LAND ABANDONMENT: CONCEPT AND CONSEQUENCES
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Abstract: Land abandonment, and the resulting decrease in Utilised Agricultural Area is a matter of great concern in regions within the European Union, among which Galicia is included. Precisely, the new Land Bank of Galicia has been put to work in 2007 to address this situation, related to many important issues in rural areas in Galicia: the catastrophic dimensions of forest fires, the decline and ageing of rural population, and an inefficient use of land which limits the competitiveness of the agricultural sector. It is worth noting, though, that the term abandonment itself needs some clarification. With this frame in mind, a theoretic discussion and a literature review on the subject are presented. Moreover, the paper emphasizes the multidimensional character of the problem and the need of complementing the economic studies with others, more focused on the territorial perspective.

Keywords: Land abandonment / Land bank / UAA / Marginal land / Forest fires.

1. INTRODUCTION

Land abandonment and the subsequent reduction of agricultural utilized area (UAA) has become an important issue in a number of regions and countries within the European Union. This is the case of Galicia, where one of the most relevant laws passed in 2007 has been the Law 7/2007 about the Land Bank of Galicia. This legislative measure was not particularly original, if we take into account that a similar project had been presented before the regional Parliament in 2003—although it was not finally passed—named draft bill on measures for the mobility of land parcels resulting from land consolidation processes in Galicia. The two

1 Law 7/2007, 21 May, about administrative and taxation measures for the conservation of agricultural utilized area and the Land Bank of Galicia, published on 31 May).
The aforementioned texts were entirely different in many aspects, but still they referred to the same problem, and this serves to confirm that topics like the decrease of UAA, the low mobility of the land market, and land abandonment are increasingly perceived as central issues related to the problems of contemporary Galician rural areas: catastrophic forest fires, decrease and ageing of rural population, and an inefficient use of the territory that hinders the competitiveness of the agricultural sector.

The reduction of UAA is a hot topic in peripheral and/or mountainous regions within the EU (among which Galicia can be included), as can be drawn from the 5,200 km² of abandoned agricultural land in the period 1990-2000 (EEA, 1996). The use of land banking to increase the average area of farms, and prevent in this way the negative effects of land abandonment, has a long tradition in European countries like France, the Netherlands, or Germany, and has also been proposed for most of the former socialist countries in Eastern Europe (van Dijk, 2006). Nevertheless, European tradition in this field focus primarily in the buying and selling of land by the bank itself, while the Galician land bank is primarily intended to act as an intermediary with almost no buying/selling capability, so the results obtained would be hardly comparable. Having this in mind, this work is not aimed at proposing specific actions, but to contribute to the theoretical debate about what is considered “abandonment”. Moreover, we will try to underline the multi-dimensional character of the process, which makes highly necessary to approach it from different scientific fields.

2. THEORETICAL CONCEPT

There is no single definition of the terms “land abandonment” or “abandoned land”, as each legal or scientific text uses its own. Differences of interpretation are sometimes important and sometimes not, but they generally come down to two categories: first, there is question of land abandonment seen as a state of land or as a process (i.e. a static-in-time approach versus a dynamic one); secondly, there is the question of whether it is the land or merely the agricultural activity that is being abandoned (Baudry, 1991; Pinto Correia, 1993). In the following sections we will explore these different approaches in more detail.

2.1. THE ABANDONMENT PROCESS: STATIC VERSUS DYNAMIC APPROACH

The total amount of population working in agriculture in Galicia has constantly decreased during the last decades. For example, the comparison of the population census of 1991 and 2001 shows a reduction of 55% (INE, 2008). While this was taking place, the total number of farms kept decreasing too (see figure 1), as can be

![Figure 1.- Number of farms in Galicia](image)

