



LEARNING AREA « SÍTIO DE MONFURADO » (Portugal)

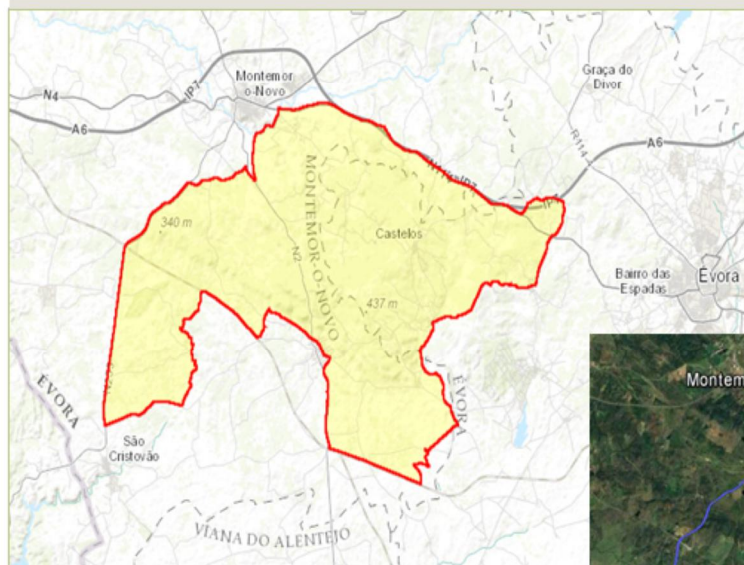
A BASELINE ASSESSMENT

Authors: Maria Isabel Ferraz-de-Oliveira, Teresa Pinto-Correia
Date: June 2017



This project has received funding from the European Union Horizon 2020 research and innovations program under Grant Agreement No. 696391

Limits and key characteristics

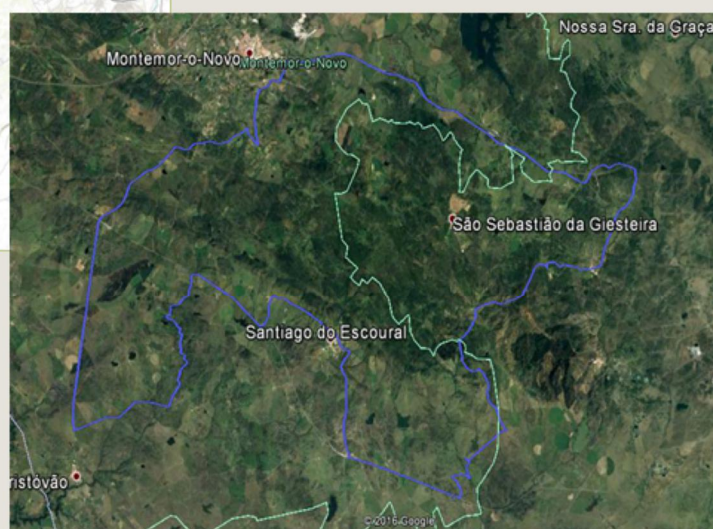


Source: Guiomar and Pinto-Correia, 2016

Sítio de Monfurado

Two Municipalities:

- Montemor-o-Novo
- Évora



- NATURA 2000 site
- Approximately 24 000 ha
- Mostly Montado

Limits and key characteristics of the “Sítio de Monfurado”

The Sítio de Monfurado (SM) lies within two municipalities, Montemor-o-Novo and Évora. With about 20 km long and 15 km wide, it has clear boundaries both to the south and east, but more complex and blurred to the north and west.

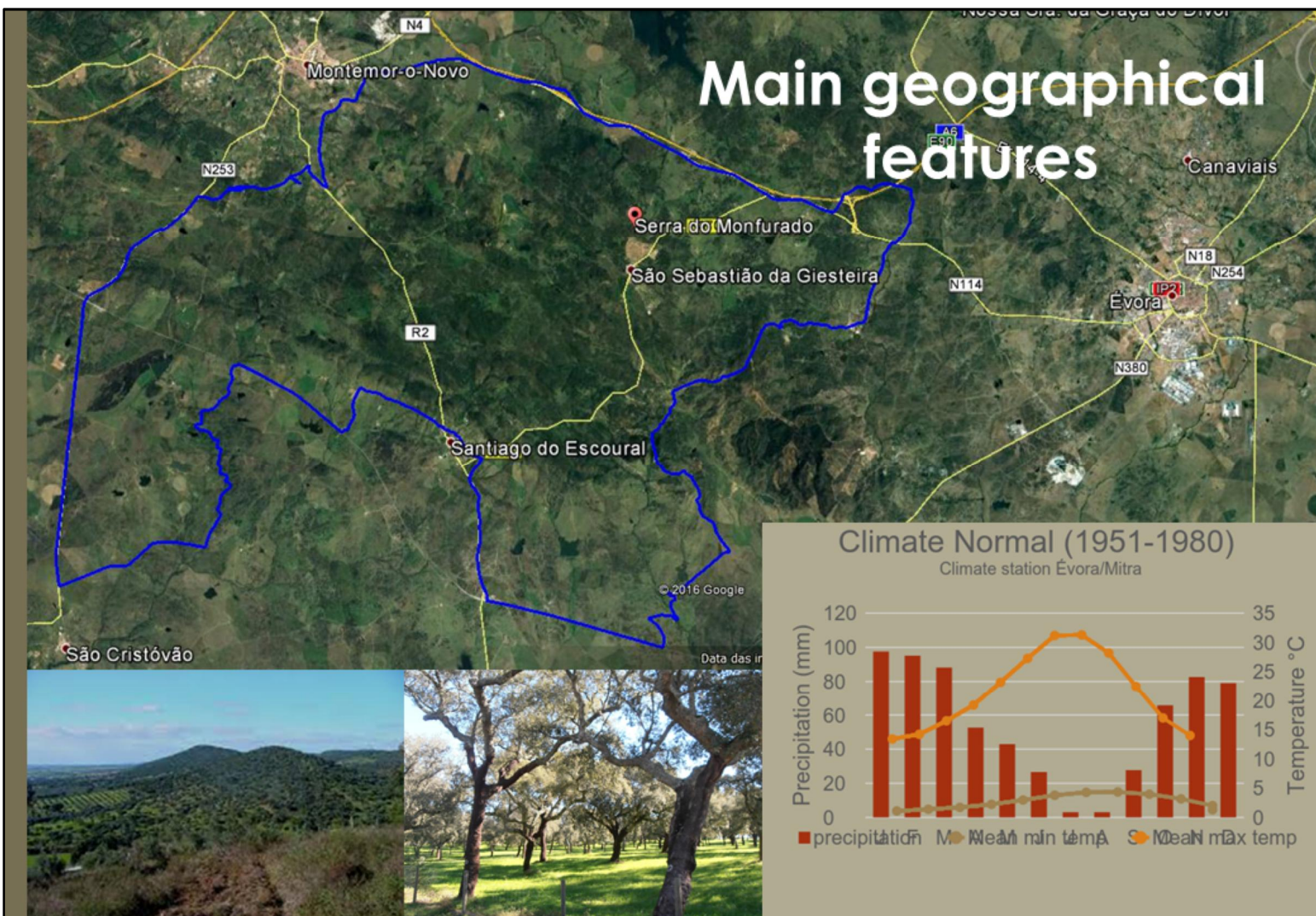
The population density within the SM is low and concentrated in a few settlements.

The diverse landscape is composed of different types of land cover in patches of various sizes: dense Montado, the characteristic silvo-pastoral system, with mixed tree cover, dense cork oak forests in the steep slopes and deep valleys, and both open grazing areas and irrigated crop areas, in the plains. The Montado is dominant and composes a mosaic with the other landcover types. This mosaic supports a rich and specific biodiversity.

The landscape character in the Monfurado site is closely related to the dense Montado cover which dominates the SM. It is generally a High Nature Value (HNV) farming system. The property structure is composed by very large estates, except around towns and villages where small scale farms dominate.

References:

Guiomar N., Pinto-Correia T. (2016), *Socio-political, economic and institutional drivers. National Report – PORTUGAL. Deliverable WP3.1. Pegasus, H2020 project, Grant agreement No 633814.*



A portrait of Sítio de Monfurado (SM) Learning Area (LA)

The Sítio de Monfurado (SM) is a Natura 2000 site (PTCON0031) located in the Central Alentejo Region, in the peneplain Alentejana.

This territory (23,946.36 ha) has a diversified morphology ranging from 150 to 420 meters in altitude and a typical Mediterranean climate with dry and hot summers and cold and wet winters, reaching an annual rainfall of 900 mm, well above average for the surrounding region (Silva, 2008).

