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The Portuguese *Montado*: A Complex System under Tension between Different Land Use Management Paradigms

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Abstract

The *Montado* is a silvopastoral system and the dominant land use in Alentejo (Portugal). Its functionalities expand beyond agricultural and forestry production. It is a system where a low-density and heterogeneous tree cover is complemented with livestock grazing and fodder production, resulting in its recognition as a high-nature-value farming system. However, for it to be effectively preserved, a balance between its many components needs to be secured. Despite the relevance and urgency of its conservation, the *Montado* has long suffered a constant decay. To better understand such decay, it is crucial to unravel why and how land use management decisions are made, and the interplay of drivers influencing such decisions. We applied discourse analysis to identify the various management paradigms that currently co-exist underpinning strategies by land managers and others. Our analysis is based on a review of the scientific literature, a media analysis, participant observations, and in-depth interviews with *Montado* farmers in Central Alentejo between 2014 and 2017, along with a survey with producers implemented during 2018. We conclude that existing strategies, and underpinning paradigms, are frequently incompatible, leading to the poor progress in halting the current decay of the system, and thus, also in securing its sustainability.

Keywords: *Montado*, paradigms, management, discourses, land use

1. Introduction

Agricultural production in Europe has been shifting between different management paradigms over the past 50 years more rapidly than ever before in history. Currently, multifunctionality [1] and sustainability [2] are leading the public and political agendas in the transition from productivism toward postproductivism. Nevertheless, such contemporary management paradigms have neither evolved linearly nor followed mutually successive patterns, but in much more complex and intertwined ways. Such complexity is being influenced by mutually opposing trends, such as intensification vs. extensification or global vs. local, and expands across multiple spatial and temporal scales, resulting in the current complex mosaic of rural land use and farming systems across Europe [3].

Diverse discourses concerning different farming management paradigms underpin such mosaic [4] that also overlay each other in similarly complex temporal and spatial patterns. Within this complex overall picture, some regional contexts, and thus also their farming and land use systems, are particularly vulnerable to degradation and are being affected by management and policy decisions that support the prevalence of unsustainable management paradigms. These are paradigms that too frequently disregard the complexity entailed by postproductivism at the expense of the efficiency and short-term financial returns that may be achieved through productivism [5]. This is clearly the case of Mediterranean region, where traditional rural land uses with access to key production factors (soils and water) are undergoing processes of rapid transformation through technological, ecological, and financial intensification, while those in marginal areas remain alternatively unchanged, frequently leading to their marginalization or even abandonment.

The Alentejo (Portugal) is one predominantly rural region where such a trend is clearly taking place, including in the *Montado*. This is problematic because the persistence of mutually contradictory management paradigms hampers efficiency, potentially driving environmental degradation and unsustainable land use. Despite being reflective of the above-described problems, and of its recent gradual qualitative and quantitative decline [6], the *Montado* still dominates the land use and landscapes of Alentejo (**Figure 1**).

In this chapter, we examine the range of management paradigms that currently co-exist in the *Montado*, the discourses that underpin each of these paradigms, and the tensions that arise from such co-existence. To achieve this, we first need to clarify our interpretation of what a management paradigm is. In this paper, we define a management paradigm as the technical, institutional, and legal setups influencing decisions by land use actors at the farm level, including their values, goals, beliefs, and worldviews. Thus, paradigms shape the ways in which farmers, land owners, and managers consider the *Montado* and also how they consider themselves positioned in relation to the system. Paradigms, therefore, strongly influence decisions and may potentially help explain trends in land use and management. Our aim is to unravel the diversity of management paradigms that jointly impact the future sustainability of a silvopastoral system, the *Montado*, by influencing everyday management decisions undertaken at the farm level. Following Foucault [7], we have also adopted and applied the concept of discourse to explore the underpinning reasons behind such management paradigms.

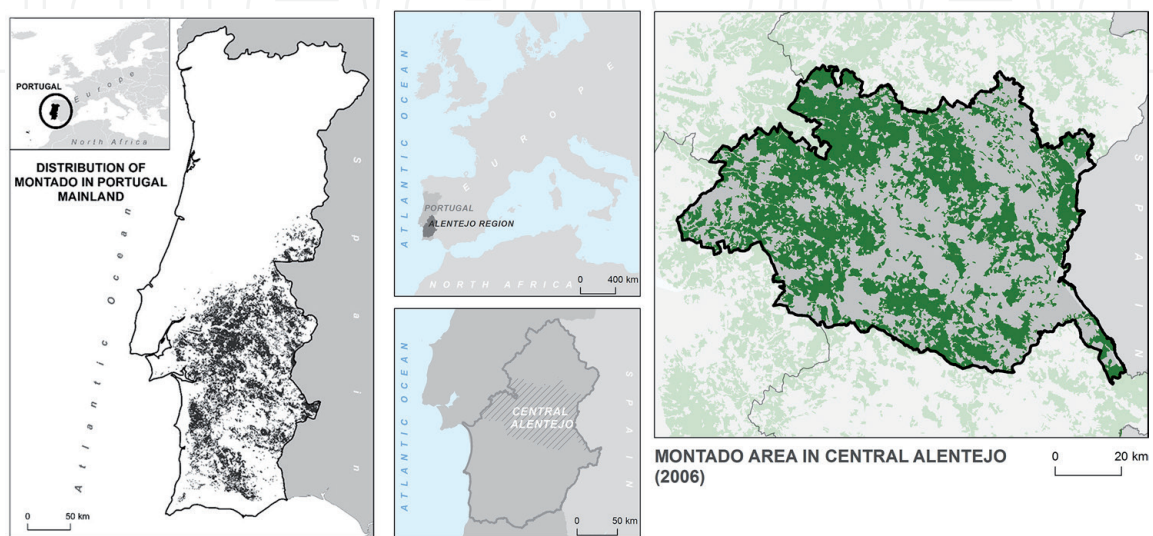


Figure 1. Distribution of Montado in Continental Portugal (left, in black) and Central Alentejo (right, in green).

