

Preferences for Rural Living: Naturbanization Versus Accessibility

Ana M. Ferrero¹ & Inmaculada Astorkiza¹

¹ Department of Applied Economics, University of the Basque Country (UPV/EHU), Bilbao, Spain

Correspondence: Ana M. Ferrero, Department of Applied Economics, University of the Basque Country (UPV/EHU), Avda. Lehendakari Aguirre, n° 83, Bilbao, 48015, Spain. E-mail: ana.ferrero@ehu.eus

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Abstract

This paper aims to determine whether the urban sprawl onto the rustic lands of the Urdaibai Biosphere Reserve (UBR) is driven by the environmental and landscape qualities of this protected natural area and can be defined as “naturbanization”. Aware that residential choice factors are both complex and multidirectional, we have taken, as a comparison scenario, the unprotected rural area which borders with the Reserve (Ex UBR). This enables us to determine whether the housing preferences of new buyers are predominantly driven by the “reserve effect” (naturbanization), or by the appeal of the neighbouring unprotected area which is closer and better communicated to the city (accessibility) and presents less stringent building regulations.

Our findings for the UBR reveal a “reserve effect” that would support the naturbanization hypothesis, but the results obtained in both property markets show that the price-boosting impact of the “accessibility/proximity effect” in unprotected rural land is stronger than that of the UBR “reserve/naturbanization effect”.

Statistical tests conducted on the variables that determine urban sprawl into the non-developable rustic land of protected and unprotected areas serve to establish a definition/characterization of naturbanization that transcends the local/particular and applies to the general, becoming a small theoretical contribution on this issue. We conclude that naturbanization is characterized by factors that influence residential preferences of property buyers (house+rustic land) for protected natural areas. What gives naturbanization a distinctive characteristic is the subjection of such protected areas to specific conservation regulations that restrict choices and decisions of prospective buyers. These facts enrich our understanding of the tradeoffs between nature protection policies and economic development in these areas.

Keywords: residential choice, naturbanization, protected natural areas, land use and building restrictions, location, rustic non-developable land, rural municipalities

1. Introduction

Researchers have coined different terms to denote the phenomenon of urban sprawl or expansion into rural areas, such as rururbanization, counterurbanization, periurbanization, deurbanization, neoruralism, etc. These problems with respect to naming and defining the process stand as proof of its complexity.

While, from the empirical perspective, every case of residential development beyond the urban limit is unique, common features can be seen in changes in land uses, the socio-economic profile of the householders, housing formats, etc. In the analysis of this process in the environs of protected areas, the relationship between residential expansion, changes in the motives behind the migration towards rural areas, and the residential appeal of protected natural areas, provide the antecedents of “naturbanization”.

According to Prados (2006) the term naturbanization is a specific form of counter urbanization that arose as an attempt to sum up the residential appeal of protected natural areas. Nevertheless, it is not easy to identify a case of naturbanization, and there is little in the literature to fall back on. The methodological proposal followed in most studies for exploring this phenomenon is an empirical one, centred mainly on the study of the socioeconomic, territorial and landscape consequences of the arrival of newcomers to rural communities that have outstanding landscape and environmental values.

Following this approach, the paper takes a closer look at the characteristics of this phenomenon in the natural protected area known as the Urdaibai Biosphere Reserve (UBR) located in the North of Spain, in order to identify differences and similarities with other areas. The study area is affected by restrictive land-use and building policies,

where the urban development issue has become highly sensitive—public corruption allegations, house demolition orders, pending court cases, etc.

The main issue this paper aims to explore is whether designation as a protected natural area (with Biosphere Reserve status and specific standards of nature and landscape heritage protection and management), has special appeal for house buyers. To this end, we compare transacted estates/properties (“estate” or “property” is used to refer to a house and the land attached to it) sited on rustic land inside the Reserve (UBR) with others sited on the unprotected rural land surrounding it (Ex UBR). While both areas support very similar agro forestry activities and landscapes, the heart of the Reserve is particularly enhanced by the estuary of the River Oka, with its marshes, sands, Atlantic oak woods and coastal villages.

The main hypothesis is that, in residential location choice decisions, house-buyers nowadays prioritize variables relating to the characteristics of the setting, such as landscape value, biodiversity, environmental quality, etc.; but without ignoring other attributes, particularly, accessibility (proximity to the place of work and to basic urban services). All these factors produce different levels of welfare for each individual/household and thus serve as differentiating criteria in decisions concerning choice of house and location of residence.

The analysis follows an empirical approach based mainly on descriptive statistics. The inference employs parametric and nonparametric techniques to analyze if the relevant quantitative variables have a heterogeneous (different) performance on the UBR versus the unprotected surrounding area (Ex UBR). The qualitative variables are analyzed using frequencies and contingency tables.

The results of this analysis can enable us to establish a definition/characterization of naturbanization that transcends the local/particular and applies to the general, as well as to enrich our understanding of the tradeoffs between ecosystem protection policies and economic development in these areas.

2. The Study Area

Urdaibai, was awarded Biosphere Reserve status by UNESCO in 1984. Situated in the North of Spain, it stretches across 220Km², totally or partially encompassing 22 municipalities, 20 of them of a rural typology and 2 of a urban typology, with a total population of just over 44.000, and a considerable level of economic activity, hence its classification as a Humanized Natural Space.

Table 1 describes the population, surface area and density of the provincial capital and its areas of influence, which include the two areas under analysis. The area or county known as *Busturialdea-Urdaibai* almost totally coincides with that of the Reserve and is located in the north eastern section of the fourth belt (30-50 km from Bilbao). Most of the unprotected rustic lands outside the reserve belong to the villages of the *Uribe* county which are situated in the north eastern section of the third belt, and are closer to (20-30 km) and better connected with the capital.

Table 1. Population, surface and population density of Bilbao, main belts surrounding the city and study area

AREA	POPULATION (inhab.)	POPULATION (%ACBC)	SURFACE AREA (km ²)	POPULATION DENSITY (inhab./km ²)
City of Bilbao	353.168	16,5	41,2	8.572,0
Great Bilbao	847.328	39,6	314,7	2.692,5
Metropolitan Bilbao	904.439	42,2	499,4	1.811,1
Uribe County (3 rd belt, northeast direction)	50.628	2,4	212	238,8
Busturialdea-Urdaibai County ¹ (4 th belt, northeast direction)	45.010	2,1	282	159,6
Bizkaia Province	1.141.457	53,3	2.217	512,7
Autonomous Community of the Basque Country (ACBC)	2.141.860	100,0	7.089	292,0

Source: Authors' own construction based on INE.

We analyse the country estate/property markets (outside the urban planning area, that is, in rustic lands where building restrictions apply) in these two areas. Current legal restrictions on urban development in these areas have not stood in the way of considerable housing expansion in rustic lands of rural areas of the Autonomous Community of the Basque Country and elsewhere in Spain. Despite being subject to the tighter controls deriving from specific nature protection laws, the Urdaibai Biosphere Reserve is no stranger to this phenomenon.

Although the decline of the primary sector working population (Figure 1) and population of most of the rural municipalities in the UBR (Table 2) might suggest that there is little or no pressure on its property market (Table 3), the reality is in fact quite different and the rate of residential development on the rustic lands that concern us is increasing.

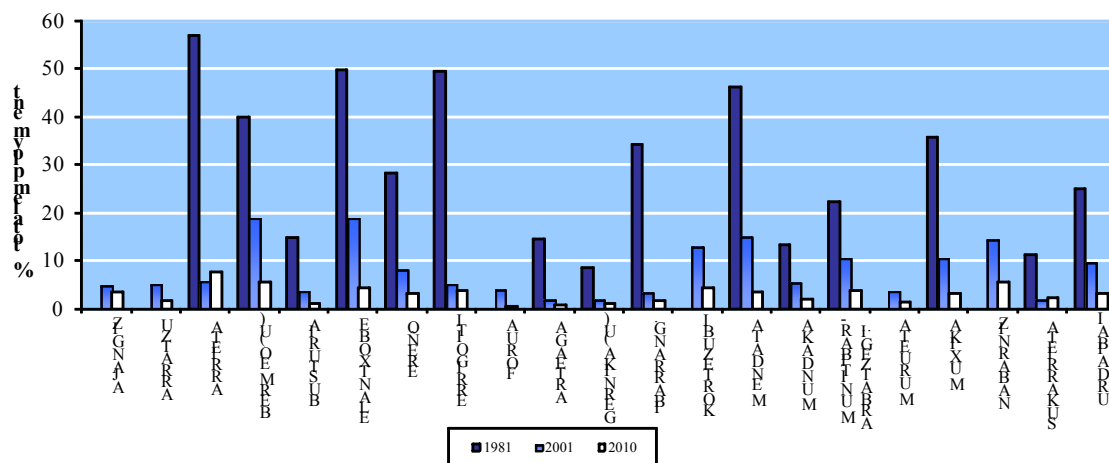


Figure 1. Primary sector¹ working population trends in Urdaibai Biosphere Reserve (1981-2010).

