

## Article

# Missing Landscapes: A Geohistory of Parkland Landscapes in Northwestern Morocco

Aziz Ballouche 

Faculty of Sciences, University of Angers, CNRS UMR 6590 ESO, F-49045 Angers, France;  
aziz.ballouche@univ-angers.fr

**Abstract:** Northwestern Morocco is characterized by highly anthropized landscapes under the combined effect of agricultural intensification, resource overexploitation, urbanization, and tourism, but also local reforestation. Reconstructing the recent changes in vegetation in the region of the lower valley of the Loukkos river near Larache and their relationship to the settlement history are particularly helpful for understanding the processes at work within the landscape construction. The geohistorical approach combines paleoenvironmental, documentary, and historical data. The last few centuries have seen the emergence of wooded stands, in which cork oaks are a structural element. As forests were retreating, parklands intended for agriculture, agroforestry, and herding, like the Spanish *dehesa* and Portuguese *montado*, began to emerge. Nearly all of them have disappeared today, but we can identify their legacy and evaluate their cultural significance through comparing them with their counterparts in the Iberian Peninsula, but also in other areas of Morocco. Their deep historical roots give this landscape an evolving heritage character that is directly linked to the communities' lifestyles, culture, and history.

**Keywords:** parkland; cultural landscape; geohistory; heritage; Morocco



**Citation:** Ballouche, A. Missing Landscapes: A Geohistory of Parkland Landscapes in Northwestern Morocco. *Land* **2024**, *13*, 649. <https://doi.org/10.3390/land13050649>

Academic Editors: Maciej J. Nowak, Florentina-Cristina Merciu and Alexandru-Ionuț Petrișor

Received: 21 March 2024

Revised: 6 May 2024

Accepted: 7 May 2024

Published: 10 May 2024



**Copyright:** © 2024 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

Generally associated with agroforestry production systems, and sometimes considered totally anthropogenic, parkland landscapes perfectly illustrate the logics of shaping at the nature/society interface, in which social, economic, and cultural factors become increasingly significant. During the Anthropocene, the capacity of human beings to modify natural planetary balances is often associated with their impact on major biogeochemical or morphogenetic climatic cycles. Still, at the plant cover level, anthropization is most often seen in terms of deterioration, and is rarely seen as a dynamic factor bearing the constructive imprint of human populations; “a biosphere shaped by human actions” with transformative capabilities to shape new environments [1–3]. Here, we propose to go beyond these sometimes simplifying visions by questioning the historical roots of the landscapes and relying on the knowledge of their legacies to contribute to the recognition of the patrimony-related value of these landscapes in an example from NW Morocco. The main question addressed here is as follows: How the ancient relationships between societies and their environment can produce “working landscapes” [4] with heritage values, to be recognized and preserved.

Parklands constitute a type of vegetation with trees or other woody plants growing isolated without joining the crowns, which is relatively common in many rural areas worldwide, but whose remarkable value in terms of landscape is seldom recognized. The nomenclature adopted in the 1990s and 2000s by the FAO formalized these types of vegetation as “trees outside of forests”, a term which includes savannas, wooded swamps, coppices, and thickets, as well as hedged fields, orchards, complementary planted fields, or tree alignments [5,6]. The large typological variety of this vegetation also covers a great diversity of landscape-shaping processes. These landscapes, or more specifically

treescapes, are generally considered to be the result of various forms of natural resource exploitation (food, fuel, fodder, fiber), known as extensive agrosystems or sylvo-pastoral or agroforest systems [4,7–9]. They also produce environmental benefits on both local and regional scales.

Some of these landscapes, such as the Spanish *dehesas* or the *bocages* of western France, have been the subject of studies which reveal their multi-dimensional cultural and ecological values, particularly as reservoirs of biodiversity. The traditional practices, usages, techniques, and knowhow employed in managing them constitute a significant historical legacy [4,10–15]. Nevertheless, while the cultural significance of these uses and management methods is increasingly appreciated in Europe, these same practices have yet to be recognized in countries in the Global South, particularly in the Maghreb. On the contrary, in Morocco, these wooded stands are often considered a result of the degradation of natural forests, and local management practices are stigmatized [16,17].

When considering only the natural vegetation dynamics, describing the processes observed as concerns relating to the degradation of parklands is entirely justifiable, especially when one documents their long-term history [18–23]. On the other hand, the recent emergence of concepts which presided over the definition of the cultural landscape—where human interactions with natural systems have, over a long period of time, formed distinctive characteristics [24]—changes the way in which we see these vegetation formations. Moreover, presently, many ecologists seriously take into account the anthropogenic ecological patterns and processes, arguing that some modified ecosystems are simply different from what previously existed and are therefore not necessarily degraded [2,17,25]. Anthropization, as the basis for the shaping of cultural landscapes, gives a new perspective and makes it possible to approach their evolution in terms of landscape trajectories that must be questioned without pejorative bias [10,25]. Confronting these trajectories with environmental changes and human history, both socio-economic and cultural, leads to a set of new research questions as follows:

- To what extent are the landscapes we observe today the legacy of a long history of the interactions of local societies and their environment?
- How have ancient practices of various populations been able to interact with the environment and construct such landscapes?
- In this context, how do observed landscape forms testify to long-term processes of interaction? How do these landscapes materialize the various modes of appropriation of space and of nature by ancient societies?
- In cases where the landscapes change due to the disruption of traditional management practices, what socially significant value can we accord to the inherited landscape forms and how can we develop them or preserve them from future decline?

To answer a part of these questions, we shall employ a geohistorical approach, utilizing a geographer's perspective on historical information to investigate the evolution of the environment, territory, and landscape through both space and time [26–28]. From this perspective, landscapes are understood as palimpsests whose different layers are deciphered, each more or less visible in the environment, but always historically determined [29,30] (Figure 1). It is this historical dimension of interactions between human societies and their environment, and their role in the emergence of the cultural features of park landscapes, which remains especially sufficiently documented in the literature [10,14,15,17,31].

Here, this approach is applied to the landscapes of the lower valley of the Loukkos River in the region of Larache in northwestern Morocco, so as to document these processes objectively. Endowed with a rich natural and historical legacy, but affected by the anthropization of its environment, the region of Larache is a good illustration of the trajectories of cultural landscapes in Morocco. In this paper, we shall begin at the micro-regional scale, specifically that of the R'mel plateau, located south of Larache (Figure 2). This approach is directly justified by the fortuitous convergence of paleoenvironmental data and the available historical sources, whether textual, cartographic, or iconographical. Nevertheless, this local example is not merely an isolated case, and it will later serve as the

basis of a more general discussion of the history of specific wooded stands or trees outside of forests landscapes.

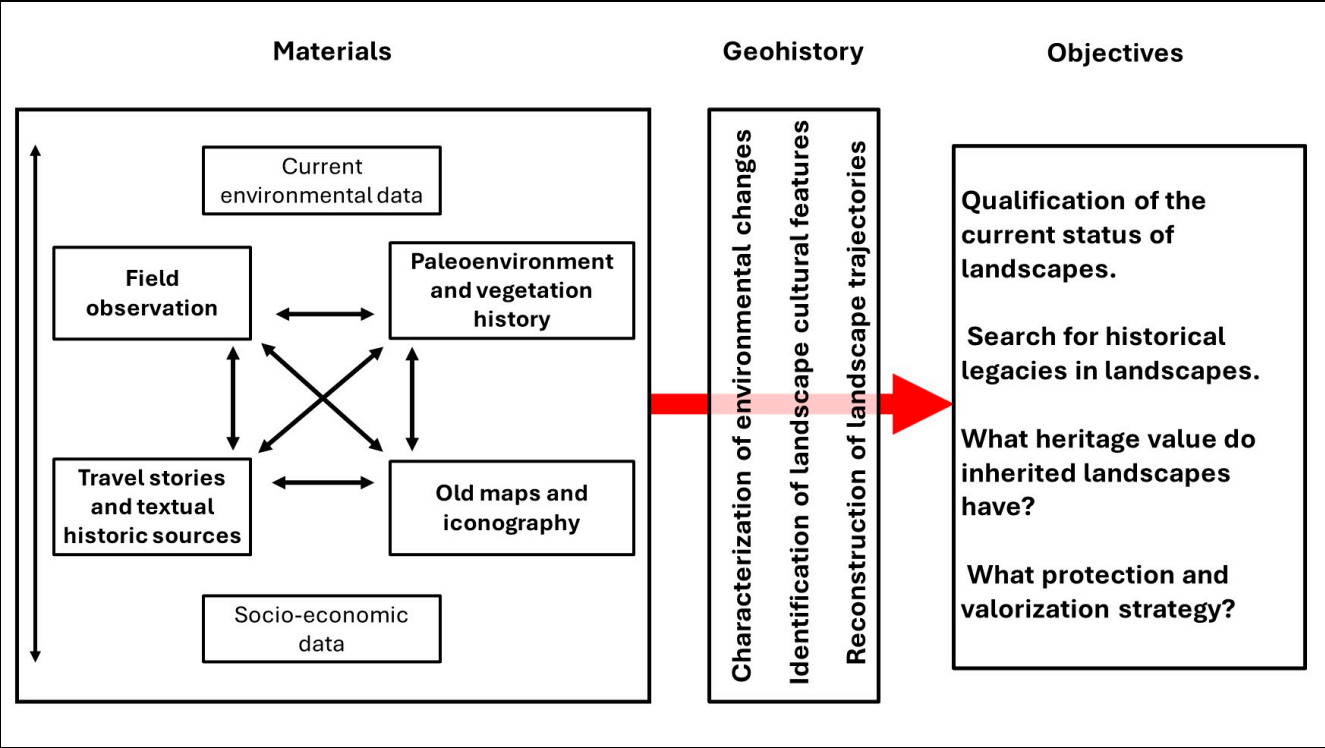


Figure 1. The research process: a geohistorical approach.

