

New roles for farming in a differentiated countryside: the Portuguese example

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Abstract Throughout Europe, the role of farming as the private provider of public goods and services increasingly valued by society is today generally acknowledged. Furthermore, in the turn towards rural development concerns, multifunctionality as an attribute of rural space has emerged, justifying the territorial approach of farming. The situation facing the multifunctionality demand is nevertheless not the same in all European regions, which by all means is getting strengthened in the transition towards post-productivism. In some regions, there is a productivist orientation and production has a dominant economic role, while others will need to be supported on other functions to survive economically and socially, or may be best suited to environmental functions alone. The vocation of the rural territories is different, and thus also the functions they are able to support. This paper discusses the concept of multifunctionality of the rural areas, and defines a possible methodological approach towards the identification of the different types of rural areas in Europe, based on the identification of ideal types, through the analysis of selected indicators. The empirical application has been developed for the Portuguese Ministry of Agriculture, aiming at assessing the differentiated characteristics and dynamics of the Portuguese rural territory. Analyzing data from 1990 and 2000, at municipal level, three dimensions have been considered: the land cover, the agricultural sector and the rural

community. Combining the three analyses, it was possible to identify different vocations of the rural space, and the role that farming could have in the future for the multifunctionality of the territory. Accordingly, the municipalities have been grouped in types, pre-defined as ideal types. This was a first attempt to understand the differentiation of the rural territory in Portugal. For decision-making it should be further developed. It nevertheless shows that there is clear differentiation concerning the possible landscape functions to be developed between regions and a possible way to assess. It also shows that a territorial approach to agriculture may be the key for the maintenance of the sector in many areas where production by itself, as it has been known until now, may be severely threatened.

Keywords Multifunctionality · Countryside · Typology · Differentiated · Indicators

Introduction

The identification of different types of rural areas, and of the role that farming still may have in these areas according to the various functions that they may support, corresponds to a conceptual and methodological challenge imposed by the differentiation of the European countryside in present days (Marsden 1998; Murdoch et al. 2004). This is anchored in a new strategic approach to the agricultural sector, based on a territorial rather than sectoral perspective: the production function is combined and integrated with other functions, displayed mostly at the landscape level, with more or less economic value, but also with social and environmental values (Wiggert et al. 2006). These new approaches emerge also from the new realities and concepts of the rural, related with transformations in

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the agricultural sector as well as in broad socio-economic processes, resulting in fluxes and relocations of people and activities, bringing in the rural new power relations and new actors, also involved in the management of land (Cloke and Little 1997; Woods 2005). Farming has until now defined the intensity and pattern of land use, and thus conditioned the landscape and its dynamics. The growing multiplicity of demands of goods and services that society places on rural landscapes resulted in an increasing concern for part of the farming externalities seen as values, and also to this shift of paradigm, from production to the other functions, as determinant in the landscape. Besides the need to understand the joint production of the various commodity and non-commodity functions (Maier and Shobayashi 2001), this territorial approach is justified by the fact that farming is no longer the economic activity supporting the rural economy, and it can in many cases be rather the opposite (Cloke and Little 1997). In rural development terms, this is an important argument, as multifunctionality of the rural area has the clear advantage of being able to be exploited by a wider community of stakeholders than the farmers alone.

The distinction between different types of areas, where farming has or may have in the future different kinds of roles, emerges thus naturally from the verification that the characteristics and the trends of change of the countryside as a whole, and thus also of its potential for various functions, has clear regional specificities. For the case of Portugal, a range of recent studies has revealed the increasing differentiation in regional development according to agriculture and land use systems and to more general socio-economic parameters (Ferrão 2004; GPPAA 2004; Marques 2004; Pinto-Correia and Breman 2007).

The aim of this paper is twofold. First, we discuss and propose a methodological approach that may lead to the identification of the main differences within rural areas, concerning commodity and non-commodity functions, and through this to a definition of types of areas, considering the different roles that agriculture may have. Second, we present the results of the application of this methodology to the case of Portugal, a country where a few areas of highly specialized and productive agriculture are followed by other areas marginal in relation to agriculture or to social parameters, or both, but that support many other functions.

Both the development of the methodology and the analysis applied to Portugal result from a study developed by the authors in 2005–2006, for the Portuguese Ministry of Agriculture (Pinto-Correia et al. 2006) and aiming at an assessment of the trends of change in the rural areas of Portugal both concerning the land cover, the agricultural sector, and the community. Recent developments concerning the (new) competition about space concerning new energy production, food and fiber production and the use of

biomass have not particularly been taken in consideration, due to the scope of the study and the limitations in time frame for the data, but the results should be interpreted as a general characterization as well as a learning and reflection basis for further analysis.