The chapter begins by describing the key structural, spatial, and socioecological characteristics of the *Montado* as it stands today, its components and their importance, the recent trends, evolution and the changes, and the main threats and opportunities. Within this initial section, we focus on two main aspects of the *Montado* that require further reflection: its current qualitative and quantitative decay, including its root causes, drivers and consequences, and its multifunctional nature, and the challenges ahead posed by intensification, globalization and financialization. Once the system has been characterized, in the third section of the chapter, we identify, describe and critically assess the multiple changes and challenges that are driving the wide range of management options undertaken in the *Montado* nowadays.

Emphasis in the chapter is made on the tensions among drivers of change across scales, including socioeconomic, financial, political and environmental ones, and hints at how this may be affecting the system's sustainability. The fourth section of the chapter identifies and explores the diverse management paradigms that can be unraveled by looking at the discourses that over the last century have dominated in the *Montado*, and how they represent different understandings of issues relevant for sustainability including power imbalances, collective perceptions, and institutional underpinnings. In the discussion, we then hint at potential pathways to progress beyond the current (problematic) situation toward more sustainable management pathways, and then close the chapter by recapitulating on the main relevant lessons learnt and barriers to progress beyond the state of the art.

2. The *Montado*

Montado is the Portuguese term used to designate the silvopastoral system, which in Spain is named as *Dehesa* [8, 9]. Montados and Dehesas spread across the central and southern regions of the Iberian Peninsula, where the dominant climate is warm-summer Mediterranean, have poor and shallow soils and strong rainfall and temperature irregularities [8, 9]. The *Montado* occupies ~1.2 million ha [6, 10], much of it in the central municipalities of Alentejo (**Figure 1**). The property structure is largely dominated by large-family-owned estates, normally ranging between 200 and 2000 ha. Only around smaller towns, a small-scale property structure appears, with a mosaic of multiple Mediterranean cultures substituting the *Montado*.

The *Montado* is characterized by a low-density tree canopy dominated by Holm and Cork Oaks (*Quercus suber* and *Quercus rotundifolia*, respectively), which can be intermixed in some areas with other tree species, including Ash (*Fraxinus* spp.) occupying the most humid soils, chestnut trees (*Castanea sativa*) in wetter and mountain climates, and other largely riparian species in the proximity of river courses, with natural or cultivated grassland in the undercover [10]. The main use of such grassland is for extensive livestock grazing, with herds of sheep or goats and Iberian pigs or cattle, depending largely on the type of terrain, soils, and characteristics of the pastures. While a few farm units breed mixed livestock, a majority of them focus only on one species, increasingly in cattle. The extensive nature of the grazing activity is justified by the strongly limiting biophysical factors, including shallow and poor soils and semidry climate, which do not generally allow for intensive grazing or any alternative or intensive agricultural land use [10].

Nevertheless, and despite a vast majority of the grazing being extensive, supplement feed is required in almost all *Montado* farms, especially during summer and autumn. Depending on management practices, pasture can be more regularly distributed or alternatively intermixed with dispersed patches of shrub. Shrub control is generally applied using livestock, often in combination with mechanical

methods that are useful at certain periods of the year. Cultivation or improvement of pastures is also a common practice [8, 9].

The balance among all these components requires detailed and comprehensive management schemes, which have been improved since the eighteenth century, with knowledge being transmitted along generations, mainly within the families of *Montado* land owners and also land managers [11, 12]. Along the twentieth century, cultivation of cereals in a large rotation with pastures and fallow was common in the *Montado*, but has progressively reduced its size and is upmost rare in the present day *Montado* [13]. This is, however, in contrast with some areas of Spanish *Dehesa* (**Figure 2**), where rotations between grasslands and extensive cultivations still persist.

This is particularly the case of some plain areas in the high plateaus of Extremadura, Andalucía, and Castilla, with low-density tree canopies that allow for mechanized cropping. Although the aim of this chapter is not to deliver a comparative analysis of diverse regional situations, these cross-regional remarks might come useful to the reader, especially to those readers that are acquainted with diverse regional realities, but that need to become aware of how influential the management practices and the cultural and policy drivers behind them are. *Montados*, considered as human-shaped ecosystems, are characterized by strong habitat heterogeneity



Figure 2.
Contrast between a Dehesa in Extremadura (left) with cereal cropping in the undercover and a Montado with grazing pastures in the Alentejo (right).



Figure 3.
Landscape mosaic including land use patches of Montado with different tree densities and spatial structures, alternating with crops (mainly in the more fertile and plain areas), shrubland (in the hilliest and least productive areas), natural and artificial water masses, and other human land-cover and land use types. Overall, this should be considered a human landscape, albeit one with high levels of ecological qualities.

