



Farmland prices and land-use changes in periurban protected natural areas

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ARTICLE INFO

Article history:

Received 2 June 2011

Received in revised form 19 October 2011

Accepted 3 November 2011

Keywords:

Protected natural areas

Densely populated areas

Farming decline

Land-use change

Non-compliance

Spatial hedonic farmland price model

Externality

Land-development control policies

ABSTRACT

This paper provides empirical and conceptual insights in analysing the factors that determine the prices of farmland within Protected Natural Areas that are close to densely populated urban areas, the changes in land use experiences as well as the additional control policies needed to curb this unsustainable trend.

The Urdaibai Biosphere Reserve nearby the metropolitan area of Bilbao (Basque Country, Spain) is the case study considered and its bordering non-protected rural area is used as a reference for comparison. A spatial hedonic farmland price model is estimated and the willingness of land purchasers to pay for different farmland characteristics quantified both inside and outside the Urdaibai Biosphere Reserve. The main results are that: (1) residential development is taking place in all categories of farmland, (2) aside from neighbouring prices, farmland prices depend on different factors depending on whether the marketed plots stand inside or outside the Protected Natural Area, (3) the “reserve effect” on land prices is less powerful than the “proximity to the metropolitan area (and motorway) effect” observed from villages of the non-protected area located in the 3rd crown of Bilbao, (4) the reasons for farmers non-compliance with policy regulations is the necessary knowledge base for the farmland conservation policy design and (5) in the light of the results, three development-control policy instruments such as Payments for Ecosystem Services, Tradable Planning Permits and development-taxes are discussed considering the factors that could improve compliance.

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Introduction

When Plantinga et al. (2002) studied the determinants of agricultural land value on the United States scale, their results provided evidence that high prices were largely a result of (capitalized rents from) land development expectations, indicating that landowners face strong economic incentives to convert agricultural land.

A recent technical report of the European Environment Agency (2010) considers that land use is following an unsustainable trend in Europe (urban sprawl, land abandonment, etc.). In the case of Spain, the Observatorio de la Sostenibilidad (2009) also confirms that artificial surfaces will replace the forest and agricultural lands in non-protected areas in relatively short periods. Although its foresight is more hopeful for Protected Natural Areas (PNA), in which a lower number of transitions among the main categories of land (urban, agricultural, forest, etc.) and a higher proportion of stable areas are anticipated, in those PNAs situated close to densely populated areas experiencing an increased residential demand and a

constrained land supply, the high farmland prices are an indicator of land-use change.

The socio-economic development model that regulators aim to push in the rustic land of these PNAs wants to preserve their farmland for agricultural purposes because the conservation of biodiversity and the existing landscape is largely linked to maintaining existing farming activities. However, landowners and potential land buyers have interests in other activities that are more profitable for them. The observed market distortions associated with conflicting social/private interests existing in most periurban PNAs become an obstacle to protect their open space of high natural value.

This study is focused on analyzing the main drivers influencing land prices in Protected Natural Areas located near densely populated areas. A Spatial Hedonic Land Price Model has been estimated to understand the links among land prices, land characteristics and land-use changes. Converting land into residential, commercial and infrastructural uses causes irreversible transformations that negatively affect the natural functions of soils. Moreover, the “developed-land” does not cover the full costs it produces. The control of this externality requires new accompanying economic policy instruments that supplement the measures currently in force such as zoning, territorial planning and other command and control regulations.

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Case study background

In the Autonomous Region of the Basque Country, as in the rest of the humid zone in northern Spain, farming based on small-scale family farms is declining and becoming residual. The study area, located in this region, hosts a Protected Natural Area (Urdaibai Biosphere Reserve) whose conservation is linked largely to the maintenance of agricultural activities, but neither agricultural policies nor the reserve protection policies in force have succeeded in changing this trend. Furthermore, its proximity to densely populated areas (Metropolitan area of Bilbao) promotes the fact that non-agricultural uses (housing) are more profitable and determine the value of the land.

The Biosphere Reserve of Urdaibai (UBR) is located in the north of the Biscay province (Autonomous Region of the Basque Country) and represents 10% of its area (23,000 ha). It is a natural basin that is largely consistent with the administrative county of Busturialdea. This protected natural area is located on the fourth crown northeast of Bilbao. Urdaibai Reserve comprises of 22 municipalities, some of which include its entire surface within the protected space, and others only part of it, hosting more than 44,000 inhabitants. In the UBR, we distinguish, on one hand, the two towns classified as “urban Urdaibai” (Bermeo and Gernika) which gather most of the industrial and service activity in the county and about 74% of its inhabitants, and on the other hand, the remaining municipalities mainly rural villages dedicated to cattle ranching, agriculture and forestry, and an average population density that does not exceed the 46 inhabitants/km² called “rural Urdaibai.” These rural villages have a small urban centre around the church square, which concentrates the majority of community services, as well as several rural neighbourhoods with a small centre and scattered farms aside from these neighbourhood centres.