The present paper is structured as follows: after this introduction, we discuss the issues at stake in the post-productivist countryside in Europe and the combination of functions at the territorial level. We then explain the present dissociation of the paths of the land cover, the agricultural production and the rural community in the rural areas of today and the analytical perspective that the acknowledgement of this separation leads to. The methods are described, and the results of the application in Portugal are presented and discussed. Finally, the positive and negative aspects, as well as the questions raised by this approach are evaluated.

The differentiated countryside

The multifunctionality of agriculture and the multifunctionality of the rural areas are rather close concepts that share many characteristics. The use of the multifunctionality concept in recent years has led to some confusion as to the meaning of the term, both in scientific and in policy making arenas (Wilson 2007). Besides the academic construction, subjects connected with negotiations (international agreements, balance of various interests), the formulation and integration of policies, for agriculture but also for conservation of nature, recreation and tourism, demand this differentiation (Vejre et al. 2007).

An evaluation of the possible functions of the rural areas, and of the role that agriculture plays for these various functions, results from the growing demand for non-commodity functions at the landscape level (Wiggering et al. 2006), but it is also a reaction to the changes and growing differentiation that has been taking place in the rural areas in Europe, concerning both structure and dominating functions (Ilbery 1998). The focus shifts from the joint production of commodity and non-commodity outputs, considering mostly the positive externalities of agriculture (Maier and Shobayashi 2001) with an economic perspective (Durand and Huylensbroeck 2003) to the identification of all functions in a given area and an evaluation of their multiple jointness relations.

The growing demand for the non-commodity functions, together with increasing specialization and competitiveness trends in the production sector, results in a growing specialization of rural spaces in Europe (Murdoch et al. 2004; Potter 2004). It may be expected that the areas with adequate characteristics for an economically sustainable production will be managed according to this function,

respecting the limits legally imposed in relation to other functions as environmental quality or recreation demands. Here, land owners will define the management of their land through the production of private goods. On the other side, in the areas with weak or no capacity for being competitive concerning production, one or a group of other functions will dictate strategies and management, according to new sources of income. These are mainly defined today through public policies, but may also be more of private kind in the future. Here, production will tend to be, as much as possible, integrated with the other functions, and may also become another type of production. Even if there is still not much research concerning this paradigm shift, it is expected that the progressive polarization may satisfy the growing social demands of the rural as a space of consumption.

As such, the perspective of multifunctionality as an attribute of the rural space brings conceptual and analytical advantages that make it possible to structure new orientations (Cairol 2005). Some of these advantages are:

- It overcomes the conceptual and strategic questions raised by the paradigm shift towards post-productivism: which role can farming secure when production loses relevance? Which externalities are or may be produced by farming that are valued by society? What is needed for the maintenance of farming, or other land management activities?
- It may be exploited by many other actors other than farmers (Potter 2004);
- It justifies the maintenance of farming beyond its economic function, or at least beyond its production function, accepting that other functions may generate the main source of income (Brouwer 2004);
- It provides the required flexibility concerning expectations and priorities for an increasingly differentiated countryside: not all the rural areas have the same potential nor do they follow the same process of transition or are in the same phase in that process. Thus, they do not have to support all functions; various combinations, according to the bio-physical, socio-economic, and cultural factors are possible (Wilson 2001).
- It facilitates the design and application of better adapted policies and related instruments for each specific type of area, and also the integration of several sectoral policies, when the territorial objectives are well defined (Vejre et al. 2007).

The independent paths of land cover, the agricultural sector and the rural community

Simultaneously with the regional differentiation of European rural areas, and explaining part of it, there has been a

progressive dissociation of the use of the land, the agricultural production and the rural community. This is quite a recent process that has been strengthened in the post-productivist period, as described by Baptista for the Portuguese reality (Baptista 1995), and which leads to an emerging issue of space, which is no longer part of agriculture and also no longer guarantees the vitality of rural society, since “the paths of agriculture, space and rural society are now dissociated”.

These processes correspond to the rural restructuring has mentioned by Woods (2005), that has been going on in Europe at different speeds and combinations in the various regions. In the mosaic of specialized rural spaces of Europe (Murdoch et al. 2004; Potter 2004), there are several types of regions where the use of the land, the agricultural sector and the rural community develop in different and separated directions. On one side, this happens because agriculture, be it the most competitive or the most traditional, is not employing many people and does not need an active rural community to be kept as a production sector. On the other side, because the rural has become attractive for a large variety of actors not connected with the agricultural sector, a rural community is not anymore defined by its connections to farming. And finally, also the issue of land management leads to this separation, as the progressive specialization of farm units as well as of regions results in the management of rural land often dissociated from farming interests, and related mostly to forestry, hunting, nature conservation or others (Ilbery 1998; Woods 2005).

