POTENTIAL IMPACTS OF P2P ACCOMMODATION ON RURAL-MOUNTAIN AREAS. A CASE STUDY FROM THE CATALAN PYRENEES (SPAIN)

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With 3 figures and 12 tables
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Summary: This paper seeks to contribute to existing literature by exploring the potential impacts of Peer-to-Peer (p2p) accommodation on a rural mountain area in the Pyrenees in Catalonia (Spain). The results indicate how widely p2p accommodation can penetrate areas of this kind. The findings suggest that this phenomenon has brought few benefits for local development and has created severe competition for conventional tourism accommodation, despite having a smaller economic impact in terms of job creation and tourist spending. In addition, the relative ease with which it avoids administrative and fiscal controls has negative repercussions for the tax revenues of local authorities. The growth in tourist rental properties is also having harmful effects on the study area in terms of its tourist load capacity, and the high pressure it puts on housing stock is causing shortages in residential housing and sharp price increases.

Zusammenfassung: Dieser Beitrag soll zur bestehenden Literatur beitragen, indem er die potenziellen Auswirkungen von Peer-to-Peer-Unterkünften auf ein ländliches Berggebiet in den Pyrenäen in Katalonien (Spanien) untersucht. Die Ergebnisse zeigen, wie weit die P2P-Akkommodation solche Gebiete durchdringen kann. Die Ergebnisse deuten darauf hin, dass dieses Phänomen der lokalen Entwicklung nur wenige Vorteile gebracht hat und zu einer starken Konkurrenz für konventionelle Tourismusunterkünfte geführt hat, obwohl die wirtschaftlichen Auswirkungen in Bezug auf die Schaffung von Arbeitsplätzen und die Tourismusausgaben geringer sind. Darüber hinaus hat die relative Leichtigkeit, mit der sie administrative und steuerliche Kontrollen umgeht, negative Auswirkungen auf die Steuereinnahmen der Gebietskörperschaften. Der Zuwachs an touristischen Mietobjekten wirkt sich zudem negativ auf die touristische Belastbarkeit des Untersuchungsgebietes aus und führt durch den hohen Druck auf den Wohnungsbestand zu Wohnungsknappheit und starken Preissteigerungen.

Keywords: P2P accommodation, rural mountain destinations, potential impacts, internet platform.

1 Introduction

New information and communication technologies, internet and social platforms are promoting a revolution in the way we produce and consume goods and services of different kinds. The “Tourism 2.0” revolution, for example, incorporates digital brokerage platforms for the purchase and management of holidays, while the marketing facilities afforded by these tools enable new producers of tourist goods and services to enter the market (Oskam and Boswijk 2016; Reinhold and Dolnicar 2018). Platforms such as Airbnb, Vrbo (HomeAway), FlipKey, and HouseTrip, which specialize in holiday rentals, today arrange the majority of rentals between private individuals, a practice that was previously organised on an informal basis between family and friends (Frenken and Schor 2019). With the advent of Airbnb and other platforms, the renting of these properties has become much easier, resulting in a marked increase in the supply of this form of accommodation, especially in cities and coastal holiday destinations (Dredge and Gyimóthy 2015). Rural areas were left behind to some extent as the phenomenon grew, due to the fact that they were relatively less important as tourist destinations and because they had a smaller concentration of underused properties (Adamiak 2018; DiNatale et al. 2018).

Numerous research studies have described how p2p accommodation, and in particular that associated with the Airbnb phenomenon, has burst onto the stage in cities and coastal destinations (García-Ayllón 2018; Guttentag 2015; Oskam and Boswijk 2016). They have also analysed the factors that have led to its appearance and subsequent growth in these places (Belk and Llamas 2011; Dredge et al. 2016; Gurran 2018; Kassan and Orsi 2012; Möhlmann 2015; Wegmann and Jiao 2017) and the spatial distribution of its expansion in cities (Gutiérrez et al. 2017; Gyódi 2018; Huebscher et al. 2020). As Cors et alt. (2020a) point out, the study of the distribution and spatial location of this type of tourist accommodation and its functional logic has focused mainly on specific urban areas (Coles et al. 2018;

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Gunter and Önder 2018). Other territorial scales have also been addressed, albeit to a lesser degree, in studies focusing on an entire country (Adamiak et al. 2019; Domènech et al. 2019; Gutiérrez and Domènech 2020; Larpin et al. 2019), or a regional area comprised of several countries (Adamiak 2020). Few specific studies have been conducted on rural areas, which have generally been analysed within a broader context that also includes urban and sub-urban areas, which typically (especially the former) have a significant volume of this form of tourist accommodation. This lack of specific research on p2p accommodation in rural areas has made it difficult to identify spatial distribution patterns, and has minimized the dynamics and functional importance of the processes that take place in rural areas in relation to this phenomenon (Cors-Iglesias et al. 2020a).

Adamiak et al. (2019) analyzed the spatial distribution at a municipal level for Spain as a whole, pointing out that this accommodation was in greatest supply in the cities and coastal towns where there was already a large amount of conventional accommodation on offer, a large stock of second homes and strong internationalization of the demand. The research showed that although Airbnb listings were concentrated above all in tourist hotspots, supply was spread over the entire country, including mountain and rural areas. Larpin et al. (2019) studied the volume and distribution of the accommodation advertised on Airbnb in Switzerland for different types of municipalities (rural versus urban), coming to the conclusion that Airbnb first appeared in the cities and only later expanded to rural areas. However, the authors point out that the trend in recent years suggests that if this growth were to continue, the supply of p2p accommodation in rural towns and villages linked to winter sports could outstrip that available in urban regions. On similar lines, Cors-Iglesias et al. (2020b) found that although this kind of accommodation was less important in rural areas of Catalonia, considerable growth had been observed in recent years as a consequence of the market in urban areas reaching maturity and/or collapsing. The same authors (Cors-Iglesias et al. 2020a) studied the territorial processes of distribution and location of p2p accommodation in rural areas of Catalonia, detecting three types of rural municipalities: a) Rural municipalities in which the current volume and the growth in the supply of this accommodation has been very striking; these municipalities are located in the coastal hinterland and in high mountain areas, in both cases close to very popular tourist destinations (with this additional supply of accommodation playing a key role in the expansion of the areas of influence of well-established tourist destinations); b) Rural municipalities in which this type of accommodation is growing at an average rate, generally located in inland areas of Catalonia and in high mountain regions with alternative (non-mass tourism) development models specialising in rural tourism (this supply of accommodation is helping boost tourism by expanding and diversifying the range of accommodation on offer); and c) Rural municipalities where no tourist accommodation was available before the arrival of p2p accommodation (normally in inland areas with a strong agricultural sector, where p2p accommodation is paving the way for tourism). As regards this last case, various studies have highlighted the enormous importance of p2p accommodation in rural areas with a deficit in terms of conventional tourist accommodation infrastructure (Cvelbar and Dolnicar 2017; Belotti 2019).

In case study research into a specific rural area in the Spanish mountains, Gómez-Martín et al. (2019) detected an important positive correlation between the supply of tourist rental accommodation and new house building in the period prior to the bursting of the real estate bubble in 2008, evidencing the close relationship between this type of accommodation and previous speculative processes. In the same vein, Domènech and Zogal (2020) analysed the spatial distribution of Airbnb properties in a mountain destination (Andorra), exploring the spatial correlation between tourist rentals and traditional accommodation and concluding that the offer of p2p accommodation tends to cluster in settlements with the highest potential for speculation.

The impact of the emergence and expansion of p2p tourist accommodation in rural areas has not been studied in great depth either. Most research studies have focused on city and coastal holiday destinations, and the results they have obtained have often led them to different conclusions regarding the impact on the conventional tourist accommodation subsector, the property market, the local economy, social sustainability and the environment (Guttentag 2015).

The effects of the conversion of residential housing into tourist rental accommodation have also been widely studied in the literature, focusing in particular on the repercussions for the property market in tourist destinations. Various different authors have highlighted that unlike the long-term rental market, online marketplaces like Airbnb offer a series of advantages and benefits that make the short-term rental market increasingly attractive for local and above all global investors (Cocola-Gant and Gago 2019; Fields 2019; Srnicek 2017; Shaw 2020). In many cities, the pressure exerted by tourism rental accommodation on the residential housing stock has led to a rise in property purchase and rental prices, resulting in a noticeable increase in gentrification (Barron et al. 2021; Horn and Merante 2017; Mermet 2017; Rodríguez-Pérez et al. 2019; Roelofsen 2018; Schäfer and Hirsch 2017; Sheppard and Udell 2016; Wachsmuth and Weisler 2018). The upsurge in tourism in these destinations has also created problems in relations between local residents and visitors (Cocola-Gant 2018; Gravari-Barbas and Guinand 2017; González-Perez 2020; Yrigoy 2019); difficulties that cast serious doubts on the alleged benefits arising from greater sociocultural interaction between the travellers who stay in tourist rental accommodation and the local community (Tussyadiah and Pesonen 2018).

As regards the effects of p2p accommodation on the conventional accommodation businesses already established in these destinations, various empirical studies carried out in urban areas show that the former is now a serious competitor for the latter, affecting above all the cheaper, lower-rated hotels, which do not belong to large chains. There are some cities where the emergence of Airbnb has caused a fall in the hotel occupation rate and a decline in revenues (RevPAR) and in the average daily income per occupied room (ADR) (Dogru et al. 2020; Gerdeman 2018; Williams and Horodnic 2017; Zervas et al. 2017). Moving beyond urban areas and analysing only the number of beds on offer in hotel versus p2p accommodation, Larpin et al. (2019) found that in Switzerland, the number of p2p rental beds was about to surpass the number of hotel beds in rural, winter sports resorts in the Alps, a clear sign of the high levels of competition between the two forms of accommodation (at least in tourist destinations of this kind). However, other studies that focus on marketing in this sector regard the two forms of accommodation as complementary rather than as competitors, in that p2p accommodation is aimed at a very specific niche of the market, who are interested in the authenticity of the tourist experience, while traditional forms of accommodation cater for traditional kinds of tourist (Bryan 2015; Heo et al. 2019). Along these lines, Frey et al. (2018) pointed out (on the basis of interviews conducted with stakeholders in the tourism sector) that in contrast to what has happened in the cities, in rural Germany tourist rentals do not compete with hotels, because hotel accommodation, which is a long-established part of rural society, caters for a very specific kind of tourist profile.