Source: Compiled by the authors from Eustat Population and Housing Census data (1981, 1991, 1996, 2001, 2010) (Note 1, Note 2 and Note 3).

Table 2. Spatial population distribution in Urdaibai Biosphere Reserve (1950-2011)

Areas & Municipalities	Years						
	1950	1960	1970	1981	1991	2001	2011
Ajangiz					361	434	458
Arratzu						368	379
Arrieta	1.017	873	679	469	422	521	542
Busturia	1.705	1.506	1.661	1.897	1.729	1.662	1.776
Elantxobe	901	817	759	577	550	443	423
Ereño	575	467	407	309	277	254	263
Errigoiti	1.150	917	671	530	440	485	557
Forua					949	987	979
G. Arteaga	1.233	1.064	977	758	752	843	879
Ibarranguelua	1.203	1.011	868	521	521	542	636
Kortezubi					383	363	430
Mendata	1.052	792	541	396	348	339	381
Mundaka	1.573	1.609	1.495	1.642	1.641	1.853	1.939
Munitibar	1.046	972	802	521	455	390	427
Murueta					201	259	308

Muxika	3.002	2.545	2.043	1.634	1.433	1.320	1.477
Nabarniz					251	221	236
Sukarrieta	551	342	222	262	280	325	354
RURAL URDAIBAI	15.008	12.915	11.125	9.516	10.993	11.609	12.454
Bermeo	12.517	13.781	17.745	18.262	17.923	16.938	17.078
Gernika	9.654	10.747	14.678	18.085	16.042	15.264	16.442
URBAN URDAIBAI	22.171	24.528	32.423	36.347	33.965	32.202	33.520
TOTAL URDAIBAI	37.179	37.443	43.548	45.863	44.958	43.811	45.974
BISCAY	569.188	754.383	1.043.310	1.189.278	1.155.106	1.122.637	1.153.351

Source: (a) Eustat Population and Housing Census data (1981, 1991, 2001, 2011); (b) Eustat population censuses (1900-1981) (Note 4 and Note 5).

Despite a long farming and fishing tradition, the Urdaibai county has, over the years, gradually lost primary sector jobs, which, despite having accounted for a quarter of all jobs up until the early eighties, had dwindled to 9.4% by 2001 and to a mere 3% by 2011.

In the rural municipalities of Urdaibai (where the fishing sector is insignificant) the share of employment in the primary sector is 4 or 5 times higher than the average for Biscay Province and the Autonomous Community of the Basque Country (ACBC) as a whole. However, between 1981 and 2011, the reduction in the share of the primary sector (from 29% to 2.51%) was greater here than in Urdaibai's urban municipalities, where it dropped from 23.6% to 3.27%. Two cases worth mentioning are the inland rural municipalities of Arrieta and Errigoiti (Figure 1) who, between 1981 and 2011, suffered employment declines of 57% to 7.54% and 49% to 3.80%, respectively.

Table 3. Housing in Urdaibai biosphere reserve (1981-2011)

AREAS & MUNICIPAL	1981			1991			2001			2011		
	Housing			Housing			Housing			Housing		
	Total	1st Home	2nd Home	Total	1st Home	2nd Home	Total	1st Home	2nd Home	Total	1st Home	2nd Home
Ajangiz				133	102	31	169	141	28	197	170	27
Arratzu				153	101	52	169	121	48	202	139	63
Arrieta	207	144	63	236	156	80	288	187	101	308	213	95
Busturia	1079	507	572	1076	489	587	1153	582	571	1354	693	661
Elantxobe	363	174	189	394	188	206	397	192	205	465	203	262
Ereño	111	80	31	106	71	35	110	76	34	119	105	14
Errigoiti	174	146	28	196	147	49	208	175	33	272	202	70
Forua				344	253	91	418	322	96	496	351	145
G. Arteaga	359	202	157	424	236	188	509	306	203	569	351	218
Ibarranguelua	457	166	291	496	170	326	508	231	277	676	280	396
Kortezubi				154	106	48	154	113	41	211	150	61
Mendata	201	103	98	168	106	62	195	118	77	207	129	78
Mundaka	1240	498	742	1248	520	728	1389	723	666	1593	855	738
Munitibar	192	128	64	214	133	81	219	133	86	304	183	121
Murueta				87	60	27	115	86	29	166	114	52
Muxika	555	389	166	556	383	173	615	412	203	610	495	115
Nabarniz				97	67	30	106	70	36	139	86	53

Sukarrieta	304	86	218	363	113	250	411	148	263	469	159	310
RURAL URDAIBAI	5245	2626	2619	6445	3401	3044	7133	4136	2997	8357	4878	3479
Bermeo	6574	4884	1689	6798	5363	1435	7.24	5980	1260	8432	7053	1379
Gernika	6080	4708	1372	5665	4547	1118	6424	5264	1160	7748	6922	826
URBAN URDAIBAI	12660	9.599	3061	12463	9.91	2553	13664	11244	2420	16180	13975	2205
TOTAL URDAIBAI	17905	12225	5680	18.908	13311	5597	20797	15380	5417	24537	18853	5684
BISCAY	405309	323341	81968	423686	348252	75434	464254	399833	64421	530355	453945	75741

Source: Compiled by the authors from Eustat population and Housing Census data (1981, 1991, 2001, 2011).

The appeal of these municipalities and their rural lands for the construction of first and second homes has grown due to factors such as their proximity to densely populated districts of the Bilbao metropolitan area, the appeal of living in a privileged natural setting, new trends in residential location, infrastructure improvements and price difference with similar houses in urban settings. Therefore the strict rules governing changes in land use imposed by biosphere reserve standards are not preventing a considerable part of this growth from taking place on rustic lands protected from urban development.

The Basque Country regional land law contemplates only three categories of non-urban or rustic land [Protected Land, Rural Neighbourhood Centre and Common Land], while the Master Plan for Land Use and Management (*MPLUM*) (Note 6) for the Urdaibai Biosphere Reserve has established seven broad land-classification categories based on the characteristics of the terrain and the degree of conservation need [Special Protection Area (*SPA*), Protection Area (*PA*), Area of Agricultural Interest (*AAI*), Forest Area (*FA*), Area of Rural Neighbourhood Centres (*ARNC*), Common Rustic Land Area (*CRLA*) and Systems Area (*SA*)].

These two legislative frameworks obviously coincide in allowing residential construction not linked to farming on non-urban land titled to what is known as a Rural Neighbourhood Centre (*ARNC*), that is, an area containing six or more farm houses situated around a public space which exerts as an agglutinating, character-defining force. The volume of residential growth permitted in any Rural Neighbourhood Centre is limited to no more than twice the existing number of houses, and the total number of houses (existing and planned) must not exceed thirty.

On the remainder of the rustic lands, both frameworks allow residential construction linked to agriculture and livestock farming (on the UBR, this is restricted to only two of the seven official land categories: Areas of Agricultural Interest -*AAI*- and Common Rustic Land Areas -*CRLA*-) subject to a series of minimum requirements, which, as the following Table 4 shows, are more stringent in the UBR. In addition, acting in the same spirit as the UBR's Master Plan for Land Use and Management (*MPLUM*), many municipalities within the Reserve have tightened up restrictions in this respect, in order to safeguard these lands for agricultural purposes.

Table 4. Minimum requirements for residential construction linked to agricultural and livestock activities

UBR	EX UBR
<u>Minimum farm unit:</u>	<u>Minimum farm unit:</u>
- <u>Area:</u> Dwelling must be physically included in a receiving plot of at least 25.000 m ² + 25.000 m ² of attached land.	- <u>Area:</u> 7.500 m ²
- <u>Labour:</u> 1 Annual Work Unit (AWU)	- <u>Labour:</u> 0.75 AWU
- <u>Others:</u> Applicant must be the head of the farm and/or figure as property owner in the deeds	- <u>Others:</u> Applicant must present a farmer's certificate, and demonstrate payment of farmers' Social Security and permanence in the activity

Source: Compiled by the authors from legislative sources.

