotest forest retreats, creating yet another valid reason to clear local forest covers.[702] Once again, traditional customs characterising material life such as wood gathering and forest farming clashed against extractive uses and agriculture. In this context of jurisdictional uncertainty, state institutions seemed to favour rotation agricultural regimes and forest clearing for industrial development, limiting traditional customary rights.[703] A survey conducted during the French decade drew a highly negative picture of agriculture and animal

[695] Gambi 1978, 191.
[696] About this reformist design see Caldora 1960, 179-184 and 205-210.
[697] Lopetrone 2020, 254-256. During these times, valuable *merinos* sheep breeds were also introduced in the region, in order to stimulate the rise of profitable animal farming activities (Cirillo 2012, 158).
[698] Intrieri 1991, 152; Pappalardo 2004, 42.
[699] See the estimates by Villani 1978, 159.
[700] See Martucci 1996, 188.
[701] About the beginning of *Carboneria* in Calabria see Greco 1872, 415-460. Also see Greco 1866; Cortese 1953-1954 Mastroberti 2018, 160.
[702] About the civil war in Calabria during the Napoleonic decade see Mozzillo 1972 vol. I; Barra 1981; Finley 1994; Puca 1992, 417-428. About the related deforestation process see Gambi 1978, 354. About social discontent see Mastroberti 2018, 152 and 159.
[703] See Gallo and Iovino 2000, 292-293.

farming in the region, described as backwards and with little room for self-improvement given the ancient techniques and tools utilised by local farmers.

Moreover, while the woodlands of Sila shrank under the weight of these unprecedented pressures, legislative measures passed by the government between 1810 and 1811 actively worked only to preserve arboreal species with a high market and construction potential.[704] As a result, by the time the French occupation ended, common domain lands had been almost wholly privatised all over the Kingdom of Naples. As argued by Giuseppe Galasso, the Napoleonic decade was the culmination of a long historical process, explicitly manifesting the progressive loss of power of municipal institutions.[705] The loss of institutional power had also paired up with commercial isolation since the permanence of Sicily in the Bourbon Kingdom cut Calabria out of key Mediterranean trade routes, accelerating the conversion of local woodlands into cultivated fields to meet subsistence demand.[706] Thus, paradoxically, the French institutional effort to solve the Sila litigation ended up aggravating it to an irreversible extent.

Natural Hazards and the Demise of a Woodland Civilisation

The Bourbon restoration period (1816-61) was a defining moment in the plateau's ecological history. Although the monarchy advocated the defence of customary rights and policies to fight deforestations, local initiatives promoted by religious and private actors incentivised agricultural regimes in upland territories and the local manufacturing sector.[707] Because the region could not count on advanced manufactures, all the productive and economic improvement efforts carried out during these times were uniquely directed towards increasing local agricultural output. As maintained by economist Andrea Lombardi, despite the modernising efforts and political reforms promoted over the last decades, local manufactures were at best "stationary" if not "backwards."[708] Such reforms went hand in hand with vigorous demographic growth for the first time in three centuries and the expansion of farmed areas to the expanse of local woodlands.[709] While data on the

[704] See Iovino and Menguzzato 2002.
[705] Galasso 2012, 130.
[706] About the economic and environmental consequences of the region's commercial isolation during the Napoleonic decade see Cozzetto 2001, 272; Pappalardo 2004, 42; Colletta 1951 vol. II, 364.
[707] See Matarese 2002, 76-77 and Cozzetto 2001, 280.
[708] Lombardi 1836, 47.
[709] During the first half of the nineteenth century, the southern Italian population registered an overall demographic growth of almost two million people (roughly from 4.9 to 6.8), in contrast with the discontinuous patterns of the previous centuries (see Del Panta et al. 1996, 277).

diminishment of forest covers during the first half of the nineteenth century is incomplete and contradictory, social injustice went hand in hand with environmental devastation.[710] Multiple anthropic and non-anthropogenic factors played into this scenario. As the population increased from about 40 to over 60 thousand due to positive climatic trends and improved agricultural outputs, local maquis and upland forests close to inhabited centres were wholly converted into arable fields for crop production.[711] These territories became renowned as *monti frumentari* – literally, "grain mountains" – a term that echoed their novel function as breadbaskets.[712] The conversion of local forest covers into arable territories was typically carried out through intensive fire regimes, which created initial benefits given the fertilising effect of ashes, increasing productivity indexes from 1:4 to 1:12. While fire fertilisation practices had existed since the Bruttian people – the already-mentioned *cesina* – their unprecedentedly exponential scale accelerated the risk of soil erosion. The systematic fertilisation of local soils with ashes meant the accelerated exhaustion of cycling nutrients, surface runoff, sediment transport, mineralisation of organic matter and other side effects that could transform fertile fields into wastelands.[713] Intensive farming exacerbated these issues, as both soils planted with rye and potato fields would ideally demand at least one year of rest every two or three years, given their demand for nutritional microorganisms.[714] Aside from increasing soil sterility and propelling the formation of barren lands, this process disrupted the delicate balance of local agro-pastoral systems. Deforestations and the increase of farmed fields, combined with the lack of adequate soil management countermeasures, accelerated the risks of food security issues.[715] These were particularly pronounced in years of crop

[710] About contradictory sources see Gangemi 1997, 79-80. About the lack of available data for the provinces of Calabria see Palmieri 2012, 18.
[711] Roughly by the mid nineteenth century, the Little Ice Age came to an end and glaciers began to retreat all over the world as global temperatures progressively increased to current standard (an estimated 1° C excursion). About glaciers' retreat see Slater 2021. About temperature rise see; Xiaoyan et al. 2004; Hansen et al. 2006; Huang et al 2021.
[712] About deforestation and grain mountains see Gallo and Iovino 2000, 295-296. For demographic data of the time see Izzo 1965.
[713] About these processes during these times see Gangemi 1997; Dimase and Iovino 1996. About the biological impacts of uncontrolled arson in the region see Terranova et al. 2009; Settinieri et al. 2018. For a general review on the impacts of fire on forest soils see Ice et al. 2004; Verma and Jayakumar 2012.
[714] Grimaldi 1845 vol. II, 110.
[715] The main proposition was the implementation of artificial lawns for stabling and pasturing, just like in northern Italy, to optimise reduced farming spaces. These were however implemented only since the late nineteenth century (Tommasi 1875, 16).

failure, as witnessed by the famine episodes of 1816-17 and 1843, which worsened social turmoil.[716]

Cultivated fields in upland areas were also more exposed to atmospheric events, as heavy rain volumes could easily wash away layers of fertile humus carrying it downslope. This phenomenon modified the flow of the already sloped local watercourses, aggravating risks of environmental hazards such as floods – known as *fiumare*. The increased volume of watercourses also accelerated overflows and the formation of swamps in downstream coastal regions.[717] Overall, during the 1820s, northern Calabria already accounted for over 3,700 swampy lands and 3,000 more subjected to temporary floods and river overflows.[718] Naturally, the increased energy supply needs of a rapidly growing population also accelerated deforestation rates. Deforestation for domestic consumption was particularly encouraged, as insufficient local road networks could not effectively allocate all the timber extracted in Sila on the local market.[719]

As woodland areas turned into "grain mountains," issues between the local population and landowners led to multiple alarms about the socio-environmental threat of deforestation and privatisation.[720] An emergent actor signalling this growing threat was the already-mentioned Economic Society of Calabria Citra.[721] Despite its active role in developing the local agricultural sector, this organisation also understood the socio-environmental implications of intensive deforestation phenomena stimulated by the expansion of large agrarian monopolies, a process that recent administrative reforms had not managed to stop.[722] Carlo Afan de Rivera, the Crown's General Director of Bridges, Roads, Wates, Forests and Hunting – a charge roughly equalling that of a Minister of the Environment – echoed these concerns.[723] In an 1828 relation, de Rivera remarked on local socio-environmental issues, proposing the plateaus' reintegration among domain lands and the restoration of customary norms to help local populations who "could almost not survive without these uses."[724] He also calculated the total amount of illegally

[716] Assante 1988, 62.
[717] See Gangemi 2007, 40.
[718] ASN, *Ministero Affari Interni*, II Inventario, bus. 4074.
[719] Iovino and Nicolaci 2016, 284.
[720] See Greco 1865.
[721] About the alarm launched by the Economic Society of Calabria Citra see Cozzetto 2001, 275-281; Intrieri 1991, 152-154.
[722] Pappalardo 2004, 34.
[723] This state organ was initially instituted in 1809 under the Napoleonic rule, inspired on a similar organ already existing in France (see de Mattia and de Negri 1988).
[724] de Rivera 1828, 7.

seized lands between 1792 and 1828, estimating it to about 24,000 *tomolate* and explicitly linked deforestations with the increase of extreme ecological events such as landslides and floods.[725] De Rivera reiterated Such concerns in an 1832 essay where he suggested strategies to manage the Kingdom's natural resources. In describing the Sila plateau, he came back to the issue of hydrogeological disorders in the region, which had transformed local water streams flowing downhill into "furious brooks."[726] These were naturally the result of relentless deforestation processes, which had led to timber scarcity and the creation of large estates.[727] However, despite his efforts contributed to the formulation of laws aimed at formally restoring traditional property rights, more vigorous means seemed to be needed to solve the legal and political intricacies of the Sila litigation.[728] The multiple alarms launched by intellectuals led King Ferdinand II to visit the region in 1833, where he could witness first-hand the appropriation of the plateau's domain lands and its socio-environmental consequences.[729]

A cause and a consequence of these events was the creation of the Civil Commissariat for the Affairs of Sila in 1838, an organ originally proposed by Zurlo, with the function to oversee and mitigate growing social conflicts.[730] The creation of this organ was a timely measure, considering the increasingly heated social scenario that led to an "anarchy strike" in the region, peaking in the demonstrations and land occupations of 1838 and 1843.[731] The intendant of northern Calabria went as far as to describe the local movement as a "giant mass of ravenous and heinous mountaineers" who would not have "avoided any excess" if deprived of their essential means of subsistence.[732] Such fierce behaviour was justified by the increasingly monopolised agrarian panorama in the plateau allegedly common lands as revealed by a territorial survey carried out during these times and the corruption of public officials to cover up abuses.[733] Out of three