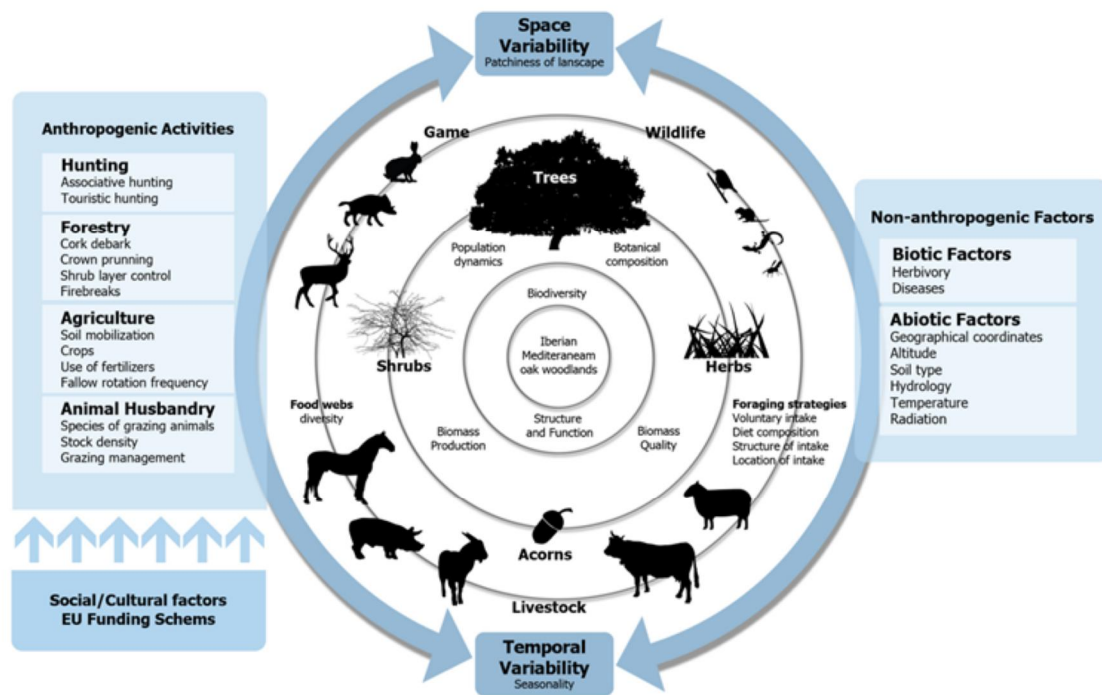
The SM diverse landscape is dominated by the Montado. The Montado is the silvo-pastoral system dominating in the region of Alentejo, and in particular in the Natura 2000 site of Monfurado - therefore the whole description of the site we hereby provide, is structured around the Montado - its characteristics and its trends of change and the respective drivers. At the SM the extensive Montados are of high tree density, well preserved and the tree stand is mostly dominated by *Q. suber*. There are, as well, *Q. rotundifolia* and mixed stands in a smaller extent which also include *Q. pyrenaica* and residually *Q. faginea* (ICNB, 2000).

References:

Silva, J. (2008) *A evolução da paisagem rural na Serra de Monfurado—As mudanças no uso do solo entre 1990 e 2005. Trabalho de fim de licenciatura em Engenharia Biofísica, Universidade de Évora.*

ICNB (2000) *Plano Sectorial da Rede Natura 2000, Sítio de Monfurado.*
<http://www.icnf.pt/portal/naturaclas/rn2000/resource/docs/sic-cont/Monfurado>.

The living Montado: a silvo-pastoral system with multiple interrelated components



Source: Ferraz-de-Oliveira et al., 2013

The Montado is a human shaped ecosystem system composed of complementary elements and activities. The open tree cover mostly composed of *Quercus rotundifolia* and *Quercus suber* in changing densities, provides forest products as wood for charcoal and cork. The trees provide shelter, both in the summer and in the winter, for the livestock grazing in the under cover. The undercover is composed of natural or cultivated pastures, combined with shrub in varied densities. The livestock grazing should be adapted to the carrying capacity of these pastures and animal grazing should allow for the natural regeneration of the tree cover, what happens naturally if not all young shoots are eaten or destroyed by the animals.

References:

Ferraz-de-Oliveira MI, Lamy E, Bugalho MN et al (2013) Assessing foraging strategies of herbivores in Mediterranean oak woodlands: a review of key issues and selected methodologies. *Agrofor Syst* 87:1421–1437.

Vegetation layers



Herbage layer:

Native Mediterranean pastures; Sown biodiverse pastures; Improved pastures



Tree layer:

Quercus suber and Q. rotundifolia woodland. Residually Q. faginea and Q. pyrenaica



Shrub layer:

Either as extensive shrub formations or in patches (eg. Calicotome villosa, Cistus salvifolius, C. ladanifer).

Montados are typically structured in three vegetation layers:

- An open tree layer composed mostly in the LA by cork oaks with an average canopy cover greater than 50%.
- An herbage layer composed by a large diversity of species, mostly annuals. Up to 135 different species of plants per 0,1ha have been reported in these ecosystem (Díaz-Villa et al. 2003). In many cases the pastures, within the LA are biodiverse sown pastures or improved pastures.
- A shrub layer which in the LA has a low cover, on average below 30% (Galantinho and Mira, 2009).

References:

Díaz-Villa MD, Marañón T, Arroyo J, Garrido B (2003) Soil seed bank and floristic diversity in a forest-grassland mosaic in southern Spain. *J Veg Sci* 14: 701-709. doi: 10.1111/j.1654-1103.2003.tb02202.x

Galantinho, A. & Mira, A.(2009). The influence of human, livestock, and ecological features on the occurrence of genet (*Genetta genetta*): a case study on Mediterranean farmland, *Ecological Research*. 24: 671. doi:10.1007/s11284-008-0538-5

Natural and semi-natural habitats



← Annual grasslands



Riparian forest habitats →



← Mediterranean temporary ponds



The SM has a high diversity of natural and semi-natural habitats. Twenty one natural habitats from the "Habitats Directive" were identified, three of which are priority habitats:

6220* - Pseudo-steppe with grasses and annuals (*Thero-Brachypodietea*)

91E0* - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae*, *Salicion albae*)

3170* - Mediterranean temporary ponds

The good status of these habitats, in particular that of the "Annual grasslands" is directly dependent on the existence of an extensive grazing activity and a multifunctional management of the Montados. The conservation of Mediterranean temporary ponds in particular, is associated to extensive grazing by sheep, during summer, in the dry phase of the ponds, for the removal of dead plant biomass (personal communication C. Cruz).

Flora species of high conservation interest



← *Narcissus fernandesii*

→ *Salix salviifolia* subsp. *australis*



Hyacinthoides vicentina ↓



↑ *Festuca duriotagana*



← *Hamilium verticillatum*



The existence of some flora species of high conservation interest is related to the adoption of specific grazing practices. For example, *Hyacinthoides vicentina* benefits from extensive grazing practices and the absence of forage species while *Hamilium verticillatum* benefits from herding practices.

Fauna species of high conservation interest



← *Lutra lutra*

Microtus cabreræ



← Bats

Chondrostoma polylepis



A number of important fauna species have their home in the LA, where the Montado plays an important role as their main feeding area. Some bat colonies such as mouse-big-bats (*Myotis myotis*) and the mourisca (*Rhinolophus mehelyi*) bat, as well as the Cabrera rat (*Microtus cabreræ*) are examples of such species which benefit from the existence of a mosaic landscape and of patches of open Montado.

Cultural heritage



The Sítio de Monfurado and surroundings have been inhabited since pre-historic times. The MS maintains an important historical patrimony which includes relevant paleolithic and neolithic edifications. There is a Cave, the Escoural cave, which remains the only grotto in Portugal where Upper Paleolithic rock art has been identified.

Most of this patrimony is located in private property and both conservation and access is an important issue that in some cases remains to be solved.

Further, many other buildings as churches and chapels, fountains and sources, and housing, demonstrate the presence of human communities along centuries.

Today this MS is also acknowledged due to the quality and integrity of its cultural landscape as well as for the traditional practices which are still used in the extensive production systems.

Human geography

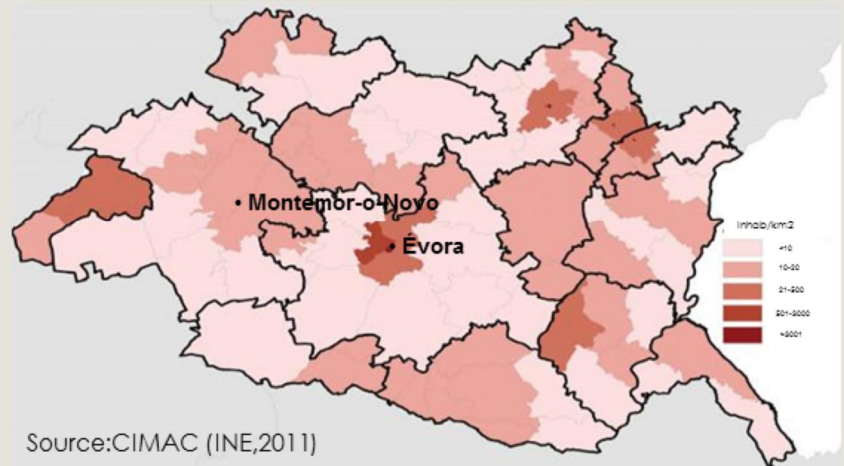
Territories	Resident population		
	2001	2010	2015
Portugal	10 362 722	10 573 100	10 358 076
Évora municipality	56 552	56 716	53 963
Montemor-o-Novo municipality	18 560	17 560	16 443

Source: PORDATA

The decrease in resident population in the rural areas is attenuated by the slight increase in the cities population

The Sítio de Monfurado, lying between Montemor-o-Novo and Évora has a very low population density: 6,1 inhabitants/km²

Population Density Alentejo Central NutsIII (2011)



Source: CIMAC (INE, 2011)

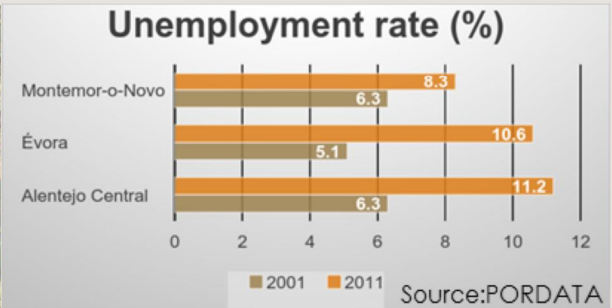
Alentejo, the host region (NutsII) of our LA, is one of the most depopulated and aged regions of the country, considered as an economically and demographic less favoured area. The region of Alentejo has always been a region of low population density, with population highly concentrated in towns and villages.