3. Naturbanization and Its Antecedents

3.1 The Process of Urban Sprawl: Terminology Overview

Areas adjacent to cities have been the first to become land reserves intended for a variety of uses such as residential, commercial and economic. Initially these areas corresponded to the first ring built on the periphery of the cities, and therefore, were spatial neighbors to those cities (Ferrás, 2000). This first perimeter around the urban core has been called suburban area or area of suburbanization (Ferrer & Urdiales, 1995). Over time, and given their proximity to the city, these spaces have acquired both a physical and functional continuity (Lopez de Lucio, 2005; Font de Arellano, 2005). In recent decades, however, urban growth has not occurred in the immediate suburbs, but in more distant and, until that point, sparsely populated rural areas (Aquachar-charpentière, 1997). If space is divided around urban centers in concentric circles or crowns, the new spaces would correspond to the second and third peri-urban crowns (Kayser, 1990) (Note 7).

The complexity of the phenomenon has led it to be studied from a multidisciplinary perspective (economic, sociological, urban and geographical). The literature review of theoretical studies (among others Bruecker, 1983; Ferras, 1998; Prados, 2008; Banai, 2015) and of empirical research developed in different peri-urban areas and periods (including Bunce et al., 2001; Lourenço et al., 2009; Miralles-Guasch & Tulla, 2012; Mohammady et al., 2012; Thaler, 2014; Kolankiewicz, 2014; etc.) allows one to conclude that the process of urban sprawl has morphological and typological modalities that vary from one area to another, depending on the location of the rural areas with respect to the nuclei that give rise to them. In the areas closest to the core the phenomenon is very intense, while in those farthest away it is less marked and sometimes nonexistent.

The dynamic of urban sprawl is a process of spatial occupation accompanied by population growth, where residential expansion is both the cause and the consequence. The process is typical of those rural areas located either in the vicinity of cities or those with good accessibility (infrastructure) by road, rail, etc. (Dematteis, 1998). It is also a function of incentive policies designed to influence real-estate, economic and social objectives (Boon et al., 2002; Craviotti, 2007; Lamb, 2007; Litman, 2015). Meanwhile, rural areas located beyond these settlements often continue to diminish in population and activity.

The functionality of peri-urban rural areas has changed. They have gone from spaces preferably engaged in agricultural/productive activities to multiactivity spaces reconstruction, tourism, nature conservation, landscape protection, housing, etc. (Heins, 2004). These functions are known in the Anglo-Saxon literature as “p” functions, “play functions”, “production functions”, “protection functions”, to which we must add a fourth function that depends on the location of these peri-urban areas, “place functions” (Bryant, 2005). This creates innumerable conflicts in land use (Larcher, 1998; Elbersen & Meadows, 1999; Torre et al., 2005; Holmes, 2006; Beard & Mercadé, 2007).

Researchers and experts have coined different terms to denote the phenomenon of urban sprawl or expansion into rural areas. The list is long: *rururbanization* (Bauer & Roux, 1976; Ferras, 1998) is used to describe the disperse urbanization of rural areas both close to and distant from urban areas; *counterurbanization* (Berry, 1976; Cloke, 1985; Fielding, 1982; Champion, 1989; Halfacree, 1994) is used to denote the opposite phenomenon to urbanization; *periurbanization or ex-urbanization* (Aquachar-Charpentière, 1997) are used in reference to the urbanization of the urban periphery; *deurbanization* (Entrena, 2004) is a term that draws on economic cycle theory; *Neoruralism* (Nogué, 1988; Hervouet, 2005; Rivera, 2009) is used to define a migratory phenomenon involving a flow of population from urban to rural areas; it has a strong ideological basis—the return to nature and the desire for an alternative lifestyle. It is driven not by economic motives, but by the desire to live freely in a peaceful, pollution-free setting with a degree of landscape quality. It has a much less ideological focus than it used to, however.

At the same time, attempts to limit and/or redefine what we mean by “city” have given rise to new concepts, such as the region-city, the global city, the disperse city, the edge city (Note 8), and the flow space (Nel.lo, 1998; Muñoz, 2004). The choice of term varies in relation to the perspective (spatial, residential, or social) from which the process is being analysed, the distance separating the periurban centres from the city, the role of urban planning, and the associated global/local environmental impact.

Standard interpretations of these terms have not yet been established and they tend to be used in the research according to the spatial characteristics of the area under analysis. Definitions revolve around factors ranging from land use to population density, and from the origins of the phenomenon to its consequences; and may even be specific to a particular city. Given the diversity and specificity of existing cases, this type of definition tends to illustrate the phenomenon without properly defining it.

In short, different terms are often used to describe the same basic idea and vice versa: the same concept can represent various different circumstances. These problems with respect to naming and defining the process stand as proof of its complexity.

3.2 Special Reference to Naturbanization

What culminated in what was to be termed “naturbanization” began as a series of urban deconcentration processes. While, from the empirical perspective, every case of residential development beyond the urban limit is unique, common features can be seen in housing formats, changes in land uses, the socio-economic profile of the householders, etc. In the analysis of this process in the environs of protected areas such as the National Parks of Doñana and Sierra Nevada (Prados, 2005; Doctor et al., 2012; Pallares et al., 2014), or the Pyrenees (Tulla et al., 2009), and in other European case studies examining the relationship between residential expansion (Raszka, 2015) changes in the motives behind the migration towards rural areas, and the residential appeal of protected natural areas, provide the antecedents of naturbanization.

A key factor in all this is the finding it is not the city and its problems that are driving this population shift, but, rather, a growing preference for rural living in smaller communities at increasing distances from the city centre. Our awareness of the fact that the main motive for moving house is to enjoy the landscape and environmental value of protected natural areas and their surrounds, has left us with a new term: naturbanization.

Specifically, the term naturbanization arose as an attempt to sum up the residential appeal of protected natural areas. A priori, these areas have stricter building restrictions, but the threat of urbanization sometimes becomes a reality, as urban planning do not always respect environmental standards, and one way around the law is to reclassify the land (Delgado, 2008, 2012). The new term focuses on the environmental value of these areas which stirs preferences, which, in turn, drive the migratory flow to the areas where they can be satisfied (Van Dam et al., 2002; Heins, 2004). It is a specific form of counterurbanization, according to Prados (2006, p. 90), who narrowed it down to “a broad concept referring to the consequences, in socioeconomic, territorial and landscape terms, of the arrival of newcomers to rural communities”.

It is not easy to identify a case of naturbanization, and there is little in the literature to fall back on. It is, however, an empirical phenomenon, as confirmed in studies by Van Dam et al. (2002) and Heins (2004) for Holland, Lourenço (2009) for Portugal, Campagna (2009) for Italy, Gude et al. (2005) for the US, or Elbersen et al. (1999), Prados (2005, 2009, 2011), Vera et al. (2011) and Pallares et al. (2014) for Spain. The methodological proposal for exploring this phenomenon is the same as for all the other terms listed above. According to Prados (2011), it should centre mainly on the study of migratory movements towards areas of appeal, with particular emphasis on the characteristics of the population segments involved, including age, reasons for moving house, income, and educational attainment, and should also consider the repercussions of the increase in the area of land occupied by housing.

Compiling a list of all the different terms used in relation to territorial occupation and the socio-economic impact of urban sprawl, and adapting them to the area under analysis is no easy task. On the one hand, despite some differences, the set of concepts used to describe the process basically explain the same phenomenon from whatever analytical perspective (spatial, residential, or social) is chosen to examine the process, also taking into account the distance of the periurban centres from the city, the role of urban planning, and the associated global/local environmental impacts. In addition, a protected natural area has, by definition, great environmental value, and thus provides a suitable setting for analyzing the naturbanization process. In short, our chosen research object will enable us to obtain a deeper understanding of the specific characteristics of the residential expansion process that is taking place on rustic non-developable land of protected natural areas, and thereby help us to identify its singularities and commonalities with respect to neighbouring unprotected areas.