Another of the aspects discussed in research are the effects on the labour market and how this in turn affects the economy as a whole. Here too there is varying evidence regarding the impact of p2p accommodation. This is because of the different scales of analysis used (local compared to global) and because some studies take the implications of the black economy associated with this subsector into account, while others do not. A range of studies at a local level in urban areas (Kaplan and Nadler 2015; Zervas et al. 2017) have noted a direct loss of employment in the conventional tourist accommodation subsector, which however appears to have been offset by the income generated for the owners of tourist rental properties and the creation of new jobs at the destination. These new jobs have appeared in response to growing demands for goods and services by tourists who by choosing a more economic form of accommodation have more money to spend on other goods and services (Quattrone et al. 2016; Tussyadiah and Pesonen 2016). This positive vision based on apparent mechanisms of compensation of expenditure and redistribution of profits contrasts with the results of other research which investigated this question at more complex scales. These include for example the papers by Fang et al. (2016) and Sundararajan (2016), who argued that the apparent positive effects for the economic system will not be effective and cannot be valued at a global scale until all the unregulated supply of accommodation has been fully legalized.

As regards environmental sustainability, it is important to make clear that there are no empirical research studies on this question. According to Dredge and Gyimóthy (2015), the *naive* discourse in relation to p2p accommodation contends that it reduces the negative impacts on the environment to the extent that it limits the need for new accommodation facilities or products to be developed and therefore saves energy and resources. In the same way, Dolnicar (2019) asserted that research on this question rarely goes beyond conceptual discussions that can generate hypotheses (Juvan et al. 2018; Midgett et al. 2018) and reports detailing the opinions of tourists regarding the sustainability of this kind of accommodation (Juvan et al. 2018; Sung et al. 2018; Wang and Ho 2017).

Little research has so far been carried out on the important question of p2p accommodation in rural areas. New studies must therefore be carried out to help expand our understanding of the p2p phenomenon and its economic, social and environmental consequences on rural destinations. With this in mind, this article seeks to contribute to the existing literature by analysing a rural mountain area where tourism is the main economic activity. We aim to explore the potential impacts of p2p accommodation on a rural area in the Pyrenees mountains in Catalonia (Spain). To do this, we: a) analyse the context that has favoured the development of p2p hosting and measure the current size of the market and its evolution; and b) offer an overview of the potential pressure exerted by p2p accommodation on the 27 rural-mountain municipalities in the Catalan Pyrenees region. To this end, we have formulated 6 hypotheses:

1. The increase in tourist rental accommodation creates strong competition for traditional forms of tourist accommodation.
2. The growth in tourist rental accommodation to the detriment of other forms of accommodation has negative effects on employment.
3. Typical users of tourist rental accommodation, a priori, have a smaller economic impact on the local area.
4. The expansion of tourist rental properties is leading to the arrival of new investors from outside the region.
5. The rapid proliferation of tourist rental accommodation and the delay in regulating it has allowed an undeclared, unofficial market to flourish. The owners of such properties avoid fiscal and administrative controls and the people who rent them avoid paying taxes such as VAT.
6. The growth in tourist rental accommodation is having harmful effects on the tourism load capacity of many municipalities and could become a factor in the collapse (at a social or environmental level) of these spaces.

The article is structured as follows: after the introduction, we describe the study area and explain the data sources and the approaches we have implemented to accomplish our objectives. We then present the results, organized into two sections. The first section explains the origins of p2p accommodation in these rural mountain areas and its subsequent development, while the second explores the potential economic, social, and environmental impacts it may have on them. We end by presenting the conclusions of this research.

2 Study area

The study area covers three *comarcas* (administrative subregions) in the Pyrenees Mountains in north-western Catalonia near the border with France (Fig. 1). The three *comarcas* are Pallars Sobirà (which comprises 15 municipalities), Alta Ribagorça (3 municipalities) and Val d'Aran (also known simply as Aran, with 9 municipalities). Our units of analysis are therefore three *comarcas* and 27 municipalities. 24 of the 27 municipalities had less than 2,000 inhabitants. The three towns with populations of over 2,000 were the capitals of the three subregions (*comarca)*. It is important to note that, in Spain, rural areas are officially defined as those municipalities with 2,000 or fewer inhabitants, a demographic criterion established by the National Statistics Institute.

Due to the very marginal geographic position of the study area, it has traditionally been very difficult to create sufficient economic dynamism to enable local people to earn enough to allow them to continue living there. The result was a rapid decline in the population, which was particularly evident from the mid-20th century onwards (Gómez-Martín et al. 2019). The positive side to this precarious economic situation was that there was little human pressure on this space in which traditional extensive farming methods enabled the maintenance and conservation of an extremely attractive natural and cultural heritage of undeniable value, which as time went by was to become its main economic resource. This heritage was a vital asset in the development of tourism, a business activity which in the last four decades has established itself as the most important driver of development in the study area, as manifested by the fact that the Gross Value Added created by the services sector, which includes tourism, is 79.2% in Aran, 71.5% in Pallars Sobirà and 71.7% in Alta Ribagorça. It is important to realize that although the GVA from primary sector activities is much lower, (the GVA from the primary sector is 0.2% in Aran, 2.7% in Pallars Sobirà and 1.9% in Alta Ribagorça), these activities remain influential in that the territory is managed by members of the farming and forestry sector.

In this part of the Catalan Pyrenees region, the development of tourism began in the mid-1960s with the inauguration of two ski resorts. The setting up of these first resorts not only paved the way to the creation of other ski centres, but also encouraged the appearance and consolidation of other forms of tourism (nature tourism, adventure

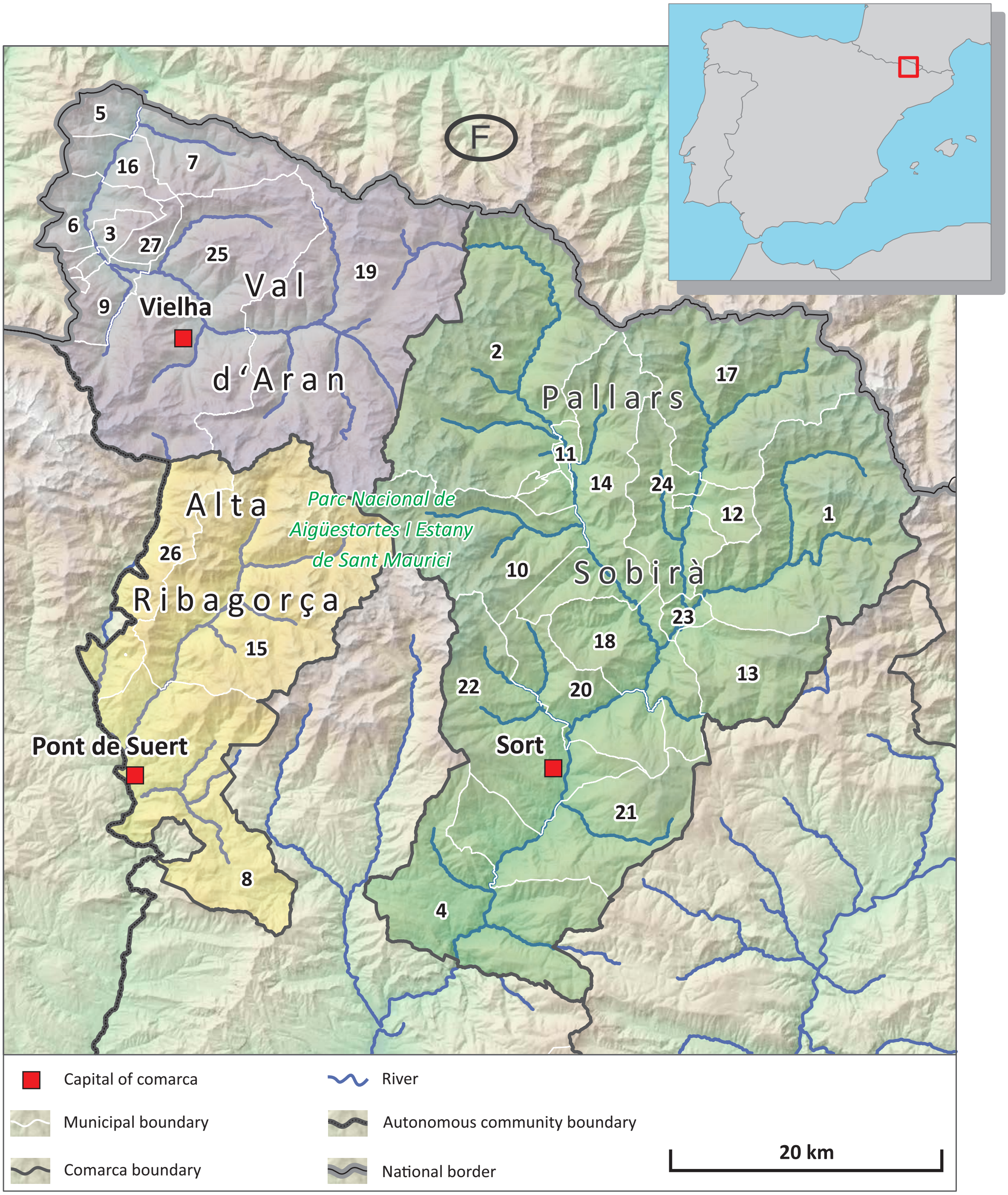

Fig. 1: Study area. Map data: Catalonia Institute of Statistics, the Cartographic and Geological Institute of Catalonia and USGS. Municipalities: 1. Alins (276 inhab.); 2. Alt Àneu (405 inhab.); 3. Arres (65); 4. Baix Pallars (331); 5. Bausen (58); 6. Bossòst (1109); 7. Canejan (107); 8. el Pont de Suert (2220); 9. Es Bòrdes (259); 10. Espot (366); 11. Esterri d'Àneu (772); 12. Esterri de Cardòs (70); 13. Farrera (116); 14. la Guingueta d'Àneu (297); 15. la Vall de Boí (1021); 16. Les (946); 17. Lladorre (230);18. Llavorsí (352); 19. Naut Aran (1803); 20. Rialp (661); 21. Soriguera (410); 22. Sort (2149); 23. Tirvia (131); 24. Vall de Cardós (364); 25. Vielha e Mijaran (5559); 26. Vilaller (561); 27. Vilamòs (187).

