CASE STUDY

"MONTADO" (PORTUGAL)

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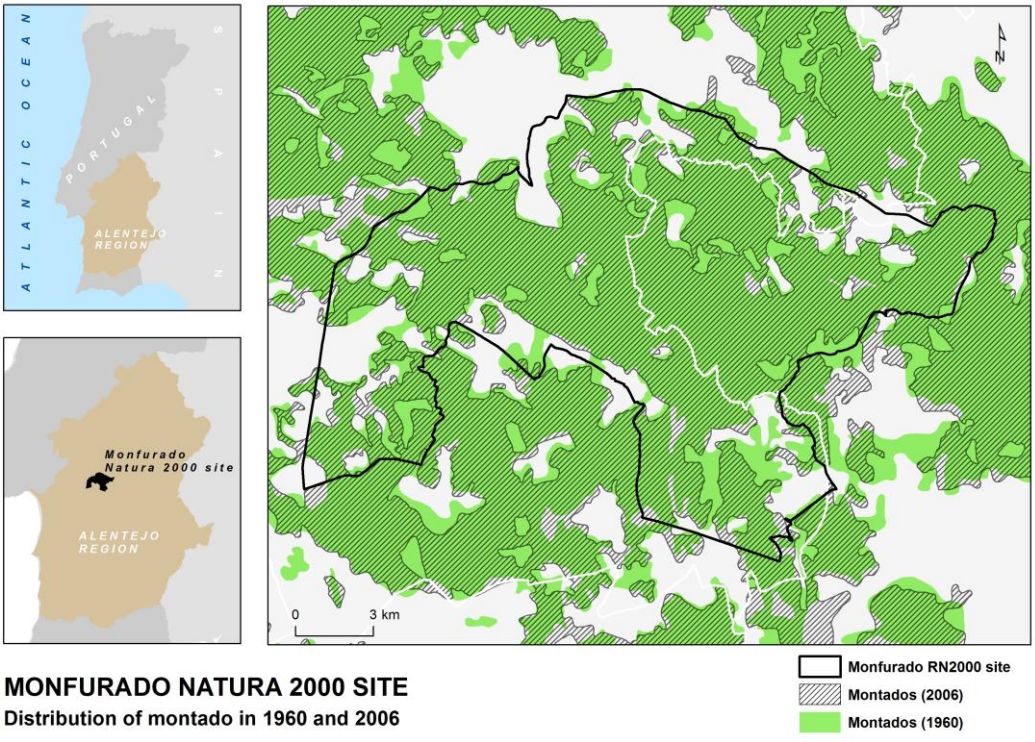
1 Introduction: What is the case study about?

The *montado* is a Mediterranean and multifunctional silvo-pastoral land-use system, dominated by cork and holm oaks trees. It is the main land cover in the Alentejo NUTS II region, occupying slightly more than 1 M ha (ICNF, 2013). It is considered as a High Nature Value Farming System, according to the European Environmental Agency. This means it is a land use system that through production practices maintains high levels of biodiversity and nature values, as well as landscape values, in particular landscape with a rich biodiversity and balance of the environmental resources, cultural value and attractiveness for leisure (Pinto-Correia *et al*., 2011). The land managers of the *montado* are mainly focused on the livestock and cork production. The *montados* have long been well established in the region and they have showed expansion or some stability over a long period starting in the eighteen century (Pinto-Correia *et al.*, 2013). However, in the last decades they have shown worrying signs of decline (Godinho *et al*., 2016).

The Case Study (CS) area is within the Nuts III "Alentejo Central" and corresponds to the Monfurado Natura 2000. This area has been classified since 2000, with almost 24,000 hectares, 3% of the total of this NUTS III region. The *montado* area within the CS area corresponds to 71% of the total area, and this in turn is 0.02% of the total *montado* area in the region of Alentejo (Nuts II). It's also partly set in in the municipality of Montemor-o-Novo (13%) and in the municipality of Évora (6%).

Figure 1: Location of the Monfurado Natura 2000 site (PT 1 study area)



MONFURADO NATURA 2000 SITE
Distribution of montado in 1960 and 2006

The ecological biodiversity, namely achieving and maintaining the presence of diverse and plentiful species and habitats, is one of the keys ESBOs of the *montado* CS. The other key ESBO is landscape character and cultural heritage that plays an important role at landscape level (Pinto-Correia & Primdahl, 2009). This ESBO has a high level of importance in the Alentejo regional identity. The two ESBOS (ecological diversity and landscape character and cultural

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heritage) have been the ones selected for the analysis. However, *montado* is capable to provide a large set of ecosystem services (Bugalho *et al.*, 2011; Pinto-Correia & Godinho, 2013; Pinto-Correia *et al*., 2013) and there are others important ESBOs, like air quality, minimisation of greenhouse gas emissions, fire protection, soil protection and animal welfare.