[725] A *tomolata* was a unit measure for agrarian surfaces: each *tomolata* could be sowed with a grain volume of about 50,5 litres. About these estimates see de Rivera 1828, 20 and 52-53.
[726] de Rivera 1832 vol. I, 14-15.
[727] de Rivera 1832 vol. II, 46.
[728] About some of these legal measures see Barletta 1864 vol. II, 34-37.
[729] Pezzi 1991, 62.
[730] For a chronology of the Commissariat's main actions see ASN, *Ministero delle Finanze*, fasc. 11706, "Corrispondenza tenuta col Commessario Civile dall'anno 1838 al 1850," vol. I-IV. Also see Basile 1989.
[731] See ASN, *Ministero di Polizia*, fasc. 2298, vol. III-IV. For a general picture also see Intrieri 1991, 159.
[732] ASN, *Ministero delle Finanze*, fasc. 11707, vol I. Also quoted in Mascia 1973, 10.
[733] About territorial surveys see ASN, *Ministero delle Finanze*, fasc. 11707, vol. I; ASC, *Demanio Silano*, fasc. 135, bus. 1006. About the corruption of public officials see the episode involving architect Giacomo Guarinelli and the Ministry of Fincnace Francesco Paolo Ruggiero reconstructed

commissioners nominated between 1838 and 1861, Domenico Paragallo and Pasquale Barletta acted with vigour and conviction, favouring local populations. Most notably, they brushed up Zurlo's inquiry, long forgotten in the maze of national archives, in the attempt to reinstate customary norms in illegally occupied domain lands. While they managed to rescue thousands of hectares from illegal occupation, by the late 1840s, only about one-fifth of the plateau's lands were still destined for collective use.

Moreover, the liberal tendencies aligned with the peninsula unification design further fuelled the conflict. As the bourgeoise pushed for the end of the monarchy, farmers reacted against the potential threat posed by this revolutionary movement on already vanishing customary rights.[734] Such a heated social scenario culminated in the exponential mobilisations of 1848, where armed contingents forcefully occupied enclosed domain lands.[735] Although state interventions managed to contain these movements, Pasquale Barletta admonished over the risks of an imminent Civil War, as local inhabitants were "ready to occupy the lands once the first snows melt."[736]

Political and jurisdictional controversies resulted in steep deforestation and hydrogeological disorders. As the Sila plateau's forest covers diminished in number, local soils became more sterile and could not effectively absorb rainwater. Lack of absorption capacity ignited floods and landslides that reached an unprecedented degree of intensity, crushing both uphill and downhill farmed lands and damaging key crops for daily subsistence.[737] In 1812, the Intendant of Calabria Citra lamented the increased floods in the region and described their negative impacts on upland and downhill territories. These impacts mainly included air insalubrity due to the creation of small swamps and damage to cultivated fields.[738] Not even the forest protection laws passed in 1838 and 1840 managed to stop woodland clearings, promoted by both local landowners to expand their tenures and peasants looking for free land strips for subsistence.[739] Paradoxically, converting a large portion of the forest to intensive agriculture

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by Basile 1989. Original documents tracing a chronology of this episode are available at ASN, *Ministero delle Finanze*, fasc. 11707, vol. II-IV.

[734] See Pappalardo 2004, 70-72; Basile 1958, 70-85.

[735] About the events of 1848 see Basile 1989.

[736] Barletta 1864 vol. II, 83.

[737] Marcelli 2006, 73.

[738] ASN – *Ministero Affari Interni*, II Inventario, bus. 3812, fasc. IV.

[739] Gangemi 1997, 67; Pezzi 1991.

generated negative externalities on both uphill and downhill cultivations, igniting a vicious cycle of natural hazards. These were worsened by more local earthquake episodes that hit different territories in the plateau's regions in 1832 (Crotone and Catanzaro), 1835 and 1854 (Cosenza) and 1836 (Rossano).

Although the Intendant also reassured local citizens on the rising public awareness of these issues, describing a generalised process of natural and anthropogenic reforestation, historical evidence from the following decades documents the persistence of these issues. In 1832, secretary of the Economic Society of Calabria Citra Gaetano Silvagni proposed the establishment of manufacturers in the region to stop the massive agricultural conversion of local forest covers and extreme events such as floods and landslides.[740] Such a statement primarily expressed a preoccupation with the incidence of severe natural hazards. Moreover, it also articulated the Society's ideas on the causes of social and environmental issues in the region. These mainly concerned the lack of economic alternatives to intensive agriculture and the failure to implement effective rotation techniques to prevent soil erosion, especially in the case of maize.[741] By 1845, Luigi Grimaldi observed issues linked to the irrigation of locally farmed lands since "not always waters flow in the right level."[742] In a certain sense, frequent social upheavals and popular revolts ended up accelerating these negative trends, as political instability aggravated the already inconsistent territorial control. In 1851, the inspector of Calabria Citra explicitly linked growing deforestation trends to hydrogeological disorders, as the increased deforestation phenomena had left "not even a palm of stable land," leading to multiple episodes of river overflows and the death of humans and animals.[743] These seemed legitimate concerns, considering that the estimated intact forest covers in the surroundings of Cosenza amounted to only one-third of their original surface. An even more drastic gap occurred around Catanzaro, where only about 17 per cent of the actual woodland area still presented forest covers.[744] The formation of stagnant water basins also increased the incidence of illnesses such as malaria, as efforts to drain internal water puddles proved ineffective. Drinkable water sources were also

[740] Silvagni 1832, 145.
[741] About the Society's preoccupation for industrial development see Lombardi 1836, 57-84. About rotation techniques in agriculture see Silvagni 1833, 200-201. See Marcelli 2006, 81 and 90.
[742] See Grimaldi 1845 vol. II, 19.
[743] ASN, *Ministero Agricoltura Industria e Commercio*, fasc. 392.
[744] About Cosenza see ASN, *Ministero Agricoltura Industria e Commercio*, fasc. 392. About Catanzaro see 1845.

contaminated, creating scarcity issues for daily physiological needs and agriculture among local populations.[745] As environmental devastation and social injustices seemed to link the plateau's future to an imminent communist revolution, the implementation of effective control and charge mechanisms seemed a faint hope, and social discontent surged.[746] Only the conciliatory action of Pasquale Barletta was able to maintain public order as the Commissary travelled across the region, attempting to bring justice back to the local population.[747]

Although Barletta posed the basis for the creation of commissions reassigning illegally occupied lands to the state's domains during his mandate, more significant historical turns were going to frustrate his dedicated work. The attack on customary norms initiated in the second half of the fifteenth century would culminate with the Italian peninsula's unification in 1861. Despite Garibaldi's short-lived promises to protect customary rights, the liberal elites that had supported the revolution secured governmental seats guaranteeing capitalist land reforms.[748] This phenomenon echoed a reformist political campaign that involved all Western Europe during the nineteenth century, from the Mediterranean basin to Scandinavia.[749] Whilst the historical length of conflicts such as the Sila litigation demonstrates the solidity and resilience of traditional societies against political and economic pressures, the emergence of modern capitalism determined their progressive demise.[750] In the Italian peninsula, the discordant historical trajectories of Northern-Central and Southern Italy converged in the same narrative of progress and modernisation epitomised by liberal capitalist reforms.[751] The Sila plateau was no exception to this rule, as witnessed by the worsening of socioeconomic reforms in the region since the late nineteenth century.

In legal terms, given the prolonged state of the litigation, all the actors involved could claim their legitimate rights to either customary norms or

[745] Gangemi 1997, 84-102.
[746] About the difficult implementation of control and charge mechanisms see Gangemi 1997, 103-106.
[747] Pappalardo 2004, 92-94.
[748] See Basile 1971, 470.
[749] For a general overview see De Moor 2017, 1. For specific examples see Yelling (1977) for England; Bonan (2016 and 2019), Corona (2009 and 2017), de Majo (2019) for Italy; Te Brake (1981) and De Moor (2010) for the Netherlands; Warde (2002) and Zückert (2003) for Germany; Jiménez-Blanco (1996), Lana Berasain (2008), Pascua Echegaray (2011) and Serrano Alvarez (2014) for Spain; Larsson (2012 and 2016) for Scandinavia.
[750] For information about the technological advancement of agrarian techniques and trade during industrial capitalism see Rich & Wilson 1987.
[751] Corona 2009, 96.

ownership of their private estates.[752] However, in practical terms, the combination of endogenous political reforms and exogenous factors led to drastic measures against customary rights. First, eliminating protectionist wheat imports policies exposed local producers to foreign competition. Second, increased market demands pushed local farmers, especially large-estate owners, to increase their output by expanding arable lands' surfaces and diversifying production with olive and vine trees.[753] Third, as deforested areas and former ecclesiastical lands were once again auctioned to the highest bidder, most affluent families could expand their estates.