4. Rustic Land. Database and Methodology

4.1 Compilation of the Database

Strictly speaking, rustic land is intended not for residential purposes, since it is mainly occupied by agriculture, livestock and forestry activities. However, the primary sector in the study area is based on small, largely uncompetitive, family farms, with problems of generational renewal that have led to their decline. Nevertheless, in a desire to protect the open spaces used by agricultural activity, the only residential development permitted on “Areas of Agricultural Interest” (AAI) and on “Common Rustic Land Areas” (CRLA) must be linked to agriculture and livestock farming. Building for strictly residential use is allowed only in “Areas of Rural Neighbourhood Centres” (ARNC).

Within the Reserve, rustic lands not classed as Areas of Rural Neighbourhood Centres (ARNC) can belong to one of six categories abovementioned based on the degree of protection [SPA, PA, AAI, FA, CRLA and SA]. Rustic land outside the Reserve is classified into three categories, but it can be simplified in two broad Areas Rural Neighbourhood Centres (ARNC) and the rest of the rustic land (*Non-ARNC*). This simpler classification is more useful for comparing and contrasting transacted properties and their owners in the both areas we wish to study.

There are virtually no existing statistics on the characteristics and prices of country properties (farmhouse and rustic lands attached). Overcoming legal restrictions on the use of personal data, the information for this study was collected from primary data sources including: (1) the Land Registry for records and characteristics of rustic property transactions, (2) the Cadastre and Valuation Section of the Biscay Province Council for the geo-referencing and fiscal valuation of properties on the rustic map of each municipality, and (3) a survey of new owners.

The land ownership records were not computerized and were found inadequate to characterize the new owners, houses and attached lands since there is no recording formula that would guarantee a basic minimum dataset.

Ascertaining the final transaction price also proved difficult, since neither the real estate offer prices nor the declared prices of the houses (for fiscal purposes) reflect the actual price paid. Appraisals of house prices by finance intermediaries (banks) are the closest approximation to the real market value. Thus, although the target population was carefully defined, the sample finally used in the study includes only a portion of the registered transactions, that is, those constructed or purchased through a finance intermediary.

We complete the data, therefore, by means of a direct survey based on personal interviews with land owners (Note 9). The questionnaire contained 67 questions grouped as follows:

- House structure and attached land characteristics (surface area of house and land, number of rooms, heating system, connection to the municipal sewage system, etc.).
- House location and accessibility (zone, land type, distance and/or driving time to the nearest urban centre, to motorway entry, and to nearest city, etc.).
- Characteristics of the Biosphere Reserve.
- Socio-economic characteristics of the owners (age, educational attainment, occupation, place of birth, prior place of residence, etc.).

The data were completed and/or validated by using other information sources, such as the inventory of new buildings held by the Reserve Trust, and the inventory of isolated new buildings situated on rustic land inside Urdaibai and not defined as a Rural Neighbourhood Centre (ARNC) (Aranda, 2001).

The next step was the laborious compilation of two databases, one for the Reserve and another for the adjacent unprotected area. The first consists of country estates/properties (Note 10) transacted between January 2000 and May 2011 occupying rustic land within the UBR and supporting either new builds or pre-existing houses. The second "Ex-UBR" database, which was compiled for purposes of comparison and contrast, reports the same set of variables for land outside the Reserve. Five rural municipalities were selected based on their high landscape value and closer proximity to the provincial capital.

These data were analysed using descriptive techniques and multivariate analysis in order to describe the market for estates/properties on rustic land in the two study areas.

4.2 Methodology

To answer the questions raised by the research, various statistical methods are used in the case study. First, for the most relevant quantitative variables, hypothesis testing about the differences between groups are realized through an analysis of variance. This analysis determines whether the characterizing variables of estates (such as the price of estate, house size, surface area of attached land, distance from municipal center, distance from county's nearest main town, distance from provincial capital, etc.) have a heterogeneous behavior in both geographical areas (UBR/Ex UBR). The analysis is extended to groups of farms generated according to other criteria, such as the type of rustic land on which they are located (ARNC/Non ARNC) and the type of construction (NB/Non NB). When this type of analysis is inappropriate, on the grounds that circumstances do not allow its use, nonparametric techniques are used.

Second, frequencies and contingency tables are used for the exploitation of qualitative information. Frequencies and percentages are organized in cells that contain information about the relationship among the different criteria.

5. Characterization of the Rustic Property Market

- Primary results extracted from the parametric and non-parametric analysis

We first need to determine whether the estate/house characteristic variables such as the price of the property, the total square metres of the building, the surface area of the attached land, distances and driving times to the municipal centre and the nearest main town, etc., yield heterogeneous results for sites located within the UBR and those located in its bordering unprotected area (Ex UBR). In other words, we wish to see if there are any significant differences between the variables relating to the type of space involved that would support the naturbanization hypothesis, and that would provide a reliable guide to the type and characteristics of the houses and their attached plots in each space.

To this end, we performed a factor analysis of the variance. This technique is commonly used to test for differences in the behaviour of one or more independent non-metric variables or factors with which to divide the sample into categories or levels of a dependent metric variable. It is similar to, albeit more complex than, the analysis of variance (for a single factor), which, in turn, is an extension of the test of difference of means, which reveals the existence of significant differences between the means of several samples or groups defined by the independent variable or factor. In the analysis of variance, the comparison is based on the F distribution, which is used to compare two variances; within-group variance, that is, the variation between the observations within each group (internal variance), taking any variation between them to be random; and inter-group variance, which compares the means of the various groups (external variance), always assuming the possible presence of both systematic and random variation. Table 5 summarises the results.

Table 5. Results of group heterogeneity using parametric analysis

GEOGRAPHICAL AREA: UBR/EX UBR*	RUSTIC LAND TYPE: ARNC/NON ARNC*	TYPE OF CONSTRUCTION: NB/NON NB*
House size	House size	Price of estate/property
Municipal population size	Surface area of attached land	
Distance from county's nearest main town	Distance from municipal centre	
Driving time from county's nrst main town	Driving time from municipal centre	
Distance from provincial capital		
Driving time from prov. Capital		

Source: Authors' own construction based on data drawn from (a) Land registry of property transactions, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to the new owners.

* Note 11, Note 12, Note 13.

The price of country property differs only for groups defined by type of construction, that is, whether the property contains an old house or a new build. New builds are considered to include not only complete new builds but also rebuilds and restorations, which differ more in legal than in practical terms. Restorations are *de facto* new builds, usually involving ruined farm-houses originally built before the UBR's Master Plan for Land Use and Management (MPLUM) came into force. Attached land size is included as an additional active variable.

UBR properties differ from Ex-UBR properties in terms of living space in the house, population size of municipality where property is located, and distance and driving time to the county main town and to the provincial capital. Likewise, properties on Areas of Rural Neighbourhood Centres (ARNC) differ from those on Non-ARNC in terms of house size and surface of attached plots as well as distance and driving time to their municipal centre (Note 14).

The estimated average marginal property prices for the interaction terms of geographical area by rustic land type (Figure 2) and geographical area by type of construction (Figure 3) reveal little variance, and prices for properties inside the protected natural area, irrespective of rustic land category and type of construction, appear, if anything, slightly lower because of their distance from and poorer connections with the provincial capital. In general, properties containing new houses reach higher prices than those being composed of old buildings, both inside and outside the Reserve. Furthermore, property prices in rural neighbourhood centres are higher than in other rural sites, and the difference is greater inside than outside the Reserve.

This observed “Reserve effect” supports the naturbanization hypothesis. On the one hand, prices rise as a result of the Reserve’s environmental quality label and the rigidity of its housing supply, but this increase is offset by the UBR’s stringent building restrictions dissuading potential buyers. The adjacent unprotected area, helped by the “proximity-of-the-capital effect” and less stringent building regulations, shows an upward trend in housing demand and prices. As might be expected, the results show that the price-boosting force of the “proximity effect” is stronger than that of the “Reserve effect”.