It is rather likely that the decrease in the number of farms will continue in the years to come because many of them are not viable in the mid term, either because of the lack of someone willing to take over the farm when the current owner retires (demographic viability), because of the lack of economic viability, or both (Sineiro García et al., 2004). As more and more farms continue to close one would suppose that the land they used to occupy would be available to be taken over by those farms still in the market. Notwithstanding, this is rarely the case, and in practice most of this land does not support any kind of activity and thus generates no income for its owners (López Iglesias, 1996). This situation is generally called “total abandonment” (DLG, 2005), and among its visible effects are the growth of natural vegetation and the deterioration of production structures (fences, rights of way, irrigation systems and the very own limits of the parcels). One of the problems with these effects is the fact that, after some years have passed, it becomes very difficult or even not feasible because of economic reasons to return the land to cultivation again (Balode et al., 1996; FAO, 2006). This static-in-time approach is included in Law 7/2007 under the concept of “abandoned land” (“predio abandonado”): “land which does not support any kind of agricultural activity...”.

In spite of what has been said, it is also true that many of the farms that are classified as not viable by theory remain active for a period of time much longer than expected. The reasons for this are many, sometimes the farm is legally transferred to the youngest spouse, sometimes there are external sources of income (e.g. part time farming), and sometimes it is even simpler: the owner continues working further than the age of retirement (López Iglesias, 1996; Sineiro García et al., 2004). In some of these cases the owner has less time available to work in the farm, in some others he/she is too old to carry out the same work as he/she used to, and for
one or other reason the way in which the farm is managed usually changes (Bal-
dock et al., 1996):

– The farm shifts towards less intensive productions.
– The same production is maintained, but in a less intensive way.
– The farm maintains or even intensifies the use in the best land, but ceases its ac-
tivities in the less productive, less accessible parcels.

Any of the aforementioned strategies can be considered a form of passive resis-
tance, and serves as an indicator of farm decline and, ultimately, of its foreseeable
closure in a not very far future. While closure does not take place, the level of
management of the land becomes occasional and generally very low. The land is
not strictly abandoned, but is near to, so this situation has usually been classified as
a form of “hidden abandonment” or “semi-abandonment” (DLG, 2005).

Hidden abandonment, as can be derived from its name, is not easy to detect on
the terrain because the growing of natural vegetation is under relative control by
the limited activities that are carried out. Total abandonment, on the other hand, is
much easier to identify, but includes in its definition many areas that might have
not been in use for decades. An intermediate option, would be to take into account
the lack of current use but also the condition of a recent agricultural past, as it is in-
cluded in the Law 7/2007 under the definition of “uncultivated land” (“predio in-
culto”): “land that supported agricultural activities in a recent past but is currently
covered by shrubs..”. Similar definitions are applied in Eastern European countries
like Poland, for example, where all agricultural land which has not been cultivated
for almost two years is considered abandoned land (DLG, 2005). We find this point
of view very interesting for the Law 7/2007, especially having in mind one of its
stated objectives: “to prevent the loss of utilized agricultural area, and to recover
what has been lost in the last years”.

2.2. COMPETITION OF OTHER USES: ABANDONMENT OF AGRICULTURE VERSUS
LAND ABANDONMENT

It has still not been explicitly said, but it is obvious that the cessation of agricul-
tural activities sometimes give place to other uses, among which affores-tation and
urbanization might be the most important. Having this in mind it becomes evident
the need to distinguish between the broader concept “abandonment of agricultural
activities” and the narrower “land abandonment”, the latter being reserved for those
cases in which no economic activity is being carried out at all.

The particular case of afforestations is very interesting, because the recent in-
crease in wooded area is generally praised among the professionals linked to the
forestry sector (e.g. Xunta de Galicia, 2001). This increase is due in part to natural
colonization by trees and in part to afforestation for timber production. It is worth saying that we are witnessing the transition from a previous policy, which encouraged afforestation without regard of the previous land use (e.g. afforestation of previous agricultural land, García Arias & Pérez Fra, 2001), to a new one which considers “abandoned land” those “tree plantations made on land that is highly suitable for agricultural use, when the understory vegetation is in a state which favours the spreading of wild fires” (Law 7/2007).