As seen above, land cover, being a determinant and also the most dynamic component of the landscape, is still the most relevant aspect for the diversity of non-commodity functions that society now places in the rural space. Even if in rough terms, the landscape pattern and its possible interest as identity support or for recreation activities and second housing, as well as the general environmental quality, can be interpreted on the basis of the land cover information. For example, where intensive and specialized farming in large scale fields dominates, the environmental quality is more threatened and the recreation interest not so relevant, even if the landscape character may be maintained. When the dominant land use are extensive large scale pastures and open silvo-pastoral systems, the environmental quality is generally high and the landscape is attractive for various recreation and second housing demands. In areas of small scale land cover patterns combining permanent cultures (vineyard, olive groves, orchards) and grazing, or yearly cultures, the landscape is diversified and still represents the traditional agriculture, thus being important for the local identity and highly attractive for residential purposes and for recreation.

Thus, the analysis of the land cover not only leads to the characteristics and dynamics of the agricultural sector, but

it also makes possible to evaluate roughly the conditions for some important non-commodity functions. As for the analysis of the agricultural sector, it not only reveals the characteristics of the sector but also its trends, in the sense of intensification, specialization, or extensification and even decay, and thus also its competitiveness and capacity for survival in the present and future market context. Finally, the analysis of broad socio-economic indicators mentioned above as the analysis of the community, reveals the attractiveness of the area, the diversity of economic activities and the social and demographic dynamics of the population. It expresses the importance of the agricultural activity in relation to other activities. It also reveals the capacity of reaction of the community when production farming is losing or has lost importance and new income sources have to be created.

Methodology

At present, one of the main challenges for research, in face of the territorial paradigm of agriculture, is the identification of how rural areas are differentiated. And also, the identification of what are the characteristics that create conditions for one or another function, or a joint group of functions. The methods here present a first attempt to the define the types of rural areas according to their potentiality at present, for the production of both commodity and non-commodity outputs.

Our aim has been a broad analysis of the rural areas at a national scale, considering indicators expressed at the municipal level as the smallest unit of analysis. We chose to study actual ongoing activities in the areas considered, e.g., the existing characteristics and recent trends of change rather than particular risks or probabilities for a certain development. The high and low values for the indicators selected for each of the three analysis, in each unit, are identified, and their combination leads to the understanding of the type of processes and trends going on.

The methodology followed for the identification of the different types of municipalities was composed by three steps: (1) analysis of selected indicators for the three dimensions of the rural space; (2) definition of the ideal types relevant for the Portuguese case; (3) definition of the indicators and thresholds significant for each type, and classification of the municipalities accordingly. A more detailed description of each step follows.

Indicator selection

Land cover, the agricultural sector and the rural community were evaluated separately, but in such a way that a comparison and combination would still be possible. Different

information sources have been selected, all with data at the municipal level, and both for 1990 and 2000, to allow both a characterization and an evaluation of trends. There is no systematic source of information for more recent dates, for the dimensions considered, and therefore this decade has been considered.

The CORINE Land Cover for 1990 and 2000 (Caetano et al. 2005) has been used, and the spatial data for the land cover classes adapted to the municipality limits, so that there was specific information on the distribution and changes of the land cover classes for each municipality. Despite some of the drawbacks of this data source (lack of detail), it was the best available for an analysis of this dimension and has proved rich in information. For the agricultural sector, statistical data from the General Agricultural Census by the National Statistical Institute have been used. Finally, for the socio-economic dimension, data from the National Census, again by the National Statistical Institute, have been used (Marques 2004).

The selection of indicators (Table 1) was based mainly on two criteria. The first was the (perceived) relevance of the indicators, judged both on earlier experiences from research projects in this area as on expert knowledge, crucial as there is no simple guideline for such selection for this type of analysis. The second was the availability of data, for the two time periods defined. Some apparently interesting indicators, such as, the changes in the price/value of land could not be used as they were not available. For the construction of the indicators, the concepts of weight and net change from the field of land cover analysis were applied, and they made it possible to weigh the indicators and thus to compare dynamics between different municipalities (Pontius et al. 2004).

