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Agrarian Dynamics and Landscape in Rural Mountain Areas of Spain

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ABSTRACT

In the following paper, we will present the results of the analysis of territorial dynamics that the mountain areas of Spain have had in recent decades from the identification and definition of factors, processes and outcomes. We have chosen several representative case studies from various Autonomous Communities corresponding to different regions of the mountains of northern Spain (Cantabrian Mountains and Atlantic Pyrenees), mountains in the northwest of Castilla and León, the Central System, the Iberian System and the Mounts of Toledo.

1. INTRODUCTION

The main objective of the research project that supports this paper has been to detect and diagnose the conditions in which the current process of renewal and socioeconomic innovation is experiencing in the Spanish mountain areas. We will also attempt to prepare proposals for valorisation of mountain landscapes, and to identify the areas of greatest transformation and the areas with sensitive potential impact. The ultimate aim has been to try to draw general conclusions from various case studies and to further research the singular features and characteristics of the selected areas.

The aims that have guided the completion of this research were the following: 1) definition of the different forms of articulation and socioeconomic integration of mountain areas, 2) recognition and diagnosis of the new dynamics of socio-territorial structure, the processes of functional specialization and transformation of territorial models, and 3) the evaluation of policies, initiatives and programs in mountain areas and design of proposals to promote sustainable development and territorial cohesion.

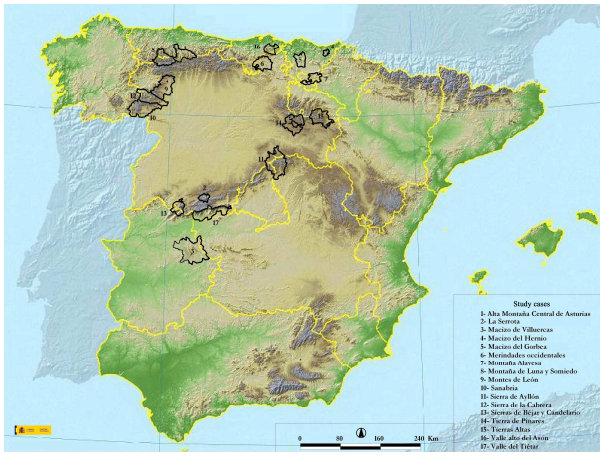

Fig. 1. Geographical location of studied mountain areas *Source: prepared by the team of researchers project from the map basis of the National Geographic Institute of Spain (IGN).*

To achieve the objectives specified above, which constitute the core of the analysis in this study, we have chosen different mountain areas as case studies (Fig. 1), selected by voluntarily basic criteria regarding the degree of change, the economic growth and the level of development reached.

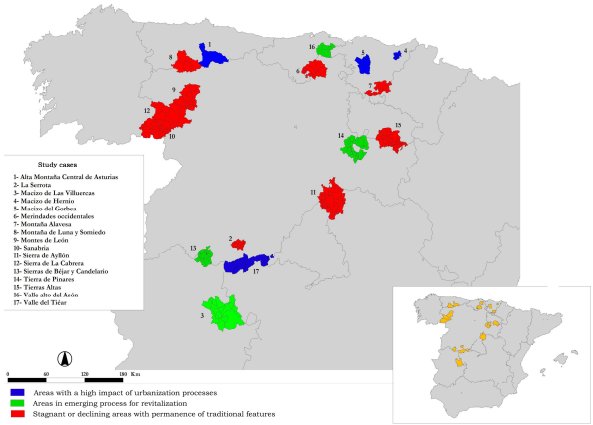

Fig. 2. Distribution of study cases by types of predominant territorial dynamics. *Source: prepared by the team of project researchers.*

All mountain counties studied are singular territories with an extraordinary wealth of resources but also with a remarkable weakness, as some of the features shared by most of these spaces exhibit (Fig. 2).

1). Areas with significant persistence of traditional features, stagnant or in decline. In some of these areas, despite their scant dynamism, symptoms or revitalization attempts are detected, especially after the recent valorisation of heritage resources: Mountain of Somiedo, high valleys of the rivers Sil and Luna, north-western Merindades, Alavesa Mountain, Mounts of León, La Cabrera, Sanabria, Tierras Altas, Mountain Range of Ayllon and La Serrota (Delgado & Plaza, 2012b) [11].

2). Areas with emerging processes of revitalization whose status, predominantly regressive or stagnant in all of them, is characterized by the recent presence of especially significant dynamizing elements: high valley of the river Asón, Tierra de Pinares, mountainous county of Bejar and Massif of Villuercas.

3). Areas with consolidated dynamics of growth, resulting in the impact of urbanization processes induced by the proximity of urban agglomerations: High Central Asturian Mountain, Massif of Hernio, Massif of Gorbea and Tiétar Valley.