Since the 60s of the last century most municipalities in Alentejo have suffered population decreases of 20-30% and Sítio de Monfurado is not an exception. This decrease trend in the resident population is less evident in the cities and more severe in the rural areas. This trend is present also in the LA and the surrounding towns, Montemor-o-Novo and Évora. The last data available for the resident population within the LA (2000) refers a total of 1469 individuals (ICNB, 2000).

Nevertheless, there are also trends of new inhabitants coming to the area, in a search for quality of life and well being. The proximity to the metropolitan area of Lisbon strongly adds to the attractiveness of the landscape. These inhabitants, however, tend to be more weekend visitors or retired people who do not take part in the economic activity in the area. They have though a role on the local economy.

The LA is well served in terms of road accesses, being easily accessible from the highway that connects Lisbon to Évora and the Spanish border (Badajoz). Regarding other public infrastructures as water, electricity and telecommunications, only the urban areas have this facilities, while farms within the rural area have autonomous systems for water supply and drainage of sewage.

Economic activity



Main economic activities

- Cork production
- Extensive animal production (cattle, Alentejano pig)
 - Hunting
- Tourism
- Other complementary activities (honey production...)



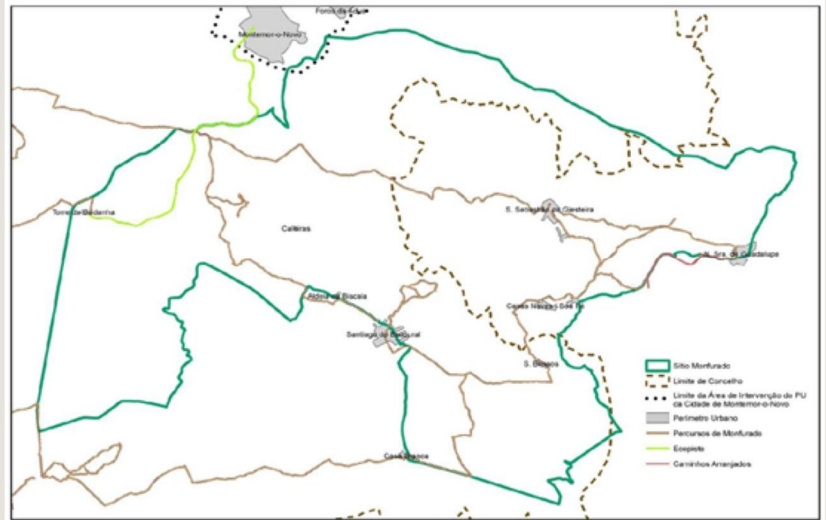
Alentejo Central (NutsIII) that hosts the Sítio de Monfurado, is considered an economical less favoured area within the Portuguese territory. Unemployment is relatively high and within the LA the main economic activities are related to the agro-sylvo-pastoral sector which is based in the Montado.

The main product of the *Quercus suber* is the cork. Wood and charcoal are by-products of both *Quercus suber* and *rotundifolia*, which still have a relevant role in the local economy, mainly in the surroundings of the small towns within the LA (S. Sebastião da Giesteira and Escoural).

Extensive animal production, mostly cattle is a very important economic activity that increased in the last decades within the LA, but without impact on the employment level, due to the progressive abandonment of the traditional grazing management practices with the presence of sheperds, in favour of the installation of fences.

Tourism and recreation are increasing and there are a few units of rural tourism in the SM, which did not exist ten years ago. Restaurants also benefit from tourism and recreational visitors. This sector may be expected to increase.

Trails and infrastructures for nature tourism in the LA



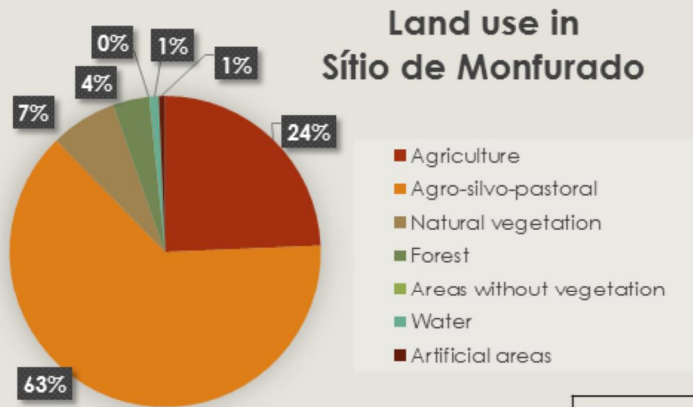
(source: PIERSM, 2010)

Trails and preserved paths within the LA

A number of trails for walkers and non motorized vehicles such as bikes and also horses have been established by the Municipalities of Montemor-o-Novo and Évora. Within the LA, 88km of environmental walkways are available for visitors and other users to experience the nature of the Montados. This paths also give access to some of the historical edifications found in Monfurado. The expansion of this trails is often impaired by the difficulties in access to private property (most of Monfurado) which, in most cases, is fenced and often locked.

The municipality of Montemor, following the LIFE program on Monfurado, established an interpretation center for the Sítio de Monfurado that provides information to the general public on the habitats and species found on the Natura 2000 Sítio de Monfurado.

Agriculture: key facts



Adapted from: PIERSM, 2010

- **Smaller farms surround urban centers and have mostly agricultural use (e.g. olive groves, annual cultures)**

- **Larger farms are mostly agro-silvo-pastoral system: Montado**

Farms' structure

Size range	Farms per class		Area per class	
ha	Nº	%	ha	%
0-5	509	68	673,024	2,07
5-10	47	6	322,875	0,99
10-20	29	4	401,039	1,23
20-100	54	7	3010,020	9,25
>100	110	15	28122,793	86,45
Total	749	100	32529,751	100

Adapted from: PIERSM, 2010

The economic activity which characterises the LA is by far related to the exploitation of the agro-silvo-pastoral system – Montado.

The main product from the trees is the **cork** extracted every 9 years and **wood and charcoal** as by-products with a much lower economic importance. Extensive animal production is also a very relevant economic activity with cattle (suckler cows) rearing in the front having replaced in a large extent **sheep** in the last decades.

Extensive **Alentejano** finishing pigs is mostly a seasonal activity (Montanheira, between October and February) based on the acorn and young grass production under the oak trees canopy.

Regarding agricultural production there are **some forage production** (hay, silage and haylage) some times irrigated mostly for feed supplementation of cattle during the pasture shortage period, usually from the end of summer until the next spring.

Hunting as an economic activity is present in the LA, however with deficient management practices resulting in reduced presence of the main species in the area (partridge and rabbit).

Other activities, with still a small expression in the LA are a result of the natural, environmental and cultural values of the region. These include honey, aromatic plants and mushroom production among others and recreation and leisure activities and supporting facilities. These are often the basis for small dimension touristic units mostly related to **"tourism in the rural space"**, **"agricultural tourism"**, **"environmental routes"** etc.

Main Agricultural Markets



Cork

- The cork oak bark is usually sold before being harvested.
- Harvesting takes place between the end of spring until mid summer, during the most active phase of cork growth.
- Cork transaction (commercialization) is mostly done between the producers and the industry or intermediaries through contracts.

Livestock

- Most livestock (cattle and sheep) is traded through the regular auctions organized by APORMOR, an association of producers in Montemor.
- Other producers associations related to individual livestock breeds, also commercialise livestock and also certified meat and meat products (PDO).
- A very reduced number of farmers complete the production cycle and commercialize meat and meat products from their own farms with their own brand.



The market circuits for cork and also for livestock are well established. However, no distinctive brand exists for the Sítio de Monfurado cork and meat products.

Cattle is often commercialised by the producers as live animals through the weekly auctions organised by a producers association (APORMOR). In a smaller extent, producers associations of specific national breeds (Raça Alentejana and Mertolenga) that have their geographic production and also processing and preparation area that includes the LA, also commercialize their breeds using the PDO denomination.

Some farms are producing under certified organic farming, and selling their products as such.



Landscape in the SM can be characterised by its main components, in terms of landscape units (largely dependent on the land cover).

The main differentiation factor is determined by the biophysical characteristics: the SM is characterised by a higher precipitation than the surrounding area, what in turn is caused by the more accidented relief and high hills (up to 400 m). This leads to a very dense and vigorous forest cover. The Montado, as already expressed in the slides before, is the dominant land cover. And it is a dense and diversified Montado, where the vigour of the tree cover creates an impression of a largely forested landscape. The Montado patches are intermixed with dense forest in the higher slopes and steep valleys. Furthermore, there are areas of open pastures and irrigated annual crops, in the plain.

The landscape is also characterised by dense and highly diverse riparian corridors, along the main streams crossing the SM. These may not be permanent streams, for the most, but still the presence of water for a large part of the year defines remarkable linear elements in the landscape. Besides the above mentioned land cover patches, there are also smaller areas of small scale mosaic and traditional olive groves, located in the surroundings of the villages. Even if these are less significant elements in the overall landscape patterns, these small scale parts of the landscape are present in the everyday life of the resident population, as they are located around the settlements.