After a detailed analysis of the maps resulting from the distribution of the status and trends for each of these indicators, an automatic cluster analysis was run, leading to the definition of groups of municipalities with similar behavior, for the group of indicators considered in each dimension. Given the relatively large number of cases (278 municipalities), the K-means method for clustering has been used, as it uses an algorithm specifically adequate to deal with large numbers of cases. A separate cluster analysis was thus created for the land cover, the agricultural sector and the community. They are shown in Figs. 1, 2 and 3.

Definition of a typology

Next, types of municipalities were identified. The types considered were emerging “ideal types”, as defined by Marsden (1998), based on the more sociological perspective from Max Weber; they do not correspond to real cases but to a logical construction resulting from the

Table 1 Selected indicators for the three dimensions of the analysis: land cover, agricultural sector and community

Land Cover (based on CORINE 1990 and 2000)	Agricultural sector (based on agricultural census 1989 and 1999)	Community (based on population census 1991 and 2001)
Total persistence	Weight of agricultural population 1999	Variation in population
Weight of urban area in total area in 2000	Net change agricultural population	Weight population <14 in 2001
Net change urban area	Weight of farmers 1999	Net change population <14
Weight agricultural area 2000	Net change of farmers	Weight population >65 in 2001
Net change agricultural area	Weight of farmers aged >55 in 1999	Net change population >65
Weight forest in 2000	Net change of farmers aged >55	Weight economically active population in 2001
Net change forest	Weight of farm units with exterior income	Net change economically active population
Weight shrub 2000	Net change total area	Weight population active in primary sector in 2001
Net change shrub	Average weight of used agricultural area in farm units 1999	Net change population active in primary sector
Weight degraded forest 2000	Net change utilized agricultural area in farm units	Weight population active in secondary sector in 2001
Net change degraded forest	Weight of irrigated utilized agricultural area 1999	Net change population active in secondary sector
Net change irrigated areas	Net change irrigated utilized agricultural area	Weight population active in tertiary sector in 2001
Net change vineyards	Weight of forest in total farm units area 1999	Net change population active in tertiary sector
Net change pastures	Net change forest in farm units area	Weight of unemployed population in 2001
Net change agriculture in natural areas	Weight poor pastures in total farm units area 1999	Net change on unemployed population
Net change natural pastures	Net change poor pastures in total farm units area	Weight of analphabet population in 2001
Net change burned areas	Weight of non utilized agricultural area in total farm units area 1999	Net change analphabet population
Net change rice fields	Net change non utilized agricultural area	Buying capacity per capita/national average in 2001
Net change fruit orchards	Average farm unit size 1999	Net change buying capacity/national average
Net change olive groves	Net change average farm unit size	Ageing index
Swap shrub		
Swap degraded forest		
% New forestation in total municipality area		

Persistence the rate of area that is kept in one class between two periods, *Net Change* the rate of change between the two periods, in relation to the total universe (area, population) of the municipality (Pontius et al. 2004), *Swap* the spatial dynamics of one class between two periods, showing the rate of the area that has been lost in one location but has been recovered in another location (Pontius et al. 2004)

observation and simplification of reality, that helps its understanding and classification (Collins and Makowsky 1993). The types identified emerged from the literature review about the differentiated countryside in Europe today, but mainly from the empirical analysis considering the three dimensions of the rural space, and their combination. Looking at the dominant characteristics in the more paradigmatic municipalities, concerning the land cover, the agricultural sector and the rural community, and understanding how these different characteristics are combined and thus which changes are taking place or expected, lead to the progressive emergence of the various types. The types were described as idealized virtual

situations, and therefore, named ideal types. In literature, there is no description as to how to determine such ideal types, when they correspond to spatial units and the aim is to combine several types of information. Therefore, a logical approach, based on the indicator analysis from the previous step, and on the expert knowledge gathered around the study for the Ministry of Agriculture, was adapted.

Selection of indicators for the final typology

Finally, significant indicators were identified for each type, and the selection of the threshold for each indicator that