Part of the overall results of the research have been published by the members of research team (Delgado Viñas & Plaza, 2012a; Delgado, 2013) [10], [6].

Table 1. Basic indicators for the analyzed mountain areas.

Counties	Number of municipalities	Surface (km²)	Population (inhabitants)	Density (inhabit./km²)
Alta Montaña Central asturiana	4	375.89	30,395	80.8
Somiedo-Pigüeña, High Sil y High Luna	4	899.50	13,583	15.1
Valle High del Asón	5	424.81	6,633	15.6
Las Merindades noroccidentales	9	773.00	6,979	9.0
Macizo del Hernio/Ernio	8	114.20	4,072	35.6
Macizo del Gorbea	8	480.50	11,184	23.3
Montaña Alavesa	6	480.70	3,179	6.6
Tierra de Pinares	22	974.00	14,633	15.0
Tierras Altas	25	867.19	2,091	2.4
Sierra de Ayllón	27	1,537.06	7,027	4.6
La Serrota	10	239.00	1,073	4.5
Sierra de Béjar-Candelario	16	548.86	24,772	45.1
Valle del Tiétar	24	1,161.60	34,940	30.1
Las Villuercas	16	2,004.52	11,534	5.7
Sanabria	18	1.419,80	7,397	5.2
La Cabrera	6	1,038.90	4,741	4.6
Montes de León	14	1,325.00	20,892	15.7
Total	**222**	**14,664.53**	**205,125**	**13.9**

Source: prepared by the team of researchers project from data of the National Institute of Statistics (INE) for 2010.

2. THEORY AND METHODOLOGY

The research has been done by conducting both fieldwork and cabinetwork. In summary, the tasks and activities carried out over these three years may be categorized as follows:

Fieldwork: recognition of the territory, surveys and interviews/meetings in the area: collecting of statistics and documentation in the regions and provincial organisms and autonomous institutions.

Cabinetwork: reviewing, reading and emptying of local and regional literature; design,

development and delivery of surveys; exploitation, processing and interpretation of surveys and information; and design of graphics and mapping.

The methodology and the work plan had, as its main objective, the development of a common database where the information obtained at the municipal level through different indicators could be found. This database provided the key project information. It included basic variables of different types:

- *territorial* (geographical area, spatial units and subunits: districts, municipalities, villages, etc.);
- *demographic* (population trends in recent years, current absolute population, population density, settlements structure);
- *housing stock;*
- *communication infrastructure;*
- *land uses and exploitation* (livestock, forestry, farming, development of use intensity indices, indices of specialization, etc.);
- *presence of other forms of exploitation* (mining, old and new industries);
- *rural tourism centres and associated jobs;*
- *figures of natural protection* (national parks, regional parks, nature reserve, natural monuments, etc.);
- *programs, initiatives and actions for rural development* (Leader, Proder) and financing the various measures developed within these interventions;
- *other forms of land use and planning* (including municipal planning figures).

3. RESULTS AND DISCUSSION

3.1. The recent dynamics of agrarian activities: a silent process of de-agrarianization

In Spanish mountain areas, three agrarian methods have traditionally been used. Firstly and most popular, there is a predominant vocation for livestock exploitation systems, usually extensive and itinerant between winter pastures of the valley bottoms and the summer high pastures. Second is the forest exploitation of autochthonous forests or the afforestation on steeper and highest slopes. The third most prominent method is with agricultural crops in the valleys and flatter areas and closer to the population centres, with small parcels grouped in enclosed succinct areas.

3.1.1. Regression of farming activity: an incomplete process of resizing of productive structures

One of the changes that all studied mountain counties without exception are experiencing is a widespread restructuring of farms. This has manifested itself in accelerated disappearance and concentration of holdings in even greater extent than in rural areas not located in mountain areas; there is eloquent data on recoil of farming or, to put it more accurately, of the dying off of it. Several examples of these dynamics are significant.

One of the most notable is the high river Asón county where, in 1982, 3,555 farms were still accounted for (Delgado, 2012b) [5]. The total number had dropped to 927 in 1999 (-73.9%) and then to 675 in 2009. The loss of 2,880 farms represents an average annual decline of -3%. In the neighbouring region of Las Merindades, in 1982, there were 1,772 farms of which, in 1999, only 620 remained (Delgado, 2012a) [4]. This loss of 1,152 farms represents a total decrease of -65% (-3.8% annually). In Sanabria, during the period from 1982-1999, 1,831 farms disappeared; 65.96% of those were there in the first date (San Roman, 2012b) [24]. In the county of Tierras Altas, the number of farms was reduced by half between the agricultural census of 1982 and 1999 (Bachiller, 2012a) [1]. In Montes de León, only 55% of existing farms in 1982 remain today. In other words, 45% of them are missing today (Maya & Sánchez, 2012) [20]. In some municipalities, the losses are greater than 70% and, in some exceptional cases, even more than 90%. The values are very similar in the Massif of Hernio: over the twenty years between 1989 and 2009, one in every two farms has disappeared (Galdós & Ruiz, 2012a) [13].