The main actors for the CS are the farmers and land owners, the public administration, namely the Institute for Nature Conservation and Forests and the municipalities, environmental non-governmental organizations, researchers, as well citizens using the *montado* for recreation or leisure regarding the aesthetic value of the *montados* (Surová & Pinto-Correia, 2008; Pinto-Correia *et al*., 2013; Godinho *et al*., 2016). The land owners are the main land managers of the *montado* areas, but part of the farms are managed by other people, as those who lease the land or employees to absentee land owners. Biodiversity and landscape character are not much important as drivers for the management decisions on the *montado*. The production activities remain as much more important drivers, as livestock and cork production.

In this context and nevertheless the role played by EU directives and the national systems of governance/legislation protecting biodiversity and landscape character in the CS area, management practices are similar to other areas, outside protected areas, with strong pressures resulting from increased intensification of livestock production, as the market drivers and the CAP livestock premium. This payment is still coupled in the Portuguese implementation of the CAP, and thus results in a pressure for increase number of animals in order to receive higher premium. The land management, specifically the increase of the grazing intensity, is one of the most important variables influencing *montado* loss (Almeida *et al*., 2016; Godinho *et al*. 2016) and with effects in its multi-functions (Almeida *et al*., 2016; Godinho *et al*., 2016; Sales-Batista *et al*., 2016). The *montado* show, in general, a regular decline in area since 1990, most noticeable by the decrease in tree density. This means the decrease in area does not occur due to areas where the trees are cut off, but due to progressive loss of tree cover density, leading to increase clearances and thus larger and larger areas where the *montado* as such disappears.

There is thus an ongoing and acknowledged conflict, between the production interests and most evident motivations of land managers, for each farm unit, and the landscape and nature conservation strategies and goals for the Montado, conceived at the territorial level but with no or limited capacity to influence decision making at the farm level. The increased grazing pressure is also contradictory to the sustainability of the *montado* in the long term, and therefore this conflict is also felt by land managers within their farm. Land managers also feel a strong sense of being heritage keepers through their estates and farm practices, and also in this way, their farm practices are in contradiction with other values, which are shared values for the social group composed of land owners and their families. Nevertheless, on most identified cases so far, the pressure for intensification is dominating in relation to concerns for long term sustainability.

Hunting is an activity which has for a long time been relevant in the Montado. The extensive use of the system combined with the complexity of land cover and the combination of multiple habitats, creates the ideal conditions for a rich game population. The exploitation of hunting as an income providing activity (through touristic hunting reserves), is much well accepted by land owners as an activity which is part of the *montado*, and plays normally in the sense of a higher attention to the shrub diversity and complexity in land cover, thus to less intensive