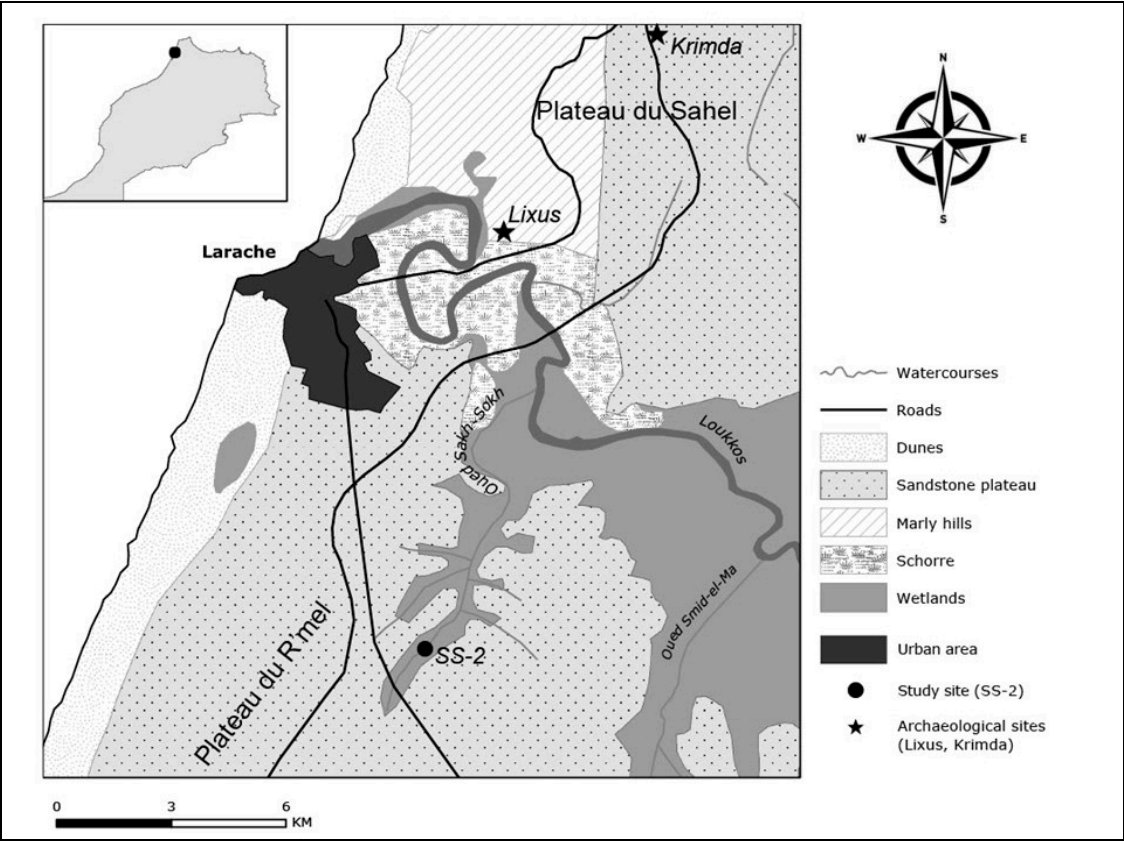


Figure 2. Location and characterization of the study area.

## 2. Materials and Methods

### 2.1. Presentation of the Study Area

The region of Larache forms a geographical ensemble encompassing the plain of the river Loukkos (Figure 2). The region is bordered on the north and the south by the Sahel and the R'mel ŷgricol. It is located on the Atlantic side of the Tingitana Peninsula, and it sits alongside the western piedmont of the Rif Mountains. The present-day climate is Mediterranean, with an annual precipitation of between 650 and 700 mm, which falls principally between October and May. The average temperature is 18 °C. On a bioclimate basis, this means a subhumid thermomediterranean climate with mild to temperate winters. Regional vegetation belongs to the cork oak domain, and, more specifically, to the “subhumid cork stands on sand” group [32]. The principal forest massif is the Larache cork oak forest, which has been largely deforested through clearing and grazing, and where *Eucalyptus*, pine, and *Acacia* reforestation has locally replaced the original vegetation. Despite anthropization, several rare species, as well as endangered species in Morocco, are still present, as are relict floristic associations, including remarkable peaty habitats [33].

From a geographic point of view, the region also constitutes the near hinterland of the city of Larache, a dominating influence, although its other polarizing city, Ksar el K bir, is also influential. Historically, the area has been inhabited in prehistoric times and throughout antiquity. The cromlech of M'zorah and the site of the ancient city of Lixus are emblematic of those times. Throughout the Middle Ages and in modern times, Larache was a critical presence in the ongoing, somewhat conflictual relationship Morocco maintained with European powers. Throughout various Moroccan dynasties, Spain and Portugal fought for control of the area. Furthermore, the region has experienced numerous waves of population due to its strategic location. At the end of the 12th century, the Almohade Sultan Abu-Y ssuf Yaqub al-Mansur constructed a small fortress at the mouth of the river. In the late 15th century, the Wattassides built a veritable citadel (Kasbah). The port of Larache later became a hideout for pirates, and eventually fell to the Spanish (1610–1689). As of the 16th century and up until the beginning of the 20th century, it was the principal outlet for products from the Loukkos Valley, the Gharb region, and such major cities as Basra or Fez. Cork, cereals, and wool were the principal goods, and the port prospered despite several periods during which it was closed to international commerce. Tribes of Arab Hilalian shepherds arrived in the area in the Middle Ages, around 1188–1189, having been brought to Morocco by the Almohad dynasty. One branch, the Riyah, settled south of the present city on the R'mel Plateau. In the 14th century, the Khlot and Tlig tribes, of the same Arab origins, drove out the Ryah. By the 15th century, they had settled there permanently, and the plateau bore their name until the beginning of the Spanish protectorate (1912–1956). The imposing military presence these tribes represented finds its justification in the strategic role of the sector, which served as a vanguard against Portuguese, Spanish, and English attempts at invasion [34].

Most of the R'mel plateau, which is the focus of this study, is presently part of the territory irrigated by The Loukkos Regional Agricultural Development Authority (ORMVAL). The territory is one of the most dynamic agricultural areas of northern Morocco, producing sugar beets, sugar cane, citrus fruits, groundnuts, tea, dairy products, etc. [35]. Present-day agrarian structures and the landscapes associated with them are thus relatively recent.