The process has had a much lower incidence in some mountainous counties near urban areas, or well connected with them, whose economy has thus experienced greater diversification. This is the case of Tiétar Valley where, according to statistics, there are 7,781 farms, only 17% less than twenty years ago, while in the province of Ávila (Martín, 2012) [19], to which it administratively belongs, losses amount to 42%. In the Alavesa Mountain, there were 824 farms in 1982 and 712 in 1999, which means a decrease of only 13.6% (Porcal, 2012) [22]. The agricultural sector of Massif of Gorbea is still under a process of adjustment and modernization which is embodied in the disappearance of a small number of farms: in the 90s, around 10% of farms were lost, but in the last intercensal, from 1999-2009, the restructuring of farms had accelerated and therefore generalized (Galdós & Ruiz, 2012b) [14]. During this time period, around 2/3 of the farms disappeared, reaching a similar decrease as had been seen in other municipalities.

The result of this process has been the amendment of the structure of agricultural production units, considering that it has hardly diminished agricultural land. As expected, the reduction of the number of farms has been primarily at the expense of the smaller ones, those between 5 and 20 hectares of Agricultural Area (UAA), and of less economic entity. On the other hand, those over 50 hectares have increased both in number and relative weight thanks to better expectations of viability.

In spite of this and with the exception of Las Merindades, the predominance of small farms remains, although the majority of them are economically unprofitable and managed often by elderly. Therefore, the restructuring should be classified as partial and insufficient if we consider that smaller farms, with less than 5 ha, in 2009 still represented 23.2% of the total. To this we must add another 9.1% from the farms with between 5 and 10 ha of UAA, which brings the relative weight of smallholding to nearly a third of the agricultural enterprises.

In 1999 in the Alavesa Mountain, more than three-fifths of farms did not reach 20 ha and no less than 45% had a marginal character (Porcal, 2012) [22]. In Montes de León two thirds of the total number of farms are working with less than 5 ha; if you have added those with 5 to 10 ha, their share amounts to 75% while production units with more than 50 ha only account for 7% of the census (Maya & Sánchez, 2012) [20].

In the region of Sanabria, according to the 1999 agricultural census, 71.6% of farms with agricultural area are under 5 ha, a clear example of a smallholder structure, while those with 50 hectares or more represent a small percentage compared to the total, equivalent to 8.5%, although they are the most viable farms (Sánchez & Maya & San Román, 2008) [25].

The most extreme cases are the La Cabrera and the Tiétar Valley: the very small subsistence farms, with less than 5 ha, accounting for 90% of total census of La Cabrera (San Román, 2012a) [23]; also in the Tiétar Valley the vast majority of farms (91%) have less than 5 ha while only 1.7% are over 50 ha (Martín, 2012) [19].

In addition to the small size of the farms, one must take into account the excessive parcelling, since each farm has a large number of plots, and also the advanced age of the owners. Usually more than 60% are over 55 years old while only 5% has not yet reached 35 years of age. Despite the implementation of programs of early cessation of activity, aging far from diminishing has increased in recent years in almost all the counties and certainly constitutes, together with the lack of young people interested to continue in the farming and the little entrepreneurial dynamism, one of the main problems what facing the sector.

One of the factors which further aggravates these hopeless circumstances is that, despite the small size of many of the farms, there are not many owners who can declare alternative profitable activity outside of farming, a percentage that, with few exceptions, has declined between 1982 and 1999. Thus from the data it can be inferred that only a small number of farms have chosen to perform a variety of profitable activities. This is linked to the high percentage of entrepreneurs in retirement age, to the industrial and tertiary network of mountainous areas and to the low participation in the food processing chain.

3.1.2. Transformation of livestock activities: extensification and specialization

The economy of the mountain regions has traditionally been based on agricultural uses that take advantage of the resources that the difference in altitude, the alternation of flat lands at the bottom of the valleys, and the sloping areas and culminating sectors offer (Delgado, 2006) [3]. Still today agricultural and forestry remain the backbone of the rural economy of most of the mountain counties analyzed, but they have undergone major transformations that differentiate them from traditional forms of exploitation (Delgado *et al*, 2007, 2010) [7], [9].

Additionally, in recent decades they have faced structural difficulties, not exclusive of mountain territories but much more pronounced there. The intense transformations experienced in Spain by the agricultural sector since the mid-twentieth century to the present due to the demands of the market economy (first, to adaptation to the Common Agricultural Policy and, later, to the increasing liberalization of markets) have had a clear impact on mountain regions.