Conversely, creating a small-medium landowner class became an unviable option. This process further increased the size of local private estates that became giant latifundium, stretching over several kilometres, especially in the province of Cosenza, where they covered about 30 per cent of the total land surface.[754] In Sila, this meant the conversion of former woodlands to industrial use, as customary norms were marginalised in favour of private property and mechanised agriculture. While the plateau's forest had sheltered and nourished local populations for centuries – and provided refuge for rebellious populations resisting land grabbing and reformism – the destruction of forest eased the plateau's assimilation within institutional apparatuses.[755] Satisfying the energy-intensive needs of the newborn Italian state also meant to optimise the exploitation of forest resources and the final dissolution of traditional agroforestry practices. Such practices had already grown in intensity and vigour since the mid-1850s before the unification of the Italian peninsula. In an 1856 relation, the same Barletta documented the growing exploitation of local arboreal species to produce coal-based fuels and their related socio-environmental impacts.[756]

Economic and industrial needs accelerated political reforms. Following an 1867 decree, local woodlands were broken down: three-quarters sold to private owners and the remaining part distributed among municipalities. This political line, strongly leaning towards the legalisation of private estates, culminated in an 1873 parliamentary relation that essentially legitimised property rights, declaring

[752] See the reconstruction by Luigi Lombardi (1885, 93).
[753] See Masi 1992, 567-568.
[754] See Masi 1992, 580.
[755] About this process along human history see Scott 2017.
[756] See Barletta 1864 vol. II, 210-214.

landowners as "not occupiers and usurpers, but the legitimate and meritorious owners of Sila since ancient times."[757] This bold declaration was followed by an 1876 law (n. 3124) that officially legitimised private estates and destined customary norms small municipal lands.[758] Such a political line condensed the new economic ideology of the time, which considered property as a rightful and exclusive use of the individual, even in the utilisation of ecological environments considered common-pool resources for millennia.[759] The few territories assigned to small tenure farmers during these times (about 35,000 ha to 15,000 families in the whole region of Calabria) were also tailored to accommodate large landowners' economic needs, containing the region's migratory exodus to keep the costs of rural labour in check.[760] Since 1886, local municipalities further cut down most of the woodlands in their jurisdiction to improve the road network built during the restoration that connected Cosenza with Spezzano and Longobucco and reached the plateau. The creation of an internal railway line complemented this effort.[761] While improved road networks rescued the plateau from semi-isolation, they further increased deforestation rates.[762]

Once again, this political line favoured the owners of large estates, as fiscal pressure curbed local enterprises and the patrolling of newly privatised lands prevented the exercise of traditional customs. However, as plains continued to be largely insalubrious and scarcely inhabited, both in the provinces of Cosenza, Catanzaro and Crotone, local inhabitants continued to occupy upland regions encompassing the Sila plateau. In this context, unequal patterns of land distribution, deforestation, and the destruction of millennial coevolutionary niches created a potentially explosive social scenario.[763] As a large portion of the local population had to resort to piecework farming in emerging *latifundium*, they were channelled into socialist labour unions and organised banditry in the worst-

[757] *Legge e regolamento sulla Sila Regia* 1877, 89.
[758] See *Amministrazione Temporanea delle Terre Silane Devolute a Cosenza e Casali*, 1879.
[759] About the development of these tendencies all over the Italian peninsula see Corona 1995, 16.
[760] Gambi 1978, 214-215.
[761] Another central road network in the region, was built in 1881. It cut the plateau diagonally from northwest to southeast for 131 kilometres, connecting Cosenza with S. Giovanni in Fiore (Bevilacqua 1985, 133). About local road networks before and after the Italian unification see also Marcelli 2006, 124-127.
[762] About these legal reforms see *Legge e regolamento sulla Sila Regia* 1877. About its effects see Intrieri 1992, 172.
[763] Masi 1992, 551.

case scenario.[764] Moreover, the local agricultural sector's lack of competitivity added a further element of social instability, subjecting local farmers' well-being to market fluctuations. A second alternative was transatlantic migrations. According to estimates, between 1876 and 1921, an estimated 968,393 people emigrated from Calabria. About 95 per cent of local immigrants left for the Americas in the hope to earn enough money to redeem a piece of land at home.[765] Those who managed to return home eventually often resumed social fights and used the economic capital acquired abroad to improve the livelihoods of their local communities.[766]

Not even the first forest law, passed in 1877, could contain the proliferation of local abuses; the conversion of local forests to agriculture was virtually the only option for local inhabitants willing to stay. As a result, between 1877 and 1907, the sole province of Cosenza lost about 43 per cent of its woodland territories, an estimated amount of 15,344 hectares. Although less data is available about the area of Catanzaro, between 1860 and 1908, woodland areas allegedly diminished by about one third.[767] The most tangible consequence of such ineffective policies was intensified hydrogeological disorders. In 1875, local intellectual Eugenio Arnoni lamented the lack of adequate measures to stem local water flows. In this context, the Sila plateau, where Calabria's three largest rivers originate (Crati, Neto and Tacina), was particularly prone to swelling during seasonal rainfalls. Arnoni bluntly argued that "no remediation endeavour" had been implemented thus far, although these were "imperatively needed!" given the frequent floods. In particular, he considered the swamping of downhill territories in the aftermath of a flood an even more lethal event than the destruction brought by "horrible torrents."[768] He also explicitly linked these events with the deforestation of large portions of the plateau, attributing particular responsibility to "those who seized and cleared public and national woodlands."[769] Similar concerns emerged among

[764] For an overall contextualisation of these causes see Gallo and Iovino 2000, 297-298. Three of the first socialist unions were created in towns surrounding the Sila plateau (Cosenza and Rogliano in 1876 and Acri in 1884). See Gambi 1978, 221 and Carvello 1981, 635-636.
[765] See Commissariato generale dell'immigrazione 1926. Also see Marenghi 1909, 693; Bevilacqua 1981, 530). In this context, the sole district of Rossano saw over 12,000 people emigrating between 1861 and 1901 (Izzo 1965). The link between regional migration patterns and land reforms is explicitly made in the agrarian inquiries carried out by Branca 1883 and Marenghi 1909.
[766] Teti 2015, 246-247.
[767] See Nitti 1960, vol. II, 114-133 and CASMEZ 1957.
[768] Arnoni 1875 vol. II, 82-83.
[769] Citation in Arnoni 1875 vol. II, 109. For a general discussion of floods, swamps and deforestation in the region see Arnoni 1875 vol. I, 33-45; vol. II, 78-120.

policymakers between the late nineteenth and early twentieth century. Finally, after centuries of similar issues, the direct link between deforestation and hydrogeological disorders was consolidated knowledge and reason for concerns.[770]

Nevertheless, similar socio-environmental issues would drag on up until the mid-twentieth century. By 1906, a special law for the region of Calabria (n. 255) first incorporated the readjustment of forest covers and water reservoirs within state functions.[771] However, its effects were nullified by the impacts of the 1908 earthquake and by the First World War. Given their contested jurisdiction among landowners and municipalities, the most badly affected territories rested between 500 and 1,200 metres. In Sila, about 20,000 hectares were deforested during these times.[772] While between 1919 and 1923, local municipalities sold some of the most depleted territories to the State Forest Agency to carry out vigorous reforestation efforts and draft the first plan for a national park of Sila, these actions were discontinuous and lacked the needed vigour.

The advent of the Fascist Regime further exacerbated deforestation trends. Indeed, the region's demographic growth resulting from the regime's interruption of emigration and the inception of birth-rate policies aggravated anthropogenic ecological pressure.[773] In this context, the region's renewed energy-intensive needs accelerated hydraulic projects to convert the plateau into a strategic hub to host hydroelectric power plants. These drew energy sources from the diverted water flows of the Neto and Tacina rivers and transformed them into "white coal."[774] A direct consequence of this action was the construction of three artificial lakes of Ampollino (1926), Arvo (1931) and Cecita (1951), flooding large portions of the plateau's valleys and accelerating the construction of small villages such as Trepidò and Lorica.[775] Moreover, the construction of hydroelectric power plants went hand in hand with the construction of sawmills that extracted local timber to construct poles for electric and telegraph wires.[776]

In addition, to accelerate economic development, before and after the onset of the fascist regime, portions of the local forest covers were sold to companies

[770] See the documentation on landslides and floods gathered by Petrucci and Versace 2005.
[771] See Iovino and Nicolaci 2016, 289.
[772] Gambi 1978, 355-356.
[773] Between 1921 and 1936, as urbanisation increased in the region, the population of Calabria increased by almost 14 percent (Cappelli 2020, 244).
[774] These plans had started in 1908, with the creation of the Sila Society of Hydraulic Forces (Bevilacqua 1985, 177).
[775] Amministrazione Provinciale Cosenza 1997, 135-142.
[776] Gallo and Iovino 2000, 301.

allegedly possessing the economic and technological tools to preserve them.[777] These initially propelled developmental processes, as witnessed by the inauguration of chemical factories processing local timber such as the Austro-German *Rueping* (1907), re-acquired in 1925 by the Forest Society of the Italian Mezzogiorno (So.Fo.Me.). Aside from the intensive exploitation of one of the still semi-pristine forests known as Gariglione (about 1,000 cubic metres of timber per hectare was extracted from the native forest), this experience would also lead to constructing a narrow railway line through the plateau's forests.[778] However, this developmental trend did not particularly benefit local woodlands, with hydrogeological disorders reaching their peak by the early 1950s. The post-World War II reconstruction effort demanded additional coal energy sources, construction materials and new lands for agriculture.[779] Overall, during these times, over twenty per cent of total forest or farmed territories in the whole region of Calabria were located in recently cleared woodland areas.[780]

Although the 1950s saw a further expansion in agricultural production, they were also characterised by the institution of the so-called OVS plan (*Opera Valorizzazione Sila*, literally "Sila Valorisation Endeavour"). This project was part of more extensive national reform plans aimed at expropriating large *latifundia* and creating small tenure farms by reallocating the land to the local population. Over 86,000 hectares owned by about 150 landowners were expropriated and allotted in smaller plots, measuring an average extension between 6 and 35 hectares. These were usually divided into settlement units of 6 to 20 homesteads.[781] Such political measures revolutionised local land ownership patterns, bringing back justice to about 25,000 rural families for the first time after many centuries since the beginning of the Sila litigation. In addition, a smaller portion was destined for reforestation and animal pasture.[782] These efforts were also accompanied by public amelioration works (e.g., rural aquifers, electric connections), the construction of housing facilities and the introduction of coppiced arboreal species (over 6,500 ha).[783] As this reform posed the conditions

[777] Iovino and Nicolaci 2016, 285.
[778] About these episodes see Carullo 1952; Cosco 2016.
[779] According to estimates, only between 1940 and 1946 about three million cubic metres of timber were extracted from the Sila plateau (see Gambi 1978, 356 and Ferrucci 1997, 222).
[780] See CASIMEZ 1957.
[781] Soriero 1985, 737-738; Gorgoni 786-788.
[782] Gambi 1978, 456-458.
[783] ARSSA 1997, 237-239.

for the consolidation of forest management practices and agricultural initiatives, it also propelled the development of a touristic sector that still characterises the Sila plateau. Such radical transformations in territorial management and developmental practices went hand in hand with conservation efforts which would eventually create a national park (more in the next chapter) and progressive recovery of local woodlands. However, although these reforms partially brought back justice to local communities and fostered the development of local industries, they could never accomplish the level of economic development that local landowners and reformist thinkers had predicted over the last two centuries.