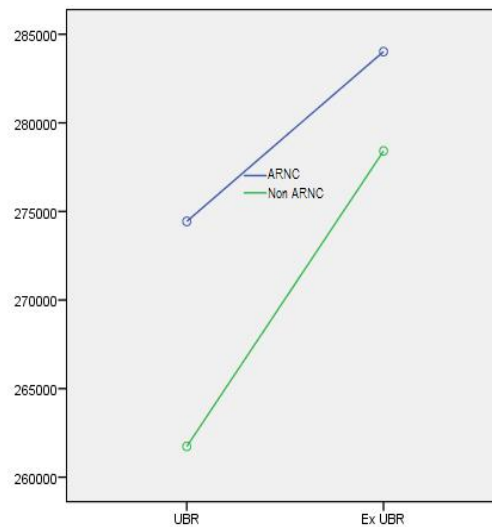


Figure 2. Estimated average marginal prices per geographical area and rustic land type

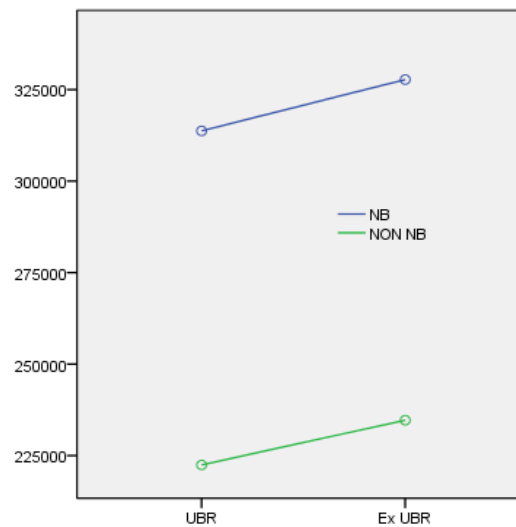


Figure 3. Estimated average marginal prices per geographical area and type of construction

Although three-factor ANOVA analysis requires normality and homoscedasticity of the variables, some of our study variables fail to satisfy these properties (Table 6). However, despite evidence to show that Fisher-Snedecor F tests in ANOVA are robust to these requirements except in extreme cases (Mongay, 2005; Hair et al., 2006), we, nevertheless, perform a non-parametric analysis for variables that violate the two above mentioned assumptions. Traditional difference of means tests, such as the Mann-Whitney U, or the Kolmogorov-Smirnov Z test, will serve to confirm and/or reject the above findings.

Table 6. Normality and homoscedasticity of the most relevant quantitative variables

VARIABLES	NORMALITY		HOMOSCEDASTICITY	
	Z Kolmogorov-Smirnov test		Levene test	
	Statistic	Significance*	Statistic	Significance
Price of estate/property	1,511	0,021	1,586	0,141
House size	1,258	0,084	1,900	0,071
Surface area of attached land	3,602	0,000	7,761	0,000
Garage size	5,016	0,000	7,804	0,006
Distance from municipal centre	2,462	0,000	1,919	0,068
Distance from county's nrst main town	1,501	0,022	1,072	0,382
Distance from provincial capital	1,105	0,174	1,433	0,193
Driving time from municipal centre	3,002	0,000	2,396	0,022
Driving time from county's nrst main town	1,827	0,003	1,047	0,399
Driving time from provincial capital	1,521	0,020	1,453	0,185

Source: Authors' own construction based on data drawn from (a) Land registry of property transactions, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to the new owners. * Note 15.

Table 7 offers a summary of the parametric and non-parametric statistical analyses showing which variables behave significantly differently according to geographical area, rustic land category and type of construction. We consider the ANOVA results of those variables satisfying normality and homoscedasticity criteria, and for the remaining variables we consider both the results of the factorial analysis of variance and those of the non-parametric tests, entering "Yes" if the result is the same for both methods and "No" otherwise.

Table 7. Summary of the parametric and non-parametric tests of homogeneity of variables for the defined categories

VARIABLES	GEOGRAPHICAL AREA:	RUSTIC LAND TYPE:	TYPE OF CONSTRUCTION:
	(UBR/EX UBR)	(ARNC/NON ARNC)	(NB/NON NB)
Price of estate/property	Yes	No	Yes
House size	Yes	Yes	No
Surface area of attached land	No	Yes	No
Garage size	No	No	No
Distance from municipal centre	No	Yes	No
Driving time from municipal centre	No	Yes	No
Distance from county's nrst main town	Yes	No	No
Driving time from county's nrst main town	Yes	No	No
Distance from provincial capital	Yes	No	No
Driving time from prov. capital	Yes	No	No

Source: Authors' own construction based on data drawn from (a) Land registry of property transactions, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to the new owners.

The same basic findings are repeated; while property prices are quite similar inside the Reserve as on its periphery, the size of the house, the distance and time to the provincial capital and the nearest main town influence the price inside and outside the Reserve.

- Characterization of types of residence

- ✓ First homes versus second homes

Traditionally, rural Urdaibai's second home population has been concentrated mainly in its coastal beach and resort towns. A floating population uses second homes at weekends and during the summer months.

Table 8 shows the figures of newly purchased and/or newly built first and second homes, inside and outside the UBR, by rural land category (ARNC/Non ARNC). Irrespective location and type of construction, most of the dwellings purchased in the UBR are first homes (82.5%), while the remaining 17.5% are holiday homes.

Table 8. Rural housing distribution by geographical area, rustic land category, type of residence and type of construction (%)

TYPE OF CONSTRUCTION	GEOGRAPHICAL AREA: UBR				TYPE OF CONSTRUCTION	GEOGRAPHICAL AREA: EX UBR			
	MAIN RESIDENCE		SECONDARY RESIDENCE			MAIN RESIDENCE		SECONDARY RESIDENCE	
	ARNC	NON ARNC	ARNC	NON ARNC		ARNC	NON ARNC	ARNC	NON ARNC
NB	61	49	17	59	NB	55	80	16	14
NON NB	39	51	83	41	NON NB	45	20	84	86
TOTAL	100	100	100	100	TOTAL	100	100	100	100

Source: Authors' own construction based on data drawn from (a) Land registry of property transactions and (b) Survey to the new owners.

The house owners surveyed commute distances of between 24 km and 50 km. The property characteristics that have led to the large number of transactions in rustic lands outside the Reserve, nearer to the provincial capital, have also had some impact inside the UBR, since the available properties vary in terms of distance and ease of connection with the provincial capital.

The rural municipalities with highest numbers of first-home and second-home purchase transactions in Urdaibai all share a decisive geographical location. One is Muxika, among the UBR towns closest in time and distance to Bilbao and bordering with the nearest main town, Gernika. Similar circumstances apply to Mendata, which is a five-minute drive from the nearest railway and bus stations and has close access to the A-8 motorway to Bilbao.

The chi-squared and likelihood ratio tests of independence (Table 9) confirm that the distribution of the variable "first versus second home" (type of residence) is the same for the protected area as for the unprotected area adjacent to it. We also find confirmation for the null hypothesis of independence of rustic land category and type of residence.

Furthermore, the results of the tests of conditional independence (Cochran's test), one to control for the effect of rustic land category in the relationship between geographical area and type of residence, and another to control for the effect of geographical area in the relationship between rustic land category and type of residence, show that there is not enough evidence to confirm the presence of significant type-of-residence variation in the property distribution of the two areas: UBR and ex-UBR. The same finding emerges when controlling for the effect of geographical area, where, again, no variation is found in the type of residence (main/secondary) of properties located in both rustic land categories (ARNC/Non ARNC).

Table 9. Test of independence between geographical area and type of residence and between rustic land category and type of residence and a test of conditional independence

STATISTICS		GEOGRAPHICAL AREA- TYPE OF RESIDENCE	RUSTIC LAND CATEGORY-TYPE OF RESIDENCE
CHI-SQUARED	Value	0,050	0,391
	Sig.	0,823	0,523
LIKELIHOOD RATIO	Value	0,050	0,392

	Sig.	0,823	0,531
COCHRAN	Value	0,032 ^(Note 16)	0,373 ^(Note17)
	Sig.	0,858 ^(Note 16)	0,193 ^(Note17)

Source: Authors' own construction based on data drawn from (a) Land registry, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to the new owners.

✓ Housing patterns

Restrictions for building on rustic land, especially inside a protected natural area, confine the sitting of new builds to rural neighbourhood centres, which are the only places where construction for strictly residential use is allowed.

Building conversions are also very common both inside and outside ARNCs. Although condominiums are uncommon in the rustic areas included in the study, in the ARNCs there are some two- and (at most) three-level apartment buildings converted from former mills or factories. This is reflected in the sample, which contains a few buildings divided either vertically or horizontally into three or four homes.

The overall majority of houses, both New Builds (NB) and resales (Non NB), fall into the category of single-family dwellings; thus, 65.6% of new builds are detached houses which, together with semi-detached (two-family) houses make up as much as 98.4% of the total (Table 10). A similar picture exists in the unprotected area outside the Reserve, where 66.2% of new builds are detached and 29.2% are semi-detached houses.

