

## **Diversity of users' preferences in landscape: contributions for the management of the Montado of Cork Oak as a multifunctional system**

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The modern society has a great variety of demands from rural landscape. The new challenge becomes a new chance for rural landscape to become a multifunctional and desirable place to live in. However, not any type of landscape can satisfy any kind of demand. Hereby, the importance of competent help for the introduction of new functions, in landscapes management related with different uses, is undisputed. One of the new components for the management, rising importance in the present-days, is the non-production functions related with the leisure and the recreation in rural areas. The traditional agro-silvo pastoral system in Alentejo, the Montado, with its corresponding open savanna like landscape, has been always appreciated in different ways by its users, but to satisfy the current society's expectations the knowledge about landscape preferences is missing. In this study, the preferences of a variety of users were surveyed, in order to know how different Montado types are preferred for the various uses. Personal interviews based on the photographs of different Montado types (N232) were carried out. The results reveal diversity among user's preferences related with their main activity in the Montado. In the last part of the paper, the used methodology is discussed and some potential tensions between the user-groups are detected.

**KEYWORDS:** Montado, multifunctionality; landscape valuation; landscape preferences; landscape management

## **1. Introduction - New perspectives to look at the rural landscape**

As the Landscape Convention (2000) is saying “landscape is an important part of the quality of life for people everywhere”. If there is intention to consider this evidence in the landscape management, the assessment of changing demands from landscape of modern society is looked-for. As the demands are different the challenge for multifunctionality of landscape is growing. Around whole Europe the societal demand for new landscape functions related with leisure, recreation and traditional landscapes is increasing. To recognize these new functions in an appropriate way in landscape management, several steps are needed. In economic terms these new functions, that are public services or goods, have currently no market value, e.g. we have been not used to pay for such functions in past. They are designed as the non-commodity outputs (OECD, 2001), and are jointly generated by production fulfilling societal needs related with the use of landscape. On the other hand indeed the increasing demand for these functions may lead them to shift into a status allowing to earn money with their production (H. Wiggering et al., 2006). That means a new market potential for farmers which depends on societal demand and preferences. Overall income of farmers is not determined only by sales revenues and costs of production of commodity outputs any longer, but also in an increasing number of cases, by sales revenues and costs of production of non-commodity outputs (H. Wiggering et al., 2006).

There is lack of data about functions and values of landscape and this, inter alia, create problems in expressing the ecological, socio-cultural and economic importance of the landscape functions in monetary terms. This situation often leads to unsolved problems and questions in the management of multifunctional landscapes, both from the private side and from the part of public policies (de Groot, 2006). To the successful valuation and economic compensation of the new landscape functions, there is a need to have more precise knowledge about public demand, preferences, and its appropriate introduction in management. Public participation in decision-making and incorporation of human preferences, needs and activities in the management plans safeguard their continuation and success (Pavlikakis, 2006).

Several studies stress the importance to investigate on the landscape preferences of different user-groups in order to find out where the preferences differ and converge (e.g. van den Berg, A. E., 1998; Willis, K. G. & Garrod, G. D., 1992). For example, the study of van den Berg (1998) about aesthetic evaluation of nature development plans by

farmers, visitors, and residents, revealed important differences between the user groups relating landscape characteristics with perceived beauty. Willis and Garrod (1992) reported similarities in preference between residents and visitors in their work about landscape evaluation in Britain.

The present paper deals with the results of a study aiming at the identification of landscape preferences of a variety of users, concerning the landscape type correspondent to the Montado system. Apart from helping in choosing the areas suitable for different non-commodity outputs, in a Montado area, it could also be helpful, in a second phase, for economic evaluations of these functions. This study is part of a large research project AGROREG, financed by the Portuguese funds for research in agriculture. The results are intended also to be introduced, together with many other types of information, into a decision support system to be used by Montado's landowners, with the main goal of a sustainable management of this multifunctional system.

## **2. The Montado, a silvo-pastoral system securing multiple functions**

The Montado is the agro-silvo-pastoral system dominant in the southern region of Portugal, Alentejo, already existing for many centuries, in more or less developed and intensive management forms. Commonly open evergreen oak woodlands form it. The dominant species of trees are cork oak (*Quercus suber*, L.) or holm oak (*Quercus ilex*, spp. *Rotundifolia*, L.). Traditionally this system is exploited by multiple land uses, combining the exploitation of tree cover, and a rotation of grazing, cultivation and fallow in the under cover. The principal commodity outputs of montado of cork oak is cork, livestock breeding and cereals. This last one has been decreasing radically in the last decades, being now mainly a silvo-pastoral system. These production functions still provide some social conditions giving income necessary for subsistence of workers living in rural areas. Apart from these main productive functions, montado include social functions as it is used by hunters, beekeepers and mushrooms pickers. Historically, these functions were important for the rural population in supplementing its food (Fonseca, 2004). Today, hunting continues as an activity of hunting associations or in the tourist regime and can offer an economic