At the core of OVS's failure was the impossibility of shaking off centuries of social injustice, providing local people with the tools and resources to gain a living from the newly acquired lands.[784] Moreover, the lack of adequate development plans translated into the assignment of land lots too small for profitable agricultural activities, which in some cases lacked crucial infrastructures such as drinkable water and electrical grids. Influence peddling and the corruption of state functionaries added fuel to the fire, tying the farmers' economic destinies to social structures of dependency culture and favours.[785] As petroleum progressively replaced coal as the primary energy source all over the Italian peninsula, the relentless extractivism that had characterised the region for at least two centuries gave way to environmental conservation and reforestation policies.[786] Moreover, while the development of new agricultural technologies increasingly optimised space and productivity, an internal migratory exodus shifted a large part of the local population towards the coastal settlements.[787] According to estimates, while between the early 1951 and 2011 the total Italian population increased by about 12 million, internal upland areas lost about 900,000 inhabitants within the same period, most of which during the twenty years 1951-1971.[788] As a result, while people shifted their residence and economic activities towards reclaimed coastal areas, the Sila plateau was relegated to a natural monument and a regional hydroelectric power supply. For the first time since time immemorial, the

[784] Lopetrone 2020, 262-264.
[785] Piselli and Arrighi 1985, 433-438.
[786] See Corona 2017, 59.
[787] About the development of new agricultural technologies see Corona and Massullo 1989; Lanzani and Zanfi 2018.
[788] About this migratory phenomenon see Colucci 2018, 318-320.

plateau's ecological metabolism was detached from the destiny of a large portion of the human population inhabiting its surroundings.

Within the relatively short time-lapse of two centuries, the plateau's ecology had likely experienced more radical transformations than throughout the previous five millennia. While these were primarily the result of anthropogenic efforts, its endemic arboreal species and the alliance between farmers and adaptive crops contributed to its unprecedented environmental spoliation. Like silkworm farming had ignited socio-environmental issues, pitch extraction and the introduction of foreign crops carried these effects to the extreme in the following centuries. Ultimately, neither the physiocratic dreams of agricultural development and conservation nor the extractive policies aimed at achieving economic growth could successfully accommodate human needs. Natural catastrophes resulting from the progressive breakdown of the plateau's ecological balance fatefully counterbalanced developmental attempts. Social issues resulted from top-down developmental reformism and the multi-species ecological destruction that progressed for several centuries. Perhaps somewhat predictably, the plateau's ecological recovery found momentum in concurrence with the decrease of human extractive activities and the first effective conservation efforts. Just like upland crops such as rye went back to a feral state, becoming endemic weeds, local arboreal species could stretch their underground networks for the first time in centuries and thrive with less human disturbance.

Part IV. Present Neglect and Future Potential

8. A Natural Simulacrum in the Anthropocene Era?

> *The isolation and poverty of mountains is the result of recent processes. Since the second half of the nineteenth century, mountains – understood as geographic, anthropologic, social and communitarian places – began to unravel progressively. Either considered as a synonym of backwardness, unproductivity, isolation or as a place of the exotic, the Eden or the Cockaigne, its precarious and problematic equilibrium breaks down. It is not a territory to dissolve but a centuries-old civilisation, a habitational, productive, and cultural system that had withstood difficulties, catastrophes, and invasions* (Vito Teti).

This concise yet dense text has traced the main features of over five millennia of human-nature relations, a trajectory marked by several epistemic changes and transformations. Throughout this long and dynamic timespan, different flora and fauna species have coexisted and coevolved with different human groups. Their material qualities have influenced their historical agency and allowed them to establish fruitful relations with human beings. These, in turn, translated into mutually beneficial coevolutionary niches. While these species constituted the fertile meadow sustaining human life (endemic arboreal species such as larch pines), humans were also able to introduce other species suitable for their livelihoods (e.g., oaks, chestnuts, mulberries). In other cases, animal species such as hogs and sheep salvaged the local environments and local inhabitants during harsh climatic and epidemic circumstances. As the chronological framework reached the present time, human material power and its capacity to mould and manipulate the plateau's ecologies through introducing different natural species grew in intensity and outreach. The introduction of sturdy crops adapted to mountain environments led to the demise of silviculture. Although in reading this history, one could endorse the idea of an increasingly dominant human civilisation, the material qualities of these species also played an essential role in this transition.

The multiple transformative forces at play during the twentieth century dramatically altered this dynamic yet constant relation. For the first time, upland territories such as Sila were no longer at the centre of human livelihoods. These effects became particularly marked during the post-war years when the onset of the historical phenomenon known as the Great Acceleration transformed the ethos of material life to an unpremeditated degree.[789] In the Italian peninsula, the Great Acceleration wore the garment of a dramatic national energy supply shift,

[789] About the Great Acceleration and its global consequences see McNeill 2000; McNeill and Engelke 2014.

particularly benefitting urban environments, transportation, infrastructures, and domestic consumption. Between 1861 and the 1950s, the energy derived from wood decreased from about 51.4 to 16.5 per cent. Conversely, the power extracted from oil, mainly imported from the Middle East, grew from 18.4 to 72 per cent between the early 1950s and 1973. Meanwhile, wood energy use shrank to just 3.1 per cent.[790] While these dramatic transformations resulted in a steep increase in urban populations, internal areas experienced decreasing or stationary demographic growth.[791]

In Sila, this process translated into a new migratory wave emptying the region, as labour patterns shifted towards the tertiary sector and rural areas progressively emptied. Such a process resulted from the unsatisfactory land distribution reforms of the post-war years, which fuelled migrations towards coastal lands and contributed to demographic stagnation.[792] Naturally, these transformations went hand in hand with a growing reforestation trend. Within a few decades, territories previously destined for agroforestry, animal farming and crop growing went back to the status of wildlife forests.[793] In Sila, the principal forest recovery process involved about 15,000 hectares of local woodlands, reclaimed from the wastelands formed by a dramatic hydrogeological disorder that had hit the region in 1953.[794] However, the same year also saw the appointment of a special Study Commission to understand hydrogeological issues better and devise countermeasures. The Commissions' proceedings constituted the basis of a soil conservation law in 1955. A conservation plan for the reforestation of over 110,000 hectares in Calabria followed suit. Overall, between 1955 and 1986, local forest density indexes increased from 14 to 32 per cent (today around 40 per cent), while farmed lands diminished by 41 per cent and pastures by 33 per cent.[795] Since the Sila plateau and its piedmont territories were one of the region's most degraded soils, it would also be one of the territories primarily involved in reforestation processes and degraded woodlands recovery –

[790] After the 1973 crisis, the total percentage of energy extracted from oil began to decrease, reaching 38.9 per cent in 2010. However, it was not replaced by coal or wood, but by natural gas, mainly exported from Russia (36.6 per cent by 2010). See Malanima 2013, 27-28.
[791] About these demographic trends see Corona 2017, 59-61.
[792] Teti 2015, 273.
[793] Between 1951 and 1971, population decreased by 19 percent in mountain areas (SVIMEZ 2011). See also Gabbrielli 1991; Iovino et al. 2014; Iovino and Nicolaci 2016, 285-286.
[794] Gallo and Iovino 2000, 302.
[795] See Iovino et al. 2014, 371; Iovino and Nicolaci 2016, 290-292. For further information see Iovino 1997: Iovino and Menguzzato 2002.

respectively, about 25 and 35 per cent of the total surface.[796] Urban centres sprawled at the same time as forest covers restored their biodiversity. Between 1951 and 1981, the population of Catanzaro increased from about 60,000 to 100,000, Cosenza from 57,000 to 107,000, and Crotone from 32,000 to 58,000. These would be the absolute peak numbers for the first two cities, while the latter grew by little more than 5,000 people within the next fifty years.[797]

While the reasons for this demographic stagnation will be assessed in the following paragraphs, the combination between reforestation efforts and the progressive abandonment of upland regions culminated in creating the National Park of Calabria in 1968. This conservation area was primarily centred upon the Sila plateau and involved the southern peaks of Aspromonte, for a total of 12,000 hectares. This monolithic entity would keep expanding, reaching 16,000 hectares by 1985. However, a defining turn would only happen in 1994 when the park split into two different entities: the National Parks of Sila and Aspromonte. The former would stretch for over 73,000 hectares, including large portions of the provinces of Cosenza (11 municipalities), Catanzaro (6), and Crotone (4).[798] Within a few decades, the Sila plateau and its piedmont territories had become one of the densest forest areas of the Italian peninsula (almost 75 per cent of its total surface).[799] The creation of this national institution to preserve local woodlands constituted the official accomplishment of the tentative conservation policies instituted over the last century. Just as importantly, it culminated a lengthy debate on the conservation of the "natural monuments" at the core of local Bruttian identity, initiated during the first decades of the twentieth century.[800]

However, while the creation of parks allowed local forest covers to regenerate, it further accelerated the abandonment of upland territories, both logistically and culturally. The first touristic initiatives carried out by Mussolini's regime during the early 1930s, creating the first villages for vacation, constituted a mere palliative measure in an epistemic process of change.[801] Such a

[796] See Iovino et al. 2014.
[797] This data is available at http://www.comuni-italiani.it/18/statistiche/popolazione.html.
[798] Ferrucci 1997, 223-225.
[799] Iovino et al. 2017.
[800] About the case of Sila see Cappelli 2020, 251-252. Also see petitions gathered between 1922-1928 by local newspaper *Bruttium* (y. 1-7). For an overview of conservation efforts in the Italian peninsula between the late nineteenth and early twentieth centuries see Piccioni 2009 and 2020; Hardenberg 2021.
[801] These included Villaggio Mancuso and Villaggio Racise (see Cappelli 2020, 245 and Lopertone 2020, 260). For an overview on the development of upland tourism in Italy see Bevilacqua 2018, 117.

transformation did not simply imply the breakdown of the millennial link between local inhabitants and local mountainous ecosystems. It also created an abrupt inversion in the public imagination related to the mountains of Calabria. What only about a century before constituted the pounding heart of lively societies suddenly became a synonym of stasis and immobility, and its central historical role for human livelihoods forgotten.[802] While these potentially detrimental effects were partially contained by the emergence of a local touristic sector, this negative image of internal areas affected local touristic development. In a region primarily renowned for its seaside tourism, upland areas have mostly been confined to seasonal tourism during the summer months. These phenomena almost always regarded former locals returning to their hometowns for holidays or affluent coastal inhabitants who built their second house in the region to escape Calabria's summer heat and its crowded beaches.[803] Modern international mobility further worsened the overall state of local tourism, except for niche sectors naively searching for unspoilt destinations, immersed in an "uncontaminated" nature.[804]