Table 10. Housing patterns by geographical area and type of construction (%)

HOUSING FORMAT	UBR		EX UBR	
	NB	NON NB	NB	NON NB
Detached (single family dwellings)	65,6	64,3	66,2	37,0
Semidetached (two family dwellings)	32,8	33,9	29,2	47,8
Other	1,6	1,8	4,6	15,2
TOTAL	100	100	100	100

Source: Authors' own construction based on data drawn from (a) Land registry, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to new owners.

This is the typical housing pattern in both study areas, as confirmed by the very low percentage of used dwelling resales that are neither detached nor semi-detached, 1.78% in the UBR and slightly more (15.21%) Ex UBR.

Detached houses are the most salient feature and one of the drivers of urban sprawl in rural areas. This housing pattern has been shaped partly by a demand characterised by a preference for rural living, avoidance of noisy neighbours, and a desire for the enjoyment of owning a piece of land; and partly by supply which is constrained by laws prohibiting apartment blocks and fomenting low-rise residential construction with a limit on building volume, mandatory architectural style guidelines, etc. In other words, the supply pattern is predetermined by rules dictating what type of homes can be built (Note 18).

However, house formats and, ultimately, house prices are not the only discriminating factors in housing demand, which is also determined by local government policies, the proximity to more densely populated towns, as well as the supply of transport, infrastructure and other services.

Prices paid were assessed in relation to the quality of views from the house, which were grouped into three landscape value categories (poor, unexceptional and excellent) in an attempt to test the independence of the two variables (average price paid and landscape value). Similar studies were carried out for the UBR and the adjacent Ex UBR area. Potentially significant differences were found among house prices in the UBR but not in the adjacent area outside it (Table 11).

Table 11. Average price index of properties by geographical area and landscape value categories (min average price=100)

LANDSCAPE VALUE (quality of views from de house)	UBR	EX UBR
Poor	100	135
Medium (Unexceptional)	141	143
Excellent	150	148

Source: Authors' own construction based on data drawn from (a) Land registry, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to new owners.

As might be expected, results in Table 12 shows an association between top-price properties and high landscape values and between cheaper properties and lower landscape values. This association has a particular strength in the UBR, since average prices of the three defined landscape value categories varies little in the Ex UBR area. The properties with excellent views of the UBR present the highest average price, although, in general terms, prices are higher in the unprotected area.

Table 12. Results of property price homogeneity according to the quality of the views

PRICE- LANDSCAPE VALUE	UBR				EX UBR			
	KRUSKAL		MEDIAN		KRUSKAL		MEDIAN	
	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.	Statistic	Sig.
	13,887	0,001	12,516	0,002	2,314	0,314	1,183	0,554

GROUPS OF LANDSCAPE VALUE	UBR	
	U MANN-WHITNEY	Z KOLMOGOROV-SMI RNOV
	Poor-Medium	Yes
Poor-Excellent	Yes	Yes
Medium-Excellent	No	No

Source: Authors' own construction based on data drawn from (a) Land registry, (b) Cadastre and valuation section of the Biscay province council and (c) Survey to new owners.

To check these results we tested the homogeneity of property prices according to landscape value categories. Given the significance of the results for the UBR, we returned to run the tests of Mann-Whitney and Kolmogorov-Smirnov Z to identify which groups differed. The results are shown in the same Table 12 differences are observed between houses with poor versus medium (unexceptional) views, and, as might be expected, between houses with excellent versus poor views. No average price differences were observed, however, for houses with unexceptional (medium) versus excellent views.

6. Characterization of New Owners

To ensure rigour, the naturbanization hypothesis must be tested with a combination of different indicators. Demographic growth has resulted in a different new settler profile. They have no attachment to agricultural or livestock activities, come from the urban setting nearby, and tend to have medium to high levels of income and educational attainment.

Here, the characterizing variables, unlike in the previous analysis, are predominantly categorical. We examined the correlation of the socio-demographic characteristics of the owners (occupation, level of educational attainment, etc.) with the selected grouping variables—geographical area, rustic land type, type of construction—to detect possible differences in their behavioural patterns.

The statistical methods used in the analysis were contingency tables and hypothesis tests (the Kruskal-Wallis test, the median test, the Mann Whitney U test, Pearson's χ^2 test, the likelihood ratio test, Cochran's χ^2 test, etc.). The two methods complement each other because tests of independence in very large samples can yield significant results even though the differences might not really be relevant, as noted by Barón and Téllez (2005). In overall terms, the two study areas were not significantly different in terms of demographic variables.

- New owners: origin and demographic dynamics

In half a century, from 1950 to 2001, the total population of the protected natural area grew by 17.8%, which is a rate of 0.3% per year, and well below the 1.9% annual growth rate of the province as a whole. However, while the urban population of the area was increasing at an annual rate of 0.9%, its rural population was falling by close to 0.4%. These historic trends (rising urban population and falling rural population) reversed in the last 15 years of the study period.

The period 1986-2001, however, was marked by negative vegetative growth in the population of Urdaibai; a situation which reached critical proportions in the rural part of Urdaibai, where the decline in vegetative growth per thousand inhabitants was greater in absolute terms than in urban Urdaibai, Biscay Province or the ACBC. This resulted in difficult circumstances for some rural municipalities, where the figures were both negative and also very high in absolute terms.

In the same period of analysis, some of Urdaibai's rural municipalities, mostly those located within the area of influence of the county's main towns, have attracted population and thus a positive migratory flow, while more poorly connected locations, further away from the county's nerve centres, have seen a negative migratory flow and the inexorable dwindling of their populations. It is also worth noting that the migratory flow across the county as a whole began to turn in the mid nineties and had switched from negative to positive by the following decade. Rural Urdaibai absorbed the new population; while the urban municipalities of Gernika and Bermeo (particularly the latter) saw an outflow of population over the last ten years of the study period, although the balance for both was positive by the end of the study period.

Thus, in rural Urdaibai, it is possible to discern two opposite dynamics: in some municipalities, negative vegetative growth has been offset in recent years by positive migratory flows, thus preventing population loss; while, in others, both population growth and the balance of migratory flow are negative. At the aggregate level, however, it should be noted that the positive balance of migratory flow outweighs, in absolute terms, population loss due to negative vegetative growth, given that the population of rural Urdaibai shows an increase of close to 1%.

The origins and destinations of new property owners in the municipalities of Urdaibai and the adjacent areas are given in Table 13, where the rows give their places of origin and the columns give the two broad geographical areas of destination (UBR and non UBR), with an indication showing whether the house is for use as a first or second home.

Table 13. Origins and destinations of property owners by geographical area and type of residence (%)

ORIGIN \ DESTINATION	UBR		Ex UBR	
	Main residence	Secondary residence	Main residence	Secondary residence
Intra-municipal	21,65	8,70	25,27	0,00
Inter-municipal	42,27	47,83	14,29	10,00
Bordering area	1,03	4,35	21,98	15,00
Bilbao	23,71	26,09	17,58	35,00
Rest of Biscay	7,22	13,04	18,68	40,00
ACBC	4,12	0,00	2,20	0,00
TOTAL	100,00	100,00	100,00	100,00

Source: Authors' own construction based on data drawn from the survey to the new owners.

All but 11% of all newcomers taking up permanent residence in the UBR come from somewhere in Urdaibai region, the adjacent area or Bilbao. The same can be said for second-home buyers in the Reserve. Two thirds of the owners of first homes have moved from one town in the reserve. The naturbanization process can therefore be described as endogenous, since the majority of the new occupants are people that used to live in the urban part of the Reserve.

The reason for moving from one town to another is, quite often, to avoid building restrictions and other difficulties facing potential house buyers (short supply and high prices) which vary from place to place. Furthermore, close to one third of all house-moves take place within the same town and involve the conversion of large old buildings, or new builds on the family's own land in order to remove a major cost component.

24% of those making up the new households are from Bilbao and only 4% come from somewhere within the ACBC beyond the borders of Biscay Province.

A similar pattern can be observed outside the UBR. One contrasting feature, however, is a notable inflow from neighbouring areas. Specifically, 22% of new first-home buyers come from towns bordering on the Reserve, suggesting that the stricter mandatory building guidelines in force in Urdaibai are driving some of the demand towards the unprotected adjacent area.

The results enable us to conclude that the residential mobility patterns of both study areas are the result of strategies involving short moves to nearby, familiar places.

- Residential location criteria

The decision to move house tends to involve a series of criteria, among which life-cycle issues intermingle the affordability of a new house when the opportunity arises, and luck in finding a property to match the demands of the buyer (Ferrero, 2010).