On the other hand, the occupation of land highly suitable for agricultural use by urbanization and afforestation has traditionally been favoured in Galicia by the total lack of planning, in spite of the letter of the Law for Spatial Planning in Galicia. A very important factor in this sense has been the low relevance of rural areas for planners (more strictly, urban planners), which can be relatively overcome with the recent Law of Planning as it includes specific categories for the protection of agricultural and wooded land. In any case, even though the law recognizes the soils of high quality as a non-renewable resource that deserves to be preserved, its application in daily practice becomes difficult because there are not rigorous, objective criteria that allow to identify it on maps, similarly to the ones included in the Territorial Plan for the Agricultural and Forest Sector of the Basque Country (Gobierno Vasco, 2005). The need for these models and criteria is likely to grow in the future, to preserve good soils from the demand of land for the production of biomass (estimated in some 17 millions of hectares in the EU; CE, 2005; Rowe et al., 2007).

3. LOCATION OF ABANDONED LAND

One of the terms closely related to abandonment is that of marginal land, which has traditionally been interpreted in the sense of land with low fertility and/or situated on steep slopes (Ellison, 1953; Cerdá, 2003). The link between marginality and abandonment is clear, because in case of adjustment of production the marginal land is usually the first to be abandoned. This fact is recognized, at the regional level, in the Directive 75/268/CEE in the form of less favoured areas for agriculture because of their biophysical conditions (mainly altitude and slope) which make them less competitive. But the experience has shown that other factors also affect the marginality of land, and indirectly the geographic location of abandonment: structural, social and economic factors also influence the suitability of land for agricultural uses (Baldock et al., 1996; FAO, 2006):

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3 Law 9/2002, of 30 December, about urban planning and protection of rural areas in Galicia, modified by the Law 15/2004, of 29 December.
Factors related to the kind of production, as it requires specific inputs.
- Structural factors such as parcel and farm size, irrigation systems, proximity to consumption centres.
- Economic factors such as variations in the prizes of inputs and outputs.
- Legal factors, property, subsidies, quotas.
- Social factors: farmers’ age, education and financial resources. Availability of younger relatives to take over the farm.

The complexity of all these factors prevents the location of abandoned land to follow a simple geographical pattern and makes the consequences worse, as the abandoned and non abandoned areas are frequently mixed up.

4. CONSEQUENCES

4.1. CONSEQUENCES FOR THE ENVIRONMENT AND THE LANDSCAPES

The environmental consequences of the cessation of agricultural activities are directly related to the changes that occur in the species composition and the density of the vegetation covering the ground. When the end of activities takes place a new cover of spontaneous vegetation starts to grow in the abandoned parcels, following a natural succession that starts with herbaceous species and leads to shrub formations and ultimately, in the absence of external disturbance, to tree stands (Prévosto et al., 2006). The speed with which this succession occurs depends on a number of factors, among which the characteristics of soil, climate, the proximity to other plant formations that could act as source of seeds, and the previous kind of agricultural activity can be cited (Sluiter, 2005). When cessation of agricultural activities does not lead to abandonment of land but to a change in use towards forestry activities, the result is similar and even faster: the transition to denser plant formations.

The higher density of biomass associated to the new land cover has an effect on the diversity of animal and plant species as well as on the quality of the resulting landscape, but the negative or positive nature of these effects is closely related to the pattern of the previous landscape. Thus, when this process takes place in areas previously occupied by traditional extensive agricultural systems (even when they were relatively intensive in terms of labour, like in Galicia) the encroachment of vegetation is considered negative because it is associated to the loss of valuable semi-natural habitats linked to human activity (High Nature Value farmland). These habitats are often represented in categories of the Natura 2000 network and

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are important for the conservation of many endangered species (EEA, 2004; DLG, 2005). It is also generally considered that the quality of the resultant landscape is lower than that of the previous one.