While further investments could spur the better development of the local eco-touristic sector, it is unlikely that they will manage to fulfil the promises of regional economic growth and maintain, let alone further improve, local environmental conservation. Although the last years have witnessed the multiplication of promising initiatives aimed a valorising this fragile internal area, negative demographic numbers combined with lack of a big-picture vision seem to condemn these territories to decay and neglect. Such an issue should constitute a critical point in the agenda of the greying Italian peninsula and a large part of the European continent. As demographic numbers drop and rural regions are left in a state of abandonment, political frameworks based on concepts such as "cultural landscape" omit the historical dynamism of these territories and, by extension, hinder their potential future contribution by conveying an image of stasis and neglect.[805] Aside from eco-tourism and other small-scale activities based on localised know-how and products of excellence, a truly reformist agenda managing to attract people and investments is urgently needed. While recent scholarly debates have managed to bring back to public attention the economic fragility of internal upland territories, they have strived to envision a possible

[802] Teti 2015, 408-410.
[803] About the making of this process see Gambi 1978, 424-427.
[804] About the crisis of the modern touristic sector see Lopetrone 2020, 274; Marini 2020, 345-347.
[805] For a critique of this concept see Montanari and Moreno 2008, 45-47.

future for these territories. This final chapter hopes to enrich these discussions, proposing a neo-materialist perspective. By looking at these environments as lively actors, it might be possible to better understand the future role of this rich ensemble of bio-genetic resources and their potential contribution to our future livelihoods, perhaps in a more sustainable and everlasting manner.

Facing Challenges

Given the substantial failure in developing the local touristic sector, the Sila plateau, just as any other upland area, is experiencing a state of partial abandonment. Overall, although uplands occupy 43 per cent of the region's total surface, only 12 per cent of the total population currently occupies mountainous lands (about 230,000 out of almost 2 million people).[806] While at first glance, these numbers could appear as the final omen of imminent disappearance, it has undoubtedly benefitted the region ecological regeneration. For example, the Sila plateau's re-wilding process has seen the absolute prevalence of larch pines and beech forests – respectively 40 and 10. At the same time, 17 per cent is occupied with forest areas where the two species intersect.[807] Their dominant presence is mainly due to their better suitability for reforestation processes, both in terms of quicker growth patterns while at the same time allowing the production of timber.

Conversely, other historically relevant arboreal species conventionally located in piedmont areas or at lower altitudes, such as chestnuts and oaks, have radically diminished. Such a process is directly linked to the intensive exploitative processes of the last two centuries and the dissolution of the customary practices related to their biological metabolism. In some territories, urbanisation processes and the development of specialised agricultural activities have also contributed to their partial disappearance, as witnessed by their fragmentary presence among terraced cultivation and other farmed arboreal species.[808] Moreover, the reforestation of traditionally endemic woodlands with coppiced trees has partially compromised local biodiversity and increased the risks of pests with the resurgence of endemic diseases that had seemed eradicated.[809]

[806] Marini 2020, 337.
[807] Iovino 2014, 288.
[808] About Calabria in general see Ienco et al. 2020; about Sila see Caridi and Iovino 2002; Iovino et al. 289-290.
[809] Barbera 2013, 497.

Despite some of the issues linked to anthropogenic reforestation processes, the effects of several decades of conservation efforts are starting to lead to positive environmental externalities. These involve the enhanced volume of biodiversity available in the local forest regarding flora and fauna species, enhanced soil quality, milder climatic patterns, and better protection from solar radiation.[810] Although the increase of species such as carabid beetles might not seem as crucial for human survival as hogs or chestnuts, their expansion should be regarded as good news by conservation biologists and any resident of the Italian peninsula. The reappearance or expansion of endemic species constitutes an undeniable sign of forest regeneration after centuries of clearings and intensive silvicultural utilisation. In a world where biodiversity has been disappearing at an unprecedented pace and an unquantifiable number of species – both already known and unknown ones – are driven to extinction almost daily, any resurgent breed counts if one wishes to reverse this catastrophic trend. Perhaps more relevant are the potential positive outcomes of increased biodiversity in facing the growing threats posed by climate change to Mediterranean environments. Although often neglected in mainstream discussions, the Mediterranean basin is one of the natural environments that will likely be most affected by climate change. According to estimates, the Italian peninsula will face several pressing challenges linked to climate change within the next century. These include primarily rising sea levels (0,43 metres by 2100) which could result in the reduction of 18 per cent of the peninsula's land surface (about 53,000 Km^2), forcing the relocation of about 20 million people (about one-third of the whole population).[811] Two related impacts would be the salinisation of coastal soils, which would become increasingly unsuitable for agriculture, and the increase of average population density from 200 to 250 inhabitants per Km^2, occupying an almost exclusively rugged territory (54 per cent hilly, 39 per cent mountainous).[812] Rising water levels would also lead to the acidification of the Mediterranean Sea, with a projected increase from 0,14 to 0,35 PH units by 2100. Water acidification would be tantamount to the topicalization of local climate patterns, with a minimum temperature increase of 1,3 °C.[813] Such a significant temperature increase is also likely to affect upland environments. Most glaciers would drain, shrinking the

[810] Mazzei et al. 2017.
[811] Spano et al. 2020, 26-29. See Pievani and Varrotto 2021, 28.
[812] See Pievani and Varrotto 2021, 29.
[813] See Spano et al. 2020, 29. Pievani and Varrotto 2021, 88-89.

amount of drinkable water and creating hydric stress all over the Italian peninsula.[814] How could "marginal territories" such as the Sila plateau successfully contribute to tackling the challenges brought by a similar climate catastrophe?

Once again, the answer seems to lie in their material potential and the positive ecological feedback loops generated by their recovering biodiversity. Aside from making coastal settlements almost inhabitable and pushing people towards internal areas, climate change is also likely to accelerate the risk of pests and fungal diseases among planted forests, threatening a large part of woodlands destined for intensive use.[815] In this context, expanding biodiversity hotspots such as the Sila plateau could constitute a precious reserve of biogenetic resources. These will undoubtedly come at hand to face the potentially new plagues brought by climatic disruptions, salinisation and soil erosion. Even more importantly, the biodiverse forests of Sila have demonstrated outstanding potential as climate change mitigators. Their forest covers possess great potential as powerful all-year-round carbon sinks. Endemic larch pine groves, both old and recently planted woodlands, have proven to be particularly suitable for this function.[816] Just as importantly, the vegetational diversity of the plateau's woods has proven potentially helpful to tackle the issue of atmospheric pollution and its deposition in water flows. Moreover, local forest covers have demonstrated the capacity to absorb potentially harmful substances such as nitrates, reducing overall pollution by atmospheric deposition and the risk of water contamination.[817]

Another good news is that local biodiversity does not seem to be negatively impacted when local woodlands are managed with modern sustainable practices that successfully harness the material potential of forests without compromising the ecological balance of local soils.[818] Sustainable reforestation practices promoted since the 1950s have proven effective. In particular, they have fostered soil amelioration by increasing its absorption capacities and limiting the risk of hydrogeological disorders.[819] While slowly advancing, soil regeneration processes have demonstrated incredible physiological resilience, showing adequate water absorption capacities even shortly after extreme events such as forest arsons.[820]

[814] About vanishing Italian glaciers se Smiraglia and Dioloaiuti 2015.
[815] Ennos 2020, 262-263.
[816] See Marino et al. 2005.
[817] See Callegari et al. 2007; Infusino et al. 2015.
[818] See Mazzei et al. 2017, 170-171.
[819] See D'Ippolito 2013; Callegari 2003.
[820] See Iovino et al. 2009.

Moreover, by absorbing high volumes of rainfall, they also provide valuable water reserves, potentially contributing to the supply of Mediterranean coastal settlements threatened by seasonal shortages and desertification.[821] Although the effects of soil degradation might be more tangible at an immediate level, the growth of underground mycelia networks in replanted forests will gradually improve the state of local soils. Forest ecology might move more slowly than anthropogenic destruction, but in these marginal lands, it is catching up. In this context, the case of Sila and other marginal upland forest environments might as well constitute a suitable example of what Christof Mauch would define as a "slow hope," the quiet and positive environmental changes that are currently happening worldwide.[822]

The Sila plateau is naturally only one of the ecological hotspots that could mitigate the effects of climate change thanks to its resourceful material patrimony. According to a recent survey, Italian forest covers have registered an average increase of at least 60,000 hectares over the last decades, reaching a total extension of over 11 million hectares (almost 40 per cent of the total national territory).[823] Such a number is particularly remarkable, considering that it implies a 75 per cent total increase since the beginning of the coastal exodus during the post-war years. Perhaps somewhat surprisingly, current forest density indexes in the Italian peninsula are higher than countries usually perceived as champions of conservations, such as Germany and England. The reason for such remarkable numbers lies in the environmental protection regulations passed over the last decades. In particular, since 1985, Italian woodlands have enjoyed some of the most rigorous rules against the risk of hydrogeological disorders and the spoliation of local landscapes. Moreover, Italian forests hold the lowest index of timber logging in the European Union.[824] To a certain extent, this enormous mass of unutilised forest cover has been considered a policy failure considering the lack of significant economic activities capable of attracting investments and people. Currently, the forest sector contributes to about 0,01 per cent of the national GDP, serving mainly as a marginal energy source lacking any form of investment towards timber-based biotechnological innovations.[825] Perhaps more importantly,

[821] See Callegari et al. 561.
[822] Mauch 2019.
[823] Marchetti et al. 2012.
[824] See Pettenella 2018, 472-476.
[825] Pettenella 2018, 477.

such a vast and neglected forest surface might even constitute a potential ecological threat. Indeed, the accumulation of dry biomass constitutes one of the main drives of the devastating forest fires that have torched the Italian peninsula over the last years during the summer season. Such a grim scenario is likely to be exacerbated by climate change in the following years as average temperatures continue to hit new records.[826] However, if well-tended and managed against possible climatic hazards, this massive forest formation constitutes a powerful national carbon sink capable of storing over 2,088 million tons of carbon dioxide.[827]

Overall, although more significant steps towards better living conditions seem to be necessary, the looming threat of climate change and economic repercussions might not necessarily mean a worsening of living standards, provided that the new ways of dealing with these challenges will treasure the teachings from the past. Such a challenge would undoubtedly enhance our understanding of the material potential of neglected host environments such as the Sila plateau. Improved knowledge nurtured by present scientific tools and a better understanding of the past will be essential in constructing new coevolutionary niches. These emerging human values would confront other species' discrete yet vital agency with enhanced awareness. Although still tentatively venturing in the realm of hypothesis, current global trends can help us to catch already a glimpse of the potentially ground-breaking role of upland environments – a role much beyond that of a shelter against climatic disasters.