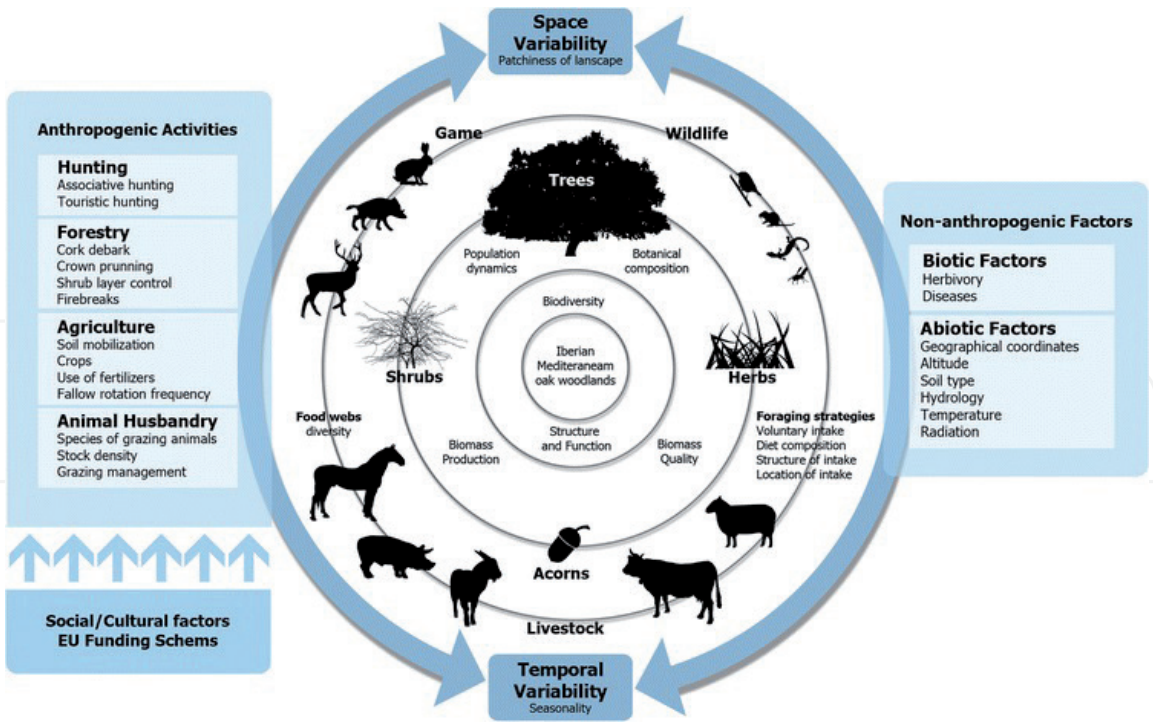


Figure 4.
The Montado as a complex dynamic land use system with its different interacting components (from [11]).

rates (Figure 3). This is due to the changing composition and density of the tree cover, in combination with an undercover mosaic of grasslands with dispersed or patches of shrubs. A pronounced patchiness of the vegetation communities and a marked seasonality of plant and animal biological cycles are characteristic features of *Montados* [11] (Figure 4). Consequently, the *Montado* has long been acknowledged as a land use system with high natural and social values, providing relevant ecosystem and landscape services well beyond the biodiversity conservation.

The specific and extremely heterogeneous environmental conditions of the Mediterranean region have played a key role in securing that these systems could prosper historically. Nonetheless, the system is now under severe threats, and undergoing qualitative and quantitative decay [6]. This is either due to insufficient innovative and adaptive land-management practices or due to pressure for rapid intensification and change. While the former trends are leading to extensification and abandonment in the less fertile and more peripheral areas, the latter are driving chronic overuse in other more fertile ones [13].

3. Ongoing changes and management challenges today

3.1 Some preliminary considerations

To critically address the key management changes and challenges being faced by the diverse key actors in the *Montado* in the early twenty-first century (farmers, managers, and policy makers), a first step is to identify and characterize the various drivers and components of the degradation trends currently affecting the system's structure and qualities. Till date, certain scientific studies have jointly assessed the spatial, ecological, and socioeconomic aspects of the degradation of the *Montado*, although this has been mostly done from a quantitative perspective, as latest assessments reflecting the state of the art seem to indicate [6]. We consider this to be clearly insufficient to provide with a full picture of the situation. Furthermore, the current trajectories of change undergoing in the *Montado* cannot be fully understood without considering the root causes and

complex drivers of land use change that are set across scalar levels that largely exceed the farm units and its immediate context. These root causes generally fall completely out of control of farmers, land managers, and other key decision makers traditionally in charge of managing changes and strategies for the *Montado*, and include globalization, financialization of agriculture and liberalization of international agricultural trade, climate change and desertification (both biophysical and human) as well as changing diets [11].

Global challenges are especially problematic for traditional and multifunctional land use systems, such as the *Montado*, where the multiple services and benefits (e.g., ecological, cultural, and socioeconomic) that they have traditionally delivered are now rendered as inefficient in a political economic context on which financial competitiveness is increasingly turning into the key criterion guiding land use decision-making [8, 9]. In relation to spatial scales, we also find the scale mismatches hampering sustainability across multiple socioecological systems to be relevant for the *Montado*. This is a system on which a clear scalar mismatch exists between the land management structures and levels in place (basically focusing on the farm level) and the financial (global), institutional (National and European) and ecological (landscape) levels at which governance is actually exercised.

3.2 Ecological, spatial, and structural changes and challenges

According to recent data [6] published following a critical overview of the problems and challenges encountered in many of the datasets of official and public information, the increasing trend in the qualitative and quantitative degradation of the *Montado* is self-evident. This includes a decrease in the total size and tree density and diversity, and also in the system's overall health. According to the sixth National Forest Inventory of Portugal [14], *Quercus suber* and *Quercus rotundifolia* *Montados* occupy in Portugal a total of 1,067,954 ha, of which 736,755 ha correspond to *Quercus rotundifolia* and circa 331,179 ha to *Quercus suber*. Also according to [6], between 1990 and 2006, approximately 90,054 ha disappeared in the *Montado* area in the Alentejo region, with an estimated annual regression rate of $0.14\% \text{ year}^{-1}$. This challenges the official data from the National Forest Inventory [14], which point out a relative stability in the *Montado*'s surface over the same period. Furthermore, when looked at the landscape scale, spatial data can be retrieved from official sources [14] indicating to the fragmentation and consecutively reduced ecological and functional connectivity of the *Montado*. This is clear from the gradual timely increase in the number of patches and decrease of their surface in the Alentejo region and the Portuguese region with the biggest concentration and best preserved *Montados* (*Montado* occupies 40% of the region's land cover). Regarding the plant health of the system, ICNF verified that more than 50% of the *Montado* with *Quercus rotundifolia* and 68% with *Quercus suber* were characterized by symptoms of slight decline, while in 4 and 10%, respectively, of the aforementioned systems, these symptoms are considered severe [10, 13]. Nonetheless, the *Montado* area decrease and health status should be linked with the stand development stage, as otherwise the results can be misleading.