tourism and cultural tourism among others), which were closely interrelated and complemented each other (high levels of diversification of tourism activity resulting in low levels of seasonality), making use of the various different resources, facilities and infrastructures that had been created in the area. Today there are six ski resorts in operation in the subregions *(comarcas)* we studied (five of them are for downhill skiing and one offers Nordic skiing facilities), so making this area the main cluster in the Spanish skiing industry. Together with skiing, nature tourism associated with the National Park (Parc Nacional de Aigüestortes i Estany de Sant Maurici) is also important, as is the adventure tourism in white-water rivers and the cultural tourism linked to the group of Romanesque Churches in the Vall de Boi, declared a World Heritage Site by UNESCO.

3 Data and methods

At the present moment, the study of p2p accommodation in Catalonia is complicated by the fact that an officially regulated stock of rental accommodation (VUT) coexists alongside a large number of flats and houses that are completely unregulated. It is difficult to calculate the size of the informal tourist rental sector due to the impossibility of finding reliable, accurate data. Such data is available however for the officially regulated tourist rental properties (known as VUTs), which are defined as "whole apartments or houses, which must be approved by the relevant Town Council and are rented by their owners, either directly or indirectly, to third parties in exchange for a price and for periods of up to 31 days". These properties are registered at the Catalonia Tourism Registry, which has proved a useful source of data for measuring the size of this market and analysing it.

Most studies in this field tend to be based on holiday rentals data that either directly appear on the websites or are obtained by various web-scraping techniques or by suppliers of information about holiday accommodation, such as AirDNA. In these last two cases, the information includes both regulated and illegal rentals. In our study, however, we decided to focus exclusively on the regulated supply of tourist rental accommodation (VUTs), due to the accuracy, stability, and reliability of the information obtained from the official register and the fact that the VUTs listed in Airbnb appear with their corresponding official registration number and can therefore be easily identified. The fact that we have adopted a different approach in our study could hinder comparisons with the few studies undertaken to date on rural areas, but we felt that the reliability of the data was paramount.

The case study approach allows us to conduct in-depth analysis, which provides useful data when it comes to answering the main questions posed in this research. The case study also enables us to work with multiple variables, developing connections between diverse geographical phenomena taking place at different scales. As one of the objectives of our study was to analyse the evolution of p2p accommodation over time, a longitudinal approach was applied, involving a quantitative methodology based on the analysis (through territorial interpretation and descriptive statistics) of data from diverse sources (Tab. 1) which, once triangulated, were complementary to each other. To this end we used above all primary quantitative data on tourism, planning, economic and fiscal aspects of this issue. These data were obtained from the Catalonia Tourism Registry, the Catalonia Inland Revenue, Incasòl (the Catalan Town Planning Institute), Exceltur (a non-profit group formed by the Chairmen of the 29 leading Spanish tourist groups), the Spanish National Statistics Institute and the Catalonia Institute of Statistics. We have also consulted all the relevant legislation and regulations on this subject, and news items from the local press. This paper also has a qualitative angle, which involved trying to find out more about the owners of these properties. This was done by analysing the content they provided in their advertisements on the Airbnb platform in November 2019 (in particular the brief personal profile provided by the hosts, regarding origin-nationality and place of residence) and the details about the owners provided in the official listings produced by the Catalonia Tourism Registry.

This exploratory study has certain limitations due to the way the information is presented at source. Firstly, some of the variables are not broken down at municipal or *comarca* level, which meant that we had to extrapolate the data provided at a regional scale. Secondly, although some information is provided on an annual basis, other data is only produced on specific census dates. Lastly, the fact that we have chosen to focus exclusively on officially regulated accommodation means our results cannot be compared with other studies referring to the whole market (officially regulated and illegal).

Tab. 1: Sources and data of the research

	Data/Source
Context / Volume / Evolution	- Registration codes, geolocation and contact information: VUTs *(Catalonia Tourism Registry).* - Data on the construction of dwellings at municipal scale: Dwelling started/Social housing dwelling *(Dep. of Territory and Sustainability; Secretary of Housing and Urban Improvement).* - Number and geographic distribution of existing buildings and their characteristics at municipal scale. Private dwelling by type: Main residence / Second home / Empty dwelling *(INE National Statistics Institute).* - Catalonia urban map. GIS that provides relevant data on urban planning and planning General data on the municipality, General planning data with land classification and urban qualification surfaces, Land classification indicators and the municipality's profile *(Dep. of Territory and Sustainability).* - Registered home sales and the sale price in Catalonia (comarca) *(Statistical Institute of Catalonia, based on Association of Registrars of Property, Movable and Mercantile Goods of Spain and Dept of Government, Public Administrations and Housing of the Generalitat de Catalunya).*
Hyp. 1: Competition to traditional accommodation	- Establishments and beds for tourist accommodation at municipal scale (by categories): Hotel/Camping/Rural G. *(Official Guide to Tourism Establishments).* - Establishments and beds in tourist dwellings at municipal scale: VUTs *(Official Guide to Tourism Establishments).* - Hotel performance indicator at marcas scale -tourist brand scale- *(INE, based on Hotel Occupancy Survey)*: RevPAR (Revenue per Available Room), ADR (Average Daily Rate) - Levels of occupancy of hotel beds at marcas (tourist brand) and municipal scale *(INE, based on Hotel Occupancy Survey).* - Levels of occupancy of camping beds at marcas (tourist brand) and municipal scale *(INE, based on Tourism Campsite Occupancy Survey).* - Levels of occupancy of rural accommodation beds at marcas (tourist brand) and municipal scale *(INE, based on Rural Tourism Accommodation Occupancy Survey).*
Hyp. 2.: Effects on employment	- Conventional establishments and beds for tourist accommodation at municipal scale (by categories): Hotel/Camping/ Rural *(Official Guide to Tourism Establishments).* - Establishments and beds in tourist dwellings at municipal scale: VUTs *(Official Guide to Tourism Establishments).* - Number of tourist accommodation companies *(INE, based on the Annual Service Survey).* - Personnel employed by type of tourist accommodation company at marcas (tourist brand) and municipal scale *(INE, based on Hotel Occupancy Survey).* - Salaried personnel by type of tourist accommodation company *(INE, based on Structural statistics of companies in the service sector).* - Number of people who are registered for the general social security scheme by sectors of activity, at municipal scale *(Dep. of Labour, Social Affairs and Family).* - Number of people who are registered for the special social security scheme for self-employed people by sectors of activity, at municipal scale *(Dep. of Labour, Social Affairs and Family).*
Hyp. 3: Economic impact on the local area.	- Average daily expenditure per tourist by main type of accommodation and origin *(INE, based on the Tourist Expenditure Survey -EGATUR-, Residents Travel Survey – FAMILITUR- and Statistics on movements of tourists at the frontiers -FRONTUR-).* - *Estudio sobre el empleo en el sector turístico español (Exceltur).*
Hyp. 4. Arrival of new investors from outside the region.	- Establishments and beds in tourist dwellings at municipal scale: VUTs *(Official Guide to Tourism Establishments).* - Registration codes, geolocation and contact information: VUTs *(Catalonia Tourism Registry).* - Analysis of the content of the legally authorized properties (VUTs) advertised on the Airbnb platform in November 2019. The personal profiles provided by the hosts were emptied, paying special attention to the information regarding origin-nationality and place of residence. - Consulting business directories: *Guia Empresas Universia, Informes-empresas, Páginas amarillas, etc.* (2019).
Hyp. 5. Effects on tax revenues.	- Tax on stays in tourist establishments at municipal scale *(Catalan Tax Agency).* - Tax on stays in tourist establishments by type of tourist accommodation *(Catalan Tax Agency).*
Hyp. 6. Effects on the tourism carrying capacity (social or an environmental).	- Number of inhabitants at municipal scale *(Municipal Population Census).* - Beds for tourist accommodation at municipal scale (by categories): Hotel *(Official Guide to Tourism Establishments).* - Beds in tourist dwellings at municipal scale: VUTs *(Official Guide to Tourism Establishments).* - Number of rental contracts at comarcas and the municipal scale *(Secretariat of Housing and Urban Improvement of the Dep. of Governance, Public Administrations and Housing, INCASÒL).* - Average contractual rent at comarcas and municipal scale (euros / month) *(Secretariat of Housing and Urban Improvement of the Dep. of Governance, Public Administrations and Housing, INCASÒL).* - Price per m^2 of new housing on a regional scale -comarcas- (euros / m2) *(Statistical Institute of Catalonia, based on Association of Registrars of Property, Movable and Mercantile Goods of Spain and Dept of Government, Public Administrations and Housing of the Generalitat de Catalunya).* - Report on the housing sector in Catalonia (several years, *Dep. of Government, Public Administrations and Housing).* - Report on sales and sale price in Catalonia (several years, *Dep. of Government, Public Administrations and Housing).* - Report on Newly built housing market in Catalonia (several years, *Dep. of Gov., Public Administrations and Housing).* - Land uses at comarcas *(Department of Agriculture, Livestock, Fisheries, Food and the Natural Environment).* - Catalonia urban map. GIS that provides relevant data on urban planning and planning General data on the municipality, General planning data with land classification and urban qualification surfaces, Land classification indicators and the municipality's profile *(Dep. of Territory and Sustainability).* - Local press news.