Improving Livelihoods

Combining these challenges could potentially lead to a new image of mountainous areas as potential host environments for a growing number of people forced to relocate from coastal areas. This would, in turn, shift pre-consolidated ideas of mountainous settlements as static environments to an image of dynamism and innovation.[828] While it would be virtually impossible – and perhaps even undesirable – to return to a lifestyle emulating the models of the past, it could certainly be possible to imagine a future in which upland territories would be more actively linked to the region's coastal areas. Such an exercise of imagination also finds legitimacy considering new global economic and demographic trends. As

[826] See Marchetti et al. 2018.
[827] See Pompei et al. 2015; CUFA and CREA 2021.
[828] Teti 2015, 302-303.

argued by sociologist Danny Dorling, the quick and crowded anthropogenic world that we experience today might soon be a mere reflection of the past. We have indeed already entered the era of the "slowdown," a world where the relentless demographic trends and economic growth that characterised our planet over the last centuries will soon give way to stagnation and degrowth. Such a trend will not necessarily mean misery and decay, but it could also lead to more excellent stability and to a more sustainable way of life.[829]

In a world projected to slow down, Alpine biodiversity hotspots such as the Sila plateau could become the scenarios of more sustainable lifestyles where their material potential would be equally exploited and preserved by humankind. A closer look at the demographic numbers in the upland areas of Calabria already reveals a progressive slowdown of the internal migratory phenomenon towards the coasts. After the great acceleration of the first post-war decades, population trends have finally reached an equilibrium and are currently relatively stationary.[830] While it might be tempting to interpret such a trend as a temporary adjustment before an even greater crack, observing these phenomena from the perspective of a global slowdown might make these areas a privileged avant-garde place to understand future trends. For example, sociologists have predicted that in a world progressively slowing down, the reduction of available surplus labour and the low cost of lands might reduce profit margins and increase individual wealth. Such a process is already undergoing in Calabrian uplands, where local inhabitants earn incomes comparable to people living in coastal metropolitan areas while inhabiting territories with a much cheaper cost of living.[831] A healthier life in less densely populated spaces with better protection from climate hazards and a higher living standard. These seem to be the main advantages for people willing to take up the challenge of returning to the roots of Mediterranean civilisation. After all, as argued by Giuseppe Galasso, the actual "value" of southern Italy lies in its link to the history, present, and future destinies of both Europe and the Mediterranean.[832] Such a transformation would not simply imply reconstructing a long-forgotten link with these environments but also merging past experiences with our current scientific understanding of natural environments. These are timely challenges, considering the looming end of the

[829] About the "great slowdown" see Dorling 2020.
[830] See the data in Marini 2020, 337.
[831] Marini 2020, 339.
[832] Quote in Cardini 1989, 15.

Great Acceleration and the rise of new needs for better living standards and safe spaces. As our overheated planet prepares for the great slowdown, the demographic and economic degrowth already underway will compel humankind to search for new values and ways of life.

The increasing trend towards the digitalisation of labour also provides a potential advantage for neglected upland environments. Whereas young people understandably seem to reject the idea of going back to the harsh rural conditions that characterised the old way of life, the increasing flexibility of third sector jobs might allow many of them to move to upland environments while working remotely.[833] The growing presence of people working from remote could accelerate the connection of upland environments to online broadband connections, bridging the digital divide currently affecting several marginal territories. Improved online communication could benefit remote work and create an online neo-community incorporating both actual inhabitants and people with any connection to the place.[834] The presence of such a digital space might potentially create positive feedback loops that would increasingly put upland territories under the radar of potential investors and policymakers. Perhaps more importantly, improved communications would undoubtedly be essential to create a link between innovative businesses centred upon a sustainability model based on the rediscovery of local traditions.[835] Incorporating cutting-edge technological innovations while simultaneously recovering customs and values of the past could allow a portion of the local population to make a living by restabilising a lively connection with its creative material environments. Such an ensemble of practices and values might further engross the already growing number of urban citizens willing to migrate to upland territories to explore new ways of life-based on a closer bond with the eco-system and a different sense of community.[836] Examples include pastoral activities centred upon the traditional practice of transhumance, timber-based artisanal manufactures, silk and wool spinning, and the production of dairies and preserves.[837] Just as significantly, living in closer contact with a thriving woodland environment could help improve people's lifestyle while at the same time strengthening conservation efforts. Such a stable relationship would

[833] About young people's rejection of traditional rural labour see Marini 2020, 344.
[834] See Teti 2020b, 174.
[835] Corrado and Ebbreo 2020, 220-221.
[836] About this internal migratory phenomenon see Barbera et al. 2018; Carrosio et al. 2018.
[837] Faccioli 2017.

lead us to a more sustainable lifestyle and potentially benefit our psychological and emotional stability. Ever since evolutionary biology has demonstrated the crucial role of woodlands in human evolution, scientists have also begun to explore the potentially beneficial emotional effects of living in contact with woodland environments and working with timber objects. Recent research has demonstrated that walking in the woods daily, tending a garden, and manufacturing wood can enormously benefit the quality of life by reducing stress levels, both mentally and physiologically. Potential benefits include strengthening the immune system, improving emotional responses, reducing stress levels, lowering blood pressure, increasing focus, and boosting sleep quality.[838]

These beneficial health effects seem to lead us to a possible world dominated by an enhanced awareness of our reliance on other species, both physiologically and emotionally. Today, the Sila plateau constitutes yet another host environment to exercise our sense of connection with the neglected woodland ecosystem. Such an endeavour implies to figuratively trespass the mental borders of contemplation and admiration for the natural monuments of the past but to picture a possible lifestyle more openly linked to vital forms of life. It means mentally exercising our connection with creative material environments such as the Sila plateau, informed by the historical understanding of their influence on human culture. Facing a likely near future of economic degrowth and climate change, we should strive to overcome a monolithic idea of these environments. Aside from stretching our minds, such a task implies abandoning the concept of an eco-touristic cornucopia and endorsing the benefits of a slower lifestyle in close connection with these environments. Just as much as the woodlands of Sila as we experience them today are a product of human actions, they also shaped human livelihoods to a radical extent. Looking at the past of similar marginal hotspots can thus help humankind shift its moral reasoning and steward other life forms. Such a moral endowment radically opposes the resigned idea of constantly impoverished and diminished biodiversity – what some scholars have ironically defined as the Emerocene – a gloomy reflection of growing extinction rates worldwide.[839] As an assemblage of genes and proteins emerging from the same ecological mesh, we need biodiversity to exist just as much as many

[838] See Maes et al. 2021; Ennos 2020, 269-270; Hirons and Thomas 2018; O'Brien and Morris 2013; Tsunetsugu 2013; Ward Thompson et al. 2012 and 2013; Park et al 2011 and 2010; Barton and Pretty 2010; Li 2010; Lee et al. 2009; Berman et al. 2008; Li et al. 2007; Maas et al. 2006; Bishop 1992.
[839] See Wilson 2016, 20, 71 and 211-212.

natural species on earth need our stewardship to keep fuelling the emerging material environments that have created organic life. In a future still presumably affected by anthropogenic natural hazards, understanding our multiple coevolutionary entanglements with our host environments can be the first significant step to reverse the looming risk of an Emerocene. This perspective might understandably seem somewhat utopian in a world still characterised by the relentless exploitation of objectified natural resources. However, the great slowdown and the pressing needs of climate change might accelerate our motivation to better understand our entanglements with the external world and devise strategies for sustainable living. Hopefully, by showing the interconnected histories of humans and other natural species at every historical turn, this research will contribute to the urgent search for an alternative mode of living. Such an effort might culminate in a less anthropocentric humanism based on multi-species solidarity and a better understanding of our role within the eco-biosphere.[840] Undoubtedly, such a simultaneously moral and material task will constitute one of our species' main challenges in the following decades.

Just as importantly, to imagine other ways of life should stem from the attempt to enrich current debates on conservation and ecological preservation. In his last book, the late ecologist and philosopher E. O. Wilson discussed the importance of conservation ecology and the need to integrate potentially beneficial technological tools to protect our environments. What at first glance might seem like an unlikely marriage might allow reconciling humankind's constant longing for prosperity with a more sustainable and energy-efficient way of life in a world shaped by biotechnologies, nanotechnologies, and robotics.[841] Perhaps more importantly, these emerging technologies could potentially help reverse perspective extinction trends induced by anthropogenic activities, currently projecting between half and one-fourth of all the world's species extinction by the turn of the century.[842] There is no doubt that rather than accommodating the idea of an emerging anthropogenic world, humankind should accept its role of steward and integrate technology in ecological conservation science. In order to accomplish such a daring task, we should also look at the

[840] For a similar idea of humanism beyond anthropocentrism see LeCain 2015 and 2021; Teti 2020b, 176.
[841] Wilson 2016, 192-193 and 204-207.
[842] Conservation scientists have renamed the synergic factors causing anthropogenic extinction with the acronym HIPPO (Habitat destruction, Invasive species, Pollution, Population growth, Overhunting). See Wilson 2016, 56-60; Laurance 2013.

creative material interconnections that have led us to the peak of the world ecological chain.

