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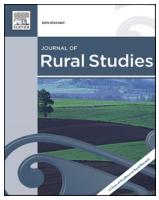

Historical changes in Mediterranean rural settlements (southern Spain, 1787–2019)

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ABSTRACT

In modern societies, changes in population patterns are often studied based on a rural vs urban duality. This dichotomous simplification overlooks the existence of a broad range of human settlements, especially in the rural world. In this work, we quantified and analysed southern Spain's population and rural settlements from the late eighteenth century to the present, distinguishing three types of settlements: agrotowns, the villages and dispersed settlements. To do this, we drew on a littleused source, Spanish property censuses, published since the mid-nineteenth century, as well as other historical sources. We observed that in southern Spain, characterised by a large number of agrotowns and scattered settlements, the method selected to estimate the rural population largely determined the settlement results obtained. We found that since the mid-twentieth century, the rural population had fallen not only in numbers but also in diversity. Historically, the rural population was heterogeneous, adapting to the territory in a context of organic economy and a reduced amount of trading. Especially notable was the weight of dispersed settlements, which accounted for almost two-thirds of rural population growth until the mid-twentieth century and for almost half the rural population

1. Introduction

The way societies have settled on territories has varied substantially throughout history (e.g., Dickinson, 1949; Roberts and Wrathmell, 2002; Infante-Amate et al., 2016). The most widespread framework to study this phenomenon in modern times has been the rural vs urban duality, which places human settlements into two broad categories with contrasting attributes (Bairoch, 1988 De Vries, 1984). Despite a lack of consensus on how to delimit both types of settlement, larger settlements with a diversified occupational structure are usually considered as urban, while scarcely populated nuclei traditionally orientated towards agricultural activities are regarded as rural (De Vries, 1984; Liu and Li, 2017). Albeit with large regional variation, the share of the global rural population fell sharply throughout the twentieth century, as cities became more prominent. The percentage of world population living in rural areas has dropped from 66 % in 1960 to 44 % in 2020 (World Bank, 2024). This process is directly linked to the growth of industrial society and globalisation, which explains why it took place earlier in Europe (De Vries, 1984; Saville, 2013; Collantes and Pinilla, 2011) than in much of the rest of the world (Liu and Li, 2017; Li et al., 2019).

Yet the dichotomous simplification of the rural/urban divide tends to overlook the hugely diverse types of human settlements that are found in rural areas. These settlements have changed in space and time following geographical, economic, and institutional constraints. Languages across the world offer an extraordinarily rich lexicon to describe a wide range of rural settlements, according to their size, their architecture, and their economic life, which have all changed through time, revealing the huge diversity masked by the label 'rural' (Roberts, 2013). Nevertheless, very few studies have analysed rural settlement typologies and their historical evolution in quantitative terms.

In Spain, our case study, the typology of rural settlements is varied. The most common type is the village (the *pueblo*), i.e., a main population centre in a rural municipality. There are currently 8131 municipalities in Spain, of which 91 % have fewer than 10,000 inhabitants (INE, 2021), the threshold chosen by Spain's National Institute of Statistics to consider them rural. However, these population centres have been historically surrounded by scattered hamlets of varying sizes, characteristics, and denominations across Spain. For example, in the region of Catalonia, the most common dispersed settlement is the *masía* (Congost, 2015); in Aragon, the *mas* (Hernández, 2008), in the Basque Country,

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the *caserío* (Cruz, 2002); and in the south of Spain, the *cortijos* and *haciendas* (Infante-Amate et al., 2016). We know that these dispersed settlements were generally larger in the peripheral provinces of Spain, both in the north and in the east and south, and smaller in the central regions. Despite their differences, most of these settlements are characterised by their small demographic scale, their relative geographical isolation, and an occupational structure concentrated almost entirely on agriculture. They also share a recent history of abandonment, which has encouraged heritage studies about these settlements (e.g. Olmedo, 2011). Recently scholars have produced the first long-term estimates of the evolution of dispersed settlements for regions such as Aragon (Ayuda et al., 2023) and Valencia (Beltran et al., 2022). The longer view.

In addition to villages and dispersed settlements, another notable type of rural settlement in southern Spain is the agrotown (*agrociudad*). They consist of large municipalities oriented towards agriculture (López-Casero, 1989; Lopez Ontiveros, 1994), that is, they are urban in size and appearance, but rural in terms of economic orientation (Blok and Driessen, 1984). Many authors suggest considering them as rural in order to avoid over-estimating urbanisation rates. Sicily, in southern Italy, provides a revealing illustration. If we were to consider Sicilian agrotowns ('urban villages' where most people were peasants) as cities, Sicily would have been the most highly urbanised region in Europe in early modern times, even ahead of the Netherlands, despite being an overwhelmingly agrarian region (Malanima, 2005: 98). There is a vast literature on the characteristics and functionality of agrotowns (e.g., Curtis, 2013), yet no empirical study has quantified their size throughout history or their geographical patterns.

The quantitative analysis of the different kinds of settlements provides a richer reading of the demographic history of a given territory, while also contributing to a better understanding of the rural/urban divide. There are no consensus criteria to distinguish between urban and rural, leading to widely different rural population estimates which, in turn, shape contradictory historical narratives and even present-day public policies.

Against this background, in this paper, we study the evolution of Andalusia's rural population and its different settlements. Andalusia is Spain's most populated region and the second largest in territory, so it presents broad geographical and population diversity. We estimated the number of inhabitants as well as other socio-economic variables in Andalusia's rural settlements at the municipal level (771 municipalities) between 1787 and 2017. We exploit this newly-constructed dataset in order to.

