Synergies and conflicts between agriculture and non-commodity functions at local landscape level: application to Castelo de Vide, South-east Portugal

Teresa Pinto-Correia, Filipe Barroso, Helena Menezes, Riomana Taveira

University of Evora, ICAM, Mediterranean Ecosystems and Landscapes Group, Evora, Portugal - mtpc@uevora.pt

Abstract: *The definition of multifunctionalty as an attribute of rural space, available to be exploited by a much larger community of stakeholders, is more encompassing than its understanding in connection with agriculture (Potter 2005). It is rooted in a reinterpretation of agriculture's contribution to rural development, its engagement with market processes and the changing role of farmers and a larger community of land managers in the so-called "consumption countryside". Farming ceases to be the most important basic sector supporting the rural economy; rather it may be the rural economy that provides the basis for the support of the agricultural sector – at least in rural areas where farming is extensive, and not easily competitive in a global market situation. Using multifunctionality of the landscape in an analytical way means assessing which functions are provided by a given landscape, in a given time, and how such functions support or conflict with each other.*

Within this new paradigm, there is thus a need to understand and assess how the various non-commodity functions, that nowadays are based in the rural landscape as a resource, depend on the land management undertaken through the farming sector, and how these other functions also, in another way, would possibly contribute to the maintenance of these land use systems, or the development of new ones, supporting the quality of the landscape.

This paper presents the results of a research project applied to the municipality of Castelo de Vide, in Southeast Portugal, where the land use is dominated by extensive silvo-pastoral systems, in large estates, and olive groves combined with grazing in small estates around the main town, both systems showing extensification trends. Due to a combination of factors related with the quality of the landscape and the particular character of the urban areas, the demand for non-commodity functions such as hunting, eco-tourism and second housing or fixation of new rural inhabitants, is already important and has been registered. The aim of the project is to understand what are the expectations of the users related with these non-commodity functions, in relation to the rural landscape, and what are the land cover patterns they prefer for their activity. And through this preference survey, to assess the role of farming in the performance of these functions, and possible synergies and conflicts for the future.

The question is which landscape pattern, from the ones present in the area, is preferred for each of the concerned functions. And which role is still required from agricultural systems, in order tohh preserve the preferred pattern.

Different expectations for the future rural landscape were identified, related with the groups of users defined. Further, the preference for different land cover patterns, and different intensities of use, was also identified. The preferred landscape may be identified for each function, but will be more hard to define for the set of functions considered.

Keywords: *landscape, multifunctionality, functions, preferences*

Introduction

The rural landscape depends directly on the transformations induced by the land use systems in place, now or along History. According to the OECD, nevertheless, rural space can no longer be defined through the importance of the agricultural sector, which has been declining both in economic and in social terms, but more through its population density. The increasing importance of other sectors in rural economy can even in the future support farming, if new synergies are developed. It is as such that the multifunctionality of the landscape is today in focus, since several functions are expected from several users: owners and farmers, hunters, visitors and tourists, inhabitants, both old inhabitants and neo-rurals, those who develop economic activities based on the landscape, nature conservationists and environmentalists, involved technical staff, and many others. The jointness

between functions, e.g., the way that the several functions relate to each other, positively or negatively, raise fundamental issues for the future management of the landscapes.

Thus, it is important to assess what the new users of the rural landscape are looking for, which pattern best suits their expectations, if the preferred patterns are common or divergent, and if they may be combined. There is also a need to assess which functions can be combined in each type of landscape and which landscapes may support different functions.

Furthermore, and considering that it is still the agricultural sector which determines the management of rural landscapes, there is a need to evaluate how the various functions that use these landscapes depend on this management, and also how they can contribute to the maintenance of the land use systems in place or the shaping of new ones.

The present paper presents and discusses the results of a research project on the expectations of the various users as to the rural landscape in a municipality in the North East of the Alentejo region (Fig.1). The main question related to the characteristics of the rural landscape that are considered most important for the expectations that people have in relation to them, and also, the type of pattern (considering distribution of land cover classes and intensities of uses which best suits each function considered.