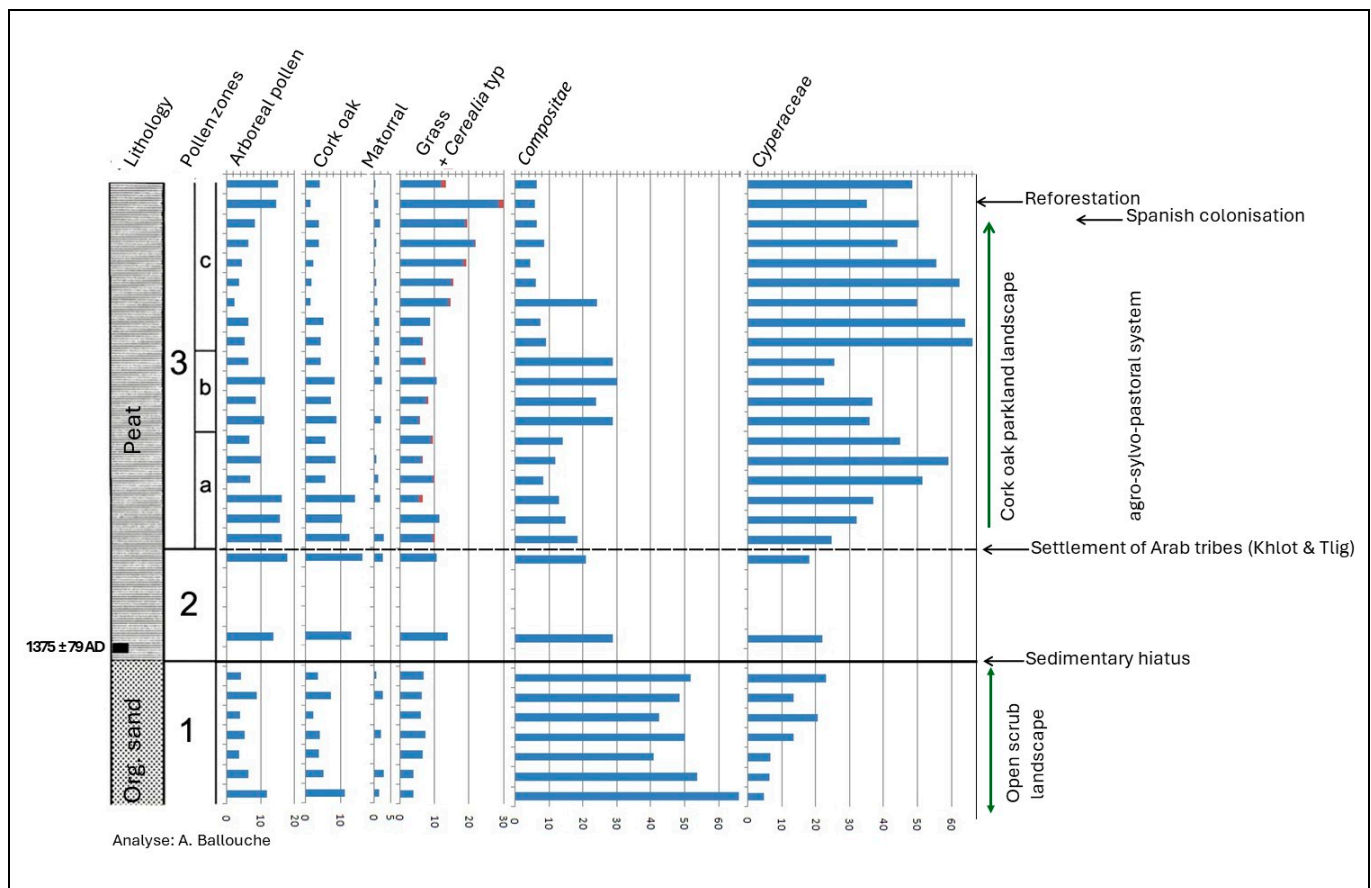
### 2.2. Methods

To answer the questions asked in the introduction, this article proposes to combine the regional vegetation history, factually documented through paleoenvironmental data, and the historical and geohistorical knowledge of the human occupation of the study area.

The paleoenvironmental data used in this research derive principally from the palynological study of the marshes of the Oued Sakh-Sokh Valley—the Oued Sakh-Sokh being a tributary of the Loukkos river. The pollen analysis concerns a 315 cm core sample (SS-2: N 35°06'28"–W 06°07'20"), carried out with a Russian peat corer. The core was opened, described for lithology (color, texture, nature), and subsampled in the field at



10 cm intervals. In the laboratory, sediment samples are processed to isolate the organic material using the classical method of Faegri and Iversen, except for the acetolysis step to preserve all of the palynomorphs [36], as follows: chemical treatments using acids (HCl, HF) to dissolve inorganic components, followed by ultrasound sieving on a mesh of 10 µm. The results of the pollen analysis were published previously [21], and only a simplified diagram is presented here (Figure 3). A radiocarbon dating, obtained 235–240 cm deep, sets a chronological starting point for the peat sequence of  $570 \pm 120$  years B.P., thus 1296–1454 AD (Ly-3787).



**Figure 3.** Summary of the environmental and landscape history on the R'mel Plateau (pollen diagram of the site Oued Sakhsokh, after Ballouche 2013, modified).

In order to translate the history of vegetation and paleoenvironments in terms of landscape trajectories, and to gain a deeper understanding of the complex interplay between local communities and their environments, we use a geohistorical approach, which analyzes textual, cartographic, and iconographic archives, mainly through a qualitative approach, which is aimed at identifying landscape features in the documents studied. Particular attention is paid to old maps because they are probably one of the most important sources of information for geohistorical research [28,37]. An exhaustive search of these cartographic documents was carried out, but only maps whose scale and figures were relevant to our question were used for this study. The sources used are both published documents (travel narratives or scientific reports) and archival material which are available in online databases (Bibliothèque nationale de France (<https://gallica.bnf.fr>), Biblioteca Nacional de España (<https://datos.bne.es>)) or in archive conservation centers in Morocco, Spain (*Archivo General de Simancas*, Madrid), or France (See Appendix A).

This dual approach allows us to identify and question the factors that influenced environmental changes and the sociocultural and political dynamics that were at the origin of the emergence of and following changes in the landscape.

### 3. Results and Discussion

#### 3.1. From Paleoenvironments to a Landscape Geohistory

The pollen diagram obtained from the Oued Sakh-Sokh marsh, south of Larache, allows for the retracing of the principal axes of the development of vegetation over the course of the past five to seven centuries, specifically that of the damp valley bottom and of the cork oak forest, which constituted the natural vegetation of the area [21]. This history can then be supplemented through comparing it with the palynological study of the site of Krimda, ten kilometers north of Larache [20]. From the peat bogs of Krimda, F. Damblon reconstructed a 3500-year history, which provides a framework, over an extended period, for the evolution of regional vegetation, which can also be integrated into a broader pattern of northwestern Morocco [18,19,22,38–40].

Since the 14th century, environmental history has essentially been determined using local hydro-geomorphological and edaphic changes in relation to the dynamic of the Lower Loukkos Valley, and by anthropic factors which have affected the catchment basins. Depression filling, recorded at both Oued Sakh-Sokh and Krimda, are the result of the anthropization of the vegetable and pedological cover of the surrounding environment, according to the clearing-erosion-silting triptych. Throughout the period, no climatic signal has been identified.

An initial reading of this history allows for the identifying of the uninterrupted, even terminal, process of the erosion of the cork oak climax forest, which, in the Middle Holocene, constituted the forest cover of large expanses of northwestern Morocco. The diagram obtained by M. Reille (1979) from the Lake Sidi Bou-Rhaba, approximately 100 km south of Larache, indicates the existence of well-developed cork stands in edaphic conditions, generally comparable to those of our study area, which date back 7000 years [19]. Some 3500 years ago, in the Krimda peat bogs 14 km to the north, a well-developed myrtle cork oak stand has been identified despite fires and grazing, which indicate human activity. We can thus conclude that, in our study area, as opposed to in the western Rif Mountains [18,22,23,40], human activity is not responsible for the expansion of cork oak stands to the detriment of deciduous oak groves since cork oak stands already constituted a natural forest.

In the Oued Sakh-Sokh diagram, evidence of anthropogenic impact is clearly perceptible [21] (Figure 3). At the end of the Middle Ages, the marked retreat of the cork oak and the advent of agriculture and grazing are simultaneous. It is possible that cork oak stands were, at that period, the site of clearing in view of grain production and grazing. In the Middle Ages, olive trees were scarce and would have been developed only much later. If, as M. Ponsich (1966) holds, olive trees were indeed cultivated in antique times, it is likely that such operations were confined to the region of Lixus or somewhere similar; since that time, such cultivation has diminished [41].

Knowledge of the occupation of the region of Larache is sufficient to attempt to explain the relationship between landscape changes and settlement history. In the wake of the 5th century departure of Roman administrators from the city of Lixus, the population of the region, and particularly that of the R'mel plateau, diminished markedly [42,43]. By the 11th century, according to El-Bakri, and by the 12th, according to Idrissi, the city of Tchemich, which, in the late Middle Ages, experienced the same fate as Lixus, had dwindled to a small village, having conserved only isolated ruins of its past splendor. On the other hand, the alluvial plain of the Loukkos (which Siraj refers to as Oued Safdad [43]), in the region of Ksar-Kebir (Souk-Kotama at the time), was already well developed. El-Gharbaoui (1981) believes that present-day population distribution still reflects these medieval circumstances. Most villages are to be found on the Loukkos plain or along the edge of the plateau overlooking the plain [34].

Deforestation from that period cannot be attributed solely to agriculture. The arrival of the first Hilalian shepherds in the area (1188–1189), under the reign of the Almohad dynasty, corresponds in time to one phase of cork oak stand erosion in the palynological study by Krimda [20]. The presence of these shepherds might also be responsible for the

observed condition of vegetation as of the starting point of the Oued Sakh-Sokh diagram, at which point the forest was already eroded (Figure 3). We believe that the subsequent rise in landscape anthropization dates to the 15th century when other military tribes and Arab Khlot and Tlig herders had arrived in the area. The situation is unchanged today. Apart from their military role in this strategic sector, the extensive sheep herding of these tribes was undoubtedly a determining factor in the construction of vegetable landscapes. Other human activities, such as lumbering, coal production, and shipbuilding, as well as fires, were also contributing factors. Incessant wars also contributed to this deterioration. Anthropogenic pressure continued to increase, according to the vagaries and vicissitudes of regional history, up until the arrival of colonialism.