The questionnaire probed residential choice criteria by categories, leaving a space to record other possible motives. The responses are summarized in Figure 4.

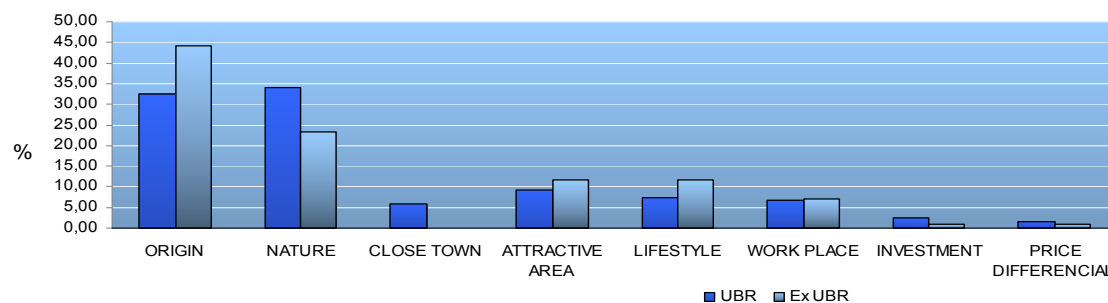


Figure 4. Residential location choice criteria (%)

Source: Authors' own construction based on data drawn from the survey to the new owners.

Unlike other cases of naturbanization, the one described in this case study is of an endogenous nature. The protagonists are for the most part local urban dwellers rather than outsiders with no previous link with their new residential surroundings. In their search for nature, they make the most of family-owned land and a deeper knowledge of the stringent regulations governing the use of rustic land for building purposes when pursuing the aim to own a property inside the Reserve. The ability to maintain their roots appears to be their dominant residential choice criterion.

“Nature” and “the attractiveness of the area” are among the most frequent responses, although no new owner claimed to be driven by the desire to “live in a protected natural area”, possibly because many would associate this with stricter rules and regulations.

The new residents largely repeat the same declared motives for choosing to purchase houses in municipalities bordering on, but exterior to, the Reserve. Proximity to a Biosphere Reserve, however, does not feature among their declared preferences. Criteria such as closeness to nature, tranquillity, security, greener surroundings and greater living space, which they tend to associate with rural living, are sufficient reasons for their choice.

• Socio-economic characterization of the inhabitants

The protagonists of the naturbanization phenomenon tend to be young couples with children born shortly before or shortly after the house move. These couples make up 77% of the sample of Urdaibai house buyers surveyed, while the over sixties account for a much smaller 10.62%.

Older house buyers are very few in number, and many are former farm-house tenants who have managed to buy their own house after many years by taking on loans to refurbish them, more for the benefit of their heirs than for their own.

Whereas average income in rural municipalities is often lower than in more urban population centres and tourist coastal centres, the newcomers to the rural municipalities of the Reserve report notably higher incomes.

The employment rate among the rural population is very high. There is not a single couple in which both partners are unemployed and the dominant trend over the study period is for two-job couples.

The active population surveyed is found to consist mainly of salaried workers with incomes above the local average. The conversion of second homes into first homes is a further indication of a middle-class inflow. The populations of both study areas have a notable proportion of highly-educated professionals. While the ratio is one in six inside the Reserve, it is even higher in the adjacent area, where 23.53% of householders belong to this category. Together, professionals from the middle and high educational attainment categories account for 29% of householders in the protected natural area 36.27% of those in the adjacent area.

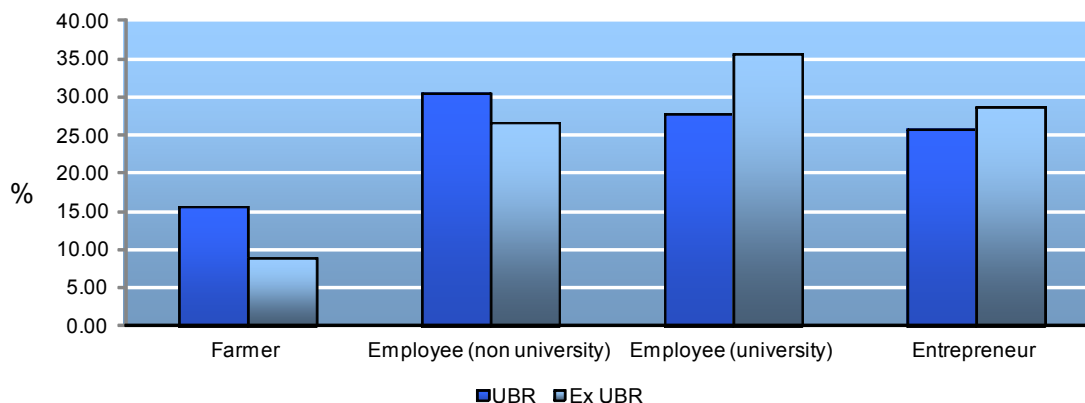


Figure 5. Occupational categories per geographical area (%)

Source: Authors' own construction based on data drawn from the survey to the new owners.

Skilled workers with vocational training make up another important category representing around 30% householders in both areas. The majority are well-paid blue-collar workers including mechanics, solderers, electricians, cabinet makers, etc.

The active population of the area also includes a significant number of entrepreneurs and several categories of self-employed. The strong buying power of this segment of the householder sample is reflected in Table 14, which shows that a high percentage of them opted for higher-priced properties.

Table 14. Numbers of householders by occupation and property price category (%)

OCCUPATION CATEGORIES	Property price index (UBR)				Property Price index (Ex UBR)			
	≤100	100-150	≥150	TOTAL	≤100	100- 150	≥150	TOTAL
-Farmer	58,82	11,76	29,41	100	0,00	33,33	66,67	100
-Skilled worker <i>(Vocational training)</i>	39,39	33,33	27,27	100	26,67	26,67	46,67	100
-Employee <i>(Univ degree, 3years)</i>	41,67	25,00	33,33	100	23,08	23,08	53,85	100

-Employee (<i>Univ degree, >4years</i>)	33,33	38,89	27,78	100	25,00	33,33	41,67	100
-Entrepreneur	18,52	33,33	48,15	100	27,59	37,93	34,48	100

Source: Authors' own construction based on data drawn from (a) Land registry and (b) Survey to the new owners.

Property prices paid were compared across occupation categories using the Kruskal-Wallis test in an attempt to identify possible differences in average willingness to pay. The average price ranges were very similar across all categories. The value of the Chi-squared statistic is 1.141 at the 0.888 (>0.05) level of significance, enabling us to confirm the null hypothesis of no differences in means between the various groups (Table 15). In other words, we are able to conclude that occupation does not play a significant role in the average property price paid.

Table 15. Property price homogeneity by occupation category

	Kruskal-Wallis test		Median test	
	Statistic	Significance	Statistic	Significance
Price-Occupation	1,141	0,888	3,046	0,550

Source: Authors' own construction based on data drawn from (a) Land registry and (b) Survey to the new owners.

There is some evidence of social self-selection in the migratory flow into the rural municipalities of Urdaibai, which tend to attract high-income groups. This finding is upheld in a report on the peri-urbanization of Biscay province issued by the Tourist Research Institute (Instituto de Estudios Turísticos, IET, 2004, p. 20), which also mentions the phenomenon of low-density development areas being taken over by higher socio-economic groups. The process ultimately leads to greater social diversification by creating a more varied class mix in which farmers are joined by professionals, skilled workers and middle managers.

7. Conclusions

Most of the rural sample areas outside the protected natural zone belong to the municipalities of the *Uribe* county situated towards the north east of the third belt, closer and better connected to the capital than those lying within the UBR boundaries. In addition, the Urdaibai Biosphere Reserve (UBR), which virtually overlaps the *Busturialdea* county, lies within a belt further from and less well-connected with the capital. While the two areas support very similar farming and forestry activities and landscapes, the River Oka estuary, with its marshes, sands, Atlantic oak woods and coastal villages, greatly enhances the heart of the Reserve.

None of our analyses reveal any significant differences in residential choice patterns between the two study areas, since the residential appeal of the UBR, which can be defined as naturbanization of a protected natural zone, is challenged by two powerful forces increasing the appeal of the surrounding area: proximity and better transport connections with Greater Bilbao, and less stringent mandatory building regulations in its rustic lands.