The groups of users were selected according to the more relevant non-commodity functions that already correspond to a social demand in the area: hunting, outdoor tourism, new residence, week-end stays. The analysis also refers to the preferred pattern for each function, and to the way this depends more or less on the existing land use system.

The paper is structured as follows: 1) Introduction, 2) discussion on the concepts of functions and multifunctionality at the landscape level, 3) methodology, 4) analysis and discussion of results, and 5) conclusion.
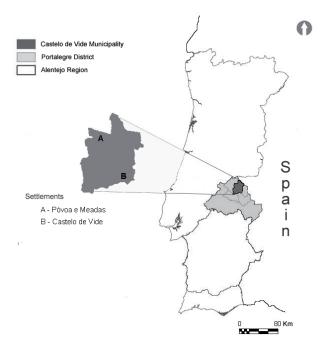

Fig. 1. Location of the Castelo de Vide Municipality in the Alentejo, South Portugal

The various functions of the rural landscape

The concept of function relates to the various goods and services supported by a landscape and which respond to the needs, demands and expectations of society (de Groot 2006). Some functions have a market value (agricultural production, forestry production), and are thus commodities. Others are non-commodities, public goods and services, for which there is no market or the market does not operate (recreation, nature conservation, identity, life quality, environmental quality, etc.) (OECD 2001).

Multifunctionality has emerged as a concept related to agriculture (OECD 2001), but its definition as an attribute of landscape is more encompassing, and can be explored by a multitude of actors (Potter 2005). It is based on the reinterpretation of the role of farming for rural development, and the change in the role of farmers who are bieng increasingly integrated in a larger group of land managers, in a rural space which besides being a production environment is becoming a consumption space.

Using multifunctionality in an analytical way means assessing the functions which are being supported by a given landscape, in a given time, and how these functions combine or conflict with each other (Cairol 2005, OECD 2001). The notion of "jointness" refers to how the production of commodities determines the provision of non-commodities and also, on the other hand, how the measures aimed at the development of non-commodity functions can be involved in the maintenance of production.

In landscapes of extensive farming systems in the periphery of Europe where farming can be threatened with decline and even abandonment, the demand for non-commodity functions has been growing. It is important to understand what determines this demand, e.g., what do the various users consider as relevant for their demand, and also which role does farming play in the maintenance or development of this demand (Wiggering et al 2006). This level of jointness is fundamental for the definition of policies and strategies for the future management of these rural areas.

These issues also express the complex interactions faced today by research: the consideration of an even wider range of factors is fundamental for the understanding of the landscape as a dynamic system, as well as to support suggestions for its design and management. A survey of literature reveals a surprising lack of publications on the required methodological developments. Much is published about multifunctionality, but much less on the way to proceed for the identification and evaluation of functions at the landscape level, and of the relationship in between them (Wiggering et al 2006).

Methodology

The methodology is divided into several phases: 1) characterization of the municipality of Castelo de Vide; in particular: characterization of the land use systems in place and identification of the non-commodity functions that are most relevant today; 2) identification of landscape areas in the municipality; 3) selection of photographs representative of each landscape area, to be used in enquiries; 4) definition of the enquiry and of the sample of users; 5) enquiries; 6) data analysis.

Characterization of the municipality of Castelo de Vide

The biophysical and socio-economic characterization of the municipality was based on already published material, as well as statistical information and maps on soils, morphology, land cover, etc.

Identification of the most relevant non-commodity functions in terms of current social demand, was based on interviews with local key people. The following functions were selected: hunting, outdoor tourism, settlement of neo-rurals and settlement of weekend visitors, as well as preservation of the cultural identity of Northern Alentejo.

Identification of landscape areas

A first delimitation of the landscape areas was based on literature on the municipality and the crossing of maps with information on the biophysical (morphology, height, hydrography, soils, etc.) and socio-economic (settlements, property structure, heritage buildings) characteristics. Field work complemented the analysis, and a first definition of the landscape areas was achieved. This definition was adjusted through a survey based on photographs representative of each landscape area. The final landscape areas were then defined.