The Law on Protection and Country Planning of the Biosphere Reserve of Urdaibai was enacted in 1989. This law provides a special legal regime for Urdaibai in order to protect, integrate and enhance the recovery of the entire ecosystems. The law itself foresees the development of various instruments, the most relevant being the Master Plan for Use and Management (MPUM), whose approval was delayed until August 1993. The MPUM classifies the land into two broad categories: (1) *surface ordered by the town planning*, which are the urban land and the developable land, outside the scope of MPUM and (2) *surface that cannot be developed (rustic land)* and therefore is subject to a special protection regime because of the values that shelters. The planning and management of rural land rests with the MPUM.

Through its guidelines, the Master Plan gives priority to a rational and sustainable use of natural resources located in the rural land. In this sense, conservation of biodiversity and the existing landscape is linked largely to maintaining existing farming activities. In order to define and regulate land use and authorized construction acts, the MPUM subdivides the rural land in different categories according to their physical and ecological characteristics: Special Protection Area (SPA), Protection Area (PA), Area of Agricultural Interest (AAI), Forest Area (FA), Area of Rural Neighbourhood Centres (RNC), Common Rustic Land Area (CRLA) and Systems Area (SA).

A bordering area of the reserve has been used as a reference for comparison. This area has a strong rural character and is also characterized by its environmental and landscape quality. Closer and better links with the capital of the province (Bilbao) across the highway, give this non-protected surrounding area a more attractive location for housing and economic activities. The area considered includes part of the territory outside the reserve of two municipalities of Busturialdea County, plus five other municipalities bordering the left bank and external of the basin of the UBR (west). These villages belong to Uribe County and are closer to Bilbao, being part

of the third crown around the city. Finally, the coastal town of Ea, which belongs to Busturialdea but not part of the UBR, delimits the reserve on its right bank (east) belonging to a more distant city crown.

The mixed production of cattle, horticulture and forestry has been the pillar on which the Basque farm called *caserío* has sustained. These small-scale family farms are operated almost exclusively by family members with practically no employees. The average size of farms is quite small. In counties like Busturialdea the average farm surface do not exceeds 6 ha and in Uribe county its size is reduced to 2.66 ha, both a bit lower than the average size in Biscay province (7 ha).

According to census data and sanitation campaigns, heads of cattle have been declining in the period studied. However, while dairy cows have been reduced to less than half, the heads of beef cattle in extensive or semi-extensive ranching have increased. This restructuring from dairy to beef cattle is also observed in other areas (Aldanondo and Casanovas, 2009) due to the subsidies given for the cessation of dairy farms and the reduction in labour hours required by beef cattle. The shift in production has the virtue of avoiding a drastic professional break, while promoting the conservation of the fields and pastures. However, this step is often the prelude to the total abandonment of ranching (Murua et al., 2001).

Being an income supplement, horticultural production is secondary in Urdaibai farming; the farms that specialize in greenhouse and/or outdoor vegetable production are limited exceptions. However, in the area surrounding the reserve and belonging to Uribe County, the small size of their holdings, its flat topography, good sunshine and close proximity to major consumer areas favoured horticultural production. Its horticultural surface has experienced a sharp drop outdoors and a significant increase in greenhouses in both hectares and number of farms.

All villages studied outside the reserve, except Bakio, and eleven rural municipalities belonging to the UBR form part of the rural areas from Objective 2 of the European Union Structural Funds.

Forest ownership is quite fragmented in Urdaibai and its average size is around 6 ha. Along with a numerical majority of small forest owners,¹ live a relatively small number of owners that assemble much of the forest area, so that 5% of forest proprietors own more than 50% of the surface covered by fast growing species.

The Forest Inventory shows that the forest area of Urdaibai² has been reduced (17.6%), but still, is beyond the 19,000 ha,³ of which more than 11,000–12,000 ha are covered by fast-growing species such as insignis pine and eucalyptus. The forest area is less important in the contiguous county of Uribe in which these plantations with exotic species occupy a total of 6167 ha. However, the forest surface remains important in terms of land use, timber production, recreation, etc., although the negative price trend of timber is stifling its already low profitability and raising serious doubts about its future.

According to the Basque Farm Accountancy Data Network (FADN) the average income per Annual Work Unit (AWU)⁴ perceived by farmers and their families engaged in dairy and beef cattle in Biscay in 2003 was only slightly higher (8877.59 €/year and 6597.28 €/year) than the minimum wage (MW) approved in Spain

¹ The vast majority of farmhouses (as well as other private owners) own a greater or lesser extent of woodlands.

² Whereas the municipalities are taken as a whole.

³ Although under the MPUM zoning, the areas classified as forest (FA) reach 31% of the UBR surface, we see that forest lands actually extends to over 60%. This is a clear indication that forests have encroached areas that are more suitable for other uses (AAI, CRLA and RNC).

⁴ AWU (Annual Work Unit) is equal to work done by one person full-time over a year (228 full working days per year if it is the farmer/owner and 275 full working days if it is an employee).

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