The case of the Basque mountainous regions serve as an example: at the Alavesa Mountain in 2008, the agricultural sector contributed 8.1% of GVA to the local economy and employed 27.6% of the occupied population (Porcal, 2012) [22]. This prominent role has been greatly reduced in recent years. Something similar has happened in the region of the Massif of Hernio where, still in 1996, half of the municipalities in the area generated an agricultural GVA of more than 20% (Galdós & Ruiz, 2012) [13], [14]. Ten years later, the percentages of all municipalities have declined significantly, even in those with the biggest agricultural specialization. The rest of the mountain regions had similar patterns, although the exception is Tiétar Valley which maintains its strong weight of agricultural activities, as deduced from the large number of workers in that sector (Martín, 2012) [19].

The fundamental cause, in addition to the development of new activities in some cases, lies in the fast pace of abandonment of farming as a result of the low profitability of the majority of farms. Although in recent years the situation has started to improve by the concentration and intensification of agricultural enterprises, the permanence of them remains highly problematic. Most of the farms that have remained are due to increased family income with income from outside the agricultural sector where it has begun to diversify the rural economy (Massif of Hernio and Tiétar Valley, e.g.) and where it has developed a market wage labour outside the farm.

As mentioned above, the Spanish mountain areas have traditionally had three forms of agricultural use: most of them have shown a predominant livestock vocation with exploitation systems usually extensive

and itinerant between the winter pastures of the valley bottoms and the summer high pastures; secondly, the forest harvesting on steeper slopes and on the summits; and finally, the agricultural crops in the flatter areas and closer to population centres, with small plots grouped in tiny cultivated fields (Delgado et al, 2010) [9].

This happens in the counties of the Cantabrian Mountains, both in the southern (Las Merindades) and northern slopes (Mountain of Somiedo, high valleys of the rivers Sil, Luna and Asón), whose inhabitants have lived for centuries off of livestock activity, one of the main factors responsible for their social and economic organization and for the outlines of its landscape (Fernández García, 2012) [15]. Since the late nineteenth century and, especially during the early twentieth century, all of these mountain areas have allowed themselves to feel the calls of *"direct actions"*. This includes the existence of an external demand for dairy and meat products, and new sales channels that have ignited the progressive economic simplification and bovine ranching specialization (the importation of foreign breeds from such countries as Switzerland and the Netherlands) and, ultimately, the simplification of agricultural landscapes. For decades the majority of the livestock activity corresponded to the bovine, which has almost always represented more than three-quarters of the total, followed far behind by sheep and goat herds, horses and pigs (Maceda & González, 2008; Herrán & Fernández & González, 2008) [18], [16].

The livestock exploitation remains, in even greater extent, a mainstay of farming as a result of the evolutionary dynamics of the final years of the twentieth century during which there has been a significant growth in livestock potential. Thus in Las Merindades, only in the period between 1982 and 1999, the number of UG has increased by 40.6%. Most of the increase corresponded to the expansion of bovine and veal (59.3%), with dramatic increases in some municipalities (Delgado, 2012a) [10]. The same has happened in Sanabria, where the regressive trend has been implemented and the predominance of cattle has been established, representing 53.8% of livestock, oriented towards meat production by taking extensive advantage of pastures (San Román, 2012b) [24].

The mountain ranges of Béjar and Candelario have been historically characterized as an eminently livestock territory in which predominated ranching of the bovine (Fernández Álvarez, 2012) [15]. At present, extensive cattle ranching is undergoing a period of restructuring, being replaced by farms of a semi-extensive type where the stabling acquires a greater presence and the high pastures are replaced by the pastures of the hillside, closer to places of locations with livestock facilities. This type of ranching has seen an increase in the number of livestock units in the last thirty years. In addition to cattle, horse breeding in recent years has gained considerable importance. This had reached its peak in the late eighties.

The high valley of the river Asón (Cantabria) is a relatively exceptional case in cattle breeding. Here, too, the process of transformation of the economy and the ranching landscape, both past and present, has a common denominator: the trend towards specialization in bovine cattle, but with an early dominance of dairy orientation that has led to the expansion of meadows and the continuous simplification of agricultural land use. The current primacy of livestock production is evidenced by the fact that the average land area devoted to natural grassland exceeds 70% of the agricultural area. In the composition of the cattle, the bovine herd maintains its importance as it represents over 88% of total (Delgado, 2012b) [5].