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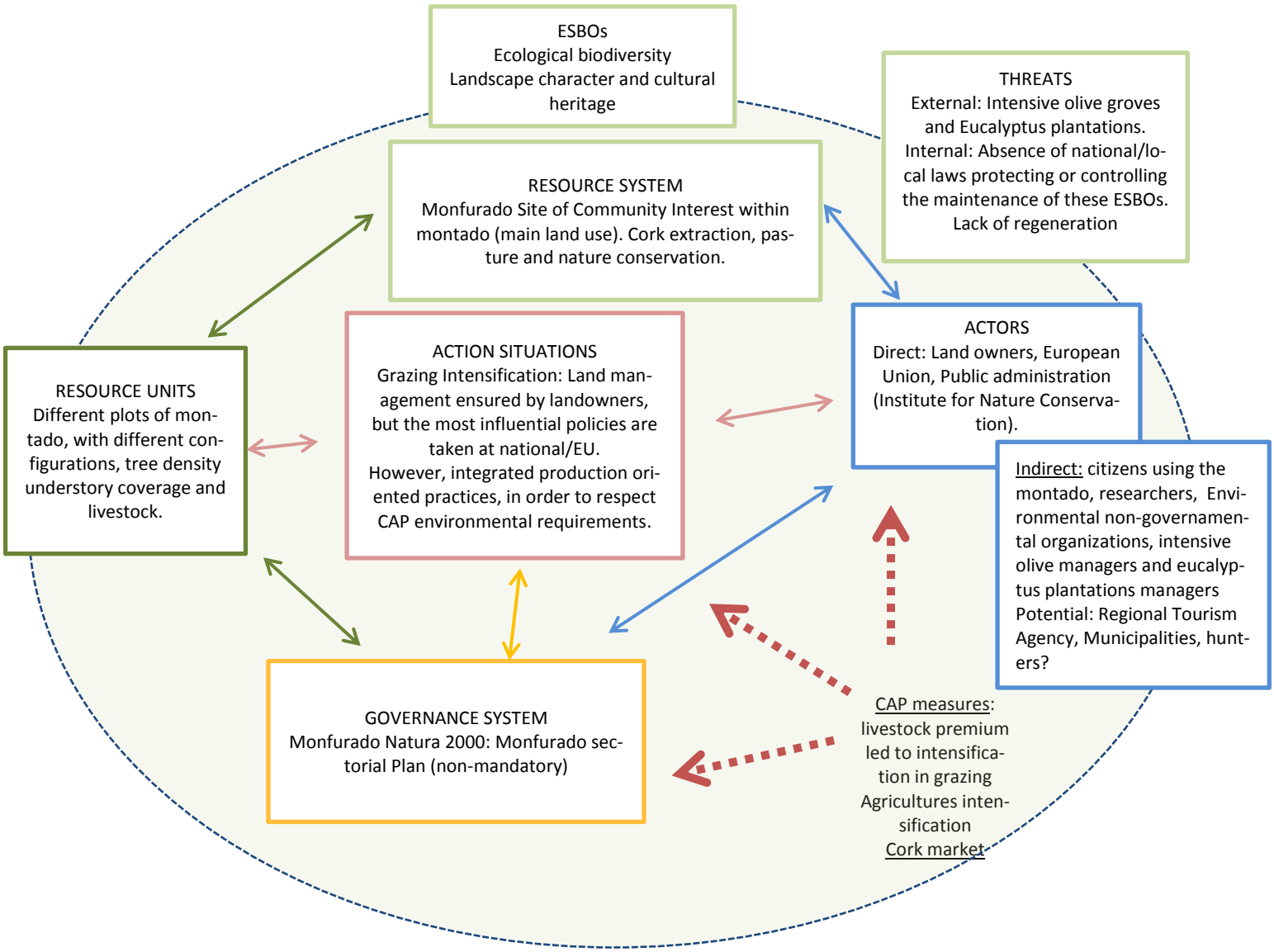
under cover use. In the cases where hunting is a relevant activity in the management calculations, the intensification of livestock is normally a smaller issue then in other cases. Other activities, like recreation and leisure activities, or honey production or bee keeping, have not managed so far to be included in a long term strategy of the *montado* land manager.

2 Definition of the social-ecological system (SES) studied

2.1 Figure of the SES, using the SES Framework



2.2 Short characterisation of key drivers/motivations

The public policies recognize the importance of *montado* for decades, specifically of the cork and holm oak trees. Since the 1920s, the national legislation establishes the protection of forest resources and the survival of the adult trees independently of the farm management goals. Nowadays, the protective measures to the cork and holm oaks are determined by the Decree-

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Law 155/2004 of 30 June. Furthermore, *montados* are included in the Natura 2000 network and recognized as High Nature Value farmlands at European scale. The multiple products, value and services that are provided by this land use system led to incorporate *montado* in several strategic initiates for regional development, namely in the case study area, as the Regional Strategy for Smart Specialization in Alentejo of December 2014 and the Operation-al Program for the Alentejo Region 2014-2020.

However, mixed with market drivers and with the productivity management motivations, the national agriculture policies and Common Agriculture Policy (CAP) measures, in particular the livestock premium and the payments according to the livestock headage, lead to intensification in grazing. This type of grazing management focus on high stocking density and cattle had been serious implications on *montado* loss (Almeida *et al*., 2016; Godinho *et al*. 2016) and also economic effects (Fragoso *et al.*, 2011).

Over the past years, the conflicts between the *montado* and other land-uses have emerged. This is the case of the recent expansion and intensification of the olive groves in Alentejo that may result in problems related to the availability of natural water supplies sufficient to support the ecological processes and cycles associated to the *montado*. The eucalyptus could be a potential land-use conflict with the *montado* (Costa *et al*., 2014). Both land-uses, olive grove and eucalyptus, have a comparative advantage over the Montado, for the landowners, from a short-term financial profitability point of view. Nevertheless, as the montado trees are protected by legislation, there is no significant replacement of montados by these other land uses. Eucalyptus may still be planted but in plots where the montado tree cover is already sparse. And intensive or super intensive olive groves are planted in the new irrigation perimeters, or other areas with irrigation possibilities, but not generally in former *montado* land.