Although both study areas have similar building regulations for their *Rural Neighbourhood Centres* (ARNC), this is not the case with their rest of rustic land (Non-ARNC). The designation of the UBR as a biosphere reserve brought with it specific intervention on land-use management in the *Non-ARNC* within its boundaries in order to maintain the rural and agricultural character of the area and limit urban development. Thus, new housing development on this land is allowed only for the use of the agricultural and livestock farming community and is subject to stricter minimum criteria in relation to farm requirements (attached land surface area, Annual Work Units, etc.) and house features (maximum buildable area in square metres, style of architecture, etc.) than apply outside the Reserve. The same difference in stringency exists in the regulation of agricultural practices in the two areas.

Current conditions offer loopholes through which new farmhouses can be (temporarily) set up, not for farming purposes, but to enable house construction. It should be noted that the study area's agricultural and livestock sector, which is based on small family farms, is largely uncompetitive and affected by generational renewal issues, which are leading to its overall decline. Hence, the policy of the Master Plan for Land Use and Management (MPLUM) to preserve the farming heritage of rustic lands within the Reserve has an uncertain future.

Meanwhile, permitted residential building potential is being tapped to the full in Rural Neighbourhood Centres (ARNC), while current and potential urban development areas in many municipal communities lie unused.

The answer to our hypothesis regarding the influence of the environmental quality of protected natural zones on residential preferences, and ultimately on shifts of population into these areas, is somewhat blurred amongst the rest of the results. The revealed preferences of the new householders are more indicative of the appeal of the natural setting (a varied landscape, environmental quality, clean air, etc.), than of an express desire to live in a nature reserve, which often entails stricter rules and regulations. For those choosing properties outside the reserve, factors such as closeness to nature, tranquillity, security, greener surroundings and greater living space, which are typically associated with rural settings, appear to be sufficient reasons for their choice, since none mentioned living close to a biosphere reserve among their preferences.

Good location and easy connection with the provincial capital are also decisive residential choice criteria (Ferrero, 2010), which explains why the preferences of many house seekers sway towards the unprotected area. These preferences also apply within the Reserve, however, and the demand for housing differs significantly from one municipality to another according to travel times and distances from main towns, coastal versus inland location, and available transport infrastructure and connections. This shows that the areas of residential expansion are determined not only by environmental factors, but also by ease of travel to the urban population centres providing jobs and essential services.

Although prices are much the same for properties inside or outside the boundaries of the Reserve, buyers tend to pay slightly more for properties in the surrounding area. In the UBR there is a discernible “Reserve effect” which supports the naturbanization hypothesis. The price-inflating effect of the environmental quality label and rigidity of housing supply is offset by tighter regulations and controls, which act as a disincentive to prospective house buyers. The “proximity to the capital effect” and less stringent building restrictions result in an upward trend in the demand and prices for property in the unprotected adjacent area. Predictably, the results show that the price-boosting impact of the “proximity effect” in the unprotected area is stronger than that of the “reserve effect”.

It is not prices that have motivated population shifts towards the Reserve and its surrounding areas. Rustic/country property prices are higher in absolute terms than urban property prices in the study sample, and only households with incomes above the provincial average can afford them. This enables us to confirm the presence of a process of socio-economic self-selection. Newcomers are not drawn to the area by job opportunities or by the prospect of implementing their own business project.

That the majority of new buyers come from local urban communities is a finding that reveals the endogenous nature of these migratory flows. Residential mobility in both study areas has been shown to fit a strategy of short moves to nearby, familiar places. It is no coincidence that one of the main revealed preferences of the new settlers is to remain within their own familiar social environment. Two out of three owners of first homes in the UBR moved to their current homes from municipalities within the Reserve; and only 35% came from further afield (Bilbao, or other parts of Biscay Province or the ACBC). Of those owning first homes in the unprotected area, 38.5% moved in from more distant areas and 22% are former Reserve dwellers driven out by the conditions imposed by its rustic property market.

There are also signs of moderate, selective demographic growth, and significant social diversification of the population, mirroring what has been observed in naturbanization processes in other places. Farmers are becoming an ever-smaller minority, not only because of the gradual abandonment of small family farms that are uncompetitive and/or have no prospect of being taken over by a younger generation, but also because of the influx of newcomers with other occupations and means of living. The proportion of farmers among the householders is small, but greater in the nature reserve than in the adjacent area. Theirs is the socio-economic group that most differentiates the two areas.

The findings of the empirical contrast of urban sprawl into the rustic non-developable land of protected versus unprotected areas, provide a small advance to the characterization and understanding of the phenomenon of naturbanization. The initial hypothesis about residential location preferences of buyers of country properties located in protected natural areas is confirmed. These preferences are determined by: (1) the characteristics of the setting, such as the high standards of nature and landscape heritage, and the good location and easy accessibility from the property (short travel times and distances to urban centres/city); (2) the characteristics of the estate, such as the size of dwelling and attached land, the type of construction, the quality of views from the house...; and (3) the price of the estate, which is dictated by the shift of the demand curve, since the supply of new housing is especially rigid and inelastic due to the stricter regulations and control of protected areas. However, increases in demand are mostly discouraged/hampered by land use and building restrictions and, in some cases, the prospective house buyers end up settling in the surrounding unprotected areas. In this regard, the specific regulations for the conservation of protected areas has several consequences: (a) it moderates the demand for properties and their rise

in price compared to unprotected areas, (b) it curbs migration to protected areas, and the new settlers have a medium-high socioeconomic profile and come mostly from local urban communities (endogenous flow), and (c) it increases the occupational and social diversity of the population and slows the abandonment of farming. These facts enrich our understanding of the tradeoffs between nature protection policies and economic development in these areas.

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Notes

Note 1. The primary sector includes agriculture, livestock and fishing.

Note 2. Several villages have detached themselves from Gernika: Arratzu (January 1, 1993); Ajangiz (January 1, 1991); Forua, Kortezubi, Murueta and Nabarniz (April 1, 1987).

Note 3. The municipalities of Bermeo and Gernika constitute what we call "Urban Urdaibai".

Note 4. "Urban Urdaibai" comprises Bermeo and Gernika. The remainder make up "Rural Urdaibai".

Note 5. The 1950, 1960 and 1970 data refer to the *de facto* population.

Note 6. That is, the Master Plan for Land Use and Management (MPLUM) of the Biosphere Reserve of Urdaibai classifies the land into two broad categories: (1) *surface ordered by the town/village planning*, which are the urban land and the developable land, and (2) *surface that cannot be developed* and therefore is subject to a special protection regime because of the values that its country land shelters. The first category is outside the scope of MPLUM planning and, only, the management of rustic land rests with the MPLUM.

Note 7. Authors such as Kayser (1990) classify the periphery of cities in three suburban crowns: the 1st peri-urban crown corresponds to the suburbanization; it is an area physically and functionally linked to the city. The delimitation of the 2nd peri-urban crown is more delicate; it has suffered transformation processes due to generalized subdivisions. Finally, the 3rd peri-urban crown maintains a more rural character; in this area the urbanization processes compete with the activities of a still active rural society which possesses a certain resistance to change. It is this third one that would match the recent peri-urbanization process.

Note 8. *Edge cities* are urban centres that evolve in the urban periphery. They have modern infrastructure and enable good quality of life. The term is not to be confused, as often occurs, with suburbs or peripheral cities. They possess all the defining characteristics of a city: industry, government, security, culture, society and religion. As well large numbers of offices, and shopping and leisure facilities, they also offer a housing supply.

Note 9. The survey is conducted on a sample of 270 new property owners randomly selected, 140 belong to municipalities inside the Reserve, and 130 to municipalities outside it.

Note 10. Each country estate/property consists of a house and the land attached forming an indivisible unit.

Note 11. The geographical area delimits country properties located within the Reserve (UBR) and outside it (EX UBR).

Note 12. The rustic land type separates country properties located into rural neighbourhood centres (ARNC) from properties outside these rural centres (NON ARNC).

Note 13. The type of construction sets apart country properties Newly Built (NB) from the rest (NON NB).

Note 14. See Abelaïras-Etxebarria and Astorkiza (2012) for a specific study of land market and its findings.

Note 15. Bilateral asymptotic significance.

Note 16. Hypothesis of conditional independence by controlling the effect of rustic land category.

Note 17. Hypothesis of conditional independence by controlling the effect of geographical area.

Note 18. Mandatory guidelines for new builds, building conversions and home extensions feature in the urban development plans of the municipalities included in the study.

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