Finally, in the 20th century, new forms of anthropization appear in the pollen diagram, representing breaks with the former logic. The arrival of large-scale hydro-agricultural equipment, which permanently reduced cork oak stands to mere remnants of public land, was concomitant with pines and Eucalyptus reforestation.

The evolution of cork oak stands over the course of the past few centuries, attributable to Anthropization, bears the imprint of continuous and evermore insistent anthropization. It corresponds to the overall course of environmental dynamics in northern Morocco and the western Mediterranean. This evolution is often seen in terms of deterioration, or, more locally, as *matorralisation* with scrub, in various stages of decline, replacing the original forest. However, in the interest of better documenting landscape trajectories and better defining the genuine landscape of this study, we need to take a geohistorical approach and, where possible, we must try to objectify these landscapes, namely by examining them through contemporary iconographic or textual prisms.

### 3.2. . . .and toward Landscape Trajectories

In the Middle Ages, on the R'mel Plateau, the cork oak was already sparse and would continue to decline [21]. Plants typical of the *matorral*, such as *Ericaceae* and *Cistaceae*, were also infrequent, whereas heliophilous plants, such as *Compositae* and *Graminae*, indicate open vegetation (Pollen zone 3 in Figure 3). The grassy character of the vegetation becomes more accentuated over time, with indications of cereal farming (Pollen zone 3c). On the sole basis of palaeobotanical data, it is difficult to characterize this type of landscape precisely. In the region of Larache, the relative wealth of historical, textual, cartographic, and iconographic sources provides useful information (See Appendix A).

Our purpose here is not to retrace the history of the area, which was the site of numerous hallmark events, most notably the “three kings” battle in August 1578, the lengthy Spanish occupation with the name of *San Antonio de Alarache* (1610–1689), or the bombings of Larache by European naval forces, sometimes with a ground military expedition (French in 1765, Austrian in 1830 and Spanish in 1860). Nevertheless, five centuries of conflict between Morocco and various European powers have produced a wealth of documentation, capable of shedding light on contemporary landscapes. Furthermore, Larache’s location, on the road between Tangier, the Kingdom’s port of entry, and the capitals of Fez or Marrakech (known in literature as “the path of the embassies”), meant that numerous travelers and such documented accounts of their passage. There are, of course, no pertinent written sources for the 14th and 15th centuries, but several 18–19th century European accounts provide useful landscape descriptions, sometimes implicitly rather than explicitly. We shall thus draw upon certain aspects of these various sources for assistance in reconstructing the landscape, while making no claim that this is an exhaustive attempt.

For the vicinity of Larache, to the north as well as to the south, references to the cork oak forest recur frequently. One must, nevertheless, proceed with caution when concerning the word “forest”, which, depending on the author, might designate a genuine forest formation (with wooded cover of varying degrees of density), an open woodland forest, a scrub, or a relatively open formation, such as a parkland. In several accounts, it is possible to identify a sufficiently dense plant formation south of Larache, which, given its setting, could be the present Larache forest. In his *Description of Africa* (circa 1530), Leo Africanus

speaks of “thick woods which shelter numerous lions”. The Spanish navigator Jacinto Narváez Pacheco’s account of the 1689 siege makes frequent use of the following terms: *bosque* (wood or forest), *Alcornocal* (cork oak stand), or *un tan espeso bosque* (a thick forest).

The most significant landscape description we have encountered is undoubtedly that written by the British Army doctor William Lempriere [1764–1834], who travelled across the plateau south of Larache in October 1789, and who was impressed by the presence of shepherds in the area: “we crossed over plains which, without the aid of the husbandman, were rich in verdure”. In conjunction with these pastoral uses, he describes the landscape by saying “we travelled amongst trees of various kinds, so agreeably arranged that the place had more the appearance of a park than of an uncultivated country”. Two years later, Jan Potocki [1761–1815] travelled across the same region, along with the ambassador of Sweden, but, this time, in mid-summer, more specifically, in late July of 1791. He mentions “uncultivated plains covered with sparse, already dry grasses” whose inhabitants “barely cultivated the land and who led a purely pastoral life”.

A century later, several accounts confirm this pastoral aspect of a landscape punctuated here and there by trees. Charles Tissot (1876) describes massifs “formed of centuries-old trees, stripped to a certain extent of their bark and whitened by time [...] interspersed by numerous large clearings”. Arthur Leared (1876) wrote that “After leaving Alcassar, and having crossed the Lucos, our course lay westward through a country studded with cork oak trees”. In 1885, Henry Duveyrier (1886) was surprised that one might speak of a wood or a forest: “Upon leaving El-’Arâiche, we entered another ‘forest’ where the most affected species were the sweet acorn oaks, the cork oak, and wild pears. The feet of the trees were widely spaced, and the interval between them was occupied by palmettos, ferns, long grasses, and various flowers”. A final account, that of Achille and René Garnier (1899), who crossed the Tingitana Peninsula at the very end of the 19th century, mentions “a forest of huge, beautiful trees, most of them cork oaks some of which are enormous. [...] We encountered several whose trunk measured more than six meters in circumference and whose main branches are larger than a man’s body”.

From these various descriptions, we can easily identify the landscapes of the sandy plateau south of Larache as wooded *savannoid*-type stands, or as parklands in which cork oak is a structural element. The spectacular appearance of these trees, which inevitably impressed travelers with their height and spread, is interesting from two points of view. On the one hand, while any number of authors refer to forests, the majestic shape of such trees is more like that of trees outside of the forest, which grow in full light, rather than a forest shape. On the other hand, the secular age of the cork oaks can also inform us about the age of the treescape that they structure. We are thus justified in comparing the 18th and 19th century landscapes south of Larache to those of the Spanish *dehesa* or the Portuguese *montado*, and in considering that they were present several centuries before such observations were made. Ideally, one would call upon iconographic representations, such as contemporary sketches or photographs.

While Larache and its coastline, as well as the mouth of the Loukkos river, figure among the most frequent subjects of sketches by European naval forces from the 17th to the 19th centuries, few iconographic documents prove to be useful in reconstructing the landscape. An oblique sketch by the German engraver Georg Keller [1576–1640] from Frankfurt is entitled “*Larache in Barbarien Von Spanischen Eingenomen 1610*”, and gives some inkling of the appearance of that landscape. Scattered trees dot the rural landscape around the edges of the fortified town, but the geographical exactitude of the sketch is merely approximate, and its depiction of the rural landscape cannot be fully significant.

Certain ancient maps, even those limited to the coastline or to the fortified town, may hold great significance [37]. It is, for example, possible to identify specific landscape details on these 17th and 18th century maps. A 1611 map by Juan Bautista Antonelli [1547–1616] (*Archivo General de Simancas*, Madrid), at the onset of the Spanish occupation, distinguishes between wooded areas to the south of the city, which most likely correspond to the present-day Larache forest, and more open spaces, where we can identify wooded grassy expanses



(Figure 4). This is undoubtedly one of the most explicit maps concerning the existence an ancient *dehesa*-like wooded landscape. On another map, one from 1774 by Diego Noble, a wooded grassy landscape is also identifiable [21]. On the map illustrating his travels in Morocco in 1861–64, the German explorer Gerhard Rohlfs indicates the entire area south of Larache in these following terms: “Weite Ebene mit ausgedehnten Korkeichen-Wäldern” (Wide plain with extensive cork oak forests). This clearly evokes an open treescape. On Spanish or French maps from the beginning of the 20th century, the study area is often referred to as *Gaba del Araix* or *Ghaba al-Araich* (forest of Larache), but the term “forest” can be debated. A map drawn in 1900–1902 by French artillery captain Nestor Larras is more explicit. It points out on the R'mel plateau a “futaie” of cork oak, but also herds of beef and sheep. The term *futaie* is used in French to designate a formation of large trees with open trunks.



**Figure 4.** Map of Larache and the surrounding area in 1611 by Juan Bautista Antonelli. The parkland landscape is clearly visible at the bottom right of the map, south of Larache. (Archivo General de Simancas, Madrid, MPD,44,040).

At the end of the 19th century, numerous travelers returned with photographs of northern Morocco. Most notable amongst them was Henry Duveyrier, cited above, who was known to have travelled throughout our study area. Unfortunately, no photographs of these landscapes figure among his series, which was entrusted to the *Geographical Society of Paris* and was deposited at the *Bibliothèque Nationale de France*. The most interesting photographic document comes much later, in 1920, at the beginning of the Spanish protectorate. It was the work of Jean Gatefosse, who had carried out a botanical survey in Morocco (Figure 5). The illustration is captioned “*Quercus suber* L. forest between Larache and Ksar el Kébir. The lower tufts, at the ground level, are composed of *Chamaerops humilis* L. The plants are



isolated by *Asphodelus microcarpus* Viv". The landscape visible in the picture shows old cork oaks scattered in a more or less continuous grassy formation, comparable to that of the Spanish *dehesa*. This document is interesting in more ways than one! On the one hand, it objectively documents the wooded appearance of the cork oak parkland to the south of Larache, which bears some resemblance to René and Achille Garnier's description, which was published 20 years earlier and is cited above. This therefore confirms the permanence of such a landscape since at least the beginning of the 17th century. On the other hand, the caption suggests differences between how the term "forest" was used at that time and how it is now used by professional naturalists.