1. Examine the historical evolution and the geographical location of rural settlements in southern Spain in order to provide a richer account of population change than the traditional narratives structured around the rural/urban divide.
2. Analyse the drivers of long-term spatial divides in rural settlement patterns, which result in some parts of Andalusia showing a persistently higher degree of population dispersion than others. Our hypothesis is that a crucial factor behind more or less dispersed settlement is land inequality, as in areas dominated by latifundia it was much more difficult for peasants to settle in small hamlets. We put this hypothesis to the test with an instrumental variable regression, and find that structural land inequality is a significant predictor of settlement dispersion in the long-run.
3. Lastly, we offer a new historical reading of the population geography of southern Spain, considering how different kinds of settlement evolved in light of broader socio-ecomic change.

2. Methodology

2.1. Case study

Andalusia is one of Spain's 17 regions (*comunidades autónomas*). It has been the country's most populated region ever since historical records began, being home to between 17 % and 20 % of the population since the sixteenth century. It is roughly the size of Portugal and larger than many other European countries. It is the only region in Europe with access to both the Mediterranean Sea and the Atlantic Ocean. It has desert areas (Almeria) but also the only tropical coast in Europe (in the provinces of Malaga and Granada). Although Andalusia's coastline is over 1000 km long, most of its surface area is mountainous, including the highest summit in the Iberian Peninsula (Mulhacén, in Granada, reaching 3479 m). Andalusia is thus a highly heterogeneous region, in terms of both geography and population.

At the end of the eighteenth century, it was one of Spain's wealthiest regions: it ranked 3rd/17 in terms of per capita income and average incomes were 43 % higher than the national average. Throughout the nineteenth century, however, its relative economic situation worsened and by the beginning of the twentieth century it was already among the poorest regions (14th/17 and with average incomes 26 % lower than the Spanish mean) (Carreras and Tafunell, 2004). Among the causes of its relative backwardness, scholars have emphasised geographical features, such as a steep topography and soil aridity, which limited historical agricultural productivity (González de Molina et al., 2015). The region's higher relative endowment of land and lower relative endowment of artisanal skills and capital limited its industrialisation, causing it to concentrate in other regions of Spain (Rosés, 2003). Additionally,it has been suggested that high levels of land inequality (traced back as far as the Reconquista) that would have resulted in a less egalitarian and less productive regional economy traced back to the Reconquista (Parejo, 2006; Oto-Peralías and Romero Ávila, 2016).

Four highly dissimilar sub-regions can be differentiated based on their population and geographical diversity (see Table 1 and Fig. 1). (i) The Valley around the Guadalquivir River: a flat area, historically oriented towards agriculture and dominated by large estates (López Ontiveros). It occupies 28 % of the territory but today accounts for 40 % of the population. Seville, the most populated city and the capital of Andalusia is located in the Valley. (ii) The coast: it only occupies 10 % of the surface area and contains only 9 % of the municipalities but today it is home to 37 % of the population. It has large port cities and areas of very intensive agriculture. The local climate has allowed commercial agriculture to include tropical crops (in the provinces of Malaga and Granada) and has led, more recently, to a specialization in greenhouse farming (in Almeria). Consequently, the coast has attracted a large population: its population density is four times higher than Andalusia's average (see Table 2).

In addition to the Valley and the coast, two mountain areas can be distinguished. (iii) The Baetic Montain Ranges or the Baetic System in the southeast. This sub-region concentrates over half Andalusia's municipalities and thus presents the highest density of population nuclei. However, its average size and population density is much smaller than that of the Valley and coast. These lands have historically been areas of peasant agriculture, with landscapes dominated by cereals and olive trees. (iv) Sierra Morena is a mountain range that separates Andalusia from the rest of the country. It has very poor soils and inaccessible areas. It has thus been less populated and is oriented to livestock and forest harvesters. Although it represents a quarter of Andalusia's territory, there are no large cities and it has always accounted for less than 15 % of Andalusian population.

2.2. Defining southern Spain's rural population

The notions of rural and urban are social constructs. Their boundaries differ according to the discipline and their definitions have changed over time (Paniagua and Hoggart, 2002; Li and Liu, 2017). Numerous delimitations have been formulated based on different criteria (economic, cultural, demographic, etc.) or even on a combination of criteria (e.g., Cloke, 2006; Sancho and Reinoso, 2012). Historically, due to the information available and to facilitate comparative studies, the 'demographic' criterion was mainly used, that is, a

Table 1
Geographic and population indicators of Andalusia's geographic regions.

		Coast	Valley	Baetic Mountains	Sierra Morena	Total
Area	[km^2]	8559	24,708	33,177	20,957	87,401
Area	[%]	10 %	28 %	38 %	24 %	100 %
Municipalities	[nº]	68	188	404	111	771
Municipalities	[%]	9 %	24 %	52 %	14 %	100 %
Municipality average size 1858	[km^2]	126	131	82	189	113
Population	[000 inhab.]	577	950	1115	272	2915
Population density	[inhab./km^2]	67.4	38.5	33.6	13.0	33.4
Population share	[%]	20 %	33 %	38 %	9 %	100 %
2017						
Population	[000 inhab.]	3065	3344	1623	339	8372
Population density	[inhab./km^2]	358.1	135.4	48.9	16.2	95.8
Population share	[%]	37 %	40 %	19 %	4 %	100 %