The landscape is also characterised by the very low population density and lack of settlements - the population is concentrated in a few villages, and also in the towns of Montemor and Évora, which both are located just at the fringe of the SM. The settlements within the large estates used to be as small villages, with several families living in each of them - up to the middle of the 20th century. Today these estates' settlements are reduced to one family, or are empty - therefore the concentration of the population in the villages is even more clear today. There are few roads or other infrastructures and no industry.

The High Nature Value of Sítio de Monfurado



Agroforestry system
Montado in larger
properties

Olive grove mosaic in
small-scale landholdings



The landscape character in the Sítio de Monfurado LA is mainly dependent on two farming systems, both considered of High Nature Value (HNV): the agro-forestry system Montado, in larger properties, characterized by an open tree canopy of *Quercus rotundifolia* and *Quercus suber* and a diverse undercover of shrubs and grasslands, sometimes intermixed with agricultural crops, grazed by domestic and wild herbivore species and in a much smaller extent the olive grove mosaic in small-scale landholdings, mixed with vegetable gardens and orchards, surrounding the urban centres.

The object of this baseline assessment is the Montado in Sítio de Monfurado.

In the LA, Sítio de Monfurado, the diverse landscape of dense and mixed tree cover in the Montado patches, dense cork oak forests in the steep slopes and deep valleys, combined with open grazing areas in the plains, supports a rich and specific biodiversity, which justifies its classification as a Natura 2000 site. The Montado at the LA, provides multiple values and services and is recognized as an exemple of traditional silvo-pastoral system with a long history of resilience and sustainability (Pinto Correia et al., 2013).

References:

Pinto-Correia, T., Godinho, S., 2013. Changing agriculture-changing landscape: what is going on in the high valued Montado landscapes of Southern Portugal? In: Ortiz-Miranda, D., Moragues-Faus, A.M., Arnalte-Alegre, E. (Eds.), *Agriculture in Mediterranean Europe: between old and new paradigms*. Emerald Group Publishing, Bingley, pp. 75-90.

The Montado time line

The “Wheat
campaign”
1926-1960

The rural
exodus
1960-1974

The Agrarian
Reform
1974-1979

Entry in the
European
Community
1980-1990

Common
Agriculture Policy
(CAP) and reforms
1990-present

The Future of
Monfurado

Explaining the present with the past

The Montado Heritage from the past



From the Book of prayers of D Manuel (1517).
Source: Dagoberto Markl (1983)

The far past of the Sítio de Monfurado is mingled with the past of Montado within Alentejo region. The Montado is the result of human intervention in the primitive dense shrub formations dominated by *Quercus coccifera*.

Historical analysis refers a diversified land use system, which is considered as the origin of Montado as early as in the XIIIth century (Pinto-Correia and Fonseca, 2009). The Montado evolution at those past times is described as follows:

"The natural forest and maquis formation was dominant in the Middle Ages, but patches with a more open and diversified agricultural use were already present during that period. According to changes in factors such as the political situation, property rights, population, demands, technology, and sensitivity and strategies from the central decision makers, the progressive transformation and use of the previous natural vegetation has been changing in intensity and form along the centuries. The most remarkable in this historical overview is the maintenance of the same complementarities in the overall land use along several centuries, and the possibilities of all types of resources to be used by humans, in various ways. Furthermore, the capacity of resilience from this agro-silvo pastoral system is remarkable. A system with the same components was maintained, since centuries ago until today, being still today the dominating land use despite the radical changes in context in modern times." (Pinto-Correia and Fonseca, 2009).

References:

Pinto-Correia, T., & Fonseca, A. M. (2009). Historical perspective of montados: The example of Évora. In J. Aronson, J. Santos Pereira, & J. G. Pausas (Eds.), *Cork Oak Woodlands on the Edge: Ecology, Adaptive Management, and Restoration* (pp. 49–56). Washington: Island Press. Retrieved from <http://issuu.com/pausas/docs/corkoak>

The wheat campaign 1926-1960



**National state
promoted wheat
campaign**



**Intensification of cereal
cultivation with use of
fertilizers and new
machinery**

**land clearance for
wheat cultivation**

**Soil depletion
Destruction of oak
regeneration
Removal of oak trees**

**1930-50 highest disappearance of Montado over
the XXth century**

Relevant happenings – Drivers

- Establishment of dictatorial regime (1928)
- "Wheat Campaign" (1929)
- Agricultural mechanisation started – state support to fertilisers and machinery (1950-63)
- Rural depopulation (to big cities, 1950)
- Swine fever –decay of free range black pigs and holm oak marginalisation (1957)

Consequences for the Montados

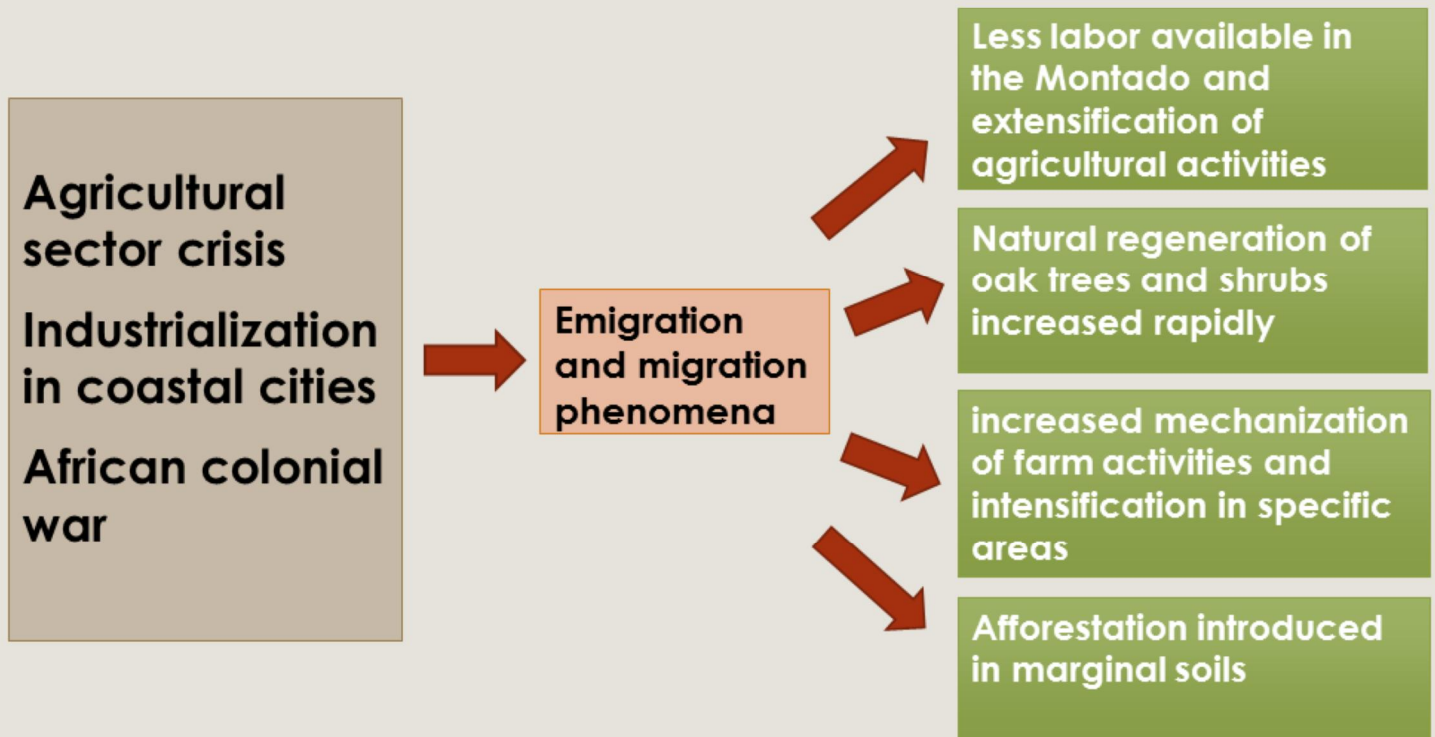
- Land clearance in order to extend cultivated areas and obtain more wheat: thousands of hectares in southern Portugal, even poorest soils, were cleaned and intensively cultivated with wheat.
- The adoption of fertilisers and machinery allowed the intensification of crop rotations
- Intensive cereal cultivation led to soil depletion, destruction of cork and holm oak natural regeneration, and partial or total elimination of trees.
- 1930–1950 was the period with the highest disappearance Montado during the twentieth century.

References:

Pinto-Correia, T., & Mascarenhas, J. (1999). Contribution to the extensification/intensification debate: new trends in the Portuguese montado. *Landscape and Urban Planning*, 46(1), 125-131.

Ferreira, D. (2001). Evolution of the Montado landscape in the inner Alentejo during the 20th century: Dynamics and environmental consequences. *Finiterra*, XXXVI, 72, 179-193

The rural exodus 1960-1974



Relevant happenings – Drivers

- Agricultural sector crisis (1950-1974) - decline of the traditional agricultural land use systems with simplification and rationalisation in the use of resources, particularly human resources. Decline of the number of people living in rural areas, and thus severe ageing and decline of the smallest and most peripheric communities
- Industrialisation in coastal cities (e.g. Lisbon–Setúbal axis since the 50s)
- African colonial war

Consequences for the Montados

- Emigration and migration phenomena, caused both by the reduction of labour absorbed by agriculture and the attraction of new jobs in the industry and urban areas, accelerated the depopulation of rural areas, mainly in 1960–70.
- Less labour was available for the Montado, however abandonment was not a reality in the Montado in Alentejo as it was in other parts of the country with smaller size property.
- At the start of the 1960s, the land clearing subsidy is suspended and wheat cultivation on marginal soils abandoned.
- Natural regeneration, mainly shrubs and cork trees, increased rapidly due to their adapted physiology.
- Afforestation in marginal soils, mainly by pine trees and eucalyptus, was introduced.