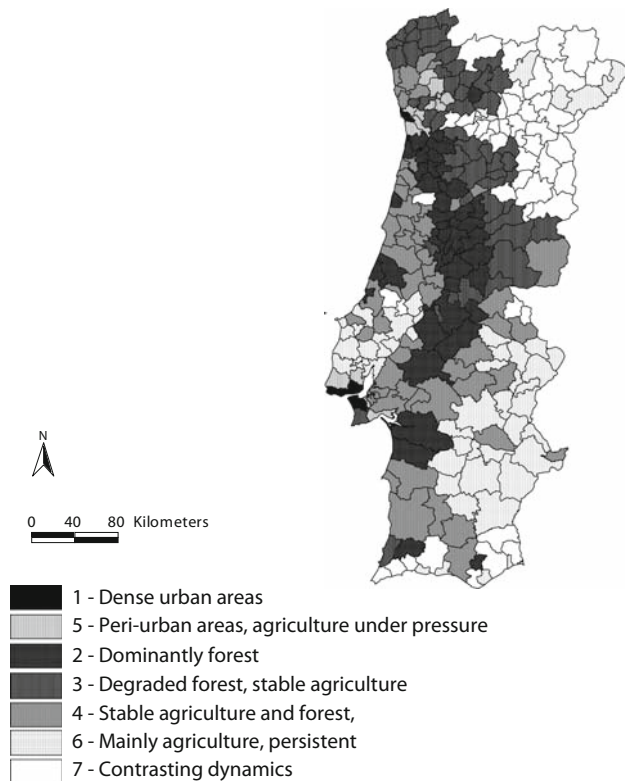


Fig. 1 Portugal: groups of municipalities resulting from the cluster analysis applied to the indicators of land cover, characteristics and dynamics 1990–2000

would define whether each municipality is placed in one or another type. These indicators and the threshold are grouped in Table 2. The thresholds were also based on the analysis of the clusters, but their fine adjustment was based on expert assessment both within the team but also with the support of an advisory group composed of experts from the Ministry of Agriculture, Ministry of the Environment, and researchers dealing with the rural areas, their dynamics and planning. Besides the indicators selected from the previous analysis of spatial and statistical data, other indicators were integrated because of its relevance for the functions and potentialities of the rural space in Portugal: the height distribution and the landscape character areas as defined in the national landscape survey (Cancela d'Abreu et al. 2004).

Each unit of analysis was as such integrated in one type, not because it corresponds exactly in every detail to its description, but it does in general terms and it tends to be closer to this than to another one. It would be possible to integrate some municipalities in two different types, when they fulfilled the conditions for both, and some others not possible to classify, when there was one single indicator value that would not fit in the thresholds defined.

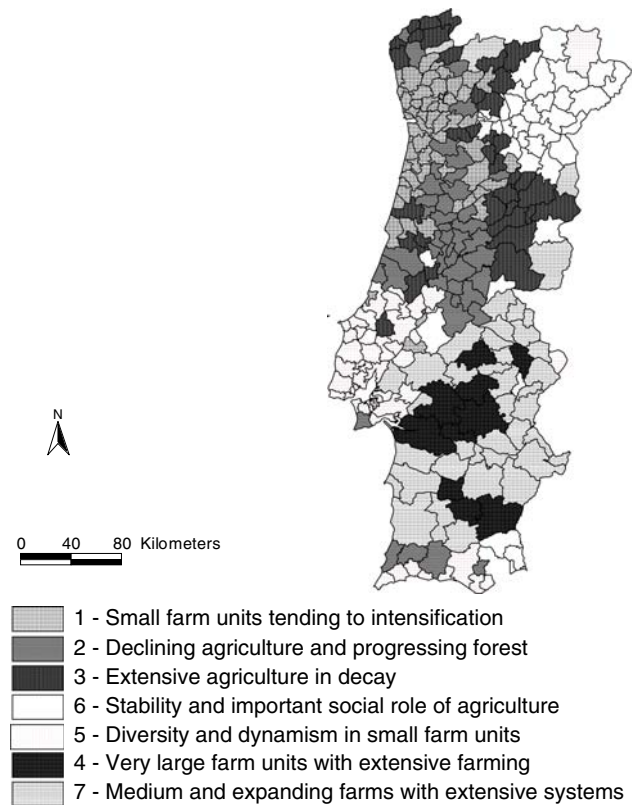


Fig. 2 Portugal: groups of municipalities resulting from the cluster analysis applied to the indicators of the agricultural sector, characteristics and dynamics 1990–2000

Results

The first step of the analysis resulted in the maps shown in Figs. 1, 2 and 3, respectively, for the land cover, the agricultural sector and the broad socio-economic characteristics. It is important to note that the analysis has not been exclusively focused on the rural municipalities, but on the totality of the continental territory of Portugal. This was due to the interest in also understanding the dynamics in the metropolitan areas, in which there is still some agricultural land but the pressures for other uses are extremely important, at the same time as the social demand for non-commodity functions such as recreation and nature conservation is also very high.

As the aim of this paper is to focus on the typology created; the analysis and discussion of these first maps will not be done in detail. It is important to note though that there are clearly identified groups of municipalities, in the different regions, that combine contrasting characteristics from the three dimensions of the analysis, in different ways. The land cover is not dependent on agriculture only, as forestry and other uses can be dominant in many areas, and the trends within the agricultural sector do not follow the trends in the community, or vice-versa.