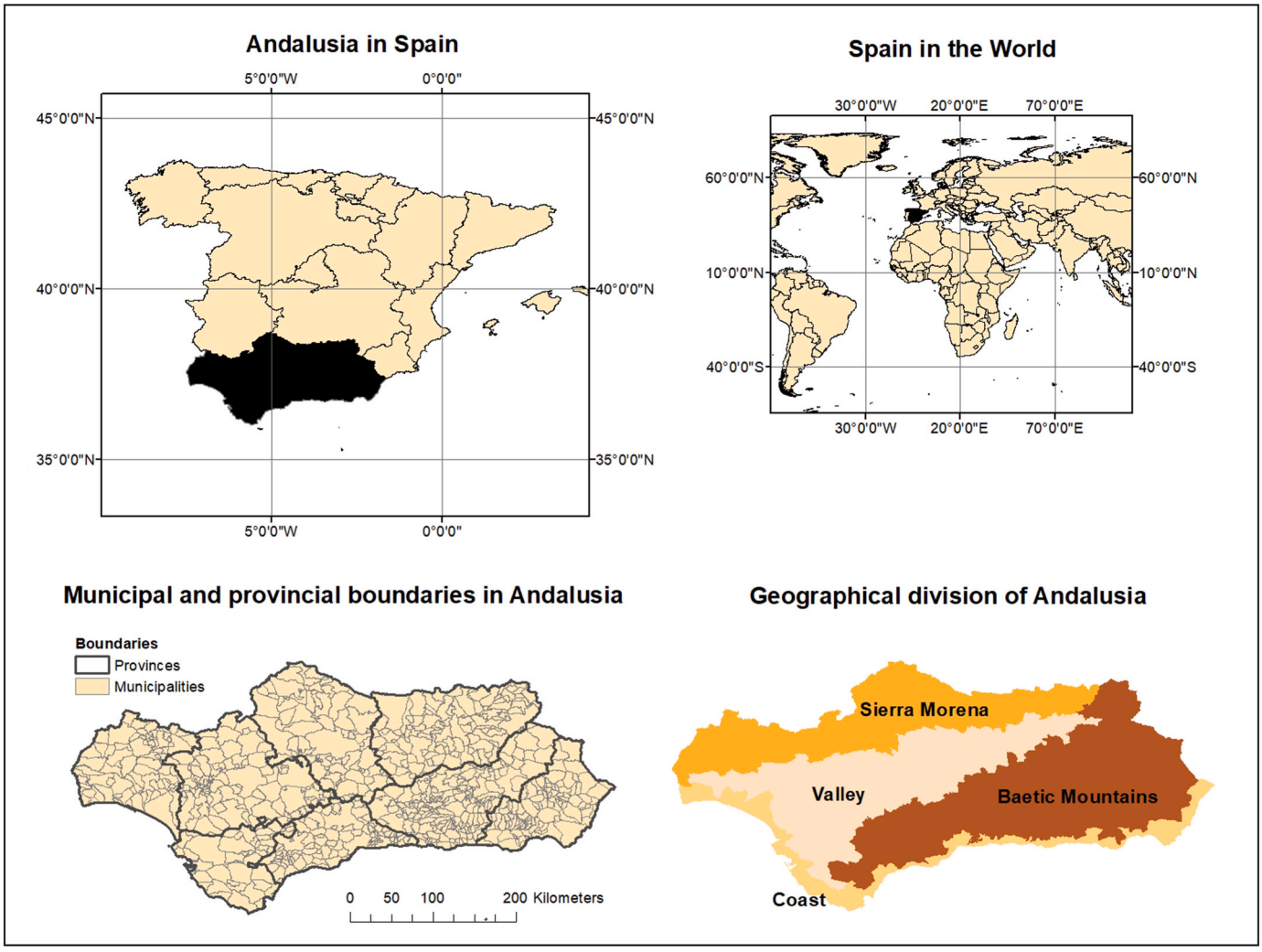

Fig. 1. Situation map of Andalusia and its administrative and geographical division.

settlement's population quantity or density (e.g., De Vries, 1984; Bairoch, 1988). In the case of Spain, leaving aside a few exceptions in which administrative criteria were applied – such as the provincial capital (Erdozáin and Mikelarena, 1996), the number of buildings with several floors (Gómez Mendoza and Luna, 1984) or the occupational structure (Llopis Agelán and González Mariscal, 2006) – most historical studies (in contemporary times) have considered population size only (e.g., Nadal, 1966; García Sanz, 1996; Reher, 1986, 1994; Tafunell, 2005; Collantes and Pinilla, 2011, 2019).

Why and to what extent is it problematic to use only the demographic criterion? Two factors can significantly affect the final estimation. First, no unified strategy has been defined to select the unit of analysis. Most historical works estimate the urban-rural population by counting inhabitants at the spatial level of municipalities. The municipality, however, is an administrative unit that is often composed of several population settlements. Although these settlements could add up to reach a certain population threshold and thus make the municipality count as 'urban', municipalities can be composed entirely of sparsely

Table 2
Instrumental variable (IV) estimate of the effect of land inequality on dispersed population, 1858–2017.

	Dispersed pop., reduced form	Land inequality IV first stage	Dispersed pop. IV second stage
Pace of Reconquista (in 100 km^2/year)	−0.199***	0.579***	
	(0.072)	(0.069)	
Average municipality jurisdiction (kms^2)	0.022***	0.035***	0.035***
	(0.004)	(0.003)	(0.007)
Moisture deficit (ET, 0–100)	0.440***	−0.352***	0.319***
	(0.073)	(0.091)	(0.080)
Land inequality (% landless in 1860)			**−0.344*** (0.126)**
Geographical controls	Yes	Yes	Yes
N	744	744	744
Model	Pooled OLS	2SLS	2SLS
F-stat first stage		44.3***	
Adjusted R^2	0.42		

Notes: dispersed population measured as the % of people living in dispersed settlements in 1858, 1888, 1910, 1930, 1960, 1986, 2000, and 2017; observations are partido judicial-year pairs (including all partidos and all censuses); census years dummies included. Moisture deficit measured by reference evapotranspiration, reflecting rainfall, soil and climate. Other geographical controls include terrain ruggedness (standard deviation of altitude), latitude and longitude. Robust standard errors reported in parentheses; ***, **, and * denote significance at the 1 %, 5 %, and 10 % levels.

populated settlements. Several authoritative studies have shown that by 1950, 52 % of the Spanish population lived in municipalities of over 10,000 inhabitants; but only 37 % lived in nuclei of over 10,000 inhabitants (García Barbancho,1946; García Sanz, 1994; 1996). This gap is much wider in areas with a large and dispersed population, such as Andalusia. Thus, scholars have emphasised the need to estimate urban-rural populations based on population centres rather than municipalities because of the likelihood of overestimating urbanisation and undercounting the rural population (e.g., Díez Nicolás, 1972; Reher, 1994; Vinuesa, 1997). However, as we will see below, information relating to population entities (i.e., distinguishable populations units within a municipality) is less accessible and more difficult to process, so most researchers have chosen to use municipality populations (see exceptions in: Reher, 1994; Gómez Mendoza and Luna, 1986).