References:

- Pinto-Correia, T., & Mascarenhas, J. (1999). Contribution to the extensification/intensification debate: new trends in the Portuguese montado. *Landscape and Urban Planning*, 46(1), 125-131.
- Ferreira, D. (2001). Evolution of the Montado landscape in the inner Alentejo during the 20th century: Dynamics and environmental consequences. *Finiterria*, XXXVI, 72, 179-193

Agrarian Reform 1974-1979

1974 Revolution – The dictatorial regime fall



Relevant happenings – Drivers

- The dictatorial regime fall (1974)
- Agrarian Reform (1975)
- Expropriation of large farms (latifundio)

Consequences for the Montados

- Intensive cereal production returned and intensive use of the Montado also, including harvesting of cork with less care for the resilience requirements of the trees.
- This new intensification phase is short but very aggressive due to the heavy machinery used for faster clearance of agricultural land, where many trees were uprooted, and livestock overgrazed on Montado.

References:

Pinto-Correia, T., & Mascarenhas, J. (1999). Contribution to the extensification/intensification debate: new trends in the Portuguese montado. *Landscape and Urban Planning*, 46(1), 125-131.

Ferreira, D. (2001). Evolution of the Montado landscape in the inner Alentejo during the 20th century: Dynamics and environmental consequences. *Finiteria*, XXXVI, 72, 179-193

Entry in the European Community 1980-1990



Pinus pinaster



Eucalyptus

Relevant happenings – Drivers

- Preparation support programs for the entry of Portugal in the European Community (1980, 1985)
- Entry of Portugal into the European Community (EC) (1986)

Consequences for the Montados

- Access to various EC financial support programs to develop the agro-forestry sector and prepare the country for international markets.
- Beginning of the fall of customs protections, although the effects of this will be softened by a 10 year period of transition.
- Some of the abandoned agricultural land and soils with low agricultural capacity have been converted into wooded areas using faster growing trees, mainly Eucalyptus and Pinus pinaster. These emerged as a viable alternative to the economy of some agroforestry holdings.
- Opening of the international markets and the reduction of crop prices (23% between 1985 and 1989), market-orientated cultivation of cereals became unprofitable in the Montado and dwindled.
- Livestock production and grazing areas in the Montado significantly increased due to direct financial support systems.

References:

Pinto-Correia, T., & Mascarenhas, J. (1999). Contribution to the extensification/intensification debate: new trends in the Portuguese montado. *Landscape and Urban Planning*, 46(1), 125-131.

Ferreira, D. (2001). Evolution of the Montado landscape in the inner Alentejo during the 20th century: Dynamics and environmental consequences. *Finiterra*, XXXVI, 72, 179-193

Common Agriculture Policy (CAP) and reforms 1990-present



Afforestation measures



Direct payment per head

CAP

**Impacting measures
for the Montado**



Financial support to mechanised shrub clearance



**Abandonment of traditional agro-silvo-pastoral management and
loss of landscape heterogeneity**

Relevant happenings – Drivers

- Common Agriculture Policy (CAP) and reforms
- Launch of European Single Market (1993)

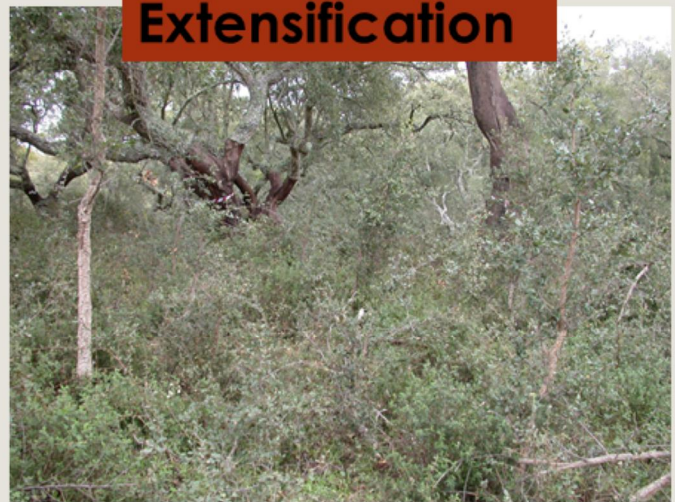
Consequences for the Montados

- Large and complex network of agro-forestry incentives for rural development.
- The reforms involved immediate price realignments for the main agricultural commodities to be phased in over the period 1992 to 1995.
- The 1992 CAP reform introduced direct payments per animal, reducing intervention prices. These headage payments, partially independent of production, contributed to stabilising income in agro-silvo-pastoral farms, especially in climatically unfavourable years.
- The economic attractiveness of the CAP incentives for livestock led many landowners to explore this financial support, and as a consequence many Montados were intensively grazed.
- European Union (EU) subsidies tended to support mechanised shrub clearance and infrastructure building, often leading to degradation of Montados.
- Agri-environmental and afforestation measures were implemented under CAP investment as a follow-up measures to compensate the farmers for the reduction of direct support.
- Cork oak area afforestation increased in set-aside agricultural lands due to several EU policies.
- Severe wildfires occurred due to the abandonment of traditional agro-silvo-pastoral management and the loss of landscape heterogeneity.

References:

- Coelho MB, Paulo JA, Palma JHN, Tomé M (2012) Contribution of cork oak plantations installed after 1990 in Portugal to the Kyoto commitments and to the landowners economy. *Forest Policy Econ* 17:59–68.
- Pinto-Correia, T., & Mascarenhas, J. (1999). Contribution to the extensification/intensification debate: new trends in the Portuguese montado. *Landscape and Urban Planning*, 46(1), 125-131.

Present main threats for the Montado



Lack of oak tree regeneration

Soil compaction

Increased fire risk

Loss of Natural Values

Despite the widely recognized value and resilience of the Montado its balance is threatened by a number of factors resulting in extensification and abandonment in more peripheral and marginal areas and intensification in more favourable areas.

In our LA the Montado is particularly prone to **intensification**:

- Over-exploitation of the tree cover
 - unbalanced cork harvest
 - pruning for charcoal production
- Intensification of activities in the undercover
 - Mechanized ploughing with deep ploughs and consequent irreversible damage of the tree root system
 - Overgrazing without a correspondent investment on the improvement of pastures

These may hinder natural regeneration of the trees and create homogeneous stands that which ultimately will induce decline of the Montado.

The threat of abandonment and **extensification**, though residual in the LA , it may occur leading to:

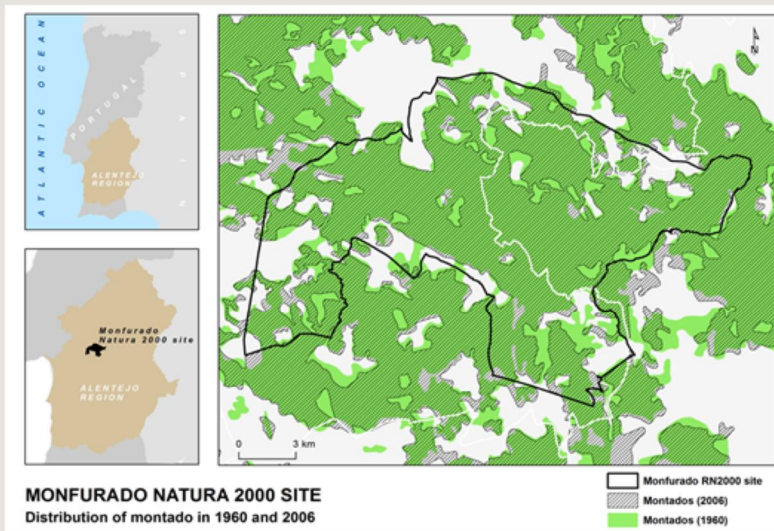
- Shrub encroachment
- Increased competition among vegetation species
- Increased risk of forest fires

Trends in the Montado

Spatial decline and landscape fragmentation

Year	1910	1960	1990	2006
Total area (km ²)	3,152.95	4,030.35	3,544.15	3,466.77
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

(Godinho et al., 2016)



Spatial decline and fragmentation of Montado in the LA Sítio de Monfurado.

1960 to 2006

Changes in the Montado pattern in Central Alentejo:

- Continuous decline of the total area covered by Montado, after 1960.
- Progressive fragmentation of the Montado, evidenced by the increase in the number and decrease in the size of Montado patches. This results in a less dense Montado with more discontinuity.

It is highlighted that the decline in Montado area is stronger than what is shown in the data (Godinho et al., 2016). Afforestation of previous open plots has been carried out in the last two decades, with support of the CAP. Thus, the figures show the total decline minus the recently planted plots. If only the decline was shown, the figures would be higher. Furthermore, decreases in tree density due to dead trees, at farm scale are presently reported by an increasing number of farmers.