4 Results and discussion

4.1 Real estate expansion, economic crisis and tourist rental properties in rural areas of the Pyrenees in Catalonia

The winter sports business that has developed in the study area has typically been accompanied by large-scale real estate operations, as has happened in other mountain areas with winter tourism (González et al. 2009). Almost all the licenses awarded by planning authorities for the opening or expansion of ski resorts have normally also permitted extensive property development at the resort or municipality (Gómez-Martín et al. 2019). As a result, winter tourism has been seen as an opportunity for the construction sector and has gone hand in hand with a rapid growth in residential and tourist accommodation (Gómez-Martín et al. 2019). The increasing amount of accommodation on offer has also been used by other types of tourism that develop in the area (nature tourism, adventure tourism, cultural tourism, etc.). New-build housing, which has led to a steep climb in the consumption of land and is above all aimed at the second home market, has been rising steadily in the study area since the appearance of the first ski resorts in the mid-20th century (Fig. 2). In the three subregions studied here, the number of new houses started for every thousand inhabitants continually exceeded the average for Catalonia until 2008 when the property bubble finally burst (Tab. 2).

But towards the end of this long period of growth, various sectorial plans and territorial planning instruments were approved in the study area which questioned the prevailing business model and put a stop to possible further urban and residential growth. These included the Partial Territorial Plan for the l'Alt Pirineu i Aran (2006), the Master Town Plan for Pallars Sobirà (2008) and the Master Town Plan for Val d'Aran (2010), which declassified a lot of the land near the ski resorts which had previously been classified as development land. They also regulated urban growth for second home building, which would only be permitted in very limited form as a continuation of the existing urban fabric. These tighter controls were followed soon afterwards by the bursting of the property bubble, bringing the construction boom to an end. In the ensuing economic crisis, the construction of new housing came to an abrupt halt (Fig. 2 and Tab. 2) and some of the developments started before the bubble burst were never finished and/or were left unsold for many years, so creating a large stock of empty housing (Tab. 3).

The excess supply of new housing (empty housing) during a sustained period of economic crisis led to a dramatic fall in prices (Tab. 4), which as time went by began to attract the interest of possible buyers, both private individuals and companies (as a form of investment). This can be seen for example in the fact that according to data from the College of Property Registrars of Spain, in 2015 the Vall d'Aran came top of the list of the 41 *comarcas* in Catalonia in house sales, while Pallars Sobirà and Alta Ribagorça were both amongst the top ten. This trend could be observed as early as 2013, when Val d'Aran and Pallars Sobirà were both amongst the top 20 in terms of the number of new houses sold. Many of these buyers were buy-to-let investors who then placed the houses on the market as tourist rental properties (as a source of return on their investment). At the same time the difficulties faced by many families and the impossibility of selling - at a decent price - most of the houses bought as second homes during the economic boom period (or simply village homes belonging to the family), also made the idea of making them available as tourist rental properties more attractive. Platforms such as Airbnb, which was founded in 2008 and opened an office in the Catalan capital, Barcelona, in 2012, have also played an important role in bringing these houses onto the market as tourist rental properties, as they offer a well-known, easily accessible channel on which to do so.

This process is giving rise to two important trends in the study area in relation to p2p accommodation. First of all, the emergence and growth of tourist rental properties (VUTs), in particular in those towns and villages linked to the winter-sports sector. Secondly, the appearance of an illegal supply of tourist rental accommodation, which has created a black economy beyond the control of the tax authorities.

Within Catalonia as a whole, regulated tourist rental accommodation (VUT) accounts for 43.6% of the total number of beds and 93.4% of all the establishments (2019). In absolute terms, there are 84,109 establishments with a total of 461,104 beds. In the subregions (*comarcas*) in the study area, there are 2,101 establishments and 11,562 beds. VUTs account for 33.1% of all officially regulated tourist accommodation beds in Alta Ribagorça, 41.8% in Val d'Aran and 20.5% in Pallars Sobirà. This kind of accommodation is typically found in municipalities with very large and medium-sized ski resorts and tends to be concentrated in areas with large amounts of new-build housing (Fig. 3). In this sense the large-scale development of p2p accommodation in these areas has been facilitated by the huge volume of properties produced by the excess supply in the real estate market created during the property boom.

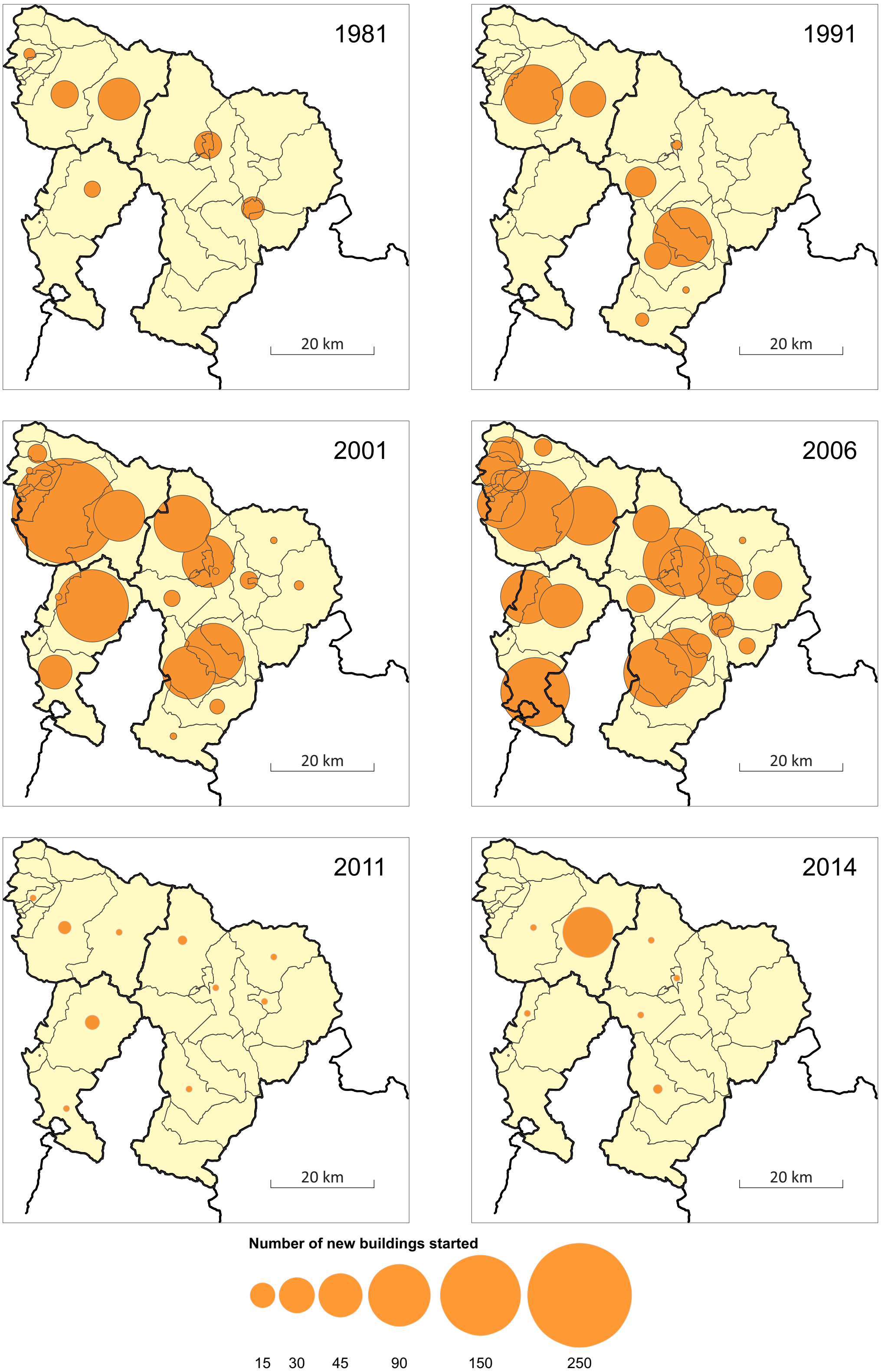

Fig. 2: Number of new buildings started in the study area. Source: Maps created by the authors using data from the Catalonia Institute of Statistics and cartographic databases from the Cartographic and Geological Institute of Catalonia.

Tab. 2: Number of new houses started per 1000 inhabitants

	1991	2001	2006	2011	2014	2018	2019
Alta Ribagorça	96.47	40.1	52.8	1.4	0.3	1.0	0.5
Pallars Sobirà	22.7	49.2	69.5	0.8	0.7	5.0	1.0
Val d'Aran	17.46	40.4	38.6	0.6	5.9	5.5	9.2
Catalonia	5.39	10.7	17.8	1.0	0.5	1.9	1.9

Source: created by the authors using data from the Catalonia Institute of Statistics.