However, a change in the composition of the cattle herd is taking place. This suffered a sharp decline in the first decade of the century (-22%). To this we must add the significant weight that the cattle meat orientation is acquiring. Nevertheless, in contrast to what happened in other counties of the Cantabrian Mountains, milk production is still a priority here. Despite some of the effects that the European Union quota system implementation has had in addition to the conditions of uncertainty that the Spanish dairy sector has seen in recent years, milk production is still important. Although the number of farms with milk quota has been reduced by 62%, the total quota available has increased by 10%. In general, municipalities with worse accessibility are those who have had greater losses. On the other hand, the municipalities with better connections, (although the number of dairy farms has been diminished), have suffered minor losses in their milk quota and, in some cases, have even increased. The above data show the development of dual cattle dynamics from a process of specialization with an important component of territorial discrimination. On the one hand, it seems to reinforce the evidence of the infeasibility of the tiny mountain dairy farms in the new socioeconomic context. On the other, it expresses that a small group of dairy farms have chosen to increase its production capacity as a means of survival, by acquiring the quotas that are left available and expanding the size of their herd and its territorial base.

In general, the mountain cattle activity has sustained itself over the bovine livestock, while the predominance has sometimes corresponded to ovine and goat livestock. This happens more frequently in some of the southernmost mountain areas or those located on the southern slope of the Cantabrian Mountains (Delgado & Gil, 2008) [8]. This occurs not only because these kinds of livestock are better suited to the ecological conditions there but also, by increasingly greater extent, because of financial aid received from Community in order to maintain the harvesting systems

in extensive and semi-extensive grazing industry. Such is the case of the Montes de León where sheep and goats represent more than 40% of livestock and in some municipalities reach even higher proportions. Bovine livestock follows in importance, representing 25% in the county (Maya & Sánchez, 2012) [20]. More than half of the agricultural area of Villuercas is engaged in livestock uses, which proves that ranching is the predominant farming activity, supported by sheep livestock (with more than half of the total livestock units). This is followed at a fair distance by cattle and goat (Plaza, 2012) [21].

In the Massif of Hernio, the extension of grassland (30% of total agricultural area) expresses the livestock vocation of the county what is also reflected in the high percentage of farms with livestock (92.1% of total) (Galdós & Ruiz, 2012a) [13]. Although also the livestock farms have experienced a considerable decrease, the recent crisis has affected them slightly less. Therefore, the livestock vocation of the county, relatively speaking, has been intensified. This is evidenced by the following different livestock evolution: from 1989 to 2009 the number of units of bovine cattle decreased while the sheep flock was up 30%, from 8,171 to 10,612, thus converting it into the dominant orientation in farms with very modest dimensions despite the recent growth.

A similar process has occurred in the Massif of Gorbea where, between 1989 and 2009, there was a decrease in the number of livestock farms and total livestock effectives, attributable to the decline in sheep, goats and pigs because horses were increased and the bovine herd hardly changed (Galdós & Ruiz, 2012b) [14]. The accelerated reduction in the number of farms in combination with a slower decline of livestock numbers has caused the herd size of each farm to be greater. However, it should also be noted that the redimensioning experienced has not been sufficient and that the livestock farms still have a reduced size in order to ensure their economic viability.

In summary, the dynamics of livestock herds in recent decades points to the general development of livestock potential, the extensification of production systems and the reduction of diversity via the livestock specialization in bovine cattle. In most cases, and in particular in that of beef whose maintenance is done through the extensive use of land, this can be qualified as organic ranching (Delgado, 2006) [3].

After accession of Spain to the European Economic Community in 1986 and especially after the implementation of subsequent amendments of the Common Agricultural Policy, the bovine cattle has tended to decrease while the sheep were reintroduced in order to complete the use of pastures. Despite this, the traditional livestock activity traverses a remarkable crisis in which several endogenous factors are involved, like the dynamics of one´s own production model, and also exogenous factors, such as the continued depopulation or the regressive evolution of the counties.

This is evidenced by the dynamics followed in Tierras Altas whose spatial organization has been dominated for centuries by mountain pastures which have maintained major sheep flocks, mostly composed of *merina* transhumant race (Bachiller, 2012a) [1]. The volume of sheep and goats decreased by 26.6% between 1982 and 1999 and virtually collapsed in the first decade of this century because of decoupling promoted by the last reform of the CAP, the abandonment of transhumance and lack of generational replacement on farms. Thus, the number of sheep and goat went from 88,367 in 1982 to 18,430 in 2008, according to livestock censuses. Additionally, the restructuring of the dairy sector also ended most dairy farms so that today the bovine cattle have been reduced by half. There were only 28 farms in 2008 and almost all of them were engaged in meat production. A very similar case is that of Cabrera, a county where the livestock activity was always very small; yet it also decreased the volume of cattle in the period 1982-1999 (San Román, 2012a) [23].

By contrast, adaptation of the different races to ecological conditions, the success of meat production and recently creating marketing channels under quality brands are contributing to the revival of livestock. Indeed, it can be observed as an almost strict coincidence between the regions where tools have been developed to improve the quality and marketing of livestock products, especially meat, and the areas where the cattle potential has grown, or at least, has remained stable.