The second problem concerns the socio-economic attributes that distinguish urban and rural. In many parts of the world, but especially in the southern areas of Mediterranean countries (Blok and Driessen, 1984; López-Casero, 1989; Donato, 2018), so-called agrotowns are very common: they consist of large settlements but with an occupational structure oriented towards agriculture. They are, therefore, at the boundary between urban and rural. In the case of Spain, agrotowns are concentrated in the south of the country, particularly in the Guadalquivir Valley (Fig. 1). González Mariscal and Llopis (2006) estimated that by 1787, 33 % of Andalusia's population lived in municipalities of over 10,000 inhabitants. However, if we exclude municipalities where most people worked in agriculture, the 'urban' percentage dropped to 11 %. This means a shift from an ostensibly urban region (by early modern Spanish standards) to one within the national average.

Conversely, a municipality with a small population can be considered rural even if it shares the same socio-economic characteristics as a city. This case is more unusual but many European cities of less than 10,000 inhabitants were true political centres or had very dynamic economies. This occurred in Andalusia in the nineteenth century, when some of the region's provincial capitals had a population that was only slightly under 10,000 inhabitants.

2.3. Sources and calculation procedure

To estimate the population of Andalusian rural settlements we mined a previously overlooked resource: the *nomenclátores*, population and household enumerations that have been sporadically published across Spain since the mid-nineteenth century. The *nomenclátores* have never been systematically exploited for long-term studies a region as large as Andalusia because they have not yet been digitised and their units of analysis are not homogeneous over time. Andalusian *nomenclátores* usually distinguish between the 'main nucleus' population and the dispersed populations of each municipality, but offer varying levels of detail. Some identify every specific scattered dwellings; others simply differentiate between the main nuclei from the rest of the population, which they collect into a single category. To create a homogeneous series for all the years studied, we reconstructed, for each municipality: (i) the municipality's total population; (ii) the population living in the main nucleus; (iii) the population living in nuclei of over 10,000 inhabitants (even if not the main nuclei); and (iv), the population living in settlements of fewer than 10,000 inhabitants. These variables were reconstructed for each of Andalusia's 771 municipalities at nine points in time between 1858 and 2017.

Municipal borders have changed throughout history, due to existing municipalities being either divided or grouped together. We harmonised the data with regard to today's territorial boundaries. Thus, when several municipalities were joined, we added the population data of the pre-existing towns, leaving each time the current capital as the main nucleus (whether rural or urban). In the case of centrifugal movements, we assumed that the distribution of the population in each municipality was analogous to the shares reported in the first benchmark year after the subdivision of the municipality.

We also estimated the active agricultural population in the years 1787, 1960 and 2001, based on the Census of Floridablanca, the 1960 Population Census and the Multiterritorial Information System of Andalusia, respectively. This information allowed us to identify agrotowns. Unfortunately, sources did not allow us to reconstruct municipal-level estimates for occupational structure for any additional years between 1787 and 1960.

We also compiled municipal information from various indicators such as school enrolment rates, unemployment levels, and population by sex, as well as a range of geographical variables. Finally, from the development economics and economic history literature, we take estimates on the different timing of the medieval Reconquista across Andalusia (Oto-Peralías and Romero-Ávila, 2016), which we will use as an instrument for 19th-century land inequality levels.

3. Pueblos, cortijos and agrotowns: rural settlements through time

Rural worlds are made up of a diversity of settlements. For our purposes, we distinguish three kinds of rural settlement: traditional villages (*pueblos*), dispersed hamlets (*cortijos*), and demographically larger 'agrotowns' typical of southern Europe. In Andalusia, each of these had distinguishing features and all three played a role in the historical rise and fall of rural population. Our new dataset allows us to examine each type of settlement at an unprecedented spatial resolution in a long historical perspective. Fig. 2 shows their demographic weight through time, in a context of urbanization; their geography is described by Fig. 3. This section looks more closely at each type of rural settlement, before analysing the factors behind their location across Andalusia.

3.1. Agrotowns

'Agrotowns' are present in many regions of the world, but they are particularly widespread in Mediterranean countries, especially in the south of Spain and Italy (Blok and Driessen, 1984; López-Casero, 1989). These types of settlements have been of interest for two reasons. First, due to their distinctive features, which place them at the boundary between rural and urban: they are urban in size, but rural regarding their economic orientation (Blok and Driessen,1984). Monographic literature

Fig. 2. Total population by settlement type in millions of inhabitants (a) and as a percentage of total (b).

on the subject tends to describe them as settlements associated with large estates, extensive agriculture, day labourers and with high levels of economic and social inequality (Boissevain, 1966; Monheim, 1971; Blok and Driessen, 1984; López-Casero, 1989). Unsurprisingly, they have been identified as one of the epicentres of the rural conflicts that gave rise to the Spanish Civil War (1936/39) (Domenech, 2013; Simpson and Carmona, 2020). Indeed, they concentrated the social upheavals brought about by the poor social conditions of the day labourer class (López-Casero, 1989:2). On the other hand, they have been the focus of quantitative urban population studies which have highlighted 'inordinate' levels of urbanisation in supposedly backward and poorly industrialised regions such as Andalusia, Apulia or Sicily (Reher,1994; Malanima, 2005).

In the case of Andalusia, agrotowns have gone from concentrating 10 % of the Andalusian population by late 18th century on a relatively constant basis until c. 1960, to being insignificant today. Indeed, few large municipalities currently exist in which the majority of the population is dedicated exclusively to agriculture. The number of agrotowns ranged from approximately 20 in the mid-nineteenth century, to 30 in 1960, maintaining a fairly stable average size of around 15,000 inhabitants during the period under study.