3.3 Socioeconomic and governance changes and challenges

Generally speaking, socio-economic aspects of the *Montado* are following the same declining trends as the spatial, structural and ecological ones (**Table 1**). A 2018 survey with over 150 *Montado* farmers and farm managers has shown that only farm businesses with a minimum of 300–400 ha are now financially sustainable, a size that has grown steadily over the past few years [15]. According to these same producers surveyed, structural changes in the diverse components of the system have been happening over the past decades that have contributed to shifting its functionality, and

	1910	1960	1990	2006
Total area (km ²)	3152.95	4030.35	3544.15	3466.77
Relative area (% Central Alentejo)	43.60	55.81	49.16	47.68
Number of patches	116	208	248	306
Mean patch size (km ²)	27.18	19.38	14.29	11.33
Variance (%)	5.54	4.41	3.71	3.35
Maximum patch size (km ²)	1838.86	2496.06	2019.46	1987.46
Minimum patch size (hectares)	0.33	0.93	0.41	0.27

Table 1.
Evolution of the distribution of Montado in Central Alentejo (1910–2006), according to baseline data in [6].

ultimately, its sustainability. These include a decline in tree density (now frequently below 120 trees/hectare) accompanied by a move toward increasingly specialized cattle-focused *Montado* farms (a 2.77% increase between 1999 and 2009). This has resulted on a less diverse and resilient livestock herd, which has worsened even further by the gradually increasing trend toward the concentration of farm property [15]. Although a tree density of 100–120 trees/ha for a *Montado* can be considered as adequate from an ecologically functional standpoint, especially if crown cover is around 50–60% and if it has more than one cohort, a significant number of the 150 *Montado* producers that were surveyed [15] considered that the decline noted in tree density in many *Montado* areas should be considered not only as a proxy of the system decline, which is partly related to its decaying multifunctional character and trend toward monofunctional specialization, but also as a possible outcome of the increasingly impacting tree pests and diseases affecting the system.

Alas, other negative trends have been detected in the system that include the ever-lowering levels in market power by farmers and managers [16], as signaled by the poor rates of farmers’ willingness to join, and associations noted the declining number of employments provided per farm unit. This can be linked to both the gradual increase in the relative cost of living and wages, and the intensification of the regional agricultural alternatives, which provide better paid and more specialized jobs. A last important trend detected is the human desertification occurring in the major regions on which *Montado* persists. Population density in the regions covered by Montado range between 168.1 inhabitants/km² in the district of Setúbal [17–20] which is closest to the Metropolitan region of Lisbon to the 14.9 Inhabitants/Km² of the Beja district [17–20]. Whilst the former is closest to the Metropolitan region of Lisbon, and thus occupies few of its human resources in agriculture, the latter is amongst the most remote and least industrialized regions in Portugal.

This results in an overall picture that indicates a difficult situation and seemingly poor prospects for the Portuguese *Montado* in the early twenty-first century. However, this problematic situation has not yet resulted in a more effective and better-coordinated responses and strategies, neither political nor social or economic, to tackle many problems of degradation signaled. It has been argued that there are cultural and political reasons behind such an inefficient response [11], but the faults and challenges in the system have not been sufficiently analyzed.

To exemplify the problems in the regulation and planning of the *Montado*, one only needs to look at the sets of legislative instruments specifically targeting the *Montado* in the Alentejo (**Figure 5**). Despite this being a region where the *Montado* is publicly acknowledged to play a key role for sustainable territorial development [18–20], the existing regulations are either partial (only protecting individual components of the system such as the oak trees [21]), insufficiently explicit and differentiated [18–20], and even advocate the support of pathways toward intensification

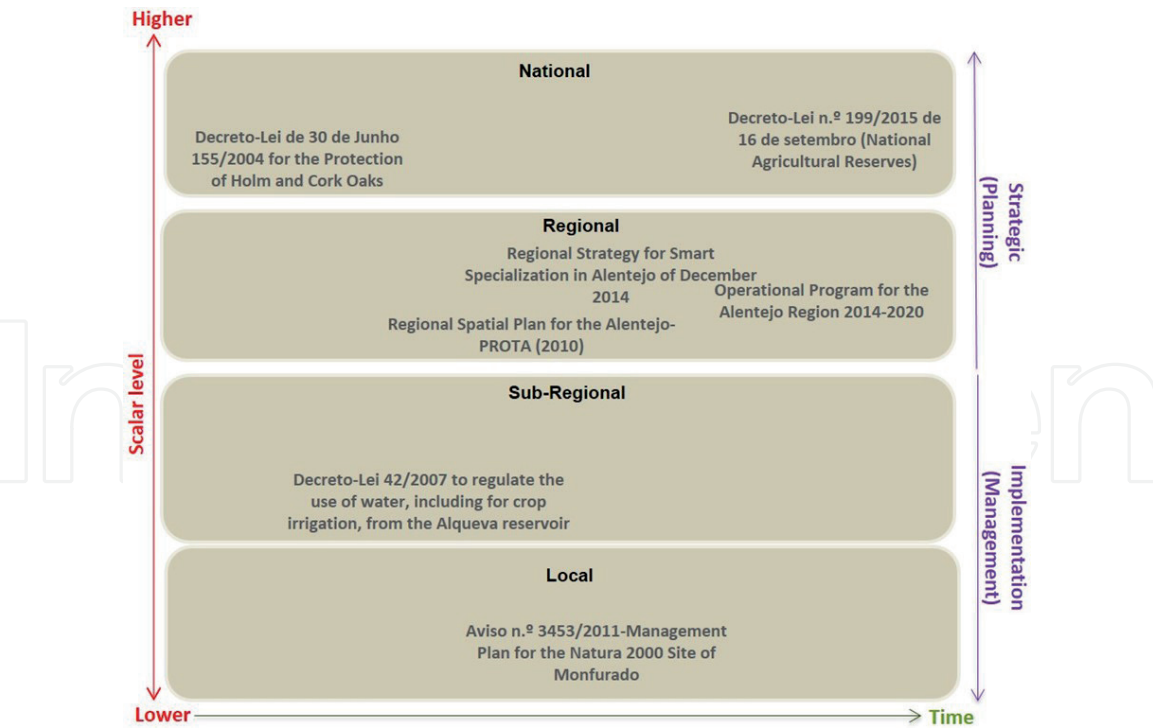


Figure 5.
Overview of the relative spatial-temporal scales and nature of the key regulatory instruments for the management of the Montado in the region of Alentejo (Portugal).

and specialization of agriculture [22]. Following such a pathway would most probably hamper the sustainability and competitiveness of traditional, extensive, and multifunctional systems, such as the *Montado*, that do not fit tightly with the “exclusivity-zoning-oriented” [23] and economic-growth-oriented approaches that have so far been preeminent in rural policies and plans across Europe.