How to look at the world in coevolutionary terms? Understandably, this is not an easy task for a non-specialised audience. Evolutionary processes are, in most cases, larger-than-life. Their slow pace and complex genetic dynamics easily evade the imagination of untrained individuals. Nevertheless, looking at humans as part of an intricate puzzle of relations in a creative material environment can help us understand the essential role of multi-species relations throughout our most recent history. Clearly, in evolutionary terms, the five millennia period analysed in this study constitutes the mere blink of an eye. However, it might undoubtedly help a less specialised audience grasp the past, present, and potentially future importance of biodiversity in the convoluted path of existence. As argued by William Cronon, one of the primary aims of environmental history should be to create narratives and concepts bringing together the "network of relationships, processes and systems that are as ecological as they are cultural."[843] Just as notably, similarly nuanced historical reconstructions informed by the interdisciplinary tools of environmental history could support conservation scientists in the challenging task of establishing a conservation baseline to restore a given ecosystem to a level of overall equilibrium. In a world increasingly marked by the pervasive telluric impact of anthropogenic forces, historical narratives such as the one proposed in this text might help foster our understanding of ecological processes and our reliance on other species to rise to prominence. Hopefully, such an understanding might also help shed light on the importance of enhancing environmental conservation to preserve the material relations that have nurtured our livelihoods in the first place. Just as importantly, our present scientific knowledge could provide us with the tools to shape techniques and methods to survive in a slower and overheated planet, making the best of storages of ecological diversity at our disposal without compromising its fragile equilibrium. Like many other neglected upland territories, the Sila plateau will likely play a central role in this transition, provided that their material potential can be fully grasped and engaged in a genuinely sustainable manner.

[843] Cronon 1992, 1349.

Bibliography

Archival Abbreviations

ASC – National Archive of Cosenza (Archivio di Stato di Cosenza).

ASF – National Archive of Florence (Archivio di Stato di Firenze).

ASN – National Archive of Naples (Archivio di Stato di Napoli).

Envelope (bus.); folder (fasc.); years (a.); volumes (vol.); insert (ins.); row (fil.).

Archival Sources

ASC – *Demanio Silano*, fasc. 135, bus. 1006, a. 1842.

ASC – *Affari Interni – II Ufficio*, *Affari Forestali*, bus. 1, fasc. 7.

ASF – *Miscellanea Medicea*, fil. 468, ins. 110.

ASN – *Collaterale. Curiae* v. 16, c. 148 v.

ASN – *Collaterale. Memorialium*, vol. 2, c. 72 r.

ASN – *Delegazione della Regia Sila*, bus. 1–25.

ASN – *Ministero Affari Interni*, II Inventario, bus. 2576.

ASN – *Ministero Affari Interni*, II Inventario, bus. 3812.

ASN – *Ministero Affari Interni*, II Inventario, bus. 4074.

ASN – *Ministero Agricoltura Industria e Commercio*, fasc. 392.

ASN – *Ministero delle Finanze*, fasc. 11706, "Corrispondenza tenuta col Commessario Civile dall'anno 1838 al 1850," vol. I-IV.

ASN – *Ministero di Polizia*, fasc. n. 2298, a. 1840–1841 vol. IV.

ASN – *Sommaria*, *Diversi*, II Numerazione, vol. 204, c. 65.

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Deutsche Zusammenfassung

Die große Sila-Hochebene im Herzen Kalabriens ist heute nur noch eine kuriose Fußnote in historischen Debatten. Sie ist ein unwahrscheinliches Beispiel für ein Gebirgsland in Süditalien, das heute für seine Küstengebiete bekannt ist. Dennoch war das Hochland von Sila bis vor weniger als zwei Jahrhunderten ein wesentlicher Bestandteil der natürlichen Ressourcen für die Wirtschaft der Region. Jahrtausendelang lieferte das Ökosystem der Sila den Bewohnern der Täler und der umliegenden Piemont-Gebiete (auch Presila genannt) nährende Ressourcen, die eine wichtige Grundlage für ihren Lebensunterhalt darstellten. Seit der Antike bildeten die charakteristischen Baumarten eine ökologische Nische in den lokalen Wäldern und stellten die Grundlage für grundlegende materielle Beziehungen und industrielle Praktiken dar. Diese fruchtbare organische Fläche ermöglichte es anderen natürlichen Arten, sich ihre ökologischen Nischen zu schaffen, darunter auch dem Menschen. Über mehrere Jahrtausende hinweg profitierten verschiedene Gruppen von diesem Mosaik der biologischen Vielfalt, indem sie ihre sozialen Normen und Regierungssysteme um die begehrtesten Ressourcen herum gestalteten. Indem sie dieses Ökosystem nach ihren Vorstellungen umgestalteten, veränderten sie es auch und schufen koevolutionäre Beziehungen zu anderen natürlichen Arten. Im Laufe der Zeit wirkte sich das Entstehen divergierender Interessen an den natürlichen Ressourcen des Plateaus stark auf die lokalen Gemeinschaften aus und führte zu sozialen Konflikten zwischen extraktiver und Subsistenzwirtschaft. Ziel dieser Forschungsarbeit ist es, eine langfristige Umweltgeschichte dieser großen Bioregion zu erstellen und die sich wandelnden Interaktionen zwischen den Menschen und den anderen dort lebenden ökologischen Akteuren zu rekonstruieren. Während die Sila-Hochebene noch immer eine der artenreichsten Regionen des mediterranen Europas darstellt,

könnte man sich bei der Analyse ihrer Geschichte einen viel größeren Waldgürtel vorstellen, der sich über ihre heutigen geografischen Grenzen hinaus erstreckt. Diese Forschungsarbeit versucht zu verstehen, wie die verschiedenen ökologischen Metabolismen der Hochebene die natürlichen Prozesse und die kulturellen und materiellen Praktiken des Menschen geprägt haben. Genauer gesagt geht es um die Frage, inwieweit Stoffwechselbeziehungen - der Austausch von Materialien und Nährstoffen zwischen verschiedenen Akteuren - hybride sozio-natürliche Beziehungen förderten.

Im Gegensatz zu wissenschaftlichen Stereotypen, die süditalienische Berggebiete oft als Orte des Stillstands und der Isolation darstellen, scheint eine fundierte historische Rekonstruktion der Sila-Hochebene ein Gesamtbild von Mobilität und Dynamik zu vermitteln, das sich aus dem Zusammenspiel menschlicher und natürlicher Faktoren ergibt. Obwohl diese Dynamik in erster Linie durch klimatische Ungleichgewichte und das Aufkommen und Verschwinden verschiedener Arten zum Ausdruck kommt, nehmen die anthropogenen Einflüsse mit der Zeit zu. In dem Maße, in dem die lokalen Gemeinschaften ihr Handwerk durch neue Praktiken und Technologien optimierten, verbesserten sie ihren Lebensunterhalt und emanzipierten sich immer mehr vom Einfluss der spezifischen ökologischen Dynamik. Während jedoch jede menschliche Gruppe, die das Hochland von Sila bewohnte, in fast jedem Fall als eine besser ausgebildete Version der vorherigen betrachtet werden konnte, wurde ihr natürliches und kulturelles Ethos weiterhin durch koevolutive Interaktionen mit den anderen Arten geprägt.

Durch den Versuch, die Sila-Hochebene aus dem begrenzten Bereich der lokalen Geschichte zu befreien, konzentriert sich diese Untersuchung auf die ko-konstruktiven Interaktionen zwischen Menschen und anderen Arten über einen

längeren Zeitraum. Vom methodischen Standpunkt aus betrachtet, übernimmt sie in erster Linie den Rahmen, der von anderen Forschern, die im Bereich der Umweltgeschichte tätig sind, vorgegeben wurde. Dabei handelt es sich um die Koevolutionsgeschichte und den Neo-Materialismus, zwei neue Perspektiven. Die Koevolutionsgeschichte, ein von Edmund Russell entwickeltes Konzept, geht davon aus, dass wichtige historische Prozesse aus der Verflechtung von Natur und Kultur hervorgehen. Russell schreibt historische Transformationen dem Bereich der ökologischen Beziehungen zu und umgekehrt und schlägt ein neues Verständnis von Evolution vor, das über die bloße Widerspiegelung genetischer Veränderungen hinausgeht. Vor diesem Hintergrund können historische Prozesse als evolutionäre Kräfte verstanden werden, die sowohl gesellschaftliche Veränderungen als auch langfristige genetische Transformationen vorantreiben. Russells Werk ist eine der wichtigsten Referenzen für die neomaterialistische Theorie von Timothy J. LeCain, die nicht-menschliche Perspektiven in die Umweltgeschichte einbezieht. Die neomaterialistische Geschichtswissenschaft zeigt die zentrale Bedeutung schöpferischer materieller Umgebungen in historischen Prozessen auf, indem sie die Wechselbeziehungen zwischen Menschen und verschiedenen Arten und Objekten untersucht. Letztlich ist das, was LeCain als "natürlich geborene Menschen" bezeichnet, das Ergebnis komplexer koevolutiver Prozesse, die zu "dem sich verändernden und entwickelnden Amalgam, das wir Mensch nennen", geführt haben.

Ausgehend von der oben erwähnten kritischen Perspektive zeigt diese Studie, wie menschliche Gesellschaften die Ökologie des Sila-Plateaus veränderten, während nicht-menschliche Akteure ihre materiellen Praktiken und kulturellen Normen prägten. Das Ergebnis war ein verworrenes Geflecht von sich gegenseitig beeinflussenden Beziehungen. Nach meiner Definition bezog diese

Waldzivilisation ihren Lebensunterhalt und ihre Energiequellen in erster Linie aus den lokalen Baumarten und ihrem ökologischen Stoffwechsel. Einheimische und eingeführte Baumarten wie Lärchen, Eichen und Kastanien ermöglichten die Ko-Konstruktion von Subsistenzpraktiken wie Tierhaltung und Pechproduktion. Sie boten auch verschiedenen Tier- und Pflanzenarten - von Schweinen und Schafen bis hin zu Seidenraupen - Unterschlupf, die die Geschicke verschiedener menschlicher Gesellschaften prägten. Der zunehmende anthropogene Druck seit der Moderne führte auch zu sozio-ökologischen Konflikten zwischen verschiedenen menschlichen Gruppen, die um den Zugang zu diesen Ressourcen konkurrierten.