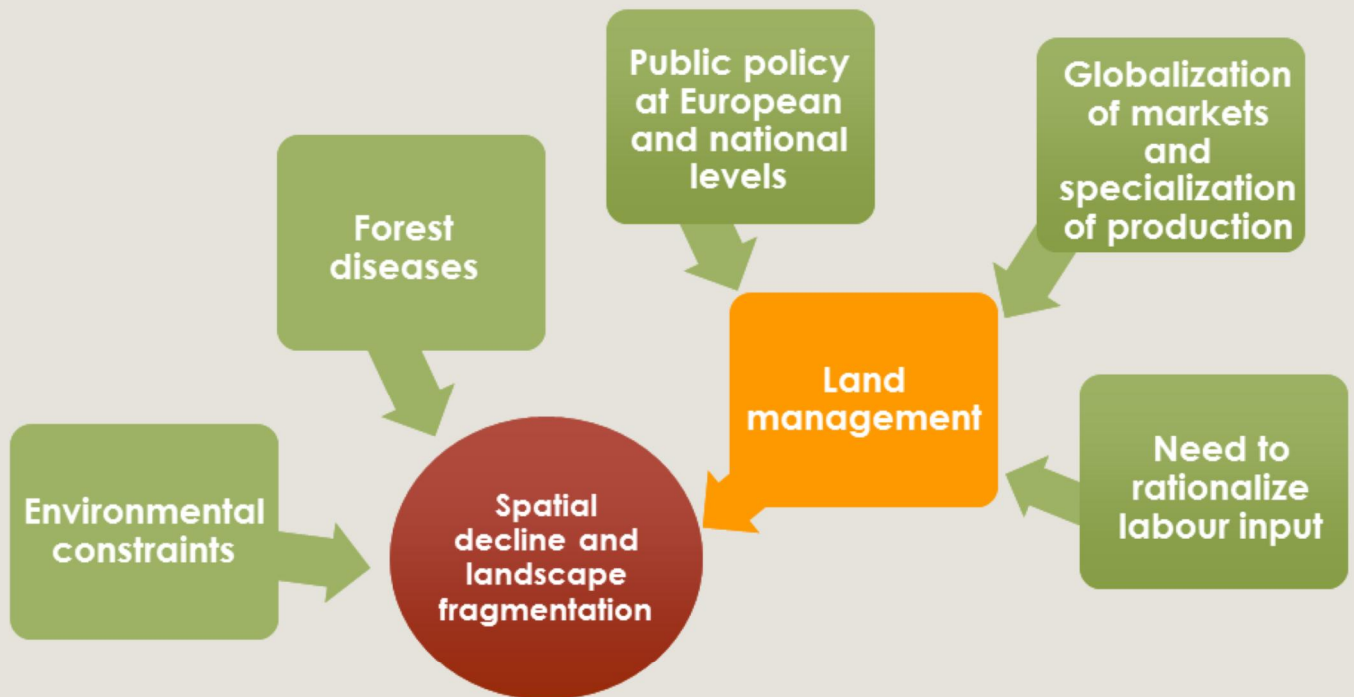
"The process of decline is slow, due to the high ecological resistance and resilience of the oak trees, but in some areas may be reaching to a point of no return, requiring short, medium and long term actions to reverse this trend." (Guiomar and Pinto-Correia, 2016)

References:

Godinho, S., Guiomar, N., Machado, R., Santos, P., Sá-Sousa, P., Fernandes, J.P., Neves, N., Pinto-Correia, T., 2016. Assessment of environment, land management, and spatial variables on recent changes in montado land cover in southern Portugal. *Agroforestry Systems* 90: 177-192.

Guiomar N., Pinto-Correia T. (2016), Socio-political, economic and institutional drivers. National Report – PORTUGAL. Deliverable WP3.1. Pegasus, H2020 project, Grant agreement No 633814.

Why is the Montado declining?



Land management and management practices are, among all, the most important drivers for Montado decline.

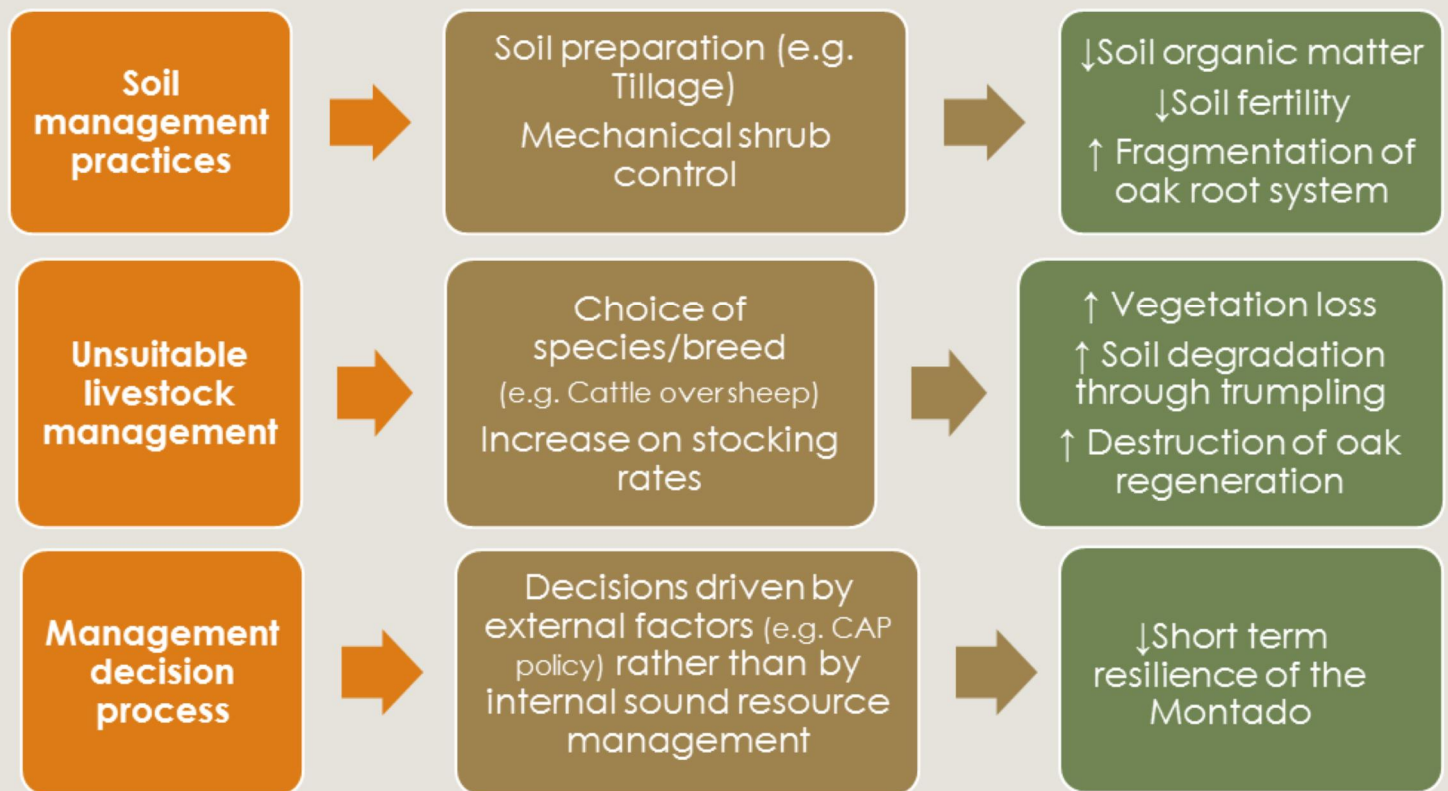
Main causes for the Montado decline (Godinho et al., 2016):

- Environmental constraints (such as soil type, hydrological conditions and wild fires);
- Oak diseases (e.g. *Phytophthora cinnamomi* fungus and insect attacks);
- Factors associate with changes in National and European policies and other sócio-economic factors:
 - Land management (increase in mechanisation and unsuitable animal stocking rates)
 - Vulnerability of the agricultural economy
 - Rural depopulation;
 - Abandonment of traditional agricultural activities

References:

Godinho, S., Guiomar, N., Machado, R., Santos, P., Sá-Sousa, P., Fernandes, J.P., Neves, N., Pinto-Correia, T., 2016. Assessment of environment, land management, and spatial variables on recent changes in montado land cover in southern Portugal. *Agroforestry Systems* 90: 177-192.

Potentially risky management practices



There are various different and often simultaneous management issues, mostly driven by a need to increase economic sustainability, that contribute to increased intensification pressures on the Montado, particularly on the tree cover, grazing resources and on the soil which is the support basis of the system: replacement of sheep by cattle, replacement of light indigenous breeds of cattle by heavier cross breeds, increases in the stocking rates, soil management and shrub control practices using heavy machinery.