Alas, conflict may also arise between National regulations, such as the Decreto Lei 199/2015 (National Agricultural Reserves) [24] that promote the increase of agricultural production, and other legal and planning instruments that focus on conservation of cultural, ecological, or landscape values incompatible with the intensification and expansion of crops. This is indeed the case, for instance, of the Natura 2000 network, which explicitly recognizes the urgency to promote conservation of *Montado* landscapes and habitats that are either significant or especially valuable, such as the Monfurado site in Alentejo [25]. Although in this case, zoning approaches may help prevent incompatible management paradigms (e.g., agricultural reserves and biodiversity hot-spots) to collide with time and space, they may also be considered as inefficient in light of what has been termed as the “island protection” model, which has now been long criticized as inefficient to drive change toward sustainable development [26]. Under this “island” approach, individual and frequently isolated spots are overprotected, while the rest of the territory is prone to development of different intensities, leading to a somehow “schizophrenic” territorial policy framework.

4. Examining the management paradigms in the *Montado* through discourse analysis

4.1 Management paradigms and underpinning social discourses

In order to identify and critically examine the management paradigms that have prevailed in the *Montado*, we will use the social discourses as entry point that may be disentangled in the assertions expressed by the various key actors influencing

the land use and landscape management. A discourse can be defined as an entity of signs that attribute meaning to particular objects, subjects, and statements [7]. When analyzing land use management, one may find it useful to explore the underlying discourses because they define the statements that are seen as legitimate about a given space or topic among a group of farmers. Therefore, discourse analysis can illicit the tacit normative foundation and the routines that are taken for granted on which the farming system and their underpinning management paradigms are based. This turns discourse analysis into an important analytical tool to unfold how these power relations play out in the case study setting.

Thus, why we opted for discourses as analytical tools to identify the management paradigms under which decisions undertaken by actors on the ground can be better understood.

In this analysis, we have explored the argumentation that emerges when farmers and land managers describe and explain their individual conduct. Our intention was not to judge particular regimes of knowledge and truth, but rather the ambition was to unfold how particular discourses provide a meaning to the management decisions that are made by various actors, and therefore to the management paradigms that underpin such decisions. We, therefore, looked for the existence of discourses, which provide justification for the different management paradigms currently underpinning farmers' decisions in the *Montado*. We did so by using an approach that could be easily replicated in other cases where multiple views and interests have gradually or simultaneously driven various management options for land use change.

4.2 Methods and sources

To achieve this, we explored different sources collated over the past 10 years, which jointly provided us with a quite comprehensive insight into the discourses and management paradigms related to this particular land use system, in the region: a review of published and unpublished results from research projects undertaken over the last 10 years, where different management options and drivers have been discussed and explored with land managers and other stakeholders [10, 11].

This was added on top of an analysis of media sources since 1990s [15]. This analysis consisted in the consultation of media sources referring to the *Montado* in Portugal, which was published between 1992 (coinciding with the MacSharry CAP reform) and May 2006. To perform this analysis, we examined 19 sources of information related to the production sector (webpages, newspapers, and magazines), using the NVIVO11 text codification software, participatory observation. This has been performed throughout our participation in various meetings where land owners express their opinion: thematic workshops, the preparation of the Green Book of the *Montados* [10], the Advisory Group of the Ministry of Agriculture for the reform of the CAP post-2013, participatory discussion forum on the *Montados* organized once a month since April 2016 at the University of Évora, and 25 in-depth interviews with *Montado* land owners and managers, as well as other stakeholders involved in its management. Finally, the results and key findings of three focus groups with land managers, one workshop with a variety of stakeholders, and a survey with over 150 farmers in the Alentejo [15] were also considered.

The projects from which we collated information for this target were the following: EU grant no. 635,577, H2020-SFS-2014-2 (SUFISA: Sustainable finance for sustainable agriculture and fisheries") and the FCT grant FCT-PTDC/CS643 GEO/110944/2009 (ATILA: "Transition pathways: assessing innovation in farm management strategies"). Furthermore, results shown in this chapter were also drawn from a research project funded by National Funds through the FCT—Foundation for Science and Technology under the project UID/AGR/00115/2013. Since key relevant

results from these projects are still unpublished, they cannot be properly cited in the text, and thus to obtain further details about them, readers should await for the publication of on-going papers, databases, or reports currently under way.

4.3 Results and findings

We identified three discourses (**Table 2**) using a grounded approach of the diverse ideas expressed by different stakeholders. Central statements were initially identified, grouped, and regrouped, leading to the generation of the different discourses that could be considered as “entry points” to the management paradigms currently shaping the fate and direction of the *Montado*. These statements were then examined in relation to (a) how language is used to “construct” the ideas or interpret information, (b) their variability, looking for inconsistencies of meaning in the constructions, via constant comparison and exploitation of the assumptions they reveal, and (c) the implications of the particular accounts and what is achieved in terms of discourse throughout each of these accounts [27]. The discourses were first conceived as ideal types, then progressively grounded and more comprehensively identified, through our interpretation of the different sources. **Table 2** shows how the three discourses can be characterized and differentiated.

Within each of the three discourses (**Table 2**) and related management paradigms, quite different versions of the *Montado* are constructed. Such versions are underpinned by different perception of the conditions for agricultural development

MONTADO Agro-silvopastoral systems	Heritage farming	Modern production farming	Land stewardship farming
Time scales	Nineteenth century and first half of the twentieth century	Started during 1960s and 1970s of the twentieth century, with a break during the revolutionary period (1974–1975), and again rising, following the integration of Portugal in the European Union	Started following the agrienvironmental stage of the CAP in 1992, but mainly after 2000
Central concepts	Rural culture Land estate Mixed agro-silvopastoral system	Modernization Rationalization Specialization Income-based decisions	Nature conservation Market Societal services Farming as nature keeper
Scope and perspective	Generational perspective	Shorter term perspective (financial gains)	Longer term perspective (intergenerational)
Societal perceptions on farming	Farming is the backbone of regional society, and farming maintains the state of social and cultural structures	Conservative and state/EU dependent	Double: both as nature keeper and nature destroyer
Key actors	Large land owners and their families	EU support schemes and labor wages	NGOs, Media, and EU agri- environmental schemes
Discourses are in this case considered as language-based analytical tools useful to unravel the diverse management paradigms under which decisions are made by farmers and land managers.			