On the contrary, where abandonment takes place in areas previously characterized by intensive agriculture and low presence of natural vegetation, the consequences are generally considered to be positive from the environmental point of view. Among the reasons for this belief we can mention the increase in the variety of vegetation covers, the provision of shelter for some plant or animal species, a decrease in the use of pesticides and fertilizers, and the provision of a richer, more diverse landscape (Baldock et al., 1996; MacDonald et al., 2000).

We should also mention here the influence of abandonment on the rate of erosion and soil loss. The effects in this field are again dependent on the geographic area that we consider. Generally speaking, the effect is positive (i.e. the erosion is reduced) in regions characterized by gentle slopes and humid climate, where the denser vegetation associated to abandonment of agriculture helps to increase infiltration of rainfall and reduce runoff (Cammeraat & Imeson, 1999; Tasser et al., 2007). The opposite can be said of regions with Mediterranean climate, where the vegetation cover grows at a much slower rate. In this case abandonment can lead to an increase in erosion, especially if the terrain presents a steep slope and it is frequently associated to a deterioration of terraces (Cerdá, 2003; Dunjó et al., 2003; Begueria, 2006; Kolouri e Giourga, 2007). Some authors have suggested changes in hydrologic cycles, as a consequence of higher infiltration and transpiration associated to denser plant formations. These changes would take the form of a reduction of the frequency and volume of flooding (Keesstra et al., 2005) or even of mean river discharge (Tasser et al., 2007).

We could not finish this section without mentioning the link between abandonment of agriculture and forest fires. The nature of this link has to do not only with the increase in the quantity of biomass accumulated on the terrain but also with a strong increase in its continuity (Moreira et al., 2001; Romero Calcerrada & Perry, 2004; FAO, 2006; Millington, 2007). In Galicia, the abandonment of activities closely related to the traditional agricultural system (especially the use of shrubs as a natural fertilizer) is usually mentioned, but many of these activities were probably abandoned as early as the decade of 1960 as a consequence of the use of chemical fertilizers (Balboa López & Fernández Prieto, 2000). It may have been in recent decades that shrubs and trees occupied parcels that were used as arable land in the traditional system, thus bringing biomass accumulation closer to populated areas and creating the conditions for the dramatic forest fires of recent years. The experience in Galicia has shown that the usual approach to the problem of forest fires (i.e. building up a large force of fire fighters and equipping them with expensive technical means) is a strategic failure if used alone, and that the problem should be approached from a wider perspective (land planning). The recent Law
3/2007 about forest fires\(^5\) indicates a change in orientation as far as it states explicitly the link between abandonment of agri-cultural activities and importance of forest fires. A similar trend can be noticed in Portugal, where a new legal figure with a strong planning character (Zonas de Intervención Florestal, Forest Intervention Zones) is being put into existence\(^6\).

### 4.2. CULTURAL CONSEQUENCES

As we have already said, the abandonment of agricultural activities is usually attached to modifications of the rural landscape. Many of these rural landscapes have been moulded by human action for centuries, and the loss of their traditional features and characteristics is, by itself, a great cultural loss. The importance of this fact is even greater if we consider that the loss of knowledge about traditional practices and jobs usually goes along, as goes the loss of valuable traditional structures such as terraces, buildings or irrigation systems that were once created for the support of farming activities (Höchtl et al., 2005).

### 4.3. ECONOMIC CONSEQUENCES

The economic consequences are derived, in the first place, from the decrease of UAA, understood as a waste of agricultural land (an scarce, non renewable, valuable resource). In Galicia, López Iglesias (2000) explained how the abandonment of agricultural use on closing farms' land prevents the farms still on business to increase their area.

Another negative effect with economic consequences is the increase of certain animal populations which are favoured by the expansion of shrubs and tree cover (MacDonald et al., 2000; Suárez Seoane et al., 2002). These overgrown populations are sometimes responsible for damage caused to farmers. Typical examples of this are roe deer and wild boar.

Agricultural abandonment is also linked to the loss of population in rural areas and its concentration in cities. As it can be seen in figure 2, this process is still ongoing in Galicia: some of the municipalities have lost up to 24% of their population between 1998 and 2006 (INE, 2008), which has obviously been quite negative for their economy. The fact that rural population does not only shrink but also gets progressively older threatens to increase significantly the social expenditure (Fernández Leiceaga, 2000).