**Figure 5.** The cork oak parkland south of Larache in 1920 with trees in typical shape (source: Jean Gatefossé, [www.persee.fr/issue/linly\\_1160-6436\\_1921\\_num\\_41\\_2](http://www.persee.fr/issue/linly_1160-6436_1921_num_41_2), accessed on 21 March 2024).

### 3.3. Working Landscapes

While it is useful to have identified these structures as parkland landscapes or wooded parks, to fully comprehend the parallel with the Iberian *dehesa* and *montado*, we must also consider the process in shaping the landscape [4,10,11,14]. Rather than being mere deteriorated cork oak stands, and specifically closed scrubs (*matorral*), these treescapes are veritable cultural landscapes, constructed through extensive herding based on the free-range and multifarious use of resources. In the highly anthropized Iberian plant formations, the herbaceous layer is systematically grazed, and the cereal culture may be interspersed, whereas the wooded population (holm oak or cork oak) is exploited for silviculture in view of production, whether wooded (wood, carbon, cork) or not (acorns, arboreal fodder, tannin, etc.). Occasionally, wild game management and exploitation are also employed. Together, these lead to highly coherent cultural landscapes over vast areas. Better known

and increasingly understood in Spain and Portugal, as well as in Italy, these landscapes are beginning to be recognized in the Maghreb, especially in the Moroccan High Atlas [44,45].

While this is typical of the western Mediterranean, these landscapes, and especially their origins and history, are insufficiently documented. Their long-standing anthropogenic character is nevertheless fully recognized [10,14,46–49]. For example, according to Carrion et al. (2000), the natural setting for the cork oak in the Iberian Peninsula would be that of a mixed forest, along with other deciduous and sclerophyllous oaks or pines. In the absence of human activity, there could not have been pure stands like those found in present-day cork oak stands and the *dehesa* [49].

In the region of Larache, at Krimda, north of the Loukkos river, F. Damblon (1991) noted a long period of agricultural or agropastoral development, not only during the Punic-Roman period, but also in the late Middle-Ages [20]. We believe that such land use must have been organized according to an infield/outfield system which created a landscape of clearings within the cork oak stand. *Matorralisation* increased in the wake of the 11th and 13th centuries. Present-day *matorrals* would seem to be the result of intensified deforestation and increased pastoral pressure, as well as of frequent pastoral fires [17].

As in the *dehesa*, the construction of wooded parks in our study area must be considered in relation to the complex agro-sylvo-pastoral system, which accompanies the history of the peopling of an area. As was explained earlier, the pastoral mode of life of the Khlot and Tlig people, who have occupied the R'mel Plateau for five centuries, is undoubtedly the principal influence on this landscape construction. It is difficult to document these processes precisely because we lack sufficiently credible sources concerning ancient production systems in the area.

In the early 20th century, just before the colonial upheavals, Eugène Aubin (1904) noted that these landscapes and their productive systems were still operative: “with few *douars* and precious few fields, the country is little more than an immense grazing land for herds of sheep and cattle”. The monograph by E. Michaux-Bellaire and G. Salmon (1905–1906) devoted to the Arab tribes of Loukkos is an important source. Despite the numerous reservations one might formulate concerning the authors’ value judgments in the pre-colonial context, the study offers a wealth of information, once filtered by a necessary critical approach. In 1882, Teodoro de Cuevas, Vice Consul of Spain in Larache and the correspondent for the *Sociedad Geográfica de Madrid*, produced a comprehensive geographical, political, historical, and commercial inventory of the area, which appeared in the society’s bulletin in 1883 and 1884. The principal interest of this document resides in its direct reporting on certain points. It is, nonetheless, strewn with approximations.

In the chapter they devote to economic life, E. Michaux-Bellaire and G. Salmon affirm that “a vast majority of Khlot and Tlig fields are farmed”. They claim, however, that the sandy, rocky fields are suitable for sheep. They note specifically the abundance of superficial ground water on the R'mel Plateau, “where water emerges just above ground level and where there is always sufficient grass, even in the summer”. Even so, they have little respect for Khlot herding practices, as clear in the following: “the cattle look after themselves, as best they can. They have neither stable, nor shelter, nor fodder, nor bedding”. Their observation concerning the absence of fodder fields or prairies in favor of driving their herds through wooded rangeland is more objective. They distinguish between this extensive sheep herding on the plateau “wherever grass is to be found, except for on cultivated land” and herding cattle or horses, activities which most often are confined to valley pastures. The degree to which sheep herding dominates can be appreciated via consulting Teodoro de Cuevas’ 1892 study, which estimates, for the whole of the Khlot and Tlig tribes, 110,000 sheep, 8800 cattle, and 3300 horses and mares. According to E. Michaux-Bellaire and G. Salmon, these numbers, while greatly underestimated, provide some idea of the relative importance of each. For the most part, sheep herding was destined for shearing, wool being one of the principal commodities traded at the local and export markets.

Yet, other facets of *dehesa* production systems have also been reported in our study area. Wood was exported for coal production, as reported by Leo Africanus as early as the



16th century in his *Description of Africa*. In recounting the activity he observed in Larache, Leo mentions majestic woods, which the city's inhabitants "have long used to produce coal, which they ship by sea to Arzilla and Tangia", both cities at the time being occupied by the Portuguese. The charcoal produced also fired numerous lime kilns and pottery and brick ovens. In Larache, being an important port for pirates of the 16th century and, from 1610 to 1689, a Spanish port, shipyards were also a significant outlet for wood. The destruction of the "forest" gained momentum in the 19th century, given the exportation of large quantities of cereal and cork, as well as timber.

According to El-Gharbaoui (1981), economic pressure for exploiting the forest was such that, on the R'mel plateau, it brought with it a veritable guild, that of the *zebbara* (woodcutters) [34]. It is nevertheless difficult to define with any certainty exactly how the wood was exploited, given that the available sources are either vague or contradictory. The twisted main branches of the trees captured in the photographs of J. Gatefosse or those of the large relict trees found even today suggest pruning and cutting practices, comparable to those of the *dehesa*, especially for producing wood for coal or firewood. In 1876, C. Tissot observed considerable cutting, but believed that it was anarchical and "dependent upon the whims of the natives". He even went so far as to predict that the disappearance of this precious natural resource was at hand. Two decades later, A. and R. Garnier had a more positive point of view regarding the situation, based on their observation of several coaling villages within the "superb Larache forest". "Far from wanting to destroy the land" to create grazing lands, as Algerian natives do, the inhabitants of Moroccan coal production villages watch over their lands to the point of jealousy, and consider fires to be calamitous accidents which must be avoided. Forest fires are, nevertheless, a reality which many such travelers have observed. Michaux-Bellaire and Salmon say that wood from the forest of Larache which belonged to the government (*Makhzen*) served for shipbuilding and for constructing the wagons used for transporting goods to Fes. They claim, however, that cork was not exploited. That assertion is contradicted by A. and R. Garnier, who observed methodical exploitation in the vicinity of a *douar*. The Sultan had banned cork exportation, so whatever did leave the area was smuggled out. The rest was sold within the country where it was used for beehives.

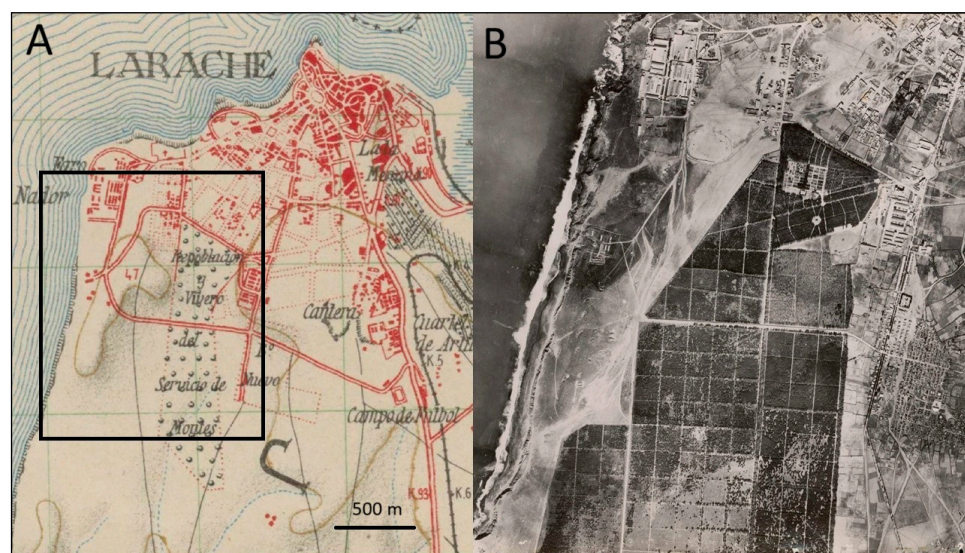
Among these diverse forms of anthropization, the precise role of the frequent military conflicts is difficult to determine. We know, however, from don Jacinto Narváez Pacheco's account of the five-month long 1689 siege of Larache, that the besieging Moroccan troops were at some point stationed in the *Alcornacal* (cork oak forest). However, we know that, in other regions of the world, wars have often been the cause of forest destruction.