Table 2.
Main contemporary discourses in the Portuguese Montado and their key characteristics

in the region and prescribe different and often conflicting management practices, which align with the different management paradigms. In the heritage discourse, the *Montado* is constructed as a set of agriculture and forestry management practices and as a unique cultural landscape overly acknowledged as heritage. The modern production discourse poses the *Montado* as a production and management system prone to be modernized and intensified, with potential for high-income generation for the land owners' benefit. Finally, the land stewardship discourse conceives the *Montado* as a forestry-based nature conservation system, which is a guarantee of environmental balance in the region. Stemming from our own research through the aforementioned projects via which the overall information was collected, it is apparent how the current dominant discourse in the context of the Portuguese *Montado* is still a modern production farming, which has so far marginalized the other two discourses.

This is reflected both within the farming community and in designing public policies. This trend is associated with prevailing power relations in the farming community, with the role of the very large national farmers' unions and with the positions held by key public institutions. Such dominance is strongly driving a minor role for the two other discourses, a fact that can be traced in the farmer's narratives.

The modern production farming discourse is linked with a series of farming management practices and options that are generally connected with monofunctional production models, thus neglecting the internal complexity of the system. Furthermore, these practices are directly dependent of external factors such as markets, marketing, and payment schemes. This represents a step backward in farm management skills and empowerment and in a loss of valuable-accumulated empirical knowledge, especially in relation to the farmers' capacity to deal with complexity, a capacity that can be considered essential to advance toward increased levels of resilience and sustainability [1].

As for the land stewardship discourse, numerous administrative and financial barriers exist toward operationalizing a number of management strategies that are essential under this paradigm, especially those related to nature and landscape conservation, making it difficult for farmers to embrace their role as land stewards. This is so despite that many farmers perceive the potential of their role as heritage stewards, a role with which they share long-term perspectives focusing on securing the well-being of future generations.

Still, concerns about the economic viability of farm units, which are strongly dominant in the modern production discourse, do also create barriers toward any novel management strategies.

Although environmental stewardship is clearly a rising discourse and management paradigm in the context of the *Montado* in Alentejo, it is still mostly prevalent in the national and international policy scales—and scarcely expressed in the policy tools acting at the farm level. Furthermore, it is mainly found with the regional to local policy institutions traditionally in conflict with agriculture, namely nature conservation, and also in actors with an integrated territorial focus, such as landscape and regional planning or tourism. Indeed, it is a discourse that is yet to be adopted by the farmers.

4.4 Key implications and reflections

National and international experts have long advocated in the media for a shift in the current productivist policies toward creating the conditions to maintain traditional farming systems, such as the *Montado*. However, it is commonly accepted by the farming sector this should not undermine the potential for Portugal to pursue increased production goals, which tightly fit with the modern production

farming discourse. The question thus remains on how traditional systems such as the *Montado* can be protected while still contributing to increased production goals, with proposals such as sustainable intensification, land sparing, and others being at time made, but without much empirical evidence either on their implementation nor on their potential benefits. For advocates of the latter options, it will thus not be necessary to choose between drastically conflicting options, and there shall be a place for both intensive and extensive agricultural practices, as currently encountered in some areas of Portugal.

However, the intensive production systems that are advocated under the modern production discourse directly clash with the multifunctionality that is inherent to the *Montado* landscapes.

Resuming, it emerged clearly from our analysis that the three discourses, and related management paradigms, identified address three fundamental aspects of the Portuguese silvopastoral system: the historical and heritage value, the production role, and the environmental benefits.

Based on our analysis, we argue that each discourse and management paradigm in isolation fails to propose a uniquely valid solution to the sustainable reproduction of the system. A further reproduction of the *Montado* system is required that combines the three aforementioned dimensions. From an economic and organizational standpoint, this needs to draw on different support systems to develop a new discourse and paradigm that can encompass all these different aspects.

Furthermore, it is also clear that the co-existence in time and space of these different discourses, and the fuzziness in their boundaries, creates tensions in the farmers and land managers. In a way, these actors are often placed in between two or all of them but draw on several for justification of decisions in relation to different issues, mostly without recognizing the inherent contradictions in their management strategies.

They need to act simultaneously in different arenas, and different arenas favor different discourses. We found that too frequently, each individual *Montado* farmer finds himself divided among all three discourses or, more accurately, is placed in an internal conflict when undertaking management decisions. He may opt to be positioned within one dominant discourse and reproduce its values and contribute to a consistent narrative. And by doing this, even if he also relates to the other discourses, he identifies them as marginal, and will not be open to new combinations of the *Montado* components, nor for related management decisions.

Alas, the absence of a clear positioning as well as the conflicts between the separate discourses and management paradigms are constantly emerging at different levels of decision-making, ranging from the farm to the regional and national administrations, and also including negotiations with Brussels for the policy support mechanisms. With time, many public policy tools applied at the *Montado* have led to contradictory practices and decisions at the farm level. Consequently, besides the problem of the *Montado* quantitative and qualitative decay and related environmental degradation, an identity crisis is equally prevalent. This is driven by the fact that there a number of different visions of the future for this farming system that currently co-exist and that are mutually incompatible, potentially generating confusion among public and private actors acting at different levels of decision-making and responding to a number of different demands, both societal and economic. Examples of differences in such visions include the ambitions to expand or focus public and private investments on certain livestock species, particularly cattle, or to specialize in cork production, both of which are rooted in the modern production discourse and which are in sheer contrast, if not in plain conflict with the vision for attaining a truly multifunctional system, which alternatively underpins both the heritage and land stewardship discourses.