Tab. 3: Number of empty houses 2011/2001

	Main residence	Second homes	Empty dwelling
	2011/2001	**2011/2001**	**2011/2001**
Alta Ribagorça	1,810/1,367	1,881/894	632/290
Pallars Sobirà	3,183/2,486	3,397/2,182	923/369
Val d'Aran	3,973/2,848	5,446/4,411	714/517
Catalonia	2,944,944/2,315,774	470,081/514,943	448,356/452,921

Source: created by the authors using data from the National Institute of Statistics INE

Tab. 4: Average price of new build housing (€/m2). Position in the ranking order of the 41 subregions (*comarcas*) in Catalonia

	2008	Position 2008	2010	Position 2010
Alta Ribagorça	2702.46	17/41	1826.00	30/41
Pallars Sobirà	2727.43	15/41	2034.74	20/41
Val d'Aran	3846.99	3/41	2736.28	7/41
Catalonia	3252.03	-	2699.55	-

Source: created by the authors using data from the Catalonia Institute of Statistics

The local authorities in the study area have reacted late and the regulatory vacuum has encouraged the rapid growth of tourist rentals. In Catalonia, the framework regulating properties for use by tourists (VUTs) is based on Decree 159/2012, of 20th November on tourist accommodation establishments and properties for use by tourists (amended by Decree 75/2020, of 4th August). The current regulation classifies VUTs as a new accommodation category in addition to already registered conventional establishments (hotels, campsites and rural guesthouses). The regularization of this new form of accommodation has enabled the authorities to exercise greater control over a market that was in constant growth and to guarantee a minimum level of quality via registration on an official register (Catalonia Tourism Registry). The progress made in the subregions studied in this research as regards the legalization of tourism accommodation is evident from the fact that the number of VUT beds as a percentage of total tourist accommodation has increased rapidly in recent years (Tab. 5).

However, the Regional Government of Catalonia estimates that a large number of these properties continue to operate illegally, outside their control. Proof of this is that in many of the municipalities in the study area there are more establishments advertised on Internet platforms such as Airbnb or Vrbo-HomeAway than are registered at the Catalonia Tourism Registry or the numbers do not coincide. In some cities with large numbers of tourists, these platforms have bowed to pressure from local authorities and have entered into collaboration agreements to help combat the illegal supply of tourism accommodation of this kind and the black economy. In Barcelona for example, Airbnb reached an agreement with the City Council (in early 2018) by which they agreed not to list tourist rental accommodation on their platform until it had received the cor-

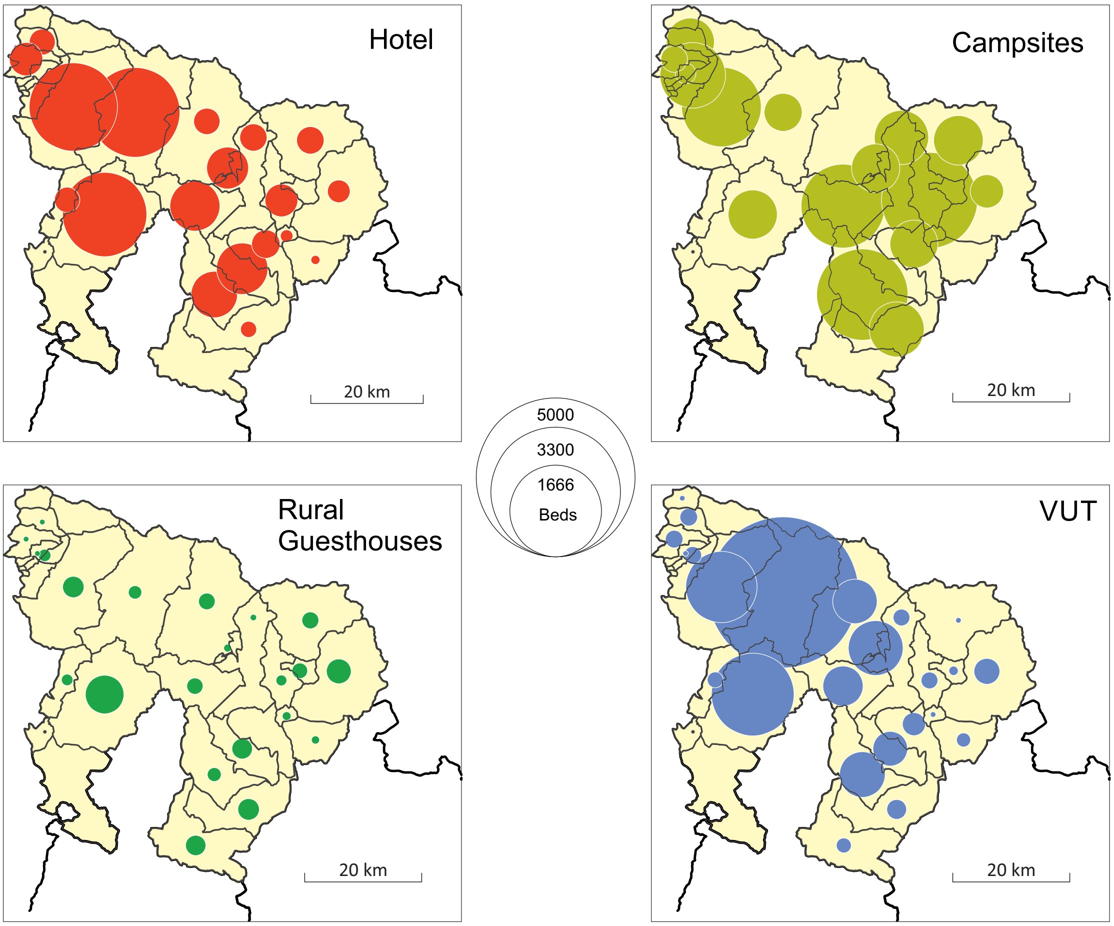

Fig. 3: Distribution of officially regulated tourist accommodation at municipal level (2019). Source: Map created by the authors using data from the Catalonia Tourism Registry, Dept. of Business and Employment and cartographic databases from the Cartographic and Geological Institute of Catalonia.

responding official registration number. However, no such agreements have been reached at Regional Government level or in the towns and villages in the study area. In December 2019, the High Court of Justice of Catalonia handed down judgement that Airbnb should stop advertising unregulated rentals in all parts of Catalonia. Despite this judgement, at the beginning of 2021, establishments not registered at the *Registre de Turisme de Catalunya* (Catalonia Tourism Registry) were still being advertised on Airbnb.

4.2 Tourist rental properties in rural areas of the Pyrenees in Catalonia and potential effects on destinations

In this context of continued expansion of tourist rental properties in the study area, the question must also be raised as to the possible repercussions of this phenomenon on local development. The study of the social, economic and environmental effects of p2p accommodation on rural spaces is of great importance as a way of assessing the effects of this global phenomenon on local economies, which are often very fragile. According to the hypothesis presented above, in order to explore the potential impacts of p2p accommodation on these destinations, we analysed aspects relating to competition with conventional tourist accommodation. We also looked at the consequences for employment and for the wider economic impact provided by tourism in this area. The implications for tax revenues and administrative control were also explored, as was the social and environmental impact of this form of accommodation.

a) The growth of tourist rental accommodation creates strong competition for traditional accommodation, made up above all of small family-owned companies. The emergence of the market for tourist rental properties and its subsequent rapid growth has coincided with a decline in

Tab. 5: Number of VUT beds as a percentage of total tourist accommodation

	2015	2016	2017	2018	2019
Alta Ribagorça	24.4%	27%	30.4%	32.4%	33.1%
Pallars Sobirà	11.4%	21.7%	15.2%	18.7%	20.5%
Val d'Aran	18.8%	24.4%	33.5%	36.4%	41.8%

Source: created by the authors using data from the Catalonia Tourism Registry, Dept. of Business and Employment.

the number of beds in rural hotels and a stagnation in the number of beds in rural guesthouses (Tab. 6). The camping sector has also been affected. Although there was an increase in the number of campsite spaces on offer between 2009 and 2014, according to official sources this was due above all to the fact that the method used to count these spaces was changed in 2011 rather than to any real increase in numbers.

The competition created by tourist rental accommodation is most clearly observed by analysing the RevPAR (Revenue per Available Room), a hotel performance indicator. The hotels in this mountain area have very low margins and show only very moderate growth compared to the figures for Catalonia as a whole (Tab. 7) or in comparison with urban holiday destinations such as Barcelona, the Costa Brava or the Costa Daurada. There are two main reasons for this poor performance. Firstly, the low levels of occupancy and secondly, the stagnation or fall in the price of hotel rooms. In terms of the occupancy rate, the data series provided by the Hotel Occupancy Survey since 1999 found that the current figures for this mountain area remain below those registered in the pre-crisis period. The proliferation of tourist rentals since then has led to strong competition for the hotel sector. In these mountain destinations it would seem that price-cutting is the most frequently used strategy for dealing with this competition from tourist accommodation rentals, as can be seen from the stagnation or fall in the average amount invoiced per occupied room (ADR). We found that the Val d'Aran subregion, which has a larger supply of high-quality and luxury hotels, was the least affected by this problem. In the data provided by the Directorate-General of Tourism of the Department of Business and Employment of the Regional Government of Catalonia, the number of beds in high quality hotels over the period 2010-2019 (four stars, four stars superior, five stars and/or deluxe) ranged between 39-50% of the total, while in Pallars Sobirà this figure was between 3-10% and in Alta Ribagorça between 23-25%. For reference purposes, we also provide these values for other parts of Catalonia: in Barcelona - over the same study period – these values were between 68-70%, in the Costa Brava between 50-60% and in the Costa Daurada between 49-66%. In Terres de Lleida, however, they were much lower, oscillating between 27-31%. The triangulation of the different variables seems to coincide with the results of research by Dogru et al. (2019), Gerdeman (2018), Williams and Horodnic (2017) and Zervas et al. (2017) for urban areas, i.e. that p2p accommodation does compete with conventional hotel accommodation and this competition is greater in areas in which most of the hotels are lower category establishments that do not belong to large chains.