The Valley has historically concentrated the greatest number of agrotowns and also the largest ones (Fig. 4). In the mid-nineteenth century, half of the agrotowns were situated in the Valley, and in the mid-twentieth century, the figure was two thirds. Some were genuine cities such as Écija, which, in 1960, had a population of almost 50,000 inhabitants (with 68 % of the labour force working in agriculture). Many others such as Carmona, Lucena, Arcos de la Frontera, Priego de Córdoba, Martos, Lora del Río or Baena concentrated over 20,000 inhabitants in their main nucleus and more than 60 % of agricultural assets in the mid-twentieth century. Until the industrialisation of agriculture, which took place in the mid-twentieth century, the Guadalquivir Valley was dotted with agrotowns oriented almost entirely to the cultivation of cereals and olive groves. But with agricultural industrialisation came tremendous increases in labour productivity (González de Molina et al., 2020), leading to the shrinking of agrotowns. Therefore, the fall of the Andalusian agrotown is not due to depopulation but to occupational change: historical agrotowns remain highly populated but, since the mid-20th century, they are no longer agrarian and have become cities like any other.

3.2. Villages

Villages (*pueblos*) are the quintessential Spanish rural settlement. The term *pueblo* itself embodies the negative connotations generally associated with the rural world. The latter have been consolidated after decades of demeaning stories, conveying backwardness, fear of change, ignorance and even misery (Del Molino, 2016). Spain's Dictionary of the Royal Academy of Language defines *pueblos* as 'lower category towns' ('category' meaning here the 'quality or importance of something'). In recent years, however, *pueblos* are being portrayed in a more positive light, as political and social movements emerge in their defence. This changing perception is largely mediated by an increasing public awareness of the villages' rapid decline and its negative social, economic, and environmental implications. This rediscovery of the merits of village life is also driven by the narrowing socio-economic gap between the rural and urban worlds, which has recently led to urban-to-rural migration. Remote working, improved services, and widespread access to communication technologies have made villages an attractive habitat once again.

Villages are the most common form of rural settlement and they reach all corners of Andalusian geography. They are, however, more common in mountainous areas, because in the valleys cities and agrotowns cast a longer shadow. In terms of their historical evolution, even if rural population fell sharply since the 1950s (Collantes and Pinilla, 2019), the population of *pueblos* as a whole, surprisingly, has not significantly decreased in the last 170 years: in the mid-nineteenth century, village populations accounted for 1.60 million inhabitants, peaked at 1.99 in 1960, and today represent 1.55 million. This does not mean that the populations of all villages remained unchanged between the 1850s and today. Rather, village populations remained stable due to compensatory movements in both directions: while the population declined in some towns, it increased to the same degree in others. But rural demographic change was led by dispersed settlements, both in the growth phase (up to c. 1960) and the decline phase (since c. 1960) (Fig. 4). Let us now examine these dispersed settlements.

3.3. Dispersed settlements

In this work, the expression "dispersed settlements" groups several forms of settlement, ranging from single-family homes such as *cortijos,* to hamlets with a significant population. The Andalusian lexicon contains over 300 terms that refer to dispersed settlements, of which 20 have been repeatedly used since the nineteenth century (Infante-Amate and Martínez de la Fuente, 2018). The first dictionaries collected words such as '*alquería*' or '*heredad*' to refer generically to isolated population centres, usually associated with farms. Over time, these terms gained in precision and spatial nuances. The notions of *casería, cortijo* or *hacienda*

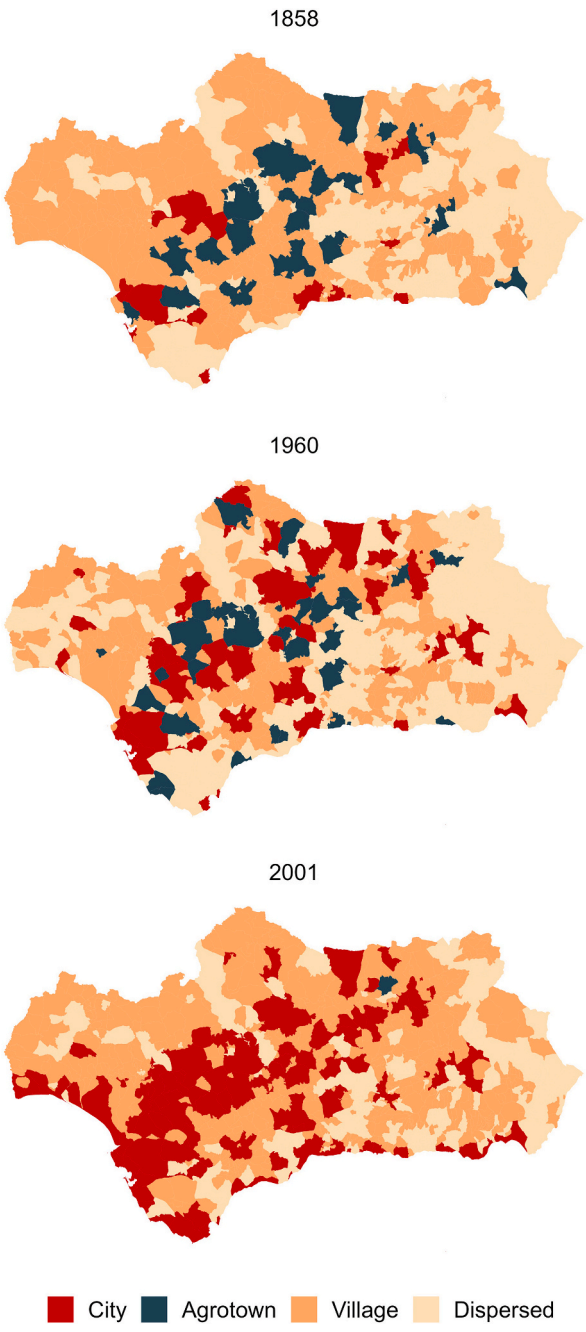

Fig. 3. Predominant habitat in Andalusia's municipalities. Dispersed type considers municipalities with more than 20 % of total population dispersed.