Despite all tensions, there is still in the *montado* land owners, generally, a collective awareness of the value of this land cover system as a cultural heritage, an unique identity dimension of the region, and as support of multiple activities which contribute to the region specific character. There is does generally a shared proud on the *montado* as a land use system characteristic of the region, which is shared with other regional actors and much promoted in the last decade, for example by the tourism authorities and private sector. Montado only occurs in large scale farms, or estates, between 100 and 2000 ha, and these are for the most in the hands of wealthy families, and in the same families for generations. The knowledge on *montado* management is thus much connected to a specific social group, the social elite of the region, and thus closely connected to a shared sense of belonging to the region and its traditions. There is much of heritage feeling and conservation in the way land owners refer to their responsibilities as managers of this system. And there is an unwritten and non explicit code of rules for how to behave and deal with the management of the land, wich is still to be fully revealed.

Exploring these complex relations and the sense of belonging to a clearly defined group, by *montado* managers, will certainly lead to the identification of collective behaviours or actions in the management of the *montado*, or even to the design of potential pathways for a more sustainable management in the future, grounded on a re-shaped discourse on what the *montado* is about and alliances with other sector than th one of cattle and cork production.

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2.3 Description of other important variables chosen

Despite the *montados* multifunctionality, nowadays there are two activities which provide most of the income: cattle production and cork extraction. Cork is most important in areas where the tree cover is dense and composed of cork oaks, livestock normally more relevant in less dense montado areas where larger investments are made on the pastures and their productivity. So, for the livestock, the major economic and politic driver are indeed related to the CAP measures, in particular the livestock premium, in so far as coupled CAP payments according to the livestock headage lead to intensification in grazing. However, intensive agriculture, associated with irrigation facilities, is also a key economic and market driver. The cork market is also relevant, and here only the market forces are playing, there is no state intervention. Many *montado* farms have cork trees and production of cork, which may be of quite different relative importance in economic terms. In this context, higher relevance of cork production leads to higher interest in maintaining a healthy tree cover.

Hunting is commercially exploited by many of the largest *montado* farms, as touristic hunting reserves. Here, hunting may correspond to a significant income, and this in turn may have an impact on a positive management concerning biodiversity and landscape, with less livestock density and more concern for the trees cover and shrub formations.

The landscape character and cultural heritage is also appreciated by society, but the accessibility to *montados* areas may become a problem because almost all areas are within private property and today are fenced. In former times when the livestock was followed by a shepherd, this issue would not be raised. Still, there is a common understanding that visitors who do not interfere with the livestock and do not manage the fences and other infrastructures, may enter private properties and walk/byke on the existing pathways. When contacted about this use, most *montado* owners will accept this entrance of visitors in their property. The extension of the properties and the extensive use are also contributing to this. Nevertheless, close to urban areas and thus confronted with higher recreation pressure, the attitude of land owners may be more strict. In Portugal, there is no clear definition in las, of recreation and visitors rights in the agricultural/forestry land. Customary rights are mostly used, and they are in the sense of having free entrance, as long as not interfering with any of the production activities ongoing, in any way.

2.4 Discussion of the SES

The majority of the managers and owners are aware of the *montados* threats. However, the income required to maintain the system active has a works as a stronger driver. The way livestock production is managed today is threatening *montado's* sustainability, namely the regeneration of the trees (cork and holm oak), leading in the long-term with increasing *montado* fragmentation. The *montado* show, in general, a decline in area and in density, normally first a decline in density of tree cover, leading in a second step to a decline in area covered by *montado*. This evidence is most noticeable by the decrease in tree density within the *montado* areas, than in the total area occupied by *montado (Almeida et al., 2016; Godinho et al., 2016)*. Furthermore, the marked aging of the trees and the lack of natural regeneration make the *montado* extremely vulnerable to biotic and abiotic disturbances that can occur in the short-term with effects in broader spatial scales (e.g. pests and diseases, fire).

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Regarding de CS area as a protected area, the EU directives and the national systems of governance/legislation should play here a role protecting the *montado* balance, for the biodiversity and landscape goals. However within the Natura 2000 areas, the management practices are similar to other areas. ICNF data shows that the livestock grazing characterizes 71% of the Agriculture Surface Area Used in this Natura 2000 site, and only 7% of these corresponds to sheep/goat stocking, while the remaining is used for cattle.