Photographs representing each landscape area

A stratified random sampling by landscape areas was defined, resulting in 15 segments of 25 hectares each, covering a minimum of 1,25% of the total landscape area (Fig.2). A large buffer area of 100 ha including each 25 ha segment was considered, so that the segment could be placed within the buffer area, in the case that practical constraints would not allow access to the first segment.

A grid with an interval of 125 m between each line was superposed on each segment. In the junction between lines, photographs were taken in each direction, North, South, East, West. All photographs were taken in April 2007, in conditions of good visibility. All photographs with poor quality were rejected. The remaining were grouped according to the combination of land cover types and intensities of the same, so that the various land cover types and combinations in each landscape area were considered. A random selection of one photograph per group was then undertaken. These photographs were used as a basis for the enquiries.

From the whole set of photographs, one was selected for each area, as the most representative of the landscape character there (Fig.3). These photographs were used in the first phase of the enquiries.
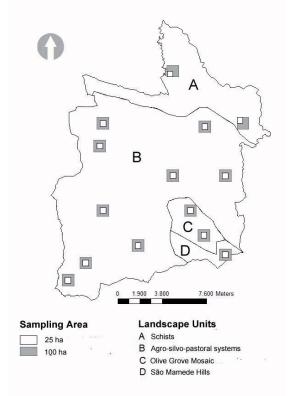

Fig. 2. Municipality of Castelo de Vide: limits of the landscape areas and location of the random sample segments
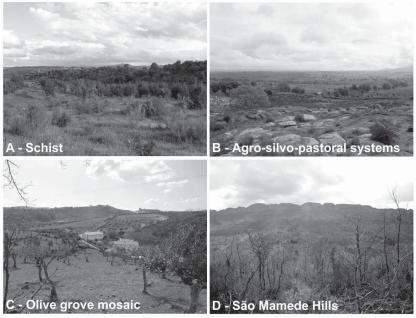

Fig. 3. Representative photos of the landscape character in the landscape areas defined for the Municipality of Castelo de Vide

Enquiry and sampling

The enquiry contains a first section for the characterization of the interviewees, and two other sections: a) the first concerning the selection of the photograph for the preferred pattern for the concerned activity in the landscape; and b) the second concerning the representations and expectations for the landscape in the area, through a free association of ideas and a Likert scale of attitudes.

As to the sample, individuals related to each of the functions were considered: a) hunting; b) outdoor recreation; c) settlement of neo-rurals and weekend visitors. Furthermore, landowners were also included, as far as possible all those with land in the segments defined: the enquiry related to their preferences and also to the management of their farm unit. The sample was built through direct contacts according to the principle of maximum variation (Patton 1990), with a minimum of n=30 for each function.

Enquiries were carried out directly by members of the project team between May and June 2007.

Data analysis

Data was analyzed in two steps. The first for the enquiries in each user group, through a descriptive statistical approach. And the second including all enquiries, through a multiple correspondence analysis, where groups of variables with similar behavior were gathered.

The municipality of Castelo de Vide

The municipality of Castelo de Vide (Fig.1) is classified as *extensive agriculture with environmental quality, in diversified territory*, according to the typology established for the whole country concerning the dynamics and changes in rural areas of Portugal (Pinto-Correia et al 2006). This means that it offers a diversified landscape with conservation and environmental values, with potentiality for a multifunctional use, maintained through extensive farming systems, now threatened by the on-going globalization processes.

It is also a municipality where land cover has been rather dynamic during recent years, resulting mainly from the extensification processes of the silvopastoral systems, but also from the forestation of agricultural areas. On the other side, it is a diversified area, with wild and poor areas close to the Sever River to the North, silvopastoral systems in large estates in the centre, small scale mosaic around the town of Castelo de Vide, and the mountain hills of São Mamede. Four landscape areas have been identified (Fig.2): a) Schists, b) Agro-Silvo pastoral systems, c) Olive grove mosaic; d) São Mamede Hills.