Resulting from these findings, It has become clearer that the multiple opportunities available for enhanced sustainability of complex land use systems such as the *Montado* may not be efficiently tackled should the currently prevalent modern production management paradigm persist. In response, in the following section, we discuss about future pathways for enhancing *Montado* sustainability options under alternative management paradigms.

5. Discussion: how to re-invent the sustainability of the *Montado*?

5.1 Why do we need to re-invent the sustainability of the *Montado*?

Resulting from our insights and research experiences in the Portuguese *Montado* over more than a decade, it is now emerging that the general trend toward qualitative and quantitative degradation will not be effectively addressed unless we obtain a clearer picture of the future direction of the system that can lead to enhanced sustainability. Furthermore, farmers and other key decision-makers will also need to be convinced that such picture is worth attaining, and the correct incentives and tools to achieve this need to be implemented. Alas, it is equally clear that the variety and imbalances of discourses and management paradigms that can be found co-existing hamper our potential to obtain and implement such a desired picture. Finally, a crucial argument needs to be made that sustainability in a system as complex as the *Montado* cannot be approached by addressing single issues on isolated topics, but that instead the entire system and the systemic interlinkages that produce unsustainable outcomes need to be jointly tackled. Thus, it seems clear that under a state-of-the-art scenario, the much-needed changes to improve sustainability will likely fail, and that we need to re-invent a future for the system that is based on novel approaches that consider changes in management paradigms and help advance toward enhancing both efficiency and sustainability.

5.2 Key changes required in management paradigms and related discourses for achieving improved sustainability

Regarding the first of these questions, no set of scenarios have been produced so far nationally for any components of the *Montado*, which is less so for the system as a whole. Nevertheless, official figures are available featuring recent and historic trends regarding issues critical for setting future scenarios, including tree cover, livestock composition and density, property structure, and human workforce [10]. Adding onto such scattered data, the analysis of discourses and management paradigms in this chapter provides an overall picture that may help in constructing scenarios.

According to our findings, tensions will likely persist between a set of management paradigms: the first and predominant of which modern production is influenced by financialization, free-trade-driven globalization, and economic competition, while an alternative one is now slowly emerging that reflects stewardship values, consideration of land and landscape as heritage, and value-adding through quality produce.

Indeed, the modern production discourse seems to be winning the battle both in the public (as reflected in the media) and political (as indicated through legislation being passed and plans approved) realms. This is consistent with the worldwide tensions between productivism and postproductivism [28] in agriculture, where despite the recent upsurging of the latter, the former is still clearly the dominant paradigm. This is actually the case even in the European context where

postproductivism is now largely encouraged, both by policy-makers and by large components of the civil society [2]. The potential effects of the apparent resistance to move toward postproductivism will likely marginalize even further multifunctional farming systems such as the *Montado* that are in a clear competitive economic disadvantage in a context where economic efficiency is the ultimate goal of agriculture, but that could instead prove competitive under a postproductivist paradigm [1], where land stewardship could be considered as a valid management paradigm.

5.3 Getting there

In regard to the second of the questions posed (what needs to change?), we consider the improvement of coordination of scalar politics, as a crucial challenge that demands urgent improvements. We hereby consider scalar politics as re-defined by Lawhon and Patel in 2013 [29] in a context of globalisation and enhanced demand for sustainability. According to the pioneer arguments put together by Brenner in 1997 [30], unless better scalar coordination is achieved, the local initiatives that are now widely advocated for improved governance and sustainability of rural areas [31] will likely fail. This is a goal that entails incentives, both sociopolitical and economic, being improved.

To achieve better scalar coordination of governance and decision-making in *Montados*, one key aspect to tackle is to improve the currently policy and planning framework, which according to our findings is largely inefficient and lacks an overall coherence and coordination. One could argue that such coherence could potentially be provided by an overarching plan that considers the complexity of *Montados* as a whole. However, according to the experience in the Spanish Dehesas, where a series of regional plans and regulations specifically targeting the Dehesas have already been approved and implemented for quite a while, it seems evident that this may be a necessary but a nonsufficient condition. While in the case of Extremadura, the pioneer region in testing the pathway of targeted policy integration, the main problems encountered relate to the lack of capacity to renovate an extremely outdated legal and policy framework [32], and in the case of Andalucía [33, 34], the key problems relate to the limitations encountered in the (largely strategic) planning instruments in place to connect the variety of scales across which decisions are made, and to engage the key stakeholders influencing land use change.

These are lessons from regions with a system similar to the *Montado* and with relatively equal socioecological conditions and challenges and thus should be indeed considered if the pathway of policy integration through planning for the Portuguese *Montado* was to be explored. On such regard, we argue that further efforts are required to improve the compatibility and mutual co-existence of the different alternatives currently available to decision-makers at different levels from the farm to the region. This should also be accompanied by specific plans that are operational and flexible enough to adapt to the specificities of the different contexts and typologies of *Montados*.

Furthermore, and even if these targets were to be specified in a plan, the heterogeneity of situations indicates that a well-crafted and carefully implemented participation scheme in the conception of the plan must firstly be prepared. This was actually how the Andalusian action plan from 2017 was crafted [34], defining some clear lessons and pathways forwarded for the Portuguese *Montado*. Drawing from such lessons, it seems now clearer that to be fully efficient, such a participatory scheme needs to be as inclusive as possible, engaging as many stakeholder groups as possible during many stages of the planning and policy-making process, especially those linking policies with management at the farm level, where the decisions are to be made.

However, these are all recommendations set at the wider policy level, and that therefore in principle, these operate in a different realm at which our analysis in this chapter has been conducted on which discourses and management paradigms realizing at the farm level are at the core of the discussion. However, unless we are capable of better linking together these policies and management decision levels, and focus on avoiding clashes between different management paradigms and underpinning discourses, securing sustainability for the Montado will become effectively impossible. In this sense, we consider the need to design a more efficient scalar governance system for the *Montado* as essential. Nevertheless, this is a “wicked challenge” [35], which will therefore only be effectively tackled through participatory and transdisciplinary schemes that transcend the strict agendas of individual research projects, farm plans, and personal research interests [36, 37]. Furthermore, any progress to be made in advancing and widening participatory decision-making will still need to be translated into effective policies and management schemes that can help move beyond the current leading paradigms and related discourses under which most farmers and land managers in the *Montado* currently operate.