(farmhouses) replaced the previous ones, and these were joined by others such as *cortijada*, understood as a group of *cortijos*, showing clear geographical specificities in the population records (Infante-Amate and Martínez de la Fuente, 2018). The *cortijo* in Lower Andalusia is described as a house associated with the large Guadalquivir Valley farms, only temporarily inhabited by day labourers during harvests or agricultural work. In Upper Andalusia the same word designates the permanent homes of small peasants who owned or exploited small farms.

These dispersed settlements were responsible for two-thirds of rural population growth between c.1850 and c.1960, when it rose from 2.1 million to 3.7 million people. Likewise, *cortijos* and the other dispersed settlements accounted for 60 % of the fall in rural population between 1960 and 2000. In other words, historical change in Andalusia's rural population was largely explained by an expansion of scattered

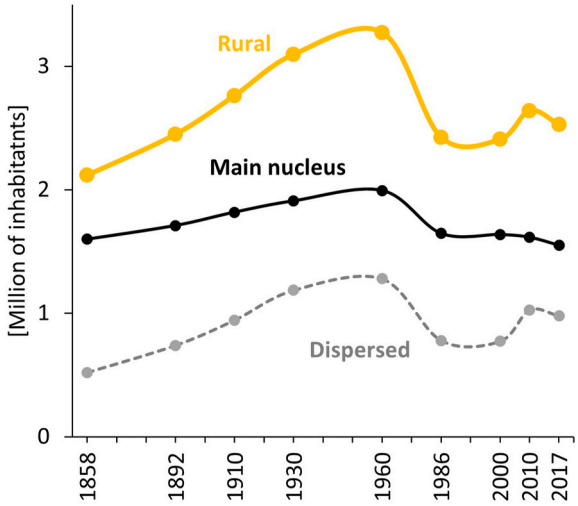

Fig. 4. Total rural population, and rural population in main nuclei and in dispersed settlements.

settlements throughout the nineteenth and first half of the twentieth centuries, and by their subsequent abandonment (Fig. 5). Scattered settlements are very common in mountainous areas and relatively rare in the Valley. Therefore, most dispersed settlements are extremely isolated with very limited access to services. If the gap between urban and rural living standards has historically been very large, it is even higher when it comes to dispersed settlements. Consequently, when the process of rural depopulation emerged, people living in these dispersed settlements had more incentives to move than most. The recent study by Ayuda et al. (2023) shows that in the case of Aragon, one of most depopulated parts of Spain, dispersed settlements were also at the heart of the process.

Today we observe an upswing which reflects a new population model with a differentiated functionality: most scattered settlements are growing in coastal areas and are oriented towards recreational and holiday use.

4. Explaining settlement patterns: land inequality, geography, and the Reconquista

Settlement patterns are an expression of human collective agency within a set of long-term structures beyond people's control. These bounded choices had, in turn, an impact on long-term changes: as we have seen, it was dispersed settlements which led the growth of Andalusian rural population and were also emblematic of its subsequent decline. By the mid-twentieth century, when Andalusia's rural population reached its historical peak, the geography of rural habitats showed significant variation across the region. These were longstanding spatial patterns which already be glimpsed in our data for the late-eighteenth and mid-nineteenth century and persisted until the turn of the millennium (Fig. 6). So why did people in some parts of Andalusia persistently live in more dispersed rural settlements?

We hypothesise that agrarian inequality, in particular in the structure of landownership, was the crucial driver of settlement dispersion. The mechanism is straightforward: if a few large landowners control all the land in a municipality, then peasants will have difficulty settling in a plot of their own outside the village. However, measuring and identifying the effect of historical land inequality on dispersed settlement is not straightforward because there are unobserved social, economic, and political confounders which could explain variation in settlement patterns across these local communities and are also related to landownership, such as market access, migration, and institutional changes. Among the latter, the historical literature has highlighted regional variation in land grants and subdivisions since the late-nineteenth