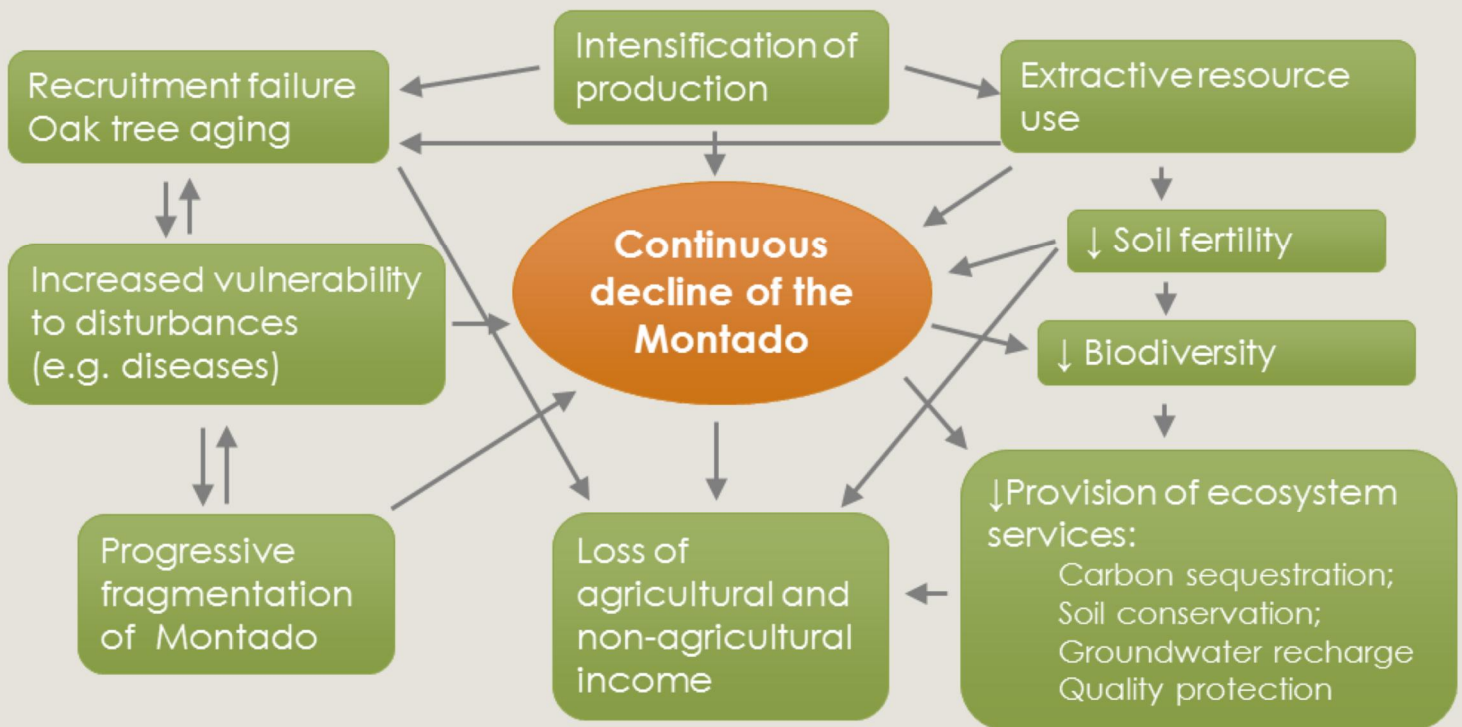
Furthermore, the whole decision making process is focused on external, mostly European and National policy factors. Farmers are abandoning a resilient thinking of their farm system considering the factors internal to the system, to adapt an external, driver oriented representation of their farm system. CAP coupled payments are seen as the main cause of this change (Pinto-Correia and Azeda, 2017).

References:

Pinto-Correia, T. and Azeda, C. (2017). Public policies creating tensions in Montado management models: Insights from farmers' representations. *Land Use Policy* 64: 76–82.

The business as usual scenario

Where do we go in 2030 in the current situation?



The long term and continuous pressure on the Montado relates mainly to recruitment failure, tree aging and an extractive resource use that in turn results in an increased vulnerability to various disturbances, a decrease of natural value and ultimately in a loss of agricultural and non-agricultural income.

The consequences of the present declining scenario of the Montado, in Sítio de Monfurado mainly associated with the intensification threat, will be acknowledged at a variety of levels: ecological, territorial, socio-cultural, economic and even aesthetic level .

The economic driving forces

Food chains and market

- Main forces explaining agricultural economy and markets:
 - Globalization of markets and food chains and pressure for specialization in production: Montado has producers of high quality veal for international beef market
 - Increase in labour costs and constraints in labour diversification on the farm: pressure for simplification of a highly diversified production system
 - Alternative and quality based food chains: localized and limited impact



- Who are the actors?
 - Land managers,
 - Livestock associations (APORMOR)-comercialization of livestock
 - Corck traders (including extractors)
 - Consumers
 - Policy makers, mainly at national level

A considerable number of protected designation of origin (PDO) and protected geographical indication (PGI) products for which the LA is an eligible region, though not exclusively have been certified.

This includes veal - "Carne de Bovino Mertolenga" (DOP), "Alentejana" (DOP); pork "Porco Alentejano" (DOP); lamb "Borrego de Montemor-o-Novo" (IGP), honey "Mel do Alentejo" (DOP) and cheese "Queijo de Évora" (DOP). These products, although certified and entitled to use the EU quality logos do not seem to be driving any particular development in the LA.

The rural development and social driving forces



Non governmental organizations
(NGOs)
Local action groups (LAGs)



Municipalities of Montemor-o-
Novo and Évora



Private companies
including a small number
of farmers

The Montado at the SM is an increasing highly valued landscape.

The LA is considered a hotspot of biodiversity with a high potential for development of recreational activities, bird watching, nature observation walks, cultural activities and hunting. Other than agriculture, touristic and cultural activities are the most important drivers for rural development within the LA.

Major players are NGOs such as MARCA in Montemor-o-Novo, Monte-Ace (LAG) in Arraiolos and Terras-Dentro (LAG) in Alcaçovas that work on the development of local strategies, supporting stakeholder networking and promote projects in the social, cultural, environmental preservation and valorization of the natural and built heritage.

The two LAGs also have responsibilities in defining and launching of Leader calls.

Some private companies and a small number of land managers are also involved in touristic activities, both providing accommodation in the form of rural tourism and eco-tourism and promoting cultural activities related to nature, heritage and gastronomy.

The municipality of Montemor-o-Novo is also an important actor with responsibility in the maintenance of nature trails and the interpretation centers of the Escoural caves and the of the Sítio de Monfurado.

The policies and political driving forces

PUBLIC OBJECTIVES

ENVIRONMENTAL AGENDA

- Legal protection of oak trees
- Special protection of Montados - Natura 2000/the Habitats directive.
- Cork oak - The National Tree (2012)
- Regional Strategy for the Smart Specialization of Alentejo (2014)
- Montado -HNVf system at European level
- LIFE projects– normative plan for SM
- agro-environmental schemes for protection and planting of trees in the Montado.

ECONOMIC AGENDA

- increase in cattle/beef production
- support to large scale farming and specialization of farming
- higher connection of Portuguese agriculture with global markets

TENSIONS

PUBLIC POLICIES

Still coupled cattle payments of the CAP (Pillar I program)



= productivist system orientation

↑ stocking rates

↑ grazing pressure



**status-quo maintenance
No need to innovate**

The Common Agriculture Policy (CAP) has been the major instrument for state intervention in agricultural systems. There is presently a tension between stated public objectives regarding the Montados and public policies that affect the Montados.

Indeed, two agendas are identified within the public objectives, an environmental agenda where strategies related to nature conservation, cultural heritage, and tourism promote the Montado as an important system to be preserved and enhanced due to its cultural and natural values and an economic agenda that supports large scale productivist and specialized farming.

On the side of the public policies the most visible impacting management decisions in the Montado is the still coupled livestock payments which are maintained in Portugal as part of the Pillar I program.

Examples of public policies and objectives at national, regional and even local level in the LA that promote the protection of Montados are:

- Legal protection of oak trees (Decree 155/2004 of 30th June)
- Special protection of Montados through Natura 2000 and the Habitats directive.
- Cork oak declared the national tree (National parliament resolution n.º 15/2012, 10th February)
- agro-environmental schemes for protection and planting of trees in the Montado.
- Regional Strategy for the Smart Specialization of Alentejo (2014)
- LIFE projects and other projects supporting extensive management in Montado (LIFE GAPS)
- The plan of intervention in the rural area of "Sítio de Monfurado", officially published by the Municipalities of Montemor-o-Novo and Évora (Aviso nº3453/2011, Diário da República nº22, II Série de 1st February and Aviso nº3305/2011, Diário da República nº21, II Série de 31st January)

Key Montado support initiatives



A number of relevant initiatives supporting the Montado and contributing to dissemination of its values are in place, at various levels. These initiatives contribute to the engagement of local actors and reinforce the regional and even national identity character of the Montado.

The most relevant initiatives at the local level have been the LIFE program GAPS coordinated by the Montemor municipality and various other research projects mostly coordinated by the University of Évora that used the Sítio de Monfurado as a case study.

At the regional level, the yearly fair of Montado and the acorn week initiative that involves local companies, in particular restaurants that during a week use products of the Montado in their menus are examples of awareness raising initiatives where the general public has the opportunity to gain knowledge on the Montado ecosystem and its products.

At the National level the green book of Montados published in 2013 is a concise report on the present state of the ecosystem Montado supported by the research and academic community, most associations of land-managers and producers that promotes a shared understanding of the system. Another very relevant initiative was the establishment of the "Centro de Competências do sobreiro e da cortiça" that includes National level research institutions, public administration, land-managers and producers, as well as the producers associations that altogether have developed a national research and innovation agenda on cork oaks and cork. This agenda represents a National research and innovation strategy for the cork oak Montados.