Due to this diversity, to a particular climate, milder than in the surrounding areas, and also to its cultural heritage, the municipality has been attracting for some years diverse types of users, both Portuguese and foreigners, for recreation and week-end stays, and even settlement in the case of neo-rurals.

Concerning farming systems, two main types may be distinguished: 1) the large farm units with extensive silvo-pastoral systems, and 2) the small farm units having olive groves, in a mosaic with grazing and fruit orchards. On large estates cattle production for meat is dominant, while in the small properties two management types are found: a) with maintenance of the traditional farm system, nowadays as a hobby activity, combining olive oil with sheep production, and b) innovation by neo-rural inhabitants who maintain an increasingly extensive system and introduce some innovation, but without market objectives. Here the number of second homes, or new houses for neo-rural inhabitants, is progressively increasing.

Analysis

Diverse expectations for the rural landscape

One of the most striking points of the analysis deals with the identification of expectations of the various user groups regarding the rural landscape. These expectations emerge from the multiple correspondence analyses organized through the questions related with representations. Even with

slight changes depending on the focus of the analysis, results are similar as to the type of expectations identified. It is important to stress that, even if the type of user (hunter, new rural, owner of a second home, eco-tourist, local inhabitant, farmer) has not been determining for the construction of the analysis, the various expectations are clearly associated with the different groups of users, which confirms that these are groups with different positions concerning the rural landscapes they use.

The following main types of expectations were identified

a) Farming: production expectation, where farming is considered as fundamental.

This is the standpoint that characterizes farmers and, among these the older ones. It is associated with a negative impression related to changes in the sense of extensification, abandonment and afforestation; it is a worried vision, centered on traditional agricultural production and skeptical about the possibility of tourism becoming a relevant economic activity.

b) Hunting: utilitarian expectation related with hunting, where farming is recognized as important to maintain a certain land cover pattern.

This is the standpoint of hunters. These have a positive view of the rural space, also independently of their specific hunting interest; they value rural space as a support for life quality, pleasant social relations, nature conservation, and environmental quality. The agricultural sector is recognized as determinant in this space, for the land cover and as an economic activity. This expectation defends the maintenance of the traditional farming systems and the related land cover patterns, and includes some concern as to risks of abandonment, fire and drought.

c) Multifunctional: expectations regarding the rural landscape as a space for diverse activities and interests, including agriculture.

This is the standpoint of the new inhabitants and of regular visitors, those who have a second home in the municipality. Even if expressing some concern as to the future of this landscape, they value it for its diverse possibilities, in the belief that these can be developed in the future, from an economic and also a cultural perspective. These expectations express somehow the wish to build a new rural space; the only resistance is expressed as to hunting. Farming is seen as important, being the activity which supports the more traditional aspects of the rural landscape and maintains a specific quality (as the Montado, or the livestock production).

d) Conservation: expectations for the rural space as recreation and leisure space based on the nature and environmental conservation values.

This expectation is shared by those who walk in the landscape, locals or visitors, and who therefore know the area well and identify specific places. With a general positive feeling, they acknowledge the role of farming as the main activity building the landscape, even if they value highly nature and the cultural heritage.

e) Bucolic: valuation of rural landscapes for their aesthetic aspects and its natural components, with no acknowledgment of the role of farming.

This is the expectation shared by foreign visitors, who walk or go on bicycle tours in the area, and who stay for relatively short periods. The highly positive impression is dominant, mainly based on aesthetical and environmental quality and an appreciation of the natural heritage. Extensively used areas are linked with natural spaces. Farming activity is not referred to, its importance being apparently ignored.

In the multiple correspondence analysis considering only the free association of ideas, two other types of expectations were identified, which are not related to specific groups of users. One is extremely negative, related to loss of viability of farming, depopulation, abandonment, fire and erosion risks. The other is not so negative, but values mainly natural aspects and the sustainability of natural systems, not recognizing farming or cultural aspects nor the combination of functions as an alternative.

Which landscape pattern for which function?