As with the coordination of policies and planning, this may be a condition *sine quae non*, but it is also far from sufficient to achieve our goal to shift the various management problems and problems that we have encountered. Indeed, a number of barriers exist that may ultimately prevent the implementation of this recommendation from turning into a reality. These barriers include:

- the slow and highly bureaucratic inertia under which largely siloed policy making (e.g., agricultural vs. environmental policies) still operate in Portugal; the inability of such specialized policy frameworks to address problems faced in inherently multifunctional systems such as the *Montado*;
- a lack of the social and cultural conditions (e.g., associativism) required to foster cooperation among managers and farmers following different management paradigms, the reduced levels of market power [15] held by a community of farmers that are extremely dependent on public subsidies, and international markets in the short and medium terms;
- the difficulties for a long-term-driven system such as the *Montado* to compete under a modern production discourse and paradigm that emphasize short-term profits and competitiveness for land use;
- and the related difficulties in operationalizing sustainability objectives that may result in short-term loss of financial gains, and the lack of clarity and frequent misuse of controversial terms that may end up justifying actions and decisions with clear negative impacts for the system’s sustainability.

This last point may be actually illustrated through the highly contested concept of “sustainable intensification” [38], a concept that largely related to that of soft sustainability, which is now considered as illegitimate in the framework of sustainable farming [39], but that has nevertheless been used as a cornerstone of the propaganda machine developed within the modern farming discourse to counteract the rising strength of land stewardship and other alternative management paradigms lately to arise.

In view of all of these challenges for the *Montado*, it is thus yet unclear whether a realistic scope exists to shift the current management paradigms and overcome the aforementioned barriers and move toward enhanced sustainability standards.

Although the diversity of situations indicated prevents us from indicating to “one-size-fits-all” type strategies, there are a few general principles that may help drive change in the correct direction.

This includes expanding the current efforts in transdisciplinary knowledge co-construction toward enhancing linkages between management and the planning and policy-making processes, thus using academia as a real bridge between policies and management practices. This is a goal that could also benefit from improved extension services that are specialized in providing information for the *Montado* farmers. Ultimately, this may help alleviate tensions arising among defendants of the various management paradigms currently in place and help streamline a more coherent, clear, and sustainable future for the system that, however, considers and reflects the diversity of situations, mindsets, and aspirations of farmers and managers in the *Montado*.

Reflecting the aforementioned necessity to better reflect and respond to diverse conditions, it might be useful to consider setting standards that are better tailored to specific local conditions when setting management requirements as prerequisites for farmers to receiving public funding, as is currently the case with Pillar-II subsidies. Furthermore, current proposals and experiences in CAP Pillar II to move beyond practice-based payments and onto result-based payments could help trigger the much-needed paradigm questioning and shift that is hereby advocated to improve sustainability.

In this sense, extension services, in close coordination with other relevant public authorities such as those dealing with nature and landscape designations and environmental standards (ICNF), could also function as responsible institutions to make sure farmers and land managers are adequately informed and engaged about their many possibilities and limitations, and also encouraged and empowered to help trigger any paradigmatic changes needed.

A last point worthy of discussion would relate to the opportunities lately opening to marketize and underline the diverse cultural and environmental benefits of the *Montado* system by emphasizing product quality, thereby giving farmers an incentive to a more sustainable production, thereby decoupling farmers from the world market. This is done in many other places of Europe, via genetic (PDO) and geographical (PGI) varietal protection schemes, and is very much aligned with the land stewardship discourse, which is in this way assigned to a marketing and value-adding tool that may help render it more attractive and competitive in the view of farmers and land managers, ultimately helping advance beyond the productivist approach that is currently dominant.

6. Conclusions

We began this chapter by outlining the complex, or even wicked, challenges that are associated with a silvopastoral system, the Portuguese *Montado*. This is a system that is characterized by its great potential for improving sustainability standards by helping reconcile farming productivity with biodiversity conservation, landscape-cultural heritage protection, and local economic development. Despite this, the system is currently suffering from a strong qualitative and quantitative degradation, and neither efficient policies nor management strategies are in place that is able to embrace the complexity of the system. We have argued that this is due to conflicts and imbalances and trade-offs between various management paradigms, which need to be better unraveled and understood.

To achieve such goal, we applied a discourse analysis, which allowed us to identify and characterize three distinctive management paradigms and corresponding discourses that have co-existed, generating tensions in the past 100 years. Currently, it

seems clear that a modern production paradigm and discourse is still prevalent, which is partly at the root of the unsustainable trajectories that the *Montado* is mostly following. In response, a land stewardship alternative paradigm is slowly rising that provides with some expectations as to more sustainable futures for the system, while remnants of a heritage paradigm still subsist in association with the conservative societal views that characterize much of the Portuguese countryside. Tensions arising among such management paradigms and related discourses are very much aligned with the transition from a productivist toward a postproductivist countryside and agriculture.

Overall, the paradigmatic shift in management that is required to secure the future sustainability of the Portuguese *Montado* is not happening. Neither policies, nor farming mind-sets nor financial instruments seem to be adequately placed to help reverse current trends of decline and degradation in the system. Nevertheless, some tips and directions for the future could be identified that may help achieve improvements and that are related to improving governance and scalar coordination, re-defining financial and policy incentives so that they are reflective of the diversity of situations potentially encountered, and better supporting, informing and guiding farmers and land managers operating on the ground through reformed extension services and knowledge-co-construction strategies that can help them consider a wider range of factors and opportunities. Whether these will ultimately be operational on the ground still remains an enigma, but at least, the baseline is now enriched in a way that, even if it does not ultimately lead to more sustainable pathways, may provide decision-makers a better picture of what the possible pathways and options may be.

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