2.5 Common aims, conflicting interests and goals

Despite the political, economic and market drivers, as the intensification of the agriculture and the livestock premium, the maintenance of the system and the montados sustainability are common aims and goals for all the main actors (land owners, farmers, governmental and political institutions, non-governmental organizations). The cultural identity of the region is linked to the *montado* and all these actors recognize this. However, society, namely consumers as well as visitors of the region and of the montado landscape, aren't aware of the challenges faced by the management of *montados*. In this context, consumers and generally urban citizens are thus not specially pressing for more sustainable or less intensive meat production or the maintenance of the *montado* landscape.

The cork market is a good example of common aims between farmers/land owners, land use system protection and market. In this context, a higher relevance of cork production leads to a higher interest in maintaining a healthy tree cover. The complexity of these land use systems requires an extensive management and thus the consideration of different temporal cycles, according to the particular dimensions of the montado management. For instance, at the tree level, the cork extraction every nine years haven't a negative impact on the biodiversity.

As described before, hunting plays an important role regarding biodiversity conservation and landscape protection. So, hunting corresponds to a significant income and thus leading to reduce the need of a higher livestock density. Only in some areas though, is hunting considered by land owners as an activity which is taken in consideration in its own management strategy. In many cases, hunting is managed and exploited by an external entity, an association or private hunters who sign contracts with the land owners, and thus remains as a secondary activity in the farm.

Regarding agro-environmental practices, farmers are using techniques (per examples: direct sowing, appropriated mobilization of soil) in order to respect CAP environmental requirements and as such avoid cuts in the subsidies they receive. More information and extension campaigns on correct shrub control techniques, respectful of the tree natural regeneration and the balance of the soil, is nevertheless highly needed.

The designation of the Montado as a Unesco World Heritage, under evaluation at UNESCO, is focused on the cultural value of the *montado*. This is certainly a value recognized by land owners, and even it is a collective domain within the land owners social group. The cultural recognition could thus be a synergy basis for different actors and actions in the montado. Nevertheless, cultural heritage needs to be combined with today management requirements and constraints, and also with the income basis in the montado – and this has so far been kept quite aside in the process of World heritage application. Thus, it is creating more conflicts than synergies, being land owners concerned about possible limitations to their room for manoeuvre.

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3 Status of the SES and potentials

3.1 Description of the SES

We can describe the Resource Systems (RS) and the Resource Units (RU) as the environmental subsystems of the Socio Ecological System (SES). The Actors and the Governance System and are made part of the social and economic subsystems.

The montado is the main land use system in the case study area and can be characterized by its multifunctionality. However, cattle production is the activity that generates more income considering the generality of *montado* types (cork oak, holm oak or mixed). In cork oak montados, cork extraction is sometimes the main activity. Thus, regarding the *montados* RS, we can consider three sectors: forest, livestock (pasture) and nature conservation. The boundaries between sectors are not well defined, even within *montado* areas given their spatial fuzziness and its multifunctional character. We would like to stress that the *montados* areas extends far beyond the area defined for the case study.

The main RU are the different plots of *montado*, with different configurations, depending on the tree density, understory coverage, etc. The dominant tree species, in different densities, need to be considered in their articulation with herbs, shrubs, type of management and cattle. Thus, one montado plot with relative homogeneous characteristics, is to be considered as a RU. In one single farm there may be thus different RU, depending on the variability of the montado in that same farm. The sustainability of farms is ensured by business models associated with livestock production and cork extraction. It is evident however high dependence on subsidies.

The mains actors are land owners and farmers. These are the most central direct actors. Other direct actors are hunters and others who develop their activities in the montado, as bee keepers. Then, as mostly indirect actors, there is the public administration, as the Institute for Nature Conservation and Forests and the Ministry of Agriculture, there are agricultural and environmental and local development non-governmental organizations, municipalities, researchers, as well as citizens using the montado for recreation or leisure. Society as a whole could be an indirect actors if the awareness for the montado was higher. Probably we can say society in the region of Alentejo, where the montado is linked to so many traditional cultural dimensions, is also an indirect actor. However, the level of organization is low and the mainly part of users and actors are outside of the case study area, thus there is little interaction between them. As for the state entities and the non governmental organizations, there are meeting opportunities and dialogue, and a shared understanding of the value of the montado. Only there is not much effective collaboration for a coordinated intervention in the montado management.