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\(^5\) Law 3/2007, of 9 April, about measures to fight forest fires in Galicia, published on 17 April.

Another very important economic consequence is related to the damage caused by forest fires, and has to be divided in two chapters: the expenditure in fire fighting equipment and personnel, which in Galicia approaches about 60 million euros annually; and, above all, the losses directly associated to the damage caused. As an example, the estimations of losses due to the fires of 2006 range between 211 million euros (Barrio et al., 2006) and 582 million euros (Picos, 2006). The fact that the former figure is calculated for the short term and the latter for the long term accounts for most of the difference between them, but in any case they are indeed impressive figures.

5. SOCIAL PERCEPTION

The way in which the local population perceives the process of agricultural abandonment (and, more specifically, the abandonment of land) is still not well studied in Galicia. Nevertheless, it is quite plausible to suppose that it includes a wide range of attitudes, depending on social extraction, urban or rural origin, sources of income, or age. An interesting work in this field is the one by Soliva (2006) for a small region of the Swiss Alps (Surses) which suffered a reduction in UAA of 35% between 1980 and 2000. The author summarized the answers of local inhabitants in four possible categories, ranging from a positive vision of the process (understood as an unavoidable consequence of progress) to a negative vision that considers abandonment a lack of respect for the work of ancestors and a waste of valuable resources. Similar results appear in Soliva et al. (2007), in this case not evaluating the perception of past changes but of those which -predictably- will happen in the future. In this work we can appreciate, moreover, differences between the inhabitants of different regions within the EU.
Despite the lack of similar studies in Galicia, it seems reasonable to suppose that opinions similar to those cited do exist among Galician citizens. In case this was true, it would be necessary to insist on dissemination works to explain to the public, both urban and rural, the opportunity and importance of measures such as the Galician Land Bank.

6. CONCLUSIONS

This paper presents a theoretic discussion about the different interpretations of the term “abandonment”. It emphasizes the need of making clear the difference between agricultural abandonment and land abandonment, even if in most of the occasions the former ultimately gives place to the latter. It is also strongly suggested that time should be explicitly taken into account to differentiate between land that has been recently abandoned and land that has not been used for agriculture for a very long time, not only because a similar distinction is made by the law 7/2007 but also because when the period of abandonment is long it becomes very difficult to restart agricultural activities. Hidden abandonment is also included as a different category that is not clearly visible on the terrain but should be considered as a potential case of total abandonment.

The multiple consequences of the process of agricultural abandonment were also explored, many of which are closely related to the big problems of rural areas in Galicia: loss of population, forest fires, and stagnation of the average farm area, for example. It was noted that, in spite of all its importance, agricultural abandonment has not been very studied in Galicia. Moreover, the only approach that had been used consisted on exploiting the data of the successive Agricultural Census, or conducting surveys among farmers (López Iglesias, 1996; Sineiro García et al., 2004). These proved to be very useful approaches, nevertheless, as they allowed to identify the relationship between abandonment and stagnation of the average farm area, as well as many of its causes, but the fact rests that the distribution of abandonment on the territory is still unknown. The actual area of abandoned agricultural land is not known, as well as its evolution along the time, and thus a need has been identified for future research that will contribute with an approach centred on the spatial component of the problem (a kind of study that is currently available for other areas of Europe, like those in MacDonald et al., 2000; Moreira et al., 2001; van Eetvelde & Antrop, 2004; Kristensen et al., 2004; Gellrich et al., 2006; Mottet et al., 2006; Tasser et al., 2007; van Doorn & Bakker, 2007). We believe that enough information exists about our territory -land use maps, aerial photography, or that contained in the Agricultural Parcels Geographic Information System (SIGPAC) of the Ministry of Agriculture- to support research and ultimately guarantee the success of initiatives like the Land Bank of Galicia.
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