A paradigmatic example of productive and territorial integration is the Seal of Quality Meat of Las Merindades (*Carmer*) promoted by the Association of Producers and Traders Meat of Las Merindades (Delgado, 2012a) [4]. To do this, farms are subject to strict control of production conditions, ranging from the characteristics of race, the feeding and controls in approved slaughterhouses, in order to ensure product traceability. The orientation to extensive livestock farming and quality production is the aim of the Cattlemen's Association of Quality Products and Sustainable Management "Extensive Livestock Farming Sanabria-Carballeda" of sheep and beef cattle, to achieve a viable livestock farm based on exploiting rangeland (San Román, 2012b) [24]. In the early '90s in the county of Tierra de Pinares there was an interesting initiative to boost beef cattle - the authorization of the certification mark of Meat Pinares-El Valle (*Carpival*) - with the aim of putting quality meat on the market, very similar to the aforementioned Las Merindades (Bachiller, 2012b) [2]. In the county of La Serrota, the *Spanish Association of Breeders of Selected Cattle of Race Ibérica Avileña-Negra* and the Regulatory Council of Carne de Ávila have promoted the

maintenance of this breed through recognition of the flesh of Avila as the first appellation of fresh meat Spain (1990) and it is among the first groups approved by the European Union as Protected Geographical Indication (Sánchez & Maya, 2012) [26]. It has also received the European seal of quality differentiated.

At other times it is the proximity to large consumer centres that explains the development or maintenance of livestock activities, as is the case in the Mountain Range of Ayllon and the county of Tierras Altas, in relation to the sale of meat products in the Madrid market (Hortelano, 2012) [17]. Although, in both examples, given the severe aging of the farms holders, the failure of this marketer impulse is a likely risk if the food industry is not consolidated as the markets require within and outside the area.

3.1.3. The expansion of forest exploitation

The use of forest resources has traditionally played a great role in mountain areas and, unlike the other agricultural activities which are more intensive in the consumption of labour force, it has increased in importance in recent times. Nevertheless, there are significant quantitative differences between the analyzed cases.

The organization of the agricultural area in the county of Tierra de Pinares is determined by its almost total dedication to forestry. The average of the whole region reaches 84%; all municipalities except two are over 50% and nearly 3 out of 4 over 80%. Not only forest mass occupies most of the municipalities but also 96% of it is devoted to timber production, which reveals the strong specialization of the area: the pine, and more specifically the *Pinus sylvestris*, the dominant species, paying homage to the name of the region. Furthermore, the forest area has grown steadily in recent decades, at the expense of pastures and croplands (Bachiller, 2012b) [2].

In the Massif of Gorbea, although there has been a slight decline in forest coverage, this occupied more than 2/3 of the territory in 2007. The wooded forest on the Atlantic side is predominant, which is covered by 72%, according Forest Inventory 2005, by fast-growing conifers, among which the dominant species is the *Pinus radiata*. On the Mediterranean side 78% of woodland forest is covered by species of native hardwoods (Galdós & Ruiz, 2012b) [14]. The most representative are the beech, the Pyrenean oak (*Quercus pyrenaica*) and the gall oak (*Quercus faginea*). In the Alavesa Mountain, the forest area is the main protagonist according to the general distribution of the land (occupied in 2007 68.2% of the regional surface and in the Massif of Hernio reaches almost 56%). The wooded area is divided almost equally between hardwoods and conifers (mostly *Pinus radiata*). With the partial exception noted in the Basque regions, the recent trend shows an expansion of the forest in all its varieties at the expense of the land that other agricultural activities leave free.

The forest area is experiencing a steady increase in Sanabria in all the croplands that are abandoned, just like in the Montes de León, where the area occupied by forest species, which extend over one-fifth of the county, has increased over recent years as a result of certain actions of reforestation, especially pine and oak to a lesser extent (San Román, 2012b) [24]. Currently, forests play important ecological and economic roles by obtaining agricultural income from the sale of timber for other economic uses once traditional forms of forest utilization have fallen into disuse.

In the Mountain Range of Ayllón the increase of the forest area also been benefited from a host of political decisions on agricultural development and planning taken some decades ago (Hortelano, 2012) [17]. The correcting of erosion in the header of watersheds and the rapid production of wood encouraged the afforestation with pines (*Pinus sylvestris*, *Pinus pinaster* and *Pinus nigra*) and other conifers on common lands and pastures. These species became competition for the original forest composed of holm oaks (*Quercus ilex rotundifolia*), gall oaks (*Quercus fagineae*), Pyrenean oaks (*Quercus pyrenaica*), junipers (*Juniperus thurifera*) and relict beeches (*Fagus sylvatica*).