Nevertheless, there are associations specialized in the production of livestock and many farms are members (e.g. the Iberian pig producers association, the Alentejo cattle producers association, the *mertolenga* producers association). Most land owners belong to the same social group and families with a long history in the region, and share a similar cultural background and strong sense of identity on Alentejo. These social and enlarged family bindings are extremely strong and have strong influence on land owners values, attitudes and behaviors. If exploited in new and innovative ways, they could eventually form the basis for novel collective actions grounded on a shared sense of heritage keeper and resource manager.

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The users living and working inside de case study area are mainly farmers, landowners and some researchers. In this case, they know each other.

Regarding Governance Systems, the *montado* areas are mainly located within large scale farms units (estates), so the main decisions are taken at land management level by landowners. As said before, land owners are taking the decisions on their farm, but most commonly respecting norms and rules and following a self-concept deeply grounded on a sense of belonging to the same, well established, dominant and conservative social group in the region. This dimension should not be underestimated, as it acts as a strong driver of land owners behaviour. It allows for a sense of security within a group, but creates linkages and constrains which are difficult to bridge over. These linkages could nevertheless be the basis for changes in the intensification practices, if well understood and worked with in an integrated way.

Today, society demand for public goods and ecosystem services is increasing and establishes a certain pressure on montado landowners to respect these demands. Some important decisions as protection of habitats and classification of protected areas, depends on national level. Market prices for cork strictly and livestock production depend on market drivers, decided mainly by the processing industry and competition from other producer markets, in other countries.

3.2 Relationships between farming and forestry, and the quantity and quality of ESBOs

Regarding the montado CS, the keys ESBOs are ecological biodiversity (achieving and maintaining the presence of diverse and plentiful species and habitats) and landscape character and cultural heritage. There isn't a concrete market and/or quantitative value for this type ESBOs, so this is only an exploratory exercise.

In the CS area, concerning ICNF data, the agro Silvo-Pastoral land use characterizes over 14.100 ha and almost 60% of the total CS area, arable agricultural areas over 5.570 ha and 23% and tree and shrub agricultural areas almost 2.400 and 10% of the total CS area (source: The Natura 2000 Network: Monfurado Sectorial Plan). The Agriculture Surface Area Used (ASAU) characterizes over 15.530 ha and 65% of the total CS area and forestry over 17.000 ha and 72%, being overlapped these uses. The forage grasses represents 13% of the ASAU, permanent pasture 56%, and livestock area 71% of the ASAU. 61% of the total forestry use is occupied by species (manly cork and holm oak) and 41% is for hunting areas (source: The Natura 2000 Network: Monfurado Sectorial Plan). In the CS area there are 149 farms, each one with an average of 104 ha of Agriculture Surface Area Used.

The montado area is declining over the past years because of the aging and the lack of natural regeneration of the dominant trees. According to the Sectoral Plan of Natura 2000 network, some animal and plant species are also threatened. In this CS, 21 natural and semi-natural habitats are identified from the ones listed in Annex B-I of the Decree-Law n.º 49/2005, 3 of which are priority habitats (source: Sectoral Plan for Natura 2000 Network). In the sectoral plan are also identified 3 species of the flora and 15 species of the fauna listed in the Annex B-II of the Decree-Law n.º 49/2005. Regarding Annexes IV-B and B-V of the same document, 2 species of the flora and 16 species of the fauna can be observed within the study area.

As we described before, land management practices, namely grazing management, have implications on the system conservation. In case of high tree density, the crown coverage plays

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an important role increasing the diversity of the animals groups and of the understory coverage. The maintenance of the main trees, as the cork and oak holm, is also fundamental to maintain the landscape character.

3.3 Key motivational, institutional and socio-economic factors

In this particular SES and situation, the key motivational, institutional and socioeconomic factors have several negative impacts on biodiversity and landscape character. We described these social, economic and political previous on the report, related with market drivers, agriculture intensification and livestock subsidies. Lobbying actions and activities are performed in sectorial and specialized production associations, like the Iberian pig producers association, the Alentejo cattle producers association and the *mertolenga* producers association. These lobbying activities are leading to the intensification of the cattle.

However, the valorisation of the cork market and the promotion of high animal welfare practices on farms could play an important role concerning the sustainability of the system.

3.4 Levels of provision, trends and determinants

The Natura 2000 Network *Monfurado* Sectorial Plan identified negative impacts of cattle production (intensive grazing), farming (intensive agriculture) and forestry activities describe below () on biodiversity caused by changing brooks course, water pollution and fires. These activities are leading to increase the number of endangered species.