supplement for landowners. Mediterranean vegetation of montado is rich in aromatic plants, which is responsible for high honey quality of this region. Nowadays, the increasing demands of national and foreign tourists ask for developing of rural tourism. There is an increasing demand of the rural landscape as a space for relaxation and recreation, and this type of landscape is particularly attractive. There are also some new rural habitants that came, usually from big cities, to live in the countryside, and temporary habitants that came to spend weekends in their second homes. Maybe the most numerous user-groups are local people that visit the Montado only occasionally to satisfy aesthetic, recreational or other experiences as an escape from daily routine (Kaur, 2004). Concerning urban people, some are actual users, but also some of them are interested in the system and can be potential future users of the Montado.

Apparently the Montado is appreciated in various ways that entail several non-commodity functions, but there is need to recognize them in appropriate way in the management. The present day management is still concentrated on production objectives, even if land owners are aware of the potential interest of the Montado for many other uses and for satisfying diverse human needs. A significant help to satisfy the needs and expectations of land-users should be the knowledge about their preferences for different Montado types. Due to the lack of these kinds of studies more research on this issue needs to be completed in Portugal.

### **3. Method**

The study refers to the region where the Montado of cork oak is most dominant, in the north-western part of region of Alentejo. Some small towns were selected as main centers for the interview process, as there were contacts and collaboration with land owners associations there. Personal interviews with variety of land-users, workers (N=26), hunters (N=26), beekeepers (N=29), mushroom pickers (N=12), national and foreign tourists (N=24), new rural inhabitants (N=31), rural inhabitants (N=28), urban dwellers from Lisbon (N=28) and landowners (N=28) of the Montado of Cork Oak were carried out. All respondents have had some previous experience with use of the Montado and they were chosen to characterize a wide range of interests involving

various points of view to this landscape. Each respondent was considered to be part of one group of users and was interviewed as such, even if he could be included in more than one group.



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

**Figure 1**

*Example of photographs used during the interviews representing different Montado types resulting from different management options. Photo 1 – open area without livestock was the most preferred Montado type by hunters; Photo 2 – dense area with composition of trees in line and with livestock, most preferred by landowners; Photo 3 – dense area with irregular composition of trees and with livestock – the favorite Montado type by inhabitants, urban dwellers, workers, tourists and new rural inhabitants; Photo 4 - dense area with irregular composition of trees and with shrubs was the favorite for mushroom pickers; Photo 5 – highly dense area with abundant understorey of shrubs was preferred by beekeepers*

For example, a hunter can also be a local inhabitant, but if he was interviewed as hunter, this was clarified at the start of the interview and he was only interviewed as such.

The contacts with respondents were carried out personally or by telephone with assist of landowners associations. Interviews with volontaires were carried out individually. In all, 232 persons agreed to participate in the survey. At the beginning of the interview, the respondent get a short introduction on the purpose of the study. As the visual stimuli, the 14 colour photographs 10 x 15 cm, corresponding to the results of different management options in Montado were used. Management affects the vegetation structure in height and composition and consequently it could affect landscape features that are relevant to preference (Hagerhall, 2000). In this case, the objective was to compare different types of Montado, corresponding to more or less intensive management and higher or lower density of trees. These combinations result in different types of landscapes. A simplification had to be admitted, because not all possible variations of the montado could be considered. This is an extremely flexible system, with many variants of management options and densities, resulting in a high variation in types. Therefore, only the most significant aspects for the project Agroreg were selected. These are related not so much with the bio-physical characteristics, but more with the management of the Montado by land owners: land cover, composition of trees, presence of shrub and livestock.

The respondents were asked to choose three preferred photographs from the point of view of their main activity in the Montado and to explain their choice. The statistical design applied the Pearson's chi-square test ( $\chi^2$ ) for following variables – montado type, gender, age, family income, number of family members, education level and participant group. A significance level of p-value 0.05 was used for all tests.

#### **4. Results**

As shown in Table 1, two factors had a significant effect on montado type preferences: gender and participant group. The high significance of gender on preferences was doubted by analysing data without user groups of hunters, landowners and beekeepers being 99% of them presented by men. The factors of age, number of family members, family income and education level proved to be insignificant, with a p-value > 0.05. The

next step was analyzing the significances within the participant groups in relation to the Montado type preferences. The p-values are showed in Table 2.