The woodlands occupy 31.2% of the Tiétar Valley and are a precious resource, which mostly belong to municipalities or the neighbours, and are now managed by public administrations under the form of Mount Utility Public (Martín, 2012) [19]. Together, these public forests produced annually around 2 million Euros generated by 75% from the auctioning of *Pinus pinaster* and *Pinus sylvestris* in lesser extent. A use that does not provide great benefits but requires a special mention is the mushroom-picking, strawberries and other berry harvesting.

The negative side of this forest wealth is given by the fires that devastate the mountains with a very extensive burnt forest area which ultimately results in a loss of forest area. Most fires are intentional although around 30% are due to negligence and another 15% are produced by lightning. The increasingly widespread habit among the urban population to go to the mountain to enjoy leisure time is in the origin of many malpractices.

3.1.4. Decadence of agricultural land use

Agricultural production, a great value for the survival of the historic mountainous societies, has usually played a less important role versus livestock or forestry production. This continues to be the case in most areas, with the exception of the Alava Mountain,

where the number of growing farms today exceeds the number of livestock farms (Porcal, 2012) [22]. While traditionally the mixed farms were dominant, the tendency to specialize in farming practices is increasing, so that the farmland still holds 18.9% of the county surface. Like in the past, dry farming predominates over the irrigated farming and the arable crops over the ligneous crops, like cereal (wheat, oats and to a lesser extent, barley), the mixed meadows and potatoes (irrigated in this case) those which mainly occupy the farmland.

Moreover, agriculture has suffered a setback during the last decades. Even in the counties where it was once more important, the cultivated area has been declining while the other uses have increased their representation to the extent that in some districts the crops have practically disappeared or remained residually.

The organization of the agricultural area in the county of Tierra de Pinares is defined by its almost total dedication to forestry uses (Bachiller, 2012b) [2]. On the other hand, crops have been relegated to areas located on the marginal areas, but they do not exceed, in any case, 15% of the agricultural area. In the central sector of the county, forest monoculture is so dominant that more than half of the municipalities lack cultivated areas. In the county of Tierras Altas, cropped area has been traditionally little. In order to suit the landforms, the crop fields were organized in terraces occupied by different cereals (wheat, barley and rye) which, from the bottom of the valleys, amounted by the hillsides to altitudes of 1400 m (Bachiller, 2012a) [1]. Today, with the partial exception of the terraces situated in the valley bottoms, most of the others are abandoned plots without cultivation and occupied by bushes. In Montes de León, the cultivated lands have lost more than a third of their length, currently occupying only 11% of the county (Sánchez & Maya & San Román, 2008; Maya & Sánchez, 2012) [25], [20]. A similar situation is seen in Sanabria and Cabrera where the area occupied by arable land has fallen by 70% since the beginning of the 90s. The potato crops have disappeared, for example. These once occupied irrigated and rain-fed plots, along with turnips and rye used as fodder. The agrarian landscape, which in the past was characterized by a mosaic of tesserae occupied by different crops, has given rise to a less varied landscape with forests and pastures only (San Román, 2012) [23], [24].

The cultivated lands still account for 9.9% of the agricultural area in the Mountain Range of Ayllon, 7% in the Massif of Hernio and only a small 4% in the Massif of Gorbea (Hortelano, 2012; Galdós & Ruiz, 2012) [17], [13], [14]. However, most of the lands are devoted to the cultivation of fodder plants and small orchards with mixed vegetables, preferably for home consumption; a few scattered fruit trees complement the modest range of agricultural alternatives.

The Tiétar Valley has a slightly different situation: here also the cultivated lands occupy the last place in the distribution of agricultural uses at only a tenth of the total (Martín, 2012) [19].

The evolution of uses since 1982 is marked by a continuous decline in cultivated land, starting with the least productive. The main difference is the incorporation of an agriculture-oriented market that began with the introduction of the cultivation of snuff, from the 50s, and has continued with the cultivation of olive trees (with the support from European funding), vineyards and other high-quality fruit and vegetable crops.

Also in the Mountain Range of Bejar-Candelario agricultural activity for market has been strengthened, which has replaced the precarious traditional subsistence agriculture (Fernández Álvarez, 2012) [15].

Currently, the productive specialization has focused on the cultivation of fruit trees, particularly the cherry tree (*Prunus avium*), especially in the Valley of the river Jerte. Facing the fruit trees monoculture, in the rest of the region the small orchards adjacent to the population centres are immersed in a process of abandonment, becoming as a result locations for the construction of second homes, where the building regulations have allowed it.