There isn't indicators available on the provision of the quality and quantity of biodiversity and landscape character/cultural heritage. There is only one temporal set of indicators available that are produced in the scope of the National Forest Inventory, but don't have adequate scale and detail to the level of monitoring that should be required in this context.

However, regarding indicators of good health of the *montados* we can establish the importance of high heterogeneity at stand level, the high heterogeneity at landscape level, the natural regeneration of the dominant trees and multi-age stands. As indicators of damage or decline of the *montados* we selected as key the decreasing in tree density; increasing montado fragmentation and pest/disease pressure in the region. It is important observe other disturbances like the livestock density, excessive pruning, agriculture intensification, brooks changing course, water pollution and fires.

Hunters play an important role, as the management which favours game is the same which benefits biodiversity and also landscape. As a hunter pay for the hunting rights, particularly in private hunting reserves, they have a role in influencing a more biodiversity friendly management by land owners.

Concerning landscape, the regional tourism agency is promoting Alentejo landscape character as the key regional identity element. Landscape, and particularly the landscape in the region of Alentejo, related with montado, is actuality more widespread in the media discourse than biodiversity. Regarding society, the level of accessibility of the population to *montado* areas and farms is very low and this could be an indicator of social performance, the way society has the power to mobilize and open these resources to all the population.

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3.5 Relevant governance arrangements and institutional frameworks

The CS area fits with the protected area of Monfurado Natura 2000 Site and with, also, 13% of the total area of Évora municipality and 6% of the total area of Montemor-o-Novo municipality. Nevertheless, there isn't relevant initiatives at the local governmental level regarding the protection of the biodiversity in Monfurado and promoting the *montados* landscape character. Concerning this protected area, the EU directives and the national systems of governance/legislation should play here a role protecting biodiversity and landscape character. However, the management practices are quite similar to other non-protected areas, with all socioeconomic, political and market pressures leading to agriculture intensification.

There are some specific obligations on cork and holm oak protection. The protection of trees is considered in national level legislation and thus the tree feeling of these emblematic species is settled as an environmental and civil crime. Some farmers and land owners follow integrated production oriented practices, in order to respect CAP environmental requirements, are protecting the dominant trees species and, also, the herbs and shrubs.

There are some non-governmental and non-profit organizations concerning the protection and valorisation of biodiversity, like Quercus and Centro de Estudos Avifauna Ibérica - CEAI, or Liga para a Proteção da Natureza - LPN, which act at regional or national level, but not specifically at the CS area level.

From some stakeholder's point of view, the valorisation and appreciation of the *montados* biodiversity and landscape is a learning sociocultural process, so, for them, isn't easy for the governmental arrangements and for the institutional frameworks play a more active role. For them the institutions should only improve the contact of the young generations with the *montado*.

4 Conclusions derived from analysis in Steps 1 and 2

4.1 Key findings on the particular SES and its potentials

The famers and land owners/managers are aware of the agriculture intensification negative impacts on biodiversity and landscape character. Actually, they even know that the sustainability of their farms will be affected at medium and long-term, namely the regeneration of the cork and holm oak trees. Nevertheless, the market drivers mixed with socioeconomic and political drivers and the need to ensure the income to maintain the system active are leading land managers to performance thinking at short-term. Therefore, the national agriculture policies and the CAP livestock premium are leading to intensification in grazing. This type of grazing management focus on high stocking density and cattle had been serious implications on *montado* loss. There are also some conflicts between the *montado* and other land-uses, like with the olive groves and eucalyptus, due to their comparative financial profitability advantages over the *montado*, from a short-term point of view.

Land owners feel the conflicts between resilience of the montado and the short term income, and are not pleased with the actual trends. Their sense of belonging and of cultural heritage keepers is strongly linked to their integration in a well defined and traditionally dominant social group, and these bindings and traditional network structures could be explored in the sense of a more collective strategy making and management understanding in the montado

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areas, where the cultural and identity values would be more activated then what they are today.

Thus, the strategies and mechanisms to increase the awareness and provision of the ESBOs should be explored in steps three and four, specifically within the land owners group, as well as in its relations with users and wider society. There are some good examples already, but far too little has been investigated on the landowners values and the power of the group bindings, and how these could be used as a basis for new collective strategies and actions.

Regarding biodiversity, hunters play an important role which hunting practices improves biodiversity friendly management by land owners. Concerning landscape and using the media, the regional tourism agency is promoting Alentejo landscape character and cultural heritage as the key regional identity element.