	Gender	Gender <sup>a</sup>	Age classess	Nº fam. members	Family Income	Education level	Participant group
<i>p</i> -value	0.005	0.700	0.220	0.968	0.099	0.243	0.000

**Table 1**

*p*-values obtained by Pearson's chi-square test ( $\chi^2$ ) relating montado type preferences with socio-economic variables and participant group. In the value of Gender<sup>a</sup> are not considered the user groups of hunters, landowners and beekeepers being mainly the men

The differences within some user groups shows to be insignificant, that could means their likeness in preferences for the Montado type. As it is showing the Table 2 the likeness was observed within groups of tourists, new rural inhabitants, rural inhabitants, workers and urbans. The data from responses about justification of favorite Montado types revealed that the preferences of hunters, beekeepers and mushroom pickers were related more with the specific biophysical conditions of the scenes for these activities. On the other hand, the other visitors, as inhabitants, urban dwellers, workers, tourists and new rural inhabitants, were mainly interested in the aesthetics aspects of the scenes. The landowners appreciated mostly the composition of trees in line due to the lower costs for management.

	Workers	Hunters	Beekeep.	Mushr. pickers	Tourists	New Rur. Inh.	Rural Inh.	Urban Dwellers	Landow.
Workers	–	–	–	–	–	–	–	–	–
Hunters	0,000	–	–	–	–	–	–	–	–
Beekeepers	0,000	0,000	–	–	–	–	–	–	–
Mushr. pickers	0,000	0,001	0,002	–	–	–	–	–	–
Tourists	<b>0,242</b>	0,000	0,000	0,016	–	–	–	–	–
New Rural Inh.	<b>0,227</b>	0,000	0,000	0,003	<b>0,418</b>	–	–	–	–
Rural Inh.	<b>0,400</b>	0,000	0,000	0,000	<b>0,347</b>	<b>0,101</b>	–	–	–
Urban Dwellers	<b>0,287</b>	0,000	0,000	0,000	0,040	0,007	<b>0,559</b>	–	–
Landowners	0,008	0,000	0,000	0,000	0,000	0,000	0,000	0,000	–

**Table 2**

*p*-values obtained by Pearson's chi-square test ( $\chi^2$ ) relating parcipitant groups within them in relation to the montado type preferences

## **5. Discussion and concluding remarks**

There are several landscape preference surveys using the methodology with the photo questionnaires. This survey verified interest of people in the photographs and curiosity to see them. That was notably facilitating the start and focus of communication about different landscape types. The recognition of different Montado types on the photographs and to associate them with the favorite activities seemed to be relatively easy for respondents. Another advantage was the possibility of respondents to simultaneously compare several photographs, alias several Montado types. Visiting different Montado types in reality during the interviews would be even more costs and time consuming. On the same time the photographs permitted a better control of the conditions under which the landscape was perceived in comparison with the real visit of the areas. Landscape perception can be influenced by different atmospheric and light conditions, and number and type of elements presented (Real, 2000). The personal interview is time consuming method, but in this kind of experimental study it was particularly helpful for better understanding the various points of view of users. This method, by using open ended questions, allowed asking the people about reason of their preferences immediately after choosing the favorite Montado types and at the same time to verify if they have understood the questions.

There were found significant variety in landscape type preferences among diverse group of participants from the point of view of their main activity in the Montado. On the base of the differences, there can be identified five groups of Montado users: landowners, hunters, beekeepers, mushroom pickers and walkers - consisting on predefined groups of tourists, new rural inhabitants, rural inhabitants, urban dwellers and workers. The affinity in landscape preferences of these last mentioned groups, defined as walkers, can be explained by the similarities in their main activity practiced in the Montado, explicitly the walking activities searching mostly the aesthetic appreciation in landscape. They highly appreciated the traditional system combining pasture with cork production, in areas of irregular tree's composition. Some participants explained their preference for irregularity as more natural, not too human influenced area in comparison with aligned composition. The main preoccupation and interest of the land owners with the production could be seen in their preferences for low cost management in aligned composition of trees and with livestock, due to the multiple incomes. It seems to be the single production interests in conflict with the aesthetic aspects of the Montado types. For the hunters, the most

preferred open areas were designating the good visibility important for aiming during the hunt and security in group hunting. The livestock presence seemed to be clearly incompatible with the hunting activity. Highly appreciated by the beekeepers and the mushroom pickers was the presence of shrubs in the understorey. As they have explained, the shrubby flora in Montado is naturally consisting on species favorable for the honey production and maintains relatively humid microclimate for the mushrooms growth. Several beekeepers have complained about shrubs cleaning in the vast areas by the landowners resulting in damaging bee's alimentation. Some hunters stressed the problems with disturbance of hunting species, having refuge in shrubby Montado areas, by the visitors.

On the base of these knowledge the following oposit interests in Montado can be detected: landowner's shrubs cleaning versus beekeeping; landowner's aligned trees management versus aesthetic appreciation; refuge shrubby areas of hunting species versus visitors and hunting versus livestock presence.

The consideration of the diversity of users' preferences and interests in future Montado's management could avoid some potential tensions or conflicts in this unique multifunctional system.

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