Paleoenvironmental and geohistorical data converge in attesting to the existence, dating back five or six centuries on the sandstone and limestone plateau, of an original cork oak parkland landscape. They also converge to show that anthropization presided over its construction and maintenance. This history is intimately linked to the role played by Arab shepherds who occupied the area, and is distinct from methods of development in the valley of the Loukkos, particularly in the vicinity of an urban center such as Ksar el-Kébir (Ksar Danhdja or Suk Kutama, depending on the period, or even the Roman *Oppidum novum*). When Arab authors mention the fertility of the area, often in general terms, they are most likely referring to the valley and its alluvial plain: "the two banks of the river are covered with gardens and vines". (*Geography of Abulfeda*, 14th century). This feature subsists up until the advent of colonization. Michaux-Bellaire and Salmon (1905) write the following: "The city of El-Qçar is ringed with gardens where there are olive, fig, pomegranate, orange, lemon, quince, palm, apple, pear, apricot and peach trees as well as vineyards. The entire Lekkoûs Valley [...] is bordered by a nearly interrupted line of fig and pomegranate trees which shade it". The valley was also used for pasturing on the natural meadows of the alluvial plain, especially cattle and horses. In the 19th century, the area upstream from the confluence of the Oued Sakh-Sokh and the Loukkos harbored the king's horses (*'Adir as-Sultan*).



It is thus remarkable that, during the 20th century, over a period of several decades, this landscape disappeared. The colonial development of the area of Larache, which had begun just prior to European land acquisition, and which gained momentum in 1927 with the *Compañía Agrícola del Lucus*, entailed, along with the modernization of agriculture, the rapid marginalization of the sylvo-pastoral rangeland. It quickly obliterated the structured landscapes, which were the product of a lengthy history. These developmental processes continued and were reinforced following Moroccan independence and the introduction of the ORMVAL irrigation programs. In the late 1970s, the sector was critically affected by the arrival of large-scale machinery and by land consolidation. The average plot of land, 1.26 ha before consolidation, grew to 6.49 ha [35]. Dams, pumping stations, and a dense network of canals control water distribution, and citrus orchards, sugar beets, and sugar cane fields, as well as groundnut, sunflower, tea, and fodder production, crisscross the R'mel plateau. The current landscape is thus relatively recent, mainly one of intensive cultivation (irrigated fields and greenhouses), having been superimposed upon what was already a polycyclic legacy.

Colonial forest management policies also contributed to obliterating these historic landscapes. Reforestation was initiated and sylvicol landscapes proliferated. In the South of Larache, reforestation was noted on Spanish maps from the 1920s, and was documented by aerial photos from 1943 (Figure 6). The ancient cork oak stands of Larache and Khalifat were brought into the State domain and are still striking, not only by their very presence, but because of several remarkable surviving specimens. Nevertheless, the forest is returning by means of afforestation, often in the form of exotic trees (*Eucalyptus*, pines, and acacias). While the agro-sylvo-pastoral system has been deprived of its function and the wooded treescape of its utility, certain relict trees still exist in the present-day landscape. The parkland landscape itself has, however, disappeared, or has been reduced to a few small areas. Century-old trees were still to be seen on the R'mel plateau recently, isolated, or more frequently within pine or *Eucalyptus* reforestations. They still exist even today, having been stratified and fully integrated into present-day landscapes, where they serve as reminders of ancient ways of life and ancient methods of land use which have now ceased to function (Figure 7).



**Figure 6.** Pine reforestation in the south of Larache. (A) Spanish colonial map (Repoblación vivero del servicio de montes, 1928). (B) Aerial photo from 1943 (source: Biblioteca nacional de Espana).





**Figure 7.** Old relict cork oak tree in the pine reforestation, south of Larache (photo A. Ballouche).

Our long-term reading of the processes in action in the parkland landscapes of the Larache region shows that these are real palimpsests in which the touches of each step of regional history are inscribed. They are therefore historical legacies in the same way as their homologues on the northern side of the Mediterranean [10,11,15,46,48–51]. While such landscapes persist in certain regions of Morocco, such as in the Middle and High Atlas [44,45], their deterioration since the pre-colonial period, and especially their disappearance during the 20th century, challenge our approach to heritage. The extensive exploitation of natural resources has fallen into disuse in many Mediterranean areas and also in northwestern Morocco. As these systems are marginalized or obliterated, the vast emblematic landscapes they created are compromised [4,9,10,13,14,49]. The *dehesa* and the *montado* in Spain or in Portugal have been become biosphere reserves and thus have been recognized for their patrimony value [4,15,52–54]. Other more ordinary landscapes of trees outside of forests, landscapes which are less esthetically interesting or whose production is more marginal, are also threatened or have already disappeared [4,12–14,17]. These landscapes represent, nonetheless, an intergenerational legacy where much is at stake, both ecologically and economically [55], but most especially, on a sociocultural and symbolic level [9,56]. On the other hand, the traditional agroforestry systems have received increasing attention in recent decades for their multifunctional role and as a sustainable development model in a world facing global changes [57]. For these different reasons, these landscapes must be identified, inventoried, preserved, and protected as tangible heritage, maintaining their presence for future generations [44,58].

#### 4. Conclusions

By definition, a landscape is the result of spatial and temporal dynamics within which nature and society interact, and both of which lead to its observable state at a given point in time. The treescape, by its composition, form, and role, is generally an indicator of the strategy that each society pursues with regard to the environment it inhabits. The missing wooded parklands in the Region of Larache clearly illustrate the anthropogenic, constructed dimension of many Mediterranean landscapes. The settlement history of the area and the evolution of the production systems associated with these populations determine landscape trajectories and even produce original examples of landscape emergence.

In our example, the historical ties with the Arab pastoralists of Hilalian origin bestows cultural value to the landscapes so created, particularly as concerning the Arab-Muslim historiographical tradition. Since the time of Ibn Khaldoun, this historiography has attempted to see, in the often turbulent Hilalian tribes and their nomadic lifestyle, the vectors of catastrophic devastation making a clean sweep of everything that lay in their path. We suggest here that we refresh our view of the landscaping role they played. Over the course of five centuries, their pastoral system, the way in which they occupied the land, and their resource management practices fashioned, aside from any ecological motivation or ideological bias, veritable cultural landscapes, as Carl Sauer (1925) defined them: *“The cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the outcome”* [59]. In terms of the agro-sylvo-pastoral-determined wooded parkland landscape, we have here depicted it to be of great originality, while recalling comparable Mediterranean systems. Its historical roots and its legacy are well established here. The persistence of such a landscape over centuries can be read as a characteristic of their sustainability and their resilience. As of the end of the 19th century, these landscapes seemed to display signs of deterioration, but it is especially their near total eradication over the last century which deserves our attention.

The changing practices of local communities and of socio-political features in space and through time, but also the shifts in the representations of nature by different actors, deeply changed and redesigned the landscape. Scientific knowledge of such landscapes and the recognition of their historical roots underscore the constructive role of the sometimes stigmatized production systems. At a time when awareness of culturally significant landscapes is on the increase, the recovery and protection of these landscapes, similar to the recovery processes of homologues in the Iberian Peninsula, have come to the fore in the Maghreb. Furthermore, the recent disappearance of the components of such landscapes and the failure of numerous naturalists to fully recognize their socio-economic and cultural determinism has impeded our understanding of ongoing environmental processes, and has biased our understanding of the nature of plant landscapes, more specifically treescapes.

**Funding:** This research received no external funding.

**Data Availability Statement:** Original data presented in the study are contained within the article. Requests for further information should be addressed to the author.

**Acknowledgments:** The author thanks Sigrid Giffon (cartographer at UMR ESO) for her technical help. He also thanks the National Archives of Spain (Archivo General de Simancas, Madrid), for access to their documentation and their authorization to use the map MPD,44,040. The author also thanks the three reviewers for their insightful comments.

**Conflicts of Interest:** The author declares no conflicts of interest.

#### Appendix A. Sources

Al-Bakri (11th c.)—كتاب المسالك والممالك *Kitāb al-Masālik wa'l-Mamālik* (Book of Roads and Kingdoms).

Al-Idrisi (12th c.)—نزهة المشتاق في اختراق الآفاق *Nuzhat al-mushtāq fī ikhtirāq al-āfāq* (“The Book of Roger”).