Table 1 expresses the preferences by the various user groups for the function they represent. A choice was to be made between four different photos, each representing one landscape area (Fig.3). Within these four possibilities, the interviewees did not express any problem in indicating their preference. As can be seen, preferences are rather divergent: whereas hunters prefer clearly landscape that is more associated with scrub and extensive uses (A and B), walkers and those who

bicycle tourers prefer systems with more human intervention, both the agrosilvopastoral areas and the olive-grove mosaic around the town of Castelo de Vide. This is also the preference of regular visitors with week-end houses. The new rural inhabitants fall into two groups, those from area A who prefer to locate their house in a more naturalized landscape, and those from Area C who prefer the more cultural and man-made landscape; some of them also express their preference for the other landscape types.

It must be pointed out that the landscape area of the São Mamede Hills (D) enjoys few preferences, mainly because it is mostly covered by decaying forest resulting from successive fires of past summers, as shown in the corresponding photo. The landscape of agrosilvopastoral systems (B) is the one which got the most preferences. Probably due to its diversified pattern, its gentle forms, its mixture of open and closed environments and its relation with extensive, non-aggressive farming systems. Surprisingly, the most well cared for landscape, the olive grove mosaic around the town (C), is all in all less preferred than the most peripheral and poor landscape (A). Even the new rural inhabitants, mostly living around the town, express a preference for this type of less humanized landscape.

Table 1. Preferences, by various user groups, from photographs representative of landscape areas A, B, C and D

Landscape Areas User Groups	A. Schists	B. Agro-Silvo-Pastoral systems	C.Olive grove mosaic	D. São Mamede Hills
Hunters	63%	33%	--	3%
Ecotourists	7%	61%	39%	2%
Neo rural inhabitants	43%	15%	28%	15%
Visitors with 2nd residence	12%	41%	41%	6%
TOTAL (accumulated)	125%	150%	108%	26%

As to the reasons for these choices, they are varied and for the most rather easy to understand, although some also raise questions which are not easy to answer. Hunters mention the diversity of species and natural aspects, including morphology. This justification for Areas A and B is rather logic. Eco-tourists, on the other hand, refer to aesthetic and sensorial aspects, as well as natural characteristics, and also to heritage aspects, the land cover structure and the landscape diversity – which also seems coherent with preference distribution. Neo-rural inhabitants are close to eco-tourists, but consider natural aspects less important and the capacity for a productive and diversified land use more important – which somehow is not coherent with the preferred choice of Area A. Visitors with a second home in the municipality refer rather much to aesthetic and sensorial aspects, morphology and land cover pattern, using arguments relating both to intensive and extensive land use.

Concerning preferences for various land use intensities in each landscape area, the analysis still needs to be completed, since trends or clear associations are difficult to distinguish both in the frequency analysis and in the multiple correspondence analysis. These results are therefore not presented here.

Discussion and Conclusion

The data obtained with the 169 enquiries in Castelo de Vide allow for a rather diversified and rich analysis, though not yet exploited in its totality. Meanwhile, it makes it possible to understand the various visions and expectations about the rural landscape in the study area, and how these various expectations correspond to different land cover patterns, and therefore also to different land use systems.

From the comparative analysis of the five expectation groups, some aspects can be stressed. In general these are positive visions which recognize the diverse values of the rural landscape, and their possible articulation. Only the one centered on agricultural production is less positive; this may be related to decline in the economic and social role of farming, as well as to the doubts concerning its future. Expression of some concern is not surprising. More surprising perhaps is the fact that almost all other expectations acknowledge the role of farming as the activity which secures the traditional land cover pattern, valued as it is. Only the last, the bucolic expectation, does not recognize this role for farming. But this is a standpoint linked mainly to visitors and foreigners, and can therefore be

explained by their scant knowledge of the area, and by the fact that these users have a reference system related to much more intensively used landscapes elsewhere in Europe.