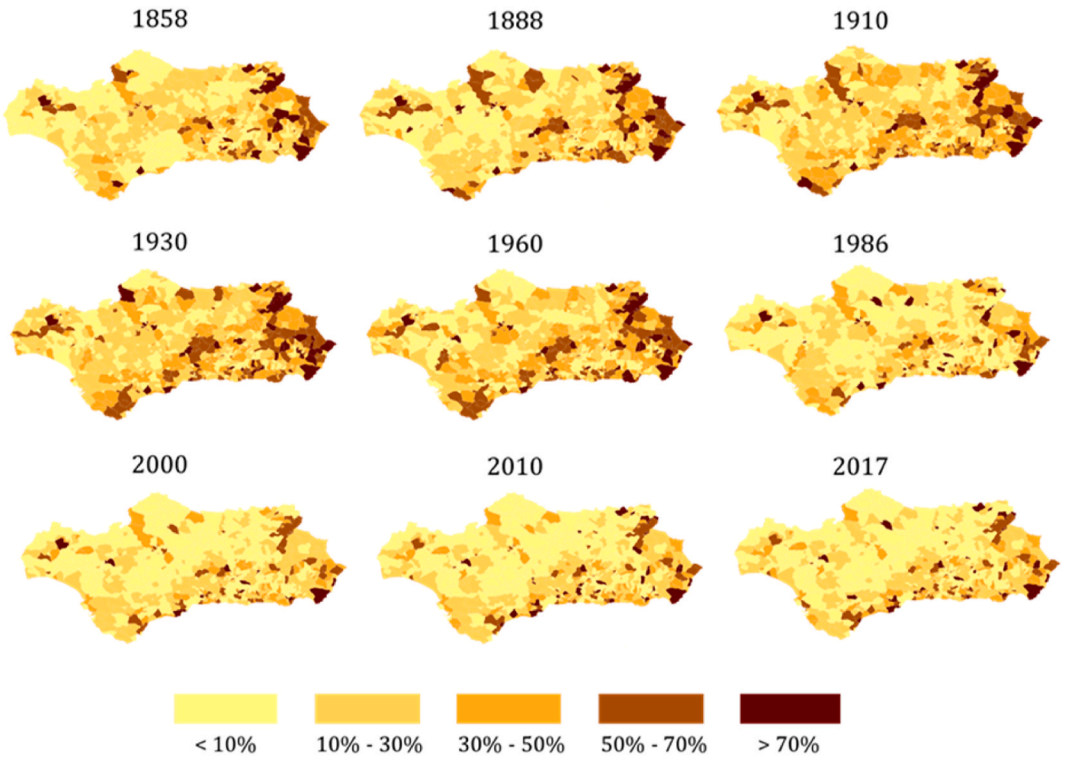

Fig. 5. Inhabitatnts of dispersed settelments as a percentage of total population.

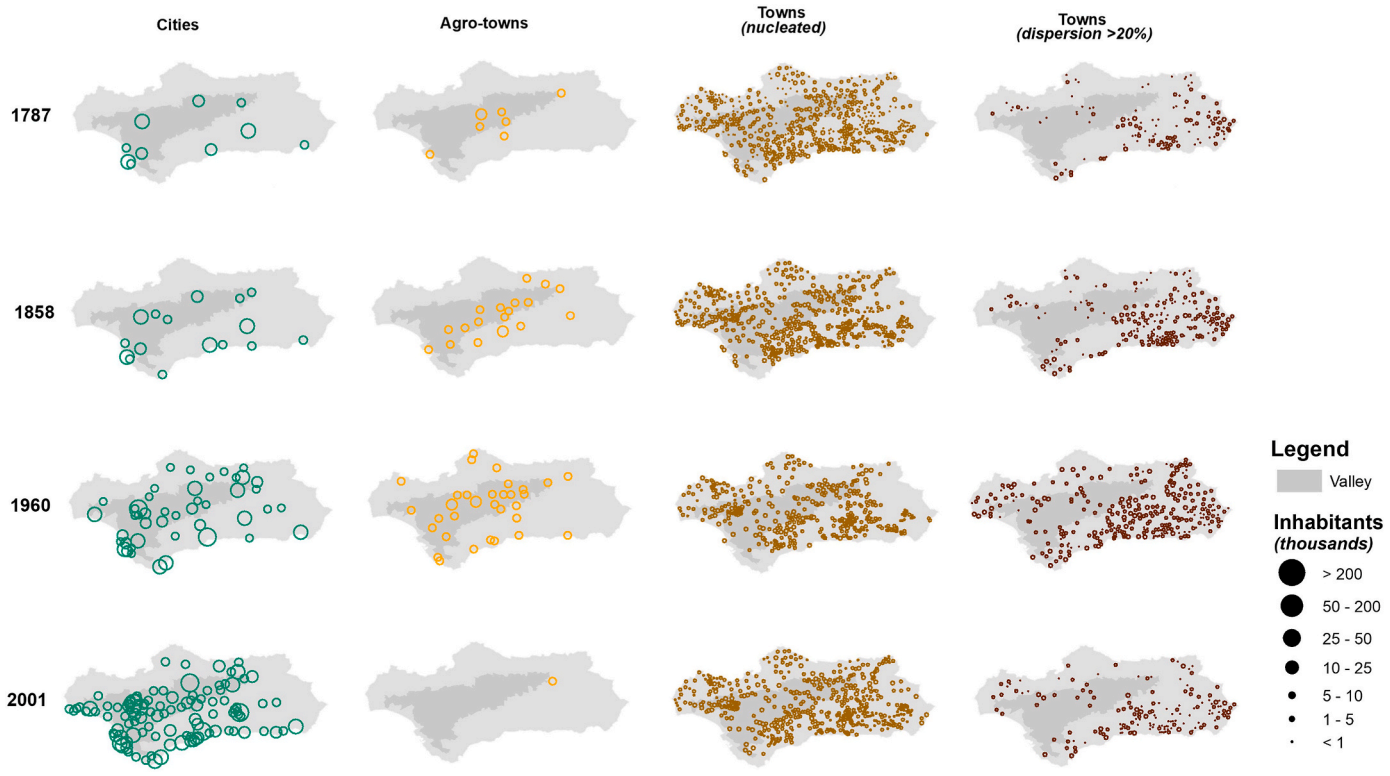

Fig. 6. Predominant type of habitat in Andalusia's municipalities.

century, with more grants in Upper Andalusia (in the south-east) (González de Molina and Sevilla, 1991; GEA, 2001), the region which seems to also concentrate most of the dispersed settlements.

To address these issues, we use the pace of the medieval Reconquista (711–1492 across Spain; 1212–1492 in Andalusia) as an instrument for mid-nineteenth century land inequality, as in Domènech and Sánchez-Cuenca (2022). The Reconquista was a protracted military conflict between the Christian kingdoms established in the north of Spain and the Muslim kingdoms that had dominated much of the Iberian Peninsula since the early 700s. In some parts of Spain, the Christian

frontier inched forward slowly, whereas in other areas the frontier advanced much more rapidly, which meant an 'imperfect colonisation of the territory'. The Crown of Castille had to rely on military orders and noble elites to administer these vast new territories, granting them huge estates and ceding them control over very large jurisdictions. Thus, land inequality became higher than it had been under Muslim rule (Malefakis 1970) and it has remained higher than elsewhere in Spain until the present. Additionally, the 'initial' colonisation by Christian settlers was also affected by the political reach of these historical elites, reflected in the size of jurisdictions, which also remains larger today in areas of fast Reconquest as Oto-Peralías and Romero-Ávila (2016) have shown. Therefore, we control for the average scale of local jurisdictions in order to exclude this political channel linking the pace of Reconquista with modern rural settlement patterns. We also need to account for terrain ruggedness and other geographical covariates that might have made Reconquest faster or slower and that could also shape modern rural settlement. The conceptual links between our variables are summarised in Fig. 7.