The competition between tourism rental and conventional accommodation (especially the Hotel sector) in the mountain area being studied here has a different dimension to that experienced in large cities such as Barcelona or coastal resorts such as Roses, Sitges, Calella, Lloret de Mar and Salou. The hotels in these areas are often controlled by large and medium-sized groups of investors or hotel chains with high turnovers, reinvestment capacities and a high degree of business diversification, all of which makes it easier for them to adapt to this new market situation. By contrast, the typical tourist accommodation in this mountain area is the "family hotel", which is either the only source of income for the family or complements its main business, generally in the farming sector (Armesto-López et al. 2018). These family-run companies cannot normally make large investments to adapt their establishments to enable them to compete with the new accommodation on the market, and are therefore often at a disadvantage when trying to attract customers. This forces them to cut the price of their rooms or in the most extreme situations to close down.

This clearly disadvantageous situation in which tourist rental accommodation is now placing traditional forms of accommodation has led some businesspeople from this sector to try to add differen-

Tab. 6: Growth in the number of beds/spaces. Base figure of 100

Hotels	**1986**	**1996**	**2004**	**2009**	**2014**	**2018**
Municipalities with a very large ski resort	100.0 (1296)	145.8 (1890)	171.4 (2221)	217.7 (2821)	229.8 (2978)	237.1 (3074)
Munic. with a medium-sized resort	100.0 (1170)	128.2 (1500)	177.2 (2073)	184.6 (2160)	165.2 (1933)	141.1 (1652)
Munic. with a small ski resort	100.0 (382)	196.9 (752)	197.9 (756)	197.9 (756)	194.5 (743)	183.2 (700)
Munic. which are capitals of subregions	100.0 (2318)	121.7 (2821)	148.7 (3447)	161.1 (3735)	165.1 (3828)	137.4 (3186)
Other municipalities	100.0 (1988)	54.9 (1599)	55.4 (1613)	58.1 (1690)	56.3 (1638)	45.8 (912)
Campsites		**1996**	**2004**	**2009**	**2014**	**2018**
Municipalities with a very large ski resort	-	100.0 (238)	100.0 (238)	100.0 (238)	119.7 (285)	119.7 (285)
Munic. with a medium-sized resort	-	100.0 (385)	103.4 (398)	103.4 (398)	123.9 (477)	123.9 (477)
Munic. with a small ski resort	-	100.0 (1415)	113.6 (1607)	123.6 (1749)	148.2 (2097)	148.2 (2097)
Munic. which are capitals of subregions	-	100.0 (2693)	109.5 (2948)	109.5 (2948)	131.3 (3537)	130.2 (3507)
Other municipalities	-	100.0 (4220)	105.2 (4441)	107.8 (4548)	129.3 (5457)	129.3 (5457)
Rural guesthouses			**2004**	**2009**	**2014**	**2018**
Municipalities with a very large ski resort	-	-	100.0 (78)	100.0 (78)	114.1 (89)	114.1 (89)
Munic. with a medium-sized resort	-	-	100.0 (314)	125.2 (393)	121.6 (382)	120.0 (377)
Munic. with a small ski resort	-	-	100.0 (195)	100.5 (196)	116.9 (228)	117.4 (229)
Munic. which are capitals of subregions	-	-	100.0 (203)	104.4 (212)	97.0 (197)	108.8 (221)
Other municipalities	-	-	100.0 (295)	124.1 (366)	134.2 (396)	127.1 (375)
VUTs					**2015**	**2018**
Municipalities with a very large ski resort	-	-	-	-	100.0 (1755)	279.6 (4907)
Munic. with a medium-sized resort	-	-	-	-	100.0 (1123)	141.6 (1590)
Munic. with a small ski resort	-	-	-	-	100.0 (342)	133.6 (457)
Munic. which are capitals of subregions	-	-	-	-	100.0 (969)	161.9 (1569)
Other municipalities	-	-	-	-	100.0 (672)	197.2 (1325)

Note: * The total number of beds appears in brackets. Source: created by the authors using data from the Catalonia Institute of Statistics.

tial value to the services they offer without having to make large investments. Many of them now offer their clients special activities and experiences in the local area (stargazing, bear-watching routes, etc.) or place greater emphasis on services related with local restaurants and gastronomy. Others specialize in specific kinds of tourists such as skiers, hikers, cycle tourists, anglers, birdwatchers or families with children (creating, on occasions, quality brands in specialized accommodation, such as for example the *Benvinguts*

Tab. 7: Evolution of the hotel performance indicator (ADR/RevPAR*)

	2010 Euros	2011 Euros	2012 Euros	2013 Euros	2014 Euros	2015 Euros	2016 Euros	2017 Euros	2018 Euros	2019 Euros
RevPAR*										
Alta Ribagorça	17.7	17.3	15.2	14.8	15.6	18.2	20.2	21.7	23.3	22.6
Pallars Sobirà	17.7	17.3	15.2	14.8	15.6	18.2	20.2	21.7	23.3	22.6
Val d'Aran	28.5	26.6	28.86	27.7	29.7	32.5	36	36.4	39.6	43.2
ADR										
Alta Ribagorça	68.6	65.2	63.4	61.4	61.4	67.1	67.1	68.8	73	71.6
Pallars Sobirà	68.6	65.2	63.4	61.4	61.4	67.1	67.1	68.8	73	71.6
Val d'Aran	75	75.3	73.8	75.7	79.6	79.5	87.3	87.4	90.8	93.9
RevPAR*										
Barcelona	68.20	74.77	75.99	77.89	79.14	89.08	95.04	100.04	97.35	105.98
Costa Brava	32.43	35.23	35.21	36.15	36.52	37.93	41.76	47.89	46.13	49.09
Costa Daurada	37.7	39.95	41.35	42.62	44.91	44.19	49.97	57.11	57.18	60.05
Terres de Lleida	16.08	15.62	14.79	13.60	15.50	16.53	16.74	18.25	20.59	23.40
Catalonia	43.71	47.01	47.29	48.68	50.43	55.94	60.69	66.42	65.17	69.70

Note: * These data were first issued in 2010. Source: created by the authors on the basis of information from the Hotel Occupancy Survey issued by the Spanish National Statistics Institute.

brand aimed specifically at hiking and cycling tourists). Others join forces to form business collaboration networks (Rural Tourism Associations, etc.).

b) The growth in tourist rental accommodation to the detriment of other forms of accommodation has negative effects on employment. The statistics produced by the Annual Service Survey of the Spanish National Statistics Institute (2018, avalaible in 2020) show that fewer people are employed in tourist rentals than by tourist accommodation companies such as hotels. The average number of workers (including the owners) per hotel is 18.4. For campsites and rural guesthouses, this figure is 11.1 and for VUTs it is only 3.4. Similar values can be seen for the number of salaried staff employed by the different types of tourist accommodation companies: an average of 18 employees per hotel company, 10.7 for campsites and rural guesthouses and only 2.3 for VUTs. These differences are mainly due to the limited number of services provided by tourist rental companies, which on many occasions involve little more than the property management services provided by real estate agencies (often located in the study area above all in the capitals of the subregions -*comarcas*-) and the cleaning services provided once the guests have left. According to the latest figures from Exceltur (2018), 22.2 jobs are generated per 100 hotel beds, while for VUTs this figure is estimated at 2.2. This unbalanced effect is clearly highlighted if we extrapolate these figures for the subregions we studied: in these three *comarcas*, for the year 2019, the 8882 hotel beds sustained 1972 jobs while the 11,562 beds in VUTS sustained just 254. The increase in tourist rental accommodation in detriment to its strongest competitor (hotels) therefore has a negative impact on the employment market (as Kaplan and Nadler 2015; Zervas et al. 2017 corroborated for urban areas), a fact that in the medium-term could affect the sociodemographic revitalisation of these areas.

c) Typical users of tourist rental accommodation, a priori, have a smaller economic impact on the local area. The figures for average daily expenditure of the tourists who visit Catalonia by types of tourist accommodation indicate that the tourists who stay in tourist rental accommodation have a smaller economic impact on the area than that generated by those who stay in conventional establishments (Tab. 8). The lower consumption capacity of this kind of tourist (often self-catering) means that they have a more limited knock-on effect on the local business fabric, made up not only of bars, restaurants, supermarkets and small shops, who sell most of the local agri-food products (Armesto-López et al. 2018), but also on the numerous companies who offer tourism-related services (mountain guides, ski schools, white-water rafting agencies, guided tours of museums and churches, etc.). It is also important to point out that statistics produced by organizations such as FAMILITUR (2016), EGATUR (2016) and Exceltur (2015) suggest that tourists who stay in tourist rental accommodation tend to concentrate

Tab. 8: Declared expenditure* by tourists by main type of accommodation (2016)

	Average daily expenditure per tourist (€)	
	Foreign tourists	Domestic tourists
Hotels	241.4	88.8
Tourist rental accommodation	141.4	51.9
Campsites, Rural Guesthouses	166.1	n.a.
Second homes, Homes owned by relatives, friends and others	81.7	n.a.

Note: * Declared expenditure includes money spent on transport, accommodation, restaurants, food, activities and other expenses. Source: Data from the Spanish National Statistics Institute and Exceltur (2015).

their expenditure on the purchase of food, drinks and cleaning products, preferably in supermarkets belonging to large chains. These supermarkets, hypermarkets and discount stores are normally located in the region (particularly in the capitals of the *comarcas*) but their corporate headquarters are elsewhere. In most cases, the goods sold in these chains are not produced in the immediate or neighbouring areas, where little Gross Value Added is generated.