4.2 Governance arrangements and institutional frameworks

The CS area fits with the protected area of Monferrato Natura 2000 Site, but the EU directives and the national systems of governance/legislation don't contribute to protecting biodiversity and promoting landscape. In this context, the land managers are under the same political and market pressures that are leading to agriculture intensification and they are seeking for income to maintain the short-term sustainability of the farms.

The CS area corresponds also to a part of the total area of Évora and Montemor-o-Novo municipalities. However, there aren't relevant initiatives at the local governmental level.

At the national level, there are legislation focus on the protection of the dominant trees. At the European level, some farmers and land owners follow integrated production oriented practices, in order to respect CAP environmental requirements, and they are protecting the dominant trees species, herbs and shrubs. In this way, environmental and agricultural policies at national and EU level should be more transversal/coherent, and also improve the collaboration the land managers (Pinto-Correia & Godinho, 2013).

An important issue in the montado management, and which requires particular attention if novel management strategies are to be designed and set in place, is that the different actors and interest groups are only communicating to a limited extent. There is some collaboration between the administration and non governmental organizations, and there are opportunities to meet between all actors, as fairs and other events. But the land owners are seldom involved in these collaborations, and the associations they relate mostly to from the sector perspective, as cattle producers associations, or forest owners associations, do not actively collaborate with other entities with a territorial concern. Land owners have not been involved in the process of UNESCO world Heritage classification, and hardly involved in the process of Nature 2000 sites design. This creates tensions and does not foster a change in mindset, on the contrary it reinforces the traditional land owners self concept and their linkages within their social group. There is too little integration of the actors involved, and much more efforts should be at least tested in this sense, to experiment new territorial integrative pathways.

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4.3 Other enabling or limiting factors

As described before, the market mixed with the public policy drivers, as well as the land owners self concept and fixed traditional network linkages are the main enabling and limiting factors that are affecting and threatening the quantity and quality of the provision of biodiversity and landscape.

4.4 Reflections on the case study methodology used and potential improvements

The case study methodology have some powerful tools to sketch out this particular case, as the key actors and activities, mechanisms and initiatives, but also to identify motivational, institutional and socio-economic factors that affect the particular SES. The Sketchpad Table and the Sketch Map were very useful to analyse the demand and the appreciation level for the key ESBOs.

In the beginning, our strategy, regarding this CS, was focus on the information and scientific knowledge (articles, papers, etc.) about *montado* in our research group. We tried to perform interviews only with key stakeholders. However, we realize that it's important to reinforce the qualitative component and the participatory approach for this CS, mainly to identify with the mechanisms to improve the provision of the key ESBOs.

5 Research and action mandate for Steps 3 and 4

5.1 Agreed objectives of activities to be undertaken with initiative/stakeholders

Since a few weeks ago, the Dynamo research group of the University of Évora is organizing and promoting the «*Tertúlias do Montado*», once a month. The key goal of *Tertúlias*, using a participatory approach basis, is to increase the stakeholders engagement with researchers and namely with scientific projects on *montado*, like the PEGASUS project. In the first session was agreed, with the stakeholders, the calendar and the main topics for the next sessions. Thus it was established some subjects for this common agenda linked to biodiversity and landscape character/cultural heritage, like ways and strategies to profit the *montados*, challenges against financial crises and climate change, public accessibility/openness to the *montados*, and strategies to improve society awareness for the *montado* value.

Concerning this opportunity to improve stakeholder's engagement and the PEGASUS goals, the key questions for the in-depth analysis in steps three and four are:

- To understand how montado land management practices respond to different policy and market drivers;
- To assess the appreciation and value of biodiversity and landscape character/cultural heritage and to link measurements of value to these specific groups: non-governmental nature conservation organizations, regional agency for tourism, associations specialized in the production of livestock community, users and wider society;
- To identify and describe the key motivational, institutional and socio-economic factors which play a role in enabling transformative practice and in respect of the mainstreaming of biodiversity and landscape character/cultural heritage provision;

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- To work with landowners and managers to both assess the potential and experiment the transformative pathway for the attitude and behaviour, as a social group , toward the montado, as a private but also at the same time a collective domain which all feel they have a responsibility to keep;
- To identify with the stakeholders societal awareness mechanisms regarding other potential key ESBOs.

5.2 Innovations, impact, transferability, potential risks and research bias

We received quite good feedback from the stakeholders and participants of the two first «*Tertúlias do Montado*» sessions. So, we expect to keep improving our strategy to engage stakeholders with the PEGASUS project, namely montado farmers and land managers, researchers, leaders from non-governmental organizations (nature conservation, regional development), local and regional public administration, as others relevant actors.

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