- Abul Fida (14th c.)—كتاب تقويم البلدان *Kitâb Taqwim al-Buldan* (A Sketch of the Countries).
- Leo Africanus (1526). *Della descrizione dell’Africa et delle cose notabili che ivi sono* (Description of Africa Translated and collected by John Pory in 1600).
- Keller, G. (ca. 1610)—*Larache in Barbarien Von Spanischen Eingenomen*. (Kulturstiftung Sachsen-Anhalt—Kunstmuseum Moritzburg Halle (Saale). MOIIF00420).
- Antonelli, J.B. (1610)—*Plano de Larache y sus alrededores*. . . Archivo General de Simancas, Madrid, MPD,44,040.
- Narváez Pacheco, J. (1689)—*Sitio de San Antonio de Alarache en 1689*. Relación escrita por don Jacinto Narváez Pacheco, y continuada por don Juan Cloquer Vargas Machuca. Colección de documentos inéditos para la historia de España, 1893, vol. 106, 319–450.
- Noble, D. (1774)—*Plano del Puerto de Larache en Berberia Cituado en la Lat. N. de 34 g. 35 m<sup>os</sup> y en la Long. de 10 g. 40 m. segun el Meridiano de Tenerife*. (<https://gallica.bnf.fr/ark:/12148/btv1b5966491c/f1.item.r=Larache%20Diego%20Noble.zoom>, accessed on 21 March 2024)
- Potocki, J. (1792). *Voyage dans l’Empire de Maroc, fait en l’année 1791*. Varsovia.
- Lempriere, W. (1798)—*A Tour from Gibraltar to Tangier, Sallee, Mogodore, Santa Cruz, Tarudant: And Thence Over Mount Atlas, to Morocco: Including a Particular Account of the Royal Harem*, Walter: London.
- Rohlfs, F.G. (1865)—Karte zur Übersicht der Reisen von G. Rohlfs in Marokko, 1861–1864. *Petermanns Geographische Mitteilungen*, Jahrgang 1865, Tafel 4.
- Leared, A. (1876)—*A Visit to the Court of Morocco*. Low, Marston, Searle, & Rivington: London.
- Tissot, C.J. (1876)—*Itinéraire de Tanger à R’bat*. C. Delagrave: Paris, 72 p.
- Cuevas, T. de (1883–1884)—Estudio general sobre el bajalato de Larache y descripción crítica de las ruinas del Lixus romano. *Boletín de la Sociedad Geográfica*, Vol. XV, XVI, XVII.
- Duveyrier, H. (1886)—Les «chemins des ambassades» de Tanger à Fâs et Meknâs en 1885. *Bulletin de la Société de géographie*, série 7, 7, 344–363.
- Garnier, A.; Garnier, R. (1899)—*Tanger: la ville des chiens*. Plon: Paris, 32 p.
- Aubin, E. (1904)—*Le Maroc d’aujourd’hui*. Armand Colin.
- Michaux-Bellaire, É.; Salmon, G. (1905–1906)—Les tribus arabes de la vallée du Lekkoûs. *Archives Marocaines*, t. IV, V, VI.
- Larras, N.P. (1907)—*El Araïch*. (Map: 1:100 000). Service géographique de l’Armée, Paris.
- Gattefossé, J. (1921)—Voyage d’études au Maroc [1920]. *Société botanique de Lyon*. 41(2), 36–70.

## References

- Folke, C.; Polasky, S.; Rockström, J.; Galaz, V.; Westley, F.; Lamont, M.; Scheffer, M.; Österblom, H.; Carpenter, S.R.; Chapin, F.S.; et al. Our future in the Anthropocene biosphere. *Ambio* **2021**, *50*, 834–869. [[CrossRef](#)] [[PubMed](#)]
- Ellis, E.C. Ecology in an anthropogenic biosphere. *Ecol. Monogr.* **2015**, *85*, 287–331. [[CrossRef](#)]
- Ellis, E.C. The Anthropocene condition: Evolving through social-ecological transformations. *Philos. Trans. R. Soc. B Biol. Sci.* **2024**, *379*, 20220255. [[CrossRef](#)] [[PubMed](#)]
- Campos, P.; Huntsinger, L.; Oviedo, J.L.; Starrs, P.F.; Díaz, M.; Standiford, R.B.; Montero, G. (Eds.) *Mediterranean Oak Woodland Working Landscapes: Dehesas of Spain and Ranchlands of California*; Springer: New York, NY, USA, 2013.
- Bellefontaine, R.; Petit, S.; Pain Orcet, M.; Deleporte, P.; Bertault, J.G. *Trees Outside Forests: Towards Better Awareness*; Conservation guide, 35; FAO: Rome, Italy, 2002.
- Chakravarty, S.; Pala, N.A.; Tamang, B.; Sarkar, B.C.; Manohar, K.A.; Rai, P.; Puri, A.; Shukla, G. Ecosystem Services of Trees Outside Forest. In *Sustainable Agriculture, Forest and Environmental Management*; Springer: New York, NY, USA, 2019; pp. 327–352.
- Hecht, S.B.; Morrison, K.D.; Padoch, C. (Eds.) *The Social Lives of Forests: Past, Present, and Future of Woodland Resurgence*; University of Chicago Press: Chicago, IL, USA, 2014.
- Prevedello, J.A.; Almeida-Gomes, M.; Lindenmayer, D.B. The importance of scattered trees for biodiversity conservation: A global meta-analysis. *J. Appl. Ecol.* **2018**, *55*, 205–214. [[CrossRef](#)]
- Plieninger, T.; Shamohamadi, S.; García-Martín, M.; Quintas-Soriano, C.; Shakeri, Z.; Valipour, A. Community, pastoralism, landscape: Eliciting values and human-nature connectedness of forest-related people. *Landsc. Urban Plan.* **2023**, *233*, 104706. [[CrossRef](#)]
- Plieninger, T. Constructed and degraded? Origin and development of the Spanish dehesa landscape, with a case study on two municipalities. *Erde* **2007**, *138*, 25–46.
- Linares, A.M. Forest planning and traditional knowledge in collective woodlands of Spain: The dehesa system. *For. Ecol. Manag.* **2007**, *249*, 71–79. [[CrossRef](#)]