The specialization of the river Jerte Valley in the production of cherries has generated a deep socio-economic change as it has gone from subsistence agriculture to an industrial character agriculture chaired by cherry as the main raw material from which liquors, jams, etc. are produced. This fact can be linked to the establishment of the Association of Cooperatives Valley of Jerte S.L., and obtaining in 1997 of the figure of quality "Denomination of Origin Jerte Cherry", the institution of new marketing channels for products from the cherry as well as other coming from other fruits like raspberries.

Cherry cultivation has stimulated the creation of companies and agricultural industries as well as numerous direct jobs. But the cultivation of cherry trees has also functioned as an instrument of tourist attraction, thus influencing the development of new facilities for catering, accommodation and sale of handicrafts, in addition to those dedicated to selling cherries and their by-products.

The declaration of the agricultural quality guaranteed figures from the appellations of origin is also the key to explaining the dynamism of agricultural activities in Villuercas from cultivation of olive trees, production of cheese (with PDO: "Los Ibores"), honey (also with Designation of Origin "Villuercas-Ibores") and wine (integrated in the Denomination of Origin "Ribera del Guadiana"). These four agrifood products have become the hallmarks and the axis of development of the county (Plaza, 2012) [21].

4. CONCLUSION

The intense transformations that have occurred in the Spanish agricultural sector since the mid-twentieth century to the present, because of the requirements of the market economy, first, and of the adaptation to the Common Agricultural Policy and the increasing market liberalization, later, have had a clear impact on the mountain counties (Delgado & Plaza, 2012b) [11]. The main cause, in addition to development of new activities in some cases, is linked to the fast rate of abandonment of farming activity due to the poor profitability of most farms. Although in the last years the situation has begun to improve by the concentration and intensification of the farms, the persistence of them is still very problematic. Most of those that have survived has been due to the increase of household income with revenues unrelated to the agricultural sector where the rural economy has begun to diversify and where wage labour market outside the farm has been developed.

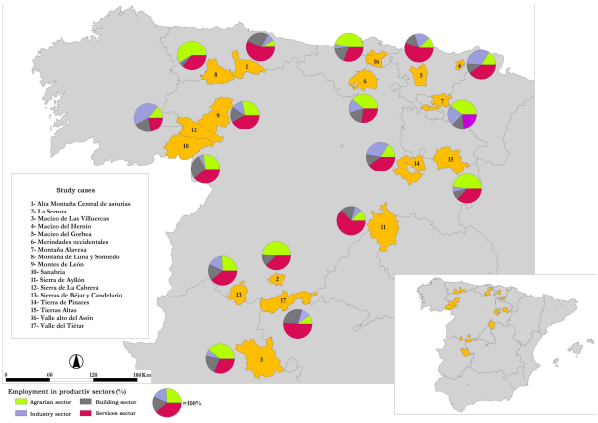

Fig. 3. Sectoral structure of productive employment in various mountain areas (2010). *Source: prepared by the team of researchers project from data of CajaEspaña.*

Traditional agricultural systems nowadays have just a residual presence in some areas. In recent decades, extensification has been generalized, because the consolidation of the uses that consume less labor (extensive livestock and forestry), and productive specialization (meat ranching, fruit) that, besides being a common denominator, has resulted in the reduction of the workforce and the simplification of rural areas and agricultural landscapes.

The dynamics of livestock during the last decades indicates the general development of the livestock potential, the extensification of productive systems and the reduction of cattle diversity. This is due to specialization in cattle raising, in most cases, and, particularly, in the beef cattle of meat whose maintenance is done through extensive land use, so, to some extent, it can be qualified as organic livestock farming. This trend is supported in quality labels and appellations of origin.

The use of forest resources has traditionally played a leading role in mountain areas and has increased in importance in recent times.

Agricultural production, with a great value for subsistence of historical mountain societies, usually had less importance than livestock or forestry. Moreover, agricultural activity has suffered a continuous decline during the last decades. Even in the counties where it once had greater importance, the cultivated area has been reduced while the other uses have increased their representation, to the point that in some regions the crops have practically disappeared or remained residually.

Nonetheless, implementation of appellations of agricultural quality guaranteed and the designations of origin are also the key to explaining the dynamism of agricultural activity in some regions. The agrifood products have become the hallmarks and the axis of development for various regions.

One change that all studied mountain regions are experiencing, without any exception, is a widespread process of restructuring of agricultural holdings that has manifested in the vertiginous decrease in the number of farms and in the increase of its territorial size. This fact speaks for itself about the regression of farming or about giving it up, to put it more precisely. This process of concentration and dimensioning has not been able, however, to eliminate excessive weight that farms with an insufficient productive and economic size still have.

Based on all of this, it can be inferred that in these mountain regions the agricultural current crisis, sometimes a genuine process of deagrarianization, is not so much a result of the decline of traditional agricultural models, which disappeared a long time ago, but a fruit of the difficult and complex process of adaptation to new territorial and economic contexts.

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