The statistics show that users of tourist rental accommodation have a smaller economic impact on the local territory and by extension on the local business fabric, so raising serious doubts about the alleged contribution made by this kind of accommodation to the economic revitalization of the areas in which it is located. The results of the research into urban areas by Kaplan and Nadler (2015), Quattrone et al. (2016), Tussyadiah and Pesonen (2016) and Zervas et al. (2017) are not applicable to our rural areas.

d) The growth of tourist rental properties is causing new investors to arrive from outside the region with little or no awareness or interest in the territorial problems facing this mountain area. As has happened in urban areas (Cocola-Gant and Gago 2019; Fields 2019; Srnicek 2017; Shaw 2020), the growth of tourist rental accommodation in the rural subregions we studied has also been accompanied by the arrival of new investors from outside these areas. Our analysis of the Airbnb platform suggests that over 80% of the private hosts have registered from places outside the *comarcas* of Pallars Sobirà, Alta Ribagorça and Aran, a fact confirmed in their brief biographies in which they normally mention where they live or come from. The detailed information from the Catalonia Tourism Registry on VUTs also points out that, above all in the municipalities with links to ski resorts, rental homes tend to be concentrated in the hands of just a few investors (Tab. 9), and that some owners owned over 20 VUT properties.

The presence of investment and tourist accommodation management companies who act as hosts is also evident on this platform. Some of these companies are newly created and appear to have their head offices in the subregions we studied or in others bordering on them (around 40%). Others however do not (the remaining 60%). The philosophy of this kind of company (some of whom own the properties while others merely act as managers) is clear from their corporate websites, which show that their sole objective is to run a profitable business without

Tab. 9: Estimation of the concentration of ownership of VUTs in municipalities with a ski resort (2018)

	% owners with 1 VUT	% owners with 2 VUTs	% owners with 3 VUTs	% owners with 4 or more VUTs
Municipalities with a very large ski resort				
Naut Aran	23.7	18.1	31.3	26.9
Alt Àneu	57.7	15.4	15.4	11.5
Municipalities with a medium-sized ski resort				
Rialp	61.9	23.8	4.8	9.5
Vall de Boí, la	27.1	28.6	7.1	37.1
Municipalities with a small ski resort				
Espot	55.6	22.3	16.7	5.6
Lladorre	100	0	0	0
Alins	58.3	25	8.3	8.3

Source: created by the authors using information from the Regional Government of Catalonia, the Catalonia Tourism Registry, and work in the field.

showing any concern or sensitivity towards the specific issues or problems affecting local areas.

The appearance and growth of tourist rental properties as a form of accommodation associated, in some cases, with owners from outside the area means that a considerable proportion of tourist spending takes place outside the area and therefore brings no direct benefits for local people, with the resulting implications for the economic development of the region.

e) The rapid proliferation of tourist rental accommodation and its late regulation has enabled a black market to develop, in which owners avoid fiscal and administrative controls and tourists do not pay the relevant taxes. This gives rise to unfair competition, a lack of quality control and undeclared income, so producing significant losses in tax revenues for both national and regional governments (as no property or business taxes are paid). The local administration is also directly affected by this unregulated situation. In the study area, the presence of illegal, unregulated tourist accommodation affects the amounts raised from the Tax on Stays in Tourism Establishments, a tax paid directly by tourists, which was introduced in Catalonia in 2012. The money raised from this tax is used to sustain the Tourism Development Fund and seeks to encourage sustainable, responsible, high-quality tourism, protect tourism resources, create and improve tourism products, develop tourism-related infrastructures and promote tourism. The revenues produced by this tax are very important for the municipal coffers in these mountain areas, as local councils can directly use 30% of the income it generates, while the remaining 70% is administered by the Regional Government. This 30% is a very necessary economic input for the local administration given that many of these small mountain municipalities have serious financial problems, as the funding they receive from the higher tiers of government depends on the number of people actually registered as residents in the municipality, a figure that does not include temporary or seasonal residents, who expect to receive the same services (it is important to remember here that the three *comarcas* in the study area have just 20,000 officially registered residents and that 24 of the 27 municipalities had less than 2,000 inhabitants.).

The revenue collected from this tax has grown steadily since it was first introduced (56.5 million euros for the period 2017-18 compared to just 34.5 million euros for the period 2012-13). In spite of this, the Catalonia Tax Office stated that in 2014, the tax gap (the difference between the potential amount that should be collected and the real amount actually received) for this tax was 29%, with high levels of fraud being detected due to non-declaration or under-declaration of stays at VUTs (76% of the total). This fraud is in addition to the illegal tourist rentals mentioned earlier, which pay no tax whatsoever.

The large number of VUTs on offer in Catalonia together with the more widespread use of these services by tourists helps explain the increase in the amount collected for this tax by type of establishment. The data show that while the overall figure for revenues from this tax (93% of revenues from this tax came from hotels, VUTs and campsites) has remained unchanged, significant changes have taken place in the proportions for each type of accommodation. In 2012-13, the breakdown was hotels 81%, campsites 7% and VUTs 5%; while for the period 2017-18 it was hotels 67%, campsites 5% and VUTs 21%. In the subregions we studied, these figures are close to the overall average figure for Catalonia (Tab. 10) and a similar situation can be observed at municipal level.

In this context of growth of tourist rental accommodation, the legalization of illegally operated properties -to enable administrative and fiscal control- and the detection of fraud due to under-declaration

Tab. 10: Tax revenue generated by type of tourism establishment

	2012-13 [€]	2014-15 [€]	2017-18 [€]
Alta Ribagorça			
Hotels	28,625 (1)	30,847 (1)	29,821 (1)
Campsites	5,177 (2)	3,534 (3)	3,156 (3)
VUTs	1,213 (4)	3,677 (2)	11,900 (2)
Rural Guesthouses	2,104 (3)	2,566 (4)	2,312 (4)
Pallars Sobirà			
Hotels	40,257 (1)	70,250 (1)	76,127 (1)
Campsites	28,106 (2)	33,014 (2)	37,269 (2)
VUTs	666 (4)	4,259 (4)	16,993 (3)
Rural Guesthouses	4,750 (3)	7,532 (3)	7,603 (4)
Val d'Aran			
Hotels	313,119 (1)	365,041 (1)	394,470 (1)
Campsites	8,030 (2)	14,332 (2)	18,987 (3)
VUTs	5,716 (3)	12,061 (3)	69,922 (2)
Rural Guesthouses	923 (4)	1,180 (4)	1,943 (4)
Catalonia			
Hotels	28,107,707 (1)	34,250,055 (1)	37,640,477 (1)
Campsites	2,358,386 (2)	2,690,437 (3)	2,843,254 (3)
VUTs	1,772,531 (3)	3,641,676 (2)	11,954,174 (2)
Rural Guesthouses	184,081 (4)	253,041 (4)	274,259 (4)

Source: Catalonia Tax Agency.

of the number of nights stayed at officially regulated VUTs are important challenges for these mountain municipalities, which typically have insufficient finance to enable them to provide the public services they are supposed to provide, the cost of which is increased by the arrival of tourists (in particular those relating to waste management, cleaning, security, streetlighting, public facilities, etc.). The additional expenditure associated with this seasonal population must therefore be compensated -at least in part- by imposing taxes on leisure and tourism activities.

f) The growth in tourist rental accommodation is having harmful effects on the tourism load capacity of many municipalities and could become a factor in the collapse (at either a social or an environmental level) of these spaces. In this case, we are talking about towns and villages with very small populations and a disproportionately large stock of tourist rental accommodation, which on many occasions are under much higher levels of pressure than those found in the city neighbourhoods or holiday resorts most commonly referred to in analyses of this problem. Well-known examples include the Ciutat Vella district of Barcelona (urban), in which there are 418 VUT beds for every 1,000 inhabitants; the Madrid-Centro neighbourhood (urban) in which there are 215; the Sevilla-Casco Antiguo (urban), 244; Lloret de Mar (coastal), 780; Calella (coastal), 106 and Palma de Mallorca-Centro (urban-coastal) in which there are 325. Although these values seem extremely high, they are exceeded in many of the municipalities in the mountain subregions in our study area (Tab. 11): in Naut Aran there are 2,522 VUT beds for every 1,000 inhabitants; in Vall de Boí there are 1,323; in Espot 906 and in Alt Àneu 963.

The VUTs have brought tourism and its related dynamics to new areas and have increased the pressure in areas in which tourism was already well established and where there was a large supply of hotel and second-home accommodation. The social and economic effects of such high levels of pressure on these small municipalities are already visible. There has been an increase in the amount of p2p accommodation, which has exacerbated some of the problems produced by earlier development of tourism based on excessive residential development and property speculation. According to the latest report on the residential rental market in Catalonia (drafted in 2017 by the Office for Housing and Urban Improvement of the Department of Government, Public Administrations and Housing from data provided by INCASÒL), two of the subregions in the study area (Val d'Aran and Pallars Sobirà) experienced very high year-on-year increases in the price of property rentals (for residential use), such that the average price in Val d'Aran is now as high as in the city of Barcelona itself and exceeds that in many of the suburban towns around the Catalan capital. This makes it increasingly difficult to rent a house in which to live on a long-term basis at an affordable price, particularly for those employed in the tourism sector to work the winter and summer seasons. This is evidenced by the fact that the number of long-term residential rental contracts entered into in Val d'Aran fell by 46% between 2016 and 2017. This has led to extreme situations in which for example the Town Council of Vielha has discovered shop units, garages and offices which have been fitted out to enable people to sleep in them given the difficulty of finding a rented apartment. Some of the Town Councils in this area (such as Vielha e Mijaran) are now aware of this problem and have decided to introduce a moratorium on the granting of new licenses for tourist rental accommodation (VUT), while others (such as Naut Aran) are considering similar measures. This moratorium in Vielha e Mijaran was established in 2017 and remains in force today. In the year 2020, the Town Council approved various changes in the town-planning regulations as a means of regulating tourism rental accommodation. As a result, the rental of accommodation to tourists will only be allowed in individual houses and in apartment blocks where all the flats are intended for this purpose. The objective is to guarantee the fundamental right of the residents of Vielha e Mijaran to housing at an affordable price, and to ensure that local residents can peacefully coexist with tourists without having to endure the noise and other problems sometimes caused by holidaymakers.