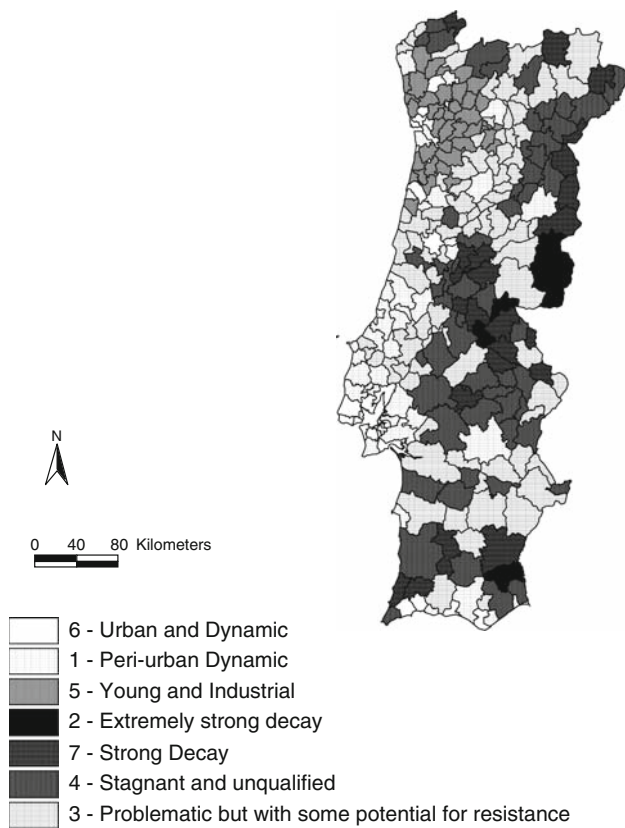


Fig. 3 Portugal: groups of municipalities resulting from the cluster analysis applied to socio-economic indicators, characteristics and dynamics 1991–2001

The indicators selected for defining each type and sub-type, as well as the thresholds defined for each indicator, are expressed in Table 2. The distribution of the municipalities according to the types is represented in Fig. 4. Some municipalities have a specific behavior according to the thresholds defined and thus, were not possible to include in any of the types.

The types defined for Portugal, based on the analysis 1990–2000, are the following:

1. Production and specialized agriculture with high profitability.
2. Extensive agriculture with high environmental quality:
 - (a) in homogeneous landscapes.
 - (b) in diversified landscapes.
3. Agriculture for spatial planning and environmental quality:
 - (a) in forestry landscapes.
 - (b) in mountain landscapes.
 - (c) in urban areas.
4. Agriculture for rural services:

- (a) in peripheric areas.
- (b) in dynamic and disturbed areas.

Municipalities of Type 1 were the only ones where a specialized and intensive agriculture, economically competitive, was dominant and occupied most of the land. This was the case of the wine production in the Douro valley, the milk production close to Porto, or the intensive irrigated agriculture in the flat valley of the Tejo River, the industrialized pig production south of Lisbon. Due to its competitiveness, the farm system and land cover pattern will probably be maintained, even if in the areas closer to the metropolitan agglomerations of Lisbon and Porto the pressure by urban growth is extremely high. In some of these municipalities, agriculture was not even dominant in land use, as other uses occupied already more space. The community was dynamic, but generally not much dependent on the farm sector. The demand for spaces of consumption, as recreation and green spaces, was also higher here due to the proximity of the urban populations, but the maintenance or promotion of these functions depends on their capacity of adapting to the productive use of the land.

Municipalities of Type 2 were those where the extensive silvo-pastoral systems were dominant, resulting in open landscapes of high interest for nature conservation and high environmental quality, also attracting other activities as hunting, green tourism and second housing. In Type 2.a, the land use was more homogeneous and mainly occupied by the silvo-pastoral systems or open fields. In Type 2.b, the former land cover types were associated in a more diversified mosaic with forest patches. The agricultural sector was highly subsidized, both within the first pillar (cattle support) and the second (agri-environmental schemes) and was doing well in economic terms, as it was managed extensively for meat production, with almost no need for labor or investment. And at the same time, the local community was marginalized, with very low densities of population, with very low education levels and high ages. Here, it is clear that agriculture was determining the use of the land but it was totally dissociated from the rural community. Farming as a production activity will probably not be able to be maintained in the same terms as in 1990–2000, in part, due to the de-coupling of subsidies. Other income sources, associated with other functions, as hunting or green tourism, will probably be exploited by the land owners. The land management for these functions supported at the same time a high environmental quality that may also be a source of economic compensation. But all this will not secure an active rural community, which will thus not be able, in most municipalities, to proceed in the sense of rural development.