12. Guillerme, S. *Les Paysages D'arbres Hors Forêt. Multi-Valorisation Dans le Cadre D'un Développement Local Durable en Europe du Sud*; MEEDDAT: Paris, France, 2010; p. 283.
13. Nerlich, K.; Graeff-Hönniger, S.; Claupein, W. Agroforestry in Europe: A review of the disappearance of traditional systems and development of modern agroforestry practices, with emphasis on experiences in Germany. *Agrofor. Syst.* **2013**, *87*, 475–492. [\[CrossRef\]](#)
14. Wolpert, F.; Quintas-Soriano, C.; Plieninger, T. Exploring land-use histories of tree-crop landscapes: A cross-site comparison in the Mediterranean Basin. *Sustain. Sci.* **2020**, *15*, 1267–1283. [\[CrossRef\]](#)
15. Myers, K.A. *A Country of Shepherds: Stories of a Changing Mediterranean Landscape*; Open Book Publishers: Cambridge, UK, 2024.
16. Quezel, P.; Medail, F. *Ecologie et Biogéographie Des Forêts du Bassin Méditerranéen*; Elsevier: Paris, France, 2003; p. 574.
17. Chebli, Y.; Chentouf, M.; Ozer, P.; Hornick, J.L.; Cabaraux, J.F. Forest and silvopastoral cover changes and its drivers in northern Morocco. *Appl. Geogr.* **2018**, *101*, 23–35. [\[CrossRef\]](#)
18. Reille, M. Contribution pollenanalytique à l'histoire holocène de la végétation des montagnes du Rif (Maroc septentrional). *Bull. A.F.E.Q.* **1977**, *50*, 53–76.
19. Reille, M. Analyse pollinique du lac de Sidi Bou Rhaba, littoral atlantique (Maroc). *Ecol. Mediterr.* **1979**, *4*, 61–65. [\[CrossRef\]](#)
20. Damblon, F. Contribution pollenanalytique à l'histoire des forêts de chêne liège au Maroc: La subéraie de Krimda. *Palaeoecol. Afr.* **1991**, *22*, 171–183.
21. Ballouche, A. Contribution à l'histoire récente de la végétation du Bas-Loukkos (Province de Larache, Maroc). *PhysioGéo* **2013**, *7*, 67–82. [\[CrossRef\]](#)
22. Cheddadi, R.; Nourelbait, M.; Bouaissa, O.; Tabel, J.; Rhoujjati, A.; López-Sáez, J.A.; Alba-Sánchez, F.; Khater, C.; Ballouche, A.; Dezileau, L.; et al. A history of human impact on Moroccan mountain landscapes. *Afr. Archaeol. Rev.* **2015**, *32*, 233–248. [\[CrossRef\]](#)
23. Muller, S.D.; Rhazi, L.; Andrieux, B.; Bottollier-Curtet, M.; Fauquette, S.; Saber, E.R.; Rifai, N.; Daoud-Bouattour, A. Vegetation history of the western Rif mountains (NW Morocco): Origin, late-Holocene dynamics and human impact. *Veg. Hist. Archaeobotany* **2015**, *24*, 487–501. [\[CrossRef\]](#)
24. UNESCO. *World Heritage Cultural Landscapes: A Handbook for Conservation and Management*; World Heritage Papers; UNESCO: Paris, France, 2009; p. 26.
25. Hobbs, R.J. Degraded or just different? Perceptions and value judgements in restoration decisions. *Restor. Ecol.* **2016**, *24*, 153–158. [\[CrossRef\]](#)
26. Baker, A.R. *Geography and History: Bridging the Divide, Cambridge Studies in Historical Geography*; Cambridge University Press: Cambridge, UK, 2003; Volume 36.
27. Grataloup, C. The history of the World has a geography (and vice versa). *Le Débat* **2009**, *154*, 67–77. Available online: <https://www.cairn-int.info/journal-le-debat-2009-2-page-67.htm> (accessed on 21 March 2024). [\[CrossRef\]](#)
28. Piovan, S.E. *The Geohistorical Approach*; Springer International Publishing: Berlin/Heidelberg, Germany, 2020.
29. Bailey, G. Time perspectives, palimpsests and the archaeology of time. *J. Anthropol. Archaeol.* **2007**, *26*, 198–223. [\[CrossRef\]](#)
30. Knight, J. Development of Palimpsest Landscapes. Vignettes: Key Concepts in Geomorphology. 2012. Available online: <https://serc.carleton.edu/68942> (accessed on 21 March 2024).
31. Smith, J. *The History of Temperate Agroforestry*; The Organic Research Centre: Cirencester, UK, 2010.
32. Sauvage, C. *Recherches Géobotaniques Sur Les Subéraies Marocaines*; Société Des Sciences Naturelles et Physiques Du Maroc: Rabat, Morocco, 1961; p. 21.
33. Muller, S.D.; Rhazi, L.; Saber, E.R.; Rifai, N.; Daoud-Bouattour, A.; Bottollier-Curtet, M.; Ghrabi-Gammar, Z. Peat mosses (*Sphagnum*) and related plant communities of North Africa. II. The Tingitanean-Rifan range (northern Morocco). *Nova Hedwig.* **2011**, *93*, 335–352. [\[CrossRef\]](#)
34. El Gharbaoui, A. *La Terre Et L'homme Dans La Peninsule Tingitane: Etude Sur L'homme Et Le Milieu Naturel Dans Le Rif Occidental*; Institut Scientifique: Rabat, Morocco, 1981; Volume 15, p. 439.
35. ANAFID. *Gestion Des Grands Périmètres au Maroc*; Association Nationale des Améliorations Foncières, de l'Irrigation et du Drainage: Rabat, Morocco, 1990.
36. Faegri, K.; Iversen, J. *Textbook of Pollen Analysis*, 4th ed.; Wiley & Sons: Chichester, UK, 1975.
37. Vilar, J.A. *Mapas, Planos y Fortificaciones Hispánicas de Marruecos* (s. XVI–XX); Ministerio de Asuntos Exteriores: Madrid, Spain, 1992; p. 604.
38. Ballouche, A. Paléoenvironnements de L'homme Fossile Holocène au Maroc. Apports de la Palynologie. Ph.D. Thesis, University of Bordeaux, Bordeaux, France, 1986; 134p.
39. Ballouche, A.; Damblon, F. Nouvelles données palynologiques sur la végétation holocène du Maroc. *Trav. De La Sect. Sci. Et Tech. Inst. Français De Pondichéry* **1988**, *25*, 83–90.
40. Boutahar, A.; Ouafaa, B.; Cariñanos, P.; Picone, R.M.; Crisafulli, A.; Mesa, J.M.; Kadiri, M.; Lamrani, Z.; Merzouki, A. Reconstructing past vegetation based on fossil and modern pollen data in Sougna mountain (Western Rif Mountains, Northern Morocco). *Rev. Palaeobot. Palynol.* **2023**, *316*, 104936. [\[CrossRef\]](#)
41. Ponsich, M. Contribution à l'Atlas archéologique du Maroc: Région de Lixus. *Bull. D'archéologie Marocaine* **1966**, *6*, 377–423.
42. Siraj, A. *L'image de la Tingitane: L'historiographie Arabe Médiévale et L'antiquité Nord-Africaine*; École Française de Rome: Rome, Italy, 1995; Volume 209, p. 732.

43. Jazwa, C.S.; Collins-Elliott, S.A. An ecological model of settlement expansion in northwestern Morocco. *Quat. Int.* **2021**, *597*, 103–117. [\[CrossRef\]](#)
44. Auclair, L.; Alifriqui, M. *Agdal. Patrimoine Socio-Ecologique de L'atlas Marocain*; Ed. IRD: Paris, France, 2012.
45. Taïbi, A.N.; El Hannani, M.; El Khalky, H.; Ballouche, A. The agroforestry parks of Azilal (Morocco): A centuries-old and still living landscape construction. *J. Alp. Res.* **2019**, *107*. Available online: <https://journals.openedition.org/rga/6524> (accessed on 21 March 2024). [\[CrossRef\]](#)
46. Marañón, T.; Ojeda, J.F. Ecology and history of a wooded landscape in southern Spain. In *The Ecological History of European Forests*; Kirby, K.J., Watkins, C., Eds.; CAB International: Wallingford, UK, 1998; pp. 107–116.
47. Grove, A.T.; Rackham, O. *The Nature of Mediterranean Europe: An Ecological History*; Yale University Press: New Haven, CT, USA, 2001.
48. Vicente, Á.M.; Alés, R.F. Long term persistence of dehesas. Evidences from history. *Agrofor. Syst.* **2006**, *67*, 19–28. [\[CrossRef\]](#)
49. Urbiet, I.R.; Zavala, M.A.; Marañón, T. Human and non-human determinants of forest composition in southern Spain: Evidence of shifts towards cork oak dominance as a result of management over the past century. *J. Biogeogr.* **2008**, *35*, 1688–1700. [\[CrossRef\]](#)
50. Carrión, J.S.; Parra, I.; Navarro, C.; Munuera, M. Past distribution and ecology of the cork oak (*Quercus suber*) in the Iberian Peninsula: A pollen-analytical approach. *Divers. Distrib.* **2000**, *6*, 29–44. [\[CrossRef\]](#)
51. López-Sáez, J.A.; Alba-Sánchez, F.; Robles-López, S.; Pérez-Díaz, S.; Abel-Schaad, D.; Sabariego-Ruiz, S.; Glais, A. Exploring seven hundred years of transhumance, climate dynamic, fire and human activity through a historical mountain pass in central Spain. *J. Mt. Sci.* **2016**, *13*, 1139–1153. [\[CrossRef\]](#)
52. Acha, A.; Newing, H.S. Cork oak landscapes, promised or compromised lands? A case study of a traditional cultural landscape in Southern Spain. *Hum. Ecol.* **2015**, *43*, 601–611. [\[CrossRef\]](#)
53. Marañón, T.; Pérez-Ramos, I.M.; Villar, R.; Acácio, V.; Aranda, I.; Camarero, J.J.; Garcia de la Riva, E.; Domínguez, M.T. Iberian oaks coping with global change: Ecological processes and management strategies. In *Quercus: Classification, Ecology and Uses*; Nova Science Publishers: New York, NY, USA, 2020; pp. 1–84.
54. Bidegain, Í.; López-Santiago, C.A.; González, J.A.; Martínez-Sastre, R.; Ravera, F.; Cerda, C. Social Valuation of Mediterranean Cultural Landscapes: Exploring Landscape Preferences and Ecosystem Services Perceptions through a Visual Approach. *Land* **2020**, *9*, 390. [\[CrossRef\]](#)
55. Serbouti, S.; Ettaqy, A.; Boukcim, H.; Mderssa, M.E.; El Ghachtouli, N.; Abbas, Y. Forests and woodlands in Morocco: Review of historical evolution, services, priorities for conservation measures and future research. *Int. For. Rev.* **2023**, *25*, 121–145. [\[CrossRef\]](#)
56. Plieninger, T.; Abunnasr, Y.; D'Ambrosio, U.; Guo, T.; Kizos, T.; Kmoch, L.; Topp, E.; Varela, E. Biocultural conservation systems in the Mediterranean region: The role of values, rules, and knowledge. *Sustain. Sci.* **2023**, *18*, 823–838. [\[CrossRef\]](#)
57. Santoro, A.; Venturi, M.; Bertani, R.; Agnoletti, M. A Review of the Role of Forests and Agroforestry Systems in the FAO Globally Important Agricultural Heritage Systems (GIAHS) Programme. *Forests* **2020**, *11*, 860. [\[CrossRef\]](#)
58. Auclair, L.; Baudot, P.; Genin, D.; Romagny, B.; Simenel, R. Patrimony for resilience: Evidence from the forest Agdal in the Moroccan High Atlas Mountains. *Ecol. Soc.* **2011**, *16*, 24. [\[CrossRef\]](#)
59. Sauer, C.O. *The Morphology of Landscape*; Publications in Geography, 2; University of California: Oakland, CA, USA, 1925.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.