Jedes Kapitel befasst sich mit einer bestimmten Pflanzen- oder Tierart, die ihre ökologische Nische im Ökosystem der Hochebene gefunden und die Lebensgrundlage und Kultur der Menschen geprägt hat. Während sich diese Arten in den meisten Fällen zeitlich und räumlich überschnitten, prägte jede einzelne einen bestimmten Moment der historischen Entwicklung der Sila-Hochebene. Daher die Idee, sich für jede in diesem Text analysierte historische Zeitspanne auf eine bestimmte Art zu konzentrieren. Sowohl die endemischen Merkmale, die Anpassungsfähigkeit als auch die koevolutiven Wechselwirkungen trugen zum Glück dieser Arten bei, während das Zusammentreffen von anthropogenen und klimatischen Faktoren zu ihrem Aussterben führte. Das erste Kapitel befasst sich mit der Gebirgsökologie von Sila, seiner geologischen Entwicklung und seinen charakteristischsten ökologischen Merkmalen. Besonders wichtig ist die Rolle der einheimischen Baumarten wie endemische Lärchen, Eichen und Kastanien beim Aufbau des Wald-Ökosystems. Obwohl Wälder als zeitlose Gebilde betrachtet wurden, die den saisonalen Kreislauf widerspiegeln, offenbart ein genauerer Blick auf die Wälder von Sila ein Bild komplexer ökologischer Dynamik. Während sich

die Wälder ständig an geologische und klimatische Entwicklungen anpassten, waren sie gleichzeitig Schauplatz wechselnder waldbaulicher Praktiken. Wie das zweite Kapitel zeigt, entwickelten mehrere vorrömische Hirtengesellschaften Praktiken der Viehzucht und der Waldbewirtschaftung in koevolutionärer Wechselwirkung mit der Ökologie der Hochebene. Seit der römischen Kolonisierung wurden auf der Hochebene auch protoindustrielle Aktivitäten ausgeübt, die zur Konsolidierung einer anthropogenen Landschaft und zur Verringerung der bewaldeten Flächen führten. Dabei handelte es sich vor allem um den Holzeinschlag für Bauzwecke und die Herstellung von Pech, beides Praktiken, die mit den harzigen und robusten Eigenschaften des örtlichen Holzes zusammenhängen.

Wie ich jedoch im dritten Kapitel erläutern werde, führten der Niedergang des Römischen Reiches, die Pest und der Beginn einer kälteren Klimaphase - der so genannten spätantiken kleinen Eiszeit - zu einem allmählichen Rückgang der anthropogenen Aktivitäten und zu einer massiven Wiederverwilderung der Hochebene. Mit der Ausdehnung der Waldfläche wurde Sila zu einem geopolitischen Limes, der das byzantinische und das lombardische Volk trennte. Der Rückgang der anthropogenen Aktivitäten kam auch widerstandsfähigen Tierarten wie Schweinen und Schafen zugute, die sich von den Waldkronen ernährten. Das Aufkommen von Schweinen und Schafen kam auch den lombardischen Germanen zugute, die eine halbwilde Tierhaltung betrieben. Wie das vierte Kapitel zeigt, schuf jedoch der Beginn einer wärmeren Klimazone - der so genannten mittelalterlichen Warmzeit - günstige Bedingungen für das Bevölkerungswachstum. Die zunehmenden anthropogenen Aktivitäten gingen einher mit dem Rückgang der Wildtiere und der Ausbreitung der gefällten Bäume wie Kastanien und Eichen. Diese Baumarten boten eine zuverlässige

Nahrungsquelle für Mensch und Tier. Ihr Holz wurde auch als Baumaterial und zur Energieversorgung genutzt.Insgesamt führte ihre zentrale Bedeutung für die Menschen des Mittelalters zur Entwicklung von Gewohnheitsnormen, die ihre Erhaltung und ihren Zugang regeln.

Wie das fünfte Kapitel zeigt, konnten diese Vorschriften jedoch soziale Konflikte nicht verhindern. Insbesondere das Aufkommen einer neuen Baumart, des Maulbeerbaums, ermöglichte das Gedeihen von Seidenproduktionszentren in den piemontesischen Städten Cosenza und Catanzaro. Die Entstehung der Seidenproduktion brachte den lokalen Gemeinschaften zwar Vorteile, begünstigte aber auch den Aufstieg wohlhabender Grundbesitzer, die sich des Gemeindelandes bemächtigten. Als große Teile der Wälder der Hochebene eingezäunt und abgeholzt wurden, kämpften die lokalen Gemeinschaften um ihre angestammten Rechte, was zu einer langen Reihe von Petitionen, Gerichtsverfahren und bewaffneten Aufständen führte - dem so genannten " Sila-Streit ". Mitte des 17. Jahrhunderts befand sich die Region aufgrund des Zusammentreffens von sozialen Problemen, wirtschaftlichem Niedergang und Naturkatastrophen erneut im sozialen und wirtschaftlichen Niedergang. Wie das sechste Kapitel zeigt, dauerte der Sila-Streit jedoch bis zur Mitte des 19. Jahrhunderts an, da sich die Menschen den Modernisierungsplänen von Intellektuellen und Großgrundbesitzern widersetzten, die den natürlichen Reichtum des Plateaus industriell ausbeuten wollten. Diese Pläne wurden schließlich nach der nationalen Einigung von 1861 mit dem Ende der Gewohnheitsnormen und der groß angelegten Industrialisierung verwirklicht. Als industrielle Praktiken die materiellen und kulturellen Praktiken ersetzten, die die Sila-Hochebene geprägt hatten, ermöglichten sie eine hierarchischere Beziehung zu ihrem lokalen Ökosystem. Dieser epistemische Übergang führte zu einer systematischen Domestizierung der

Natur und zur Entwicklung der Landwirtschaft mit der Einführung von robusten Feldfrüchten. Obwohl die natürlichen Arten der Hochebene nicht mehr die Lebensgrundlage der Menschen prägten, wurden ihre Holzressourcen zu einem Vorteil für eine sich entwickelnde Nation, die für die Energieversorgung und andere industrielle Zwecke stark auf Holz angewiesen war.

Wie im abschließenden Kapitel gezeigt wird, verlor das Sila-Plateau mit der Energiewende nach dem Krieg zum ersten Mal in seiner Geschichte seine Bedeutung als ein zentrales Ökosystem. Als das Zeitalter des Anthropozäns seinen Anfang nahm, wurde Sila zu einem verdinglichten Naturdenkmal, was durch die Einrichtung eines Nationalparks im Jahr 1968 verkörpert wurde. Dieser Trend wurde durch die fortschreitende Aufgabe von Hochlandgebieten noch verstärkt, da die menschlichen Siedlungen massiv in die Küstengebiete verlagert wurden. Obwohl Waldökosysteme wie das Sila-Plateau heute als Kulisse für "Naturdenkmäler" dienen, ist es angesichts der dringenden klimatischen Herausforderungen wie der globalen Erwärmung und des steigenden Meeresspiegels notwendig, ihre frühere Bedeutung wiederzuentdecken, um zukünftige Bewältigungsstrategien vorzustellen und zu entwickeln.

Acknowledgements

This research emerged from an intense five-year academic spell. As such, remembering and thanking all the people who contributed to its realisation might become a more arduous effort than the research itself. Therefore, as I drift back into the misty seas of the past, I apologise in advance for my erroneous omissions.

In no way could this list begin with anyone else but Christof Mauch. His mentorship and support have shaped my doctoral path since the very first days of my RCC experience (even before I would physically reach Munich or be officially enrolled as a doctoral student!). Christof is undoubtedly the most generous and supportive person I have ever encountered in my personal and professional life. All my accomplishments of the last five years bear his iconic mark, and his example continues to be inspiring.

On a similar note, I thank Tim LeCain for endorsing my contribution to the branch of scholarship that he has created. While I couldn't help but feel like a newbie of environmental history throughout this doctoral path, his academic endorsement and mentorship provided me with the needed intellectual tools and emotional strength to venture into the creative material environments bolstering my research.

None of the multiple accomplishments of these past five years would have been possible if Gabriella Corona hadn't seen in me a potential environmental history scholar even before I realised it myself. I am deeply grateful for her help in navigating through the swampy reality of doctoral applications, which led me to the RCC in the first place, and for the continuous inputs throughout the years.

I thank the whole RCC academic community for the multiple practical opportunities and intellectual challenges that significantly contributed to my formation throughout the years. I particularly wish to thank my fellow doctoral colleagues Andreas Jünger, Martin Fonck, Eugenio Luciano, Katrin Kleemann, Claire Lagier, Noemi Quagliati, Talitta Reiz, Fausto Ignatov Vinueza, Jonatan Palmblad Daniel Dumas, and Ayushi Dhawan, for their friendship and support throughout this journey. I also thank all the senior RCC colleagues whose

friendship and example played an essential role in shaping my research profile well beyond this doctoral dissertation. These include, Claiton Marcio da Silva, Roberta Biasillo, Eduardo Relly, Monica Vasile, Serenella Iovino, Uwe Lübken, Giacomo Bonan, and Simone Müller.

Other colleagues (and friends) who contributed in multiple ways to this personal journey include Sandro Dutra e Silva, Mirko Mondillo, Stefano Morello, Angela Zottola, Daniele Valisena, Gilberto Mazzoli, and Samira Peruchi Moretto.

A big thank you to all the archivists and librarians who contributed, sometimes reluctantly, to the making of my doctoral research and the multiple side-projects that shaped my bumpy academic path.

No research feeds of sole academic liaisons. Countless non-academic friends in Naples, Nuremberg, Munich, and other parts of the world were as essential for my research as everyone else. Predictably, although unexpectedly for a rookie scholar, their support mainly consisted of steering the emotional wheel away from research-related matters, reminding me that a part-time life outside the academia is possible, even during a PhD.

I thank my parents and my brother for their unconditional support throughout the years. This did not only include emotional loyalty and encouragement but also practically assisting the completion of my research, becoming my private librarians and book senders during one of the most challenging times ever for human mobility. Your commitment to my cause unquestionably demonstrates that I was born in the world's luckiest 1 per cent regarding family affection.

Finally, I thank my partner Vitória for bearing with me every step of the way with kindness, empathy, and love. No words could manage to express the importance of your presence by my side, nor my gratefulness for your support (let alone in a foreign language!). I will, therefore, not even venture in expressing them but hope to do the same for you in the following years of our life together.