Table 2 Indicators selected for each type of municipality and the defined thresholds

Type 1	<p>Technical-economic orientation (OTE): 7 (open air horticulture), 10 (quality wine), 11 (other wine and grape), 12 (fresh fruit), 16 (milk), 17 (mostly milk)</p> <p>Or</p> <p>Weight of the gross margin/agriculture working unit >200% of national average(100)</p> <p>Gross margin with no support (coupled and decoupled) >80% of total gross margin</p>
Type 2.a	<p>Persistence of land cover >87.5% of total municipality area</p> <p>Weight of agricultural area >60% of total municipality area</p> <p>Weight of agricultural population <30% of total population</p> <p>Average farm unit size >30 ha.</p> <p>Ageing index >130</p> <p>Population density <50 (inhabitants km⁻²)</p> <p>Weight of gross margin/utilized agricultural area <30% of national average(100)</p>
Type 2.b	<p>Persistence of land cover >80% of total municipality area</p> <p>Weight of agricultural area <60% of total municipality area</p> <p>Weight of shrub and forest >40% of total municipality area</p> <p>Weight of agricultural population <30% of total population</p> <p>Average farm unit size >30 ha.</p> <p>Population density <30 (inhabitants km⁻²)</p> <p>Weight of more productively utilized agricultural area in the utilized agricultural area <50%</p> <p>Weight of the gross margin/utilized agricultural area <25% of national average (100)</p> <p>Ageing index >170</p>
Type 3.a	<p>Weight of total shrub and forest >40% of total municipality area</p> <p>Weight of agricultural area <60% of total municipality area</p> <p>Weight of degraded forest >10% of total municipality area</p> <p>Population density <80 (inhabitants km⁻²)</p> <p>Ageing index >115</p>
Type 3.b	<p>Height >700 m</p> <p>Weight of total shrub and degraded forest >25% of total municipality area</p> <p>Population density <70 (inhabitants km⁻²)</p> <p>Average farm unit size <20 ha.</p>
Type 3.c	<p>Weight of urban area >20% of total municipality area</p> <p>Or</p> <p>Net change urban area >5% of total municipality area</p> <p>Population density >500 (inhabitants km⁻²)</p> <p>Weight of agricultural population <5% of total population</p>
Type 4.a	<p>Weight of agricultural area >50% of total municipality area</p> <p>Weight of used agricultural area in the farm unit >60%</p> <p>Weight of total shrub and forest <40% of total municipality area</p> <p>Average farm unit size <20 ha.</p> <p>Weight of agricultural population >30% of total population</p> <p>Population density <100 (inhabitants km⁻²)</p>
Type 4.b	<p>Population density >80 (inhabitants km⁻²)</p> <p>Average farm unit size <10 ha.</p> <p>Gross margin with no support (coupled and decoupled) >70% of the gross margin</p> <p>Weight of more productive utilized agricultural area in the utilized agricultural area >60%</p> <p>Weight of agricultural area >20% of total municipality area</p> <p>Ageing index <170</p>

Municipalities of Type 3 are those where agriculture was clearly residual, or marginal, both in terms of land cover, of economic activity and in social terms, but may have an

important role for a balanced spatial management of the areas. In Type 3.a, the forest cover was dominant and in Type 3.b, it might also be, but the height, above 700 m, was

also a limiting factor for the maintenance of agriculture. These were the municipalities in central inland and the central mountain areas of Portugal, with a weak farming sector and an extremely weak community. The land cover was mainly dominated by forest, and some areas of extensive grazing, but the landscape pattern was progressively simplified as farming areas disappeared or were reduced. The remaining agriculture was a residual small scale activity, but it still could have a role to maintain some specific landscape areas and to prevent the risks of fire; and, if it could be compensated for that, the local community, even if modest, would be supported. Type 3.c, corresponded to another type of situation, mainly close to Lisbon and Porto, where the urban occupation was dominant, but a residual agriculture that still was there, occupying small areas of land, could be maintained as a supporter to the green structure in urban spaces, with a role in the quality of life in urbanized environments, leisure and education activities, as well as environmental functions globally.

In the municipalities of Type 4, agriculture was small or medium scale, with a diversified pattern of land cover, shaping diversified landscapes that could be highly attractive for the development of non-commodity functions. In Type 4.a, present mainly in Northeastern Portugal, agriculture still had a relevant social role, as many families had a connection to the sector, and there was the willingness and dynamics required for the development of rural services, that could profit from the natural and cultural conditions of an attractive landscape. As there were not many other economic activities in the area, there was an extra need for rural development support that could be the financial basis for the development of new activities in the countryside, following the maintenance of an agriculture focused on quality and specific regional products. In Type 4.b, agriculture did not have an important social role, but was diversified, dynamic, and dominated the land cover mosaic. At the same time, the rural community was dynamic and relatively well educated and skilled. These characteristics occurred mainly North from Lisbon; as the demand from a close market for all types of rural functions was growing, the potentialities for the development of rural services was very positive.