Resulting consequences on farm setting

CONVENTIONAL EXTENSIVE

Medium-large farms: 20-500ha
 Traditional farmers with rural background
 Production oriented
 Management focused on livestock
 Low investment

LOW RESILIENCE

- Low innovation capacity
- High subsidy dependence
- Low succession possibilities

SPECIALIZED AGRIBUSINESS

Very large farms: >500ha
 Traditional family business/
 Production oriented
 Management: intensifying for maximum profit
 High investment capacity

LOW RESILIENCE

- High specialization
- High dependence on external production factor
- High subsidy dependence

MULTIFUNCTIONAL

Small-large farms: <100ha
 Urban background
 Diversification perspective
 Product differentiation: organic/quality
 Differentiated strategies of management ⇒ well being
 High levels of decision and management

HIGH RESILIENCE

- High diversification
- Environmental friendly production
- High succession possibilities

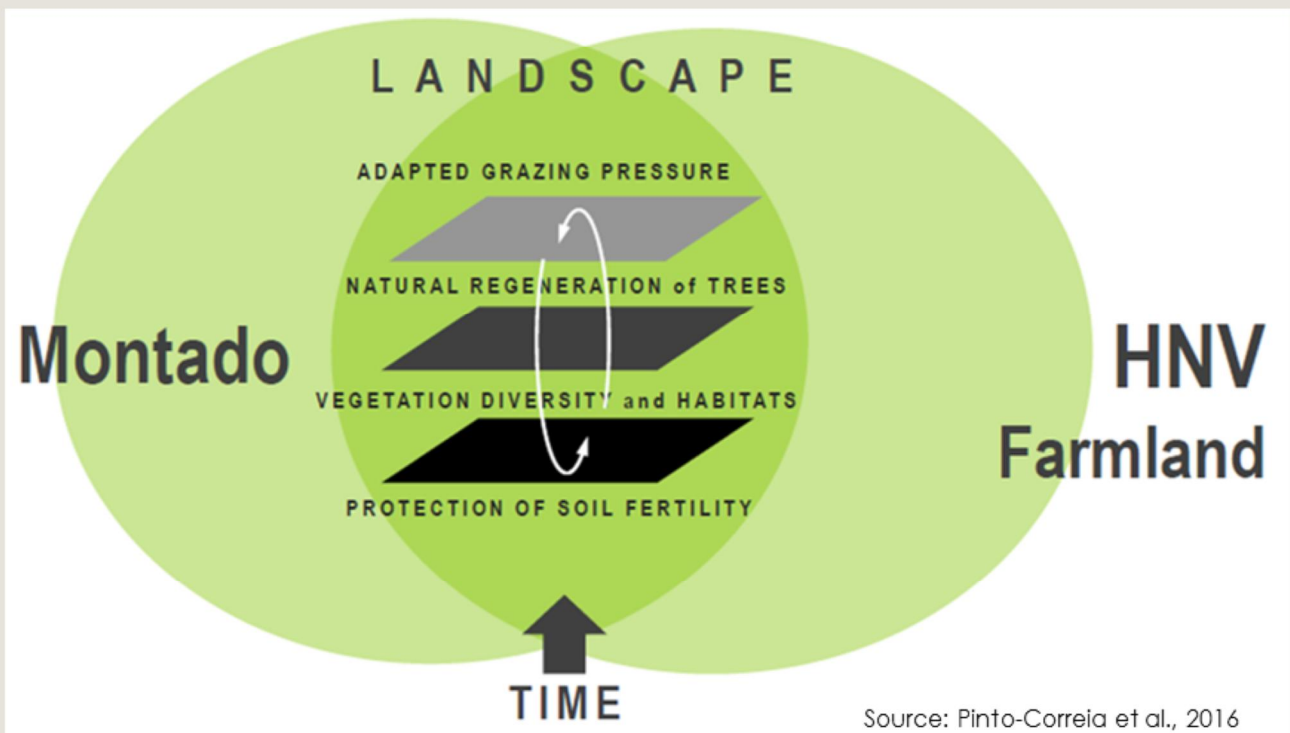
The farm management models in the LA were described by Pinto-Correia (2013) in three different groups: Conventional extensive, specialized agribusiness and multifunctional innovative.

- The first group is frequently associated with medium to large sized farms in the LA context. In most cases the farms are managed by their owners, living in the farms (no secondary land managers) and often having a rural background. Management in this type of farms is production oriented and mostly monofunctional, focused on livestock rearing. Investment and innovation capacity is usually low.
- The specialized agribusiness farm type is also production oriented however with a level of intensification introduced to maximize profits. It is usually associated with much larger farms (greater than 500ha) and working as a family business where day to day management is carried out by contracted "sub land managers" while main decisions are taken by the owners. Often the owners do not live permanently in the farm, and have a high investment capacity. The management of these farms is usually highly specialized and also dependent on resources coming from outside of the farm such as feed supplements for cattle.
- The third group of farms, usually much smaller (<100ha) is the multifunctional type. These farms are managed with a diversification and multifunctional perspective and have deep concerns regarding environmentally friendly production methods (e.g. integrated and organic agriculture).

References:

Pinto-Correia T. 2013. *Understanding changes in rural landscape management: contributions from transition theory*. Oral communication: CBA Seminars in Ecology and Evolution, Faculdade de Ciências da Universidade de Lisboa, 14 October. Lisbon, Portugal.

The HNV vision



A common vision for the future of Montado in the LA Sítio de Monfurado acknowledges, promotes and valorises the inherent features of this complex agro-silvo-pastoral system while also maintaining its intrinsic rurality. This vision was built with the participation of a number of stakeholders using focus groups within a previous European FP7 project (FarmPath) and interviews carried out under the HNV-Link project.

The Montado in this vision is considered as an identity element of the land use and is valorised as an agro-silvo-pastoral system and recognised as a biodiversity hot spot with multiple public services. The different "layers" of the ecosystem (soil, herbage and shrubs, trees and animals) are interdependent and directly affected by management activities. The various products of this unique ecosystem are also intimately connected to the identity of the Montado in this vision.

The present decline of the Montado which may lead to more discontinuities and less dense covers and even disappearance in certain areas will impact the valued landscape and rural identity.

In order to preclude this declining trends with implications on the differentiating character of the landscape, this vision put forward the creation of a prestige brand of Montado. The creation of a Montado brand requires cooperation between actors, strategic plan, training and leadership. The Montado brand will act as a recognized identification umbrella for all products and services coming from the Montado, enabling a more coherent commercialization and supporting the creation of added value which in turn support sustainable management.

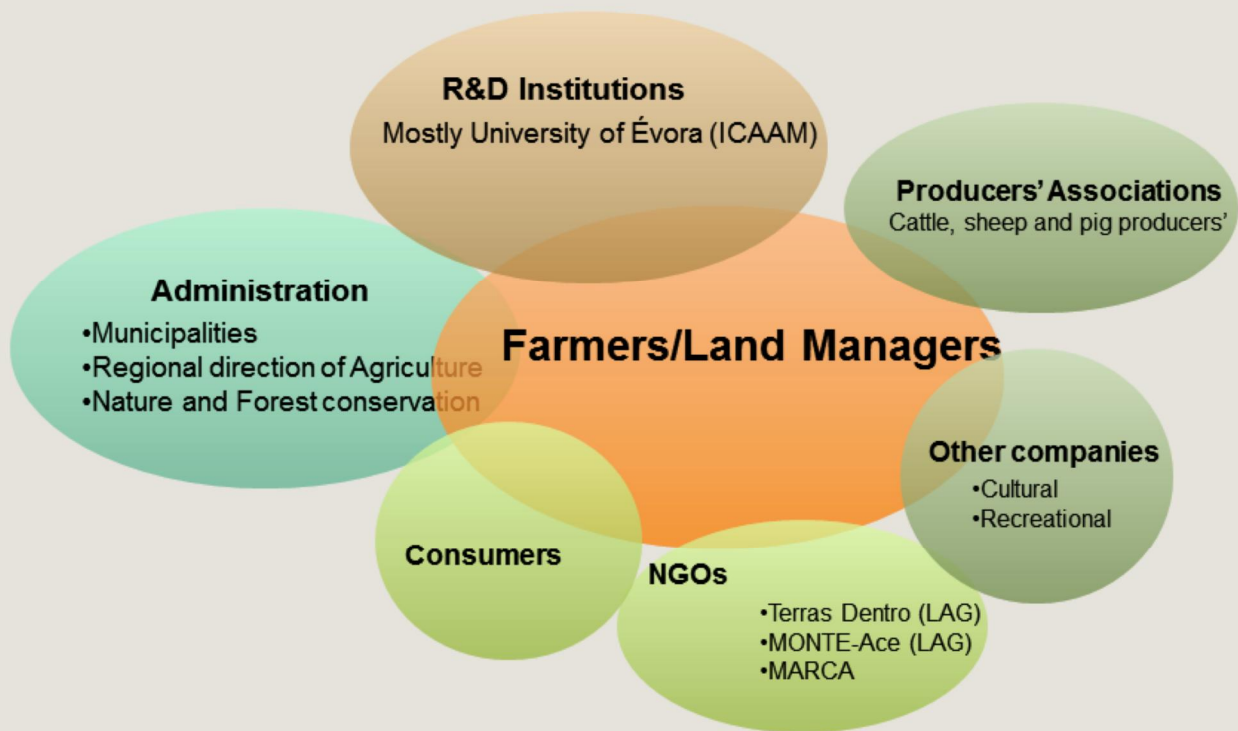
What does need to be addressed for the HNV vision

Main problems to overcome

- Low soil fertility
 - Lack of new oak trees
 - Undifferentiated products
 - Resistance to multifunctionality
 - Economic agenda supporting productivis and specialization farming
 - Lack of investment of farmers in improving management practices
- 
- Soil management to restore and gain fertility
 - Oak recruitment
 - Valorization of Montado products in the market
 - Training
 - Specific policies for the Montado, considering it as a system
 - Immobility and lack of entrepreneurial spirit



Who are the actors to get involved in the process? How?



The Montado is declining, even in Sítio de Monfurado.

Can we do something jointly to prevent this decline? What? Whom?