As for synergies, they seem evident between the production function, as organized today in the municipality, and all other non-commodity functions. Nevertheless, there are conflicts between hunting and residence and recreation functions, the most obvious tensions arising between the utilitarian and pragmatic views of hunters, who stress the need to preserve the present pattern, and the views of neo-rural inhabitants who envision building a new reality and a new integration between functions.

As for the choice between photographs and the different landscape patterns, what can be concluded generally? That certain functions do have a clear preference for a particular landscape pattern, as in the case of hunting and ecotourism. Furthermore, these two functions focus on diverging patterns. The functions related with life quality, week-end visitors and residence, express more dispersed preferences that are not always easy to interpret or relate to the remaining distribution of replies.

Concerning the functions aspect of this study:

Hunting is clearly identified as a function with a well-defined demand, and with a utilitarian and pragmatic, somewhat also conservative, view of the landscape and of the land use systems that maintain it. It is also this function which opposes most to the remaining non-commodity functions, even if it may be combined with no problem with the production systems in place.

Functions related with recreation and eco-tourism also relate to a clear demand for human made landscapes, but they are the ones which value least the role of farming in the construction of a certain landscape pattern. Regarding foreign visitors, their lack of acknowledgment of the role of farming may be worrying, given that these are the visitors probably with the most capacity and openness to pay for the goods and services they expect from rural landscapes.

Concerning the use of rural landscapes as a place of residence or a place to visit in the weekend, the analysis highlights expectations of multifunctionality, and also a diversified demand in terms of a specific landscape pattern. It seems that this is the vision most closely connected with the possibility to create new landscapes for the future, with new land cover patterns and new management forms – even if it values the traditional systems and may possibly incorporate part of them in future proposals.

This was the first attempt to assess expectations and preferences by various users of the rural landscape, applied to a landscape that has been maintained until now by extensive systems, but that has an uncertain future. In methodological terms, several questions seem solved, but others are challenges that require further progress in these domains of analysis.

As has been explained, identification of expectations by various users delivers explicit results and clear differences between groups, which makes it possible to trust the chosen approach. In the same way, the photographs representative of the four landscape areas displaying clearly different patterns, have been identified with no problem by the interviewees and have produced interesting results.

As to preferences between the landscape areas, the lack of clarity of results may result as well from the low definition of the users' real preferences, as from the type of photographs used, showing a true fuzzy pattern – the real pattern, but which makes detailed differentiation by observers difficult. New approaches must be developed in order to better solve this question. This is a field which lacks methodological development, at least in Mediterranean extensive landscapes, and to which this paper hopes to be a contribution.

References

Cairol, D. (Coord.), 2005. *Multifunctionality of Agriculture and Rural Areas: from trade negotiations to contributing to sustainable development*. New Challenges for research. Summary of main results of the European project Multagri, Sixth Framework Research Programme.

de Groot, R., 2006. Function-analysis and valuation as a tool to access land use conflicts in planning for sustainable, multi-functional landscapes. *Landscape and Urban Planning*, 75:175-186

OECD, 2001. Multifunctionality, Towards an Analytical Framework. *Organization for Economic Cooperation and Development, Paris*

Patton, M., 1990. Qualitative Evaluation and Research Methods. *Sage Pub., London*

Pinto-Correia, T., Breman, B., Jorge, V. and Dneboska, M., 2006. Estudo sobre o Abadono em Portugal Continental. Análise das Dinâmicas da Ocupação do Solo, do Sector Agrícola e da Comunidade Rural. Tipologia de Áreas Rurais*. Estudo para o Ministério da Agricultura. Documento de Trabalho.Universidade de Évora*

Potter, C., 2005. Multifunctionality as an agricultural and rural policy concept, in Brouwer F.(Ed), *Sustaining Agriculture and the Rural Environment - Governance, Policy and Multifunctionality*: Cheltenham, Edward Elgar, p. 15-35

Wiggering, H., Dalchow, C., Glemnitz, M., Helming, K., Muller, K., Schultz, A., Stachow, U. and Zander, P., 2006. Indicators for multifunctional land use – Linking socio-economic requirements with landscape potentials. Ecological Indicators*, 6: 238-249*