The naive discourse which claims that p2p rentals have a smaller environmental impact than conventional tourism is called into doubt if we return to the origin of this phenomenon in the study area. In this mountainous rural area, the stock of tourist rental accommodation is made up above all of newly built properties rather than traditional village houses. The large numbers of properties which are enabling the swift expansion of p2p accommodation in rural areas originated above all in the recent property boom and speculative investment in building land. The vast increase in construction work in these subregions led to enormous tracts of agricultural land being converted into building land, resulting in the rapid occupation of large areas of huge environmental and landscape value (Tab. 12). This disproportionate increase in new housing and the associated

Tab. 11: Number of VUT beds and hotel beds per 1000 registered inhabitants

	VUT beds / 1000 inhab		Hotels beds / 1000 inhab
	2015	2018	2018
Municipalities with a very big ski resort			
Naut Aran	903.4	2522.9	1823.0
Alt Àneu	405.4	963.1	327.0
Municipalities with a medium-sized ski resort			
Rialp	177.1	357.5	782.6
Vall de Boí, la	1003.0	1323.9	1416.3
Municipalities with a small ski resort			
Espot	776.2	906.3	1383.0
Lladorre	26.2	26.4	637.9
Alins	191.0	455.2	353.0
Capitals of sub-regions			
Sort	132.8	190.9	190.4
Pont de Suert, el	54.9	67.2	113.0
Vielha e Mijaran	100.9	183.3	583.4
Other Municipalities			
Arres	89.6	95.2	0.0
Baix Pallars	80.0	133.3	0.0
Bausen	103.4	93.8	0.0
Bòrdes, Es	211.0	330.8	0.0
Bossòst	24.6	55.0	193.0
Canejan	0.0	0.0	0.0
Esterri d'Àneu	410.4	758.7	399.5
Esterri de Cardós	150.7	246.4	0.0
Farrera	237.3	319.7	128.0
Guingueta d'Àneu, la	19.0	184.6	460.6
Les	6.3	63.9	250.0
Llavorsí	203.4	298.3	433.2
Soriguera	129.9	193.0	257.2
Tírvia	39.2	44.8	198.7
Vall de Cardós	46.2	147.8	552.0
Vilaller	19.4	93.3	225.0
Vilamòs	103.7	383.6	0.0

Source: created by the authors on the basis of data from the Catalonia Tourism Registry, the Dept. of Business and Employment and the Catalonia Institute of Statistics.

surge in tourist numbers also brought a huge environmental burden in terms of additional water supply, energy consumption and waste generation.

The growth in tourist rental properties is having harmful effects on these regions in terms of their load capacity (high number of beds per inhabitant). The high pressure it puts on housing stock is also causing problems in terms of the availability of housing for residential use and sharp price increases, analogous to what has happened in urban areas (Barron et alt 2021; Horn and Merante 2017; Mermet 2017; Schäfer and Hirsch 2017; Sheppard and Udell 2016; Wachsmuth and Weisler 2018). In addition, the original stock of properties that is enabling the expansion of p2p accommodation in rural areas was produced by the real estate boom and property speculation. This was made possible by the reclassification of large tracts of land on which building was not permitted and their subsequent conversion to building land, resulting in the widespread occupation of land of enormous environmental and landscape value.

In years to come, and with the benefit of greater hindsight, a more in-depth analysis of the effects of the proliferation of tourist rental properties in these mountain areas must be conducted from both an environmental and a social perspective.

Tab. 12: Land use change between 2001 and 2010 (ha)

2001	Forest area			Cropland				
	Forests	Scrubland	Others (meadows, pastures, etc.)	No vegetation	Dry farming	Irrigated	Urban and others	Total
Alta Ribagorça	10,708	7,156	23,774	560	236	89	267	**42,790**
Pallars Sobirà	61,846	2,935	55,085	13,192	2,161	289	382	**135,890**
Val d'Aran	10,500	4,986	37,603	9,630	55	0	516	**63,290**

2010	Forest area			Cropland				
	Forests	Scrubland	Others (meadows, pastures, etc,)	No vegetation	Dry farming	Irrigated	Urban and others	Total
Alta Ribagorça	16,382	22,850	1,545	836	590	180	407	**42,790**
Pallars Sobirà	63,030	62,120	6,440	1,663	1,049	187	1,401	**135,890**
Val d'Aran	21,877	35,232	4,544	903	51	2	683	**63,290**

Source: Department of Agriculture, Livestock, Fisheries, Food and the Natural Environment.

4 Conclusions

The study presented here has explored the geographical dimension of the officially regulated supply of p2p accommodation in a rural mountain area in the Catalan Pyrenees and its potential impacts on these destinations. This research has revealed the widespread significance of this phenomenon, which was observed in 26 of the 27 municipalities in the study area and is directly related with a large stock of underutilized real estate assets (in most cases new-build housing and second homes) and, to a lesser extent, with the previous existence of conventional tourist accommodation. In fact, the research has also highlighted the enormous importance of p2p accommodation in rural municipalities with a deficit of conventional tourist accommodation infrastructure. p2p accommodation has provided a new way to make a return on real estate assets all over the world. Rural areas of the Catalan Pyrenees are no exception.

The new-build accommodation that has emerged in rural mountain areas of Catalonia in association with p2p has created few new opportunities for local residents. In fact, quite the opposite is true. The online platforms through which this type of accommodation is rented have enabled external economic agents who operate from outside these subregions to enter the market and make profits at the expense of local people. It was not until the negative effects of the proliferation of this kind of accommodation had become evident in these regions that the need to regulate and/or limit these activities was first proposed. It is possible that the positive ideological discourse associated with the "sharing" spirit that originally pervaded some of these platforms helped delay the application of corrective measures by regional and municipal governments; the fragile demographic base in these areas has also weakened the capacity of local actors to respond. This regulatory weakness and the very limited pressure exerted by local residents has made these rural areas an excellent alternative for the big Internet platforms and real estate investors, whose capacity to expand in big cities is becoming more and more limited.

In these mountain rural destinations, the properties are either owned by small companies or by private individuals, both mainly from outside the region, and a considerable number of these properties are concentrated in the hands of just a few investors. We have also noted the appearance of management companies who manage a string of properties of this kind. The p2p accommodation on offer in rural mountain areas in Catalonia (Spain), far from consolidating itself as an endogenous tourism product similar to conventional tourism accommodation with a strong territorial base, has in fact become part of the neoliberal dynamics so prevalent during the boom years, and has proved incapable of reverting the negative urban growth trends associated with the excessive, disproportionate construction of second homes. The p2p accommodation that has emerged in this mountain area has increased and exacerbated some of the problems that were becoming visible prior to the bursting of the real estate bubble, so calling into question the argument that p2p accommodation could act as a lifeline for endangered rural economies.

In these rural mountain areas, VUTs now account for a high percentage of officially regulated tourism accommodation (in some cases over 30%). There are also large numbers of unregulated properties. Both forms of accommodation provide strong competition for the conventional tourism sector and in particular for hotels, a fact evidenced by the stagnation in the number of hotel beds on offer in the area and the low scores they achieve on hotel profitability indicators. Although similar trends have been observed in Spanish city destinations, the urban hotel sector has a much greater capacity to respond in that it is mainly made up of large and medium-sized investment groups with high turnovers, reinvestment capacity and a widely diversified business structure.

The growth of tourist rental accommodation to the detriment of other forms of accommodation has a negative impact on job creation and official statistics highlight that many fewer people are employed in tourist rental accommodation companies than in conventional tourism businesses such as hotels. This means that the continuing rise of tourist rental accommodation at the expense of its greatest competitor (tourist accommodation) has evident repercussions on the labour market, a fact which in the medium term could damage the sociodemographic revitalization of these territories. In addition, statistics show that users of tourist rental accommodation have a smaller economic impact on the local area and by extension on the local business fabric, so raising serious doubts about the alleged contribution made by this kind of accommodation to the economic revival of the areas in which it is located. Similarly, within the context of the growth of tourist rental accommodation in the study region, it was observed that tax revenues from these properties had increased, a change that was clearly beneficial for local councils in that it increased the financial resources available to them. However, the official bodies responsible for inspecting this sector have uncovered high levels of fraud in officially regulated tourist rental properties, in the form of unpaid tax and underdeclared stays. In addition to these types of tax fraud in regulated properties, there are also large numbers of illegal, undeclared tourist rental properties on offer in this area, which pay no tax whatsoever.

The growth in tourist rental properties is having harmful effects on these regions in terms of their load capacity (high number of beds per inhabitant). The high pressure it puts on housing stock is also causing problems in terms of the availability of housing for residential use and sharp price increases. This in spite of the real estate boom and property speculation, which led to the rezoning of large tracts of land, often of enormous environmental and landscape value, on which building was not permitted and their subsequent conversion to building land. Rather than being a new source of housing for local people, the prohibitive prices resulting from property speculation meant that most of these new homes were bought by people from outside the area looking for second homes or by investors in tourist rental accommodation.

Tourist rental accommodation is now a strong player in economically and environmentally vulnerable spaces such as rural mountain areas. The tourism sector has proven very permeable to new tendencies and to the development of new paradigms. However, not all the territories in which these changes are taking place show the same degree of vulnerability or the same capacity to respond and to adapt. When faced with a disruptive phenomenon, different areas respond in different ways depending, among other things, on their particular geographical characteristics. These distinctive characteristics that influence the magnitude of the impacts must be taken into account when designing policies and strategies to regulate the phenomenon.

The results of this exploratory study indicate the need for future research to: a) investigate the impacts identified in this study in a more systematic way, and b) propose solutions that might reduce the impact of the increase in p2p accommodation in rural areas. Another reason for continued investigation of this phenomenon would be to assess the effects of the Covid-19 pandemic on the tourism rental market in rural areas.

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