It is worthwhile mentioning here that these types correspond to general trends in the municipalities according to the indicators selected, the thresholds defined, and the time frame of the analysis, the decade between 1990 and 2000. Within each municipality, there were surely specific differentiated characteristics and trends, that were not possible to identify at this scale of analysis, both in spatial and temporal terms. And also, according to other thresholds, based on different criteria, the distribution of the municipalities could also be different. Eight types were defined, as this number derives naturally from the cluster analysis in

the three dimensions; if more detail was needed, more types or sub-types could be identified. The picture of the country would thus be more detailed, but the large groups would still be the same, as they are possible to identify coarsely also in the separated analysis of the land cover, the agricultural sector and the community.

Discussion

These types should not be considered as the ultimate classification for the Portuguese municipalities and the role that farming may have in the future. But they may serve as a basis for reflection, which is needed for defining future strategies for most of the countryside in Portugal, as production cannot justify anymore the farming systems in place nor the non-commodity functions they have supported until now. The recent developments that may lead to new competitions for land, as energy crops and biomass production, have not been considered in particular, due to the scope of the study. But these new trends still will not change the vulnerability of the less productive territories, nor their potential for supporting other functions besides production. The distribution in the map of Fig. 4 reflects thus a differentiation of the Portuguese countryside, in an integrative perspective where trends and vocations, according to the dominant characteristics, including potentialities that may be worth developing and limitations that would be difficult to alter.

For a more complete analysis, many types of information should be added that were not possible to consider in the study presented here: strong and weak aspects for

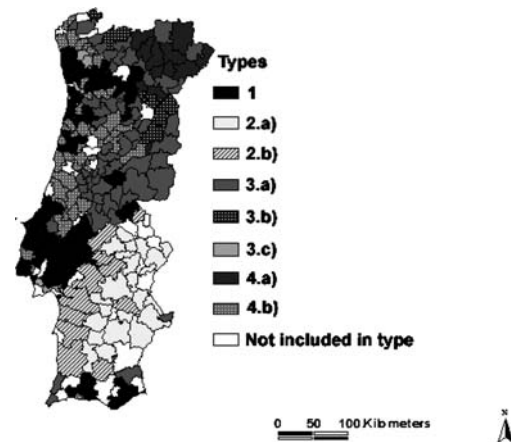


Fig. 4 Typology of municipalities according to the territorial role that agriculture may have in a differentiated countryside: *Type 1* production and specialized agriculture with high rentability, *Type 2* extensive agriculture with high environmental quality *a*, in homogeneous landscapes *b* in diversified landscapes, *Type 3* agriculture for spatial planning and environmental quality, *a* in forestry landscapes, *b* in mountain landscapes, *c* in urban landscapes, *Type 4* agriculture for rural services, *a* in peripheric areas, *b* in dynamic and disturbed areas

biodiversity and nature conservation, landscape character and role in local or regional identity, management of water resources as to quantity and quality, management of energy resources and conditions for possible new energy production (bio-crops for instance), etc. These types of information, if data and resources are available, may nevertheless be integrated in the same type of analysis, following a similar methodology, leading to a more precise and complete picture of the reality.

Furthermore, it would be important to combine a more economically oriented assessment, in the dimension “agricultural sector”, so that there is an evaluation of the viability of the farm units according to the functions they may be supporting in the landscape, besides production. This economic assessment should be based on the farm unit, as it is still the unit for decisions on land management, or maybe on farm types. Also, on the dimension “rural community”, the characterization of the local economies and its relationship with the urban territories would also be a relevant contribution for a more fine analysis. Combining these data with the typologies and perspectives for the territory maybe could be the way for a more integrated and territorial management of the farm sector in the future.

It is clear that this typology should be used with care. Reality within each municipality and of the many factors that affect its trends is complex. But new analytical approaches are needed, when acknowledging that farming has to be understood in a territorial perspective, and furthermore that production will not justify its maintenance in many rural areas in the future, while the social demand for other functions displayed by the rural landscape increases. Also the recent developments in crop demands require this type of new approach to rural areas management, since they contribute to a higher complexity at stake in the short term, while the landscape, social and cultural characteristics of rural areas only change in the long term.

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