We test these insights with a two-stage least squares (2SLS) regression at the level of historical *partidos judiciales* (court districts), the only sub-provincial unit for which we have nineteenth-century land inequality data. Our treatment variable will be the percentage of landless labourers in 1860, instrumentalised by the pace of the late-medieval Reconquista estimated by Oto-Peralías and Romero-Ávila (2016),[1]; our outcome is the percentage of population living in dispersed settlements in all census years between 1858 and 2017, calculated from our own database. Besides geographical variables of particular interest (ruggedness, moisture) we also control for latitude and longitude to account for omitted spatial patterns. Column 1 shows the reduced-form regression of settlement dispersion on our instrument and the other exogenous covariates. Columns 2 shows the first stage of the 2SLS regression, confirming that the pace of the medieval Reconquista is a strong predictor of modern land inequality.

Notes: dispersed population measured as the % of people living in dispersed settlements in 1858, 1888, 1910, 1930, 1960, 1986, 2000, and 2017; observations are partido judicial-year pairs (including all partidos and all censuses); census years dummies included. Moisture deficit measured by reference evapotranspiration, reflecting rainfall, soil and climate. Other geographical controls include terrain ruggedness (standard deviation of altitude), latitude and longitude. Robust standard errors reported in parentheses; ***, **, and * denote significance at the 1 %, 5 %, and 10 % levels.

Historical land inequality, instrumented the pace of the late-medieval Reconquista, had a large and negative effect on the percentage of people living in dispersed rural settlements across censuses from 1858 to 2017 (Column 3). The implication of these results is that an increase of 10 percentage points in the share of landless labourers in 1860, using only the variation driven by the legacy of the Reconquista pace, decreases dispersed settlement by over 3.4 percentage points. Importantly, this effect remains significant with the inclusion of latitude and longitude, so it is not simply capturing the fact that the Reconquista advanced from the north-west to the south-east of Andalusia. Interestingly, we also find that dispersed settlement was significantly more likely in regions with acute moisture deficit, beyond the indirect effect via land inequality (as more arid areas were less desirable for large landowners). This could be a reflection of the territorial footprint of agriculture being necessarily larger where the primary productivity of land is lower, which encourages population dispersion. In sum, our analysis shows that the differences in rural settlement patterns across Andalusia were longstanding. The rise and fall of Andalusia's rural population was led by dispersed settlements, which expanded in the late-nineteenth and early-twentieth centuries and shrank since. Throughout this process, however, the relative prevalence of dispersed settlements across Andalusia remained stable. The results of our model show that land inequality—determined in part by the region's deeper past—and local landscapes (moisture regimes) were crucial drivers of differences in dispersed settlement location from the mid-nineteenth century until the present. In a context of unequal landownership in some of the better-endowed areas, the growth of Andalusia's rural settlements (most of them in *Cortijos*) was concentrated on its poorer soils, which might contribute to explain the region's relative backwardness as well as the exhaustion of her soils since the late-nineteenth century and the consequent stagnation of agriculture in the region (González de Molina, 2002; González de Molina et al., 2015).

5. A new reading of population change in S-Spain

This work started with the premise that the urban/rural divide was a categorical simplification as it refers to only two types of settlements. This division overlooks a broad range of settlements that make up many territories, especially in the south of Spain, where agrotowns and dispersed settlements have been crucial to historical development. The distinctions presented here offer a richer understanding of southern Spain's population shifts, from both a geographical and chronological perspective. Considering the joint evolution of the different types of settlement, we find five distinct periods.

1) Until 1910. Throughout the nineteenth century, the rural population continued to expand worldwide almost without exception. Cities, however, began to grow at a faster rate, leading to urbanisation (De Vries, 1984; Collantes and Pinilla, 2019). In the case of Andalusia, the rural population continued to increase at the same rate until the early twentieth century, and even at a higher rate than city populations. This was driven, as we explained above, by the formidable growth of dispersed settlements, while village populations remained relatively stagnant. Thus, between 1858 and 1910, the populations of *cortijos* grew by 1.6 % per year compared to 0.6 % in the case of cities. The population concentration that is assumed to have unfolded since the nineteenth century (e.g., Goerlich et al., 2015) with the growth of cities was mirrored by a dispersal process in the rural world.

Until the early twentieth century, the Andalusian economy, like that of most of the world, remained largely dependent on land, and transport systems were based on animal traction (González de Molina et al., 2015). The railway network only reached major cities and did not serve most of the mountainous areas. In parallel, liberal agrarian reforms gave many peasant families access to property, especially in mountainous areas (GEA and Grupo de Estudios Agrarios, 2002). The result was an agricultural colonisation which was accompanied by a population colonisation process via farmhouses and villages, especially in mountainous areas. Why did *cortijos* and hamlets grow more than villages? As indicated above, the newly colonised lands were increasingly distant from the main population centres. This factor, together with the need to reside in the farm for security and transportation cost reasons, made the farmhouse, especially in mountain areas, the most widespread basis for population growth in the rural world (Infante-Amate et al., 2016).

2) Between c. 1910 and 1950/1960. The rural population continued to grow, especially in scattered nuclei, while total village population remained stagnant. Despite their continued expansion in this period, scattered rural settlements were, however, already growing much more slowly than cities. For the first time, the urban world was expanding faster than the rural world. Between 1910 and 1960, the urban population rose from 28 % to 45 % (based on entities).

Why did the growth of dispersed settlements slow down? The scope for further colonisation of new agricultural areas was already reduced,

[1] We are very grateful to Daniel Oto-Peralías for sharing with us his estimates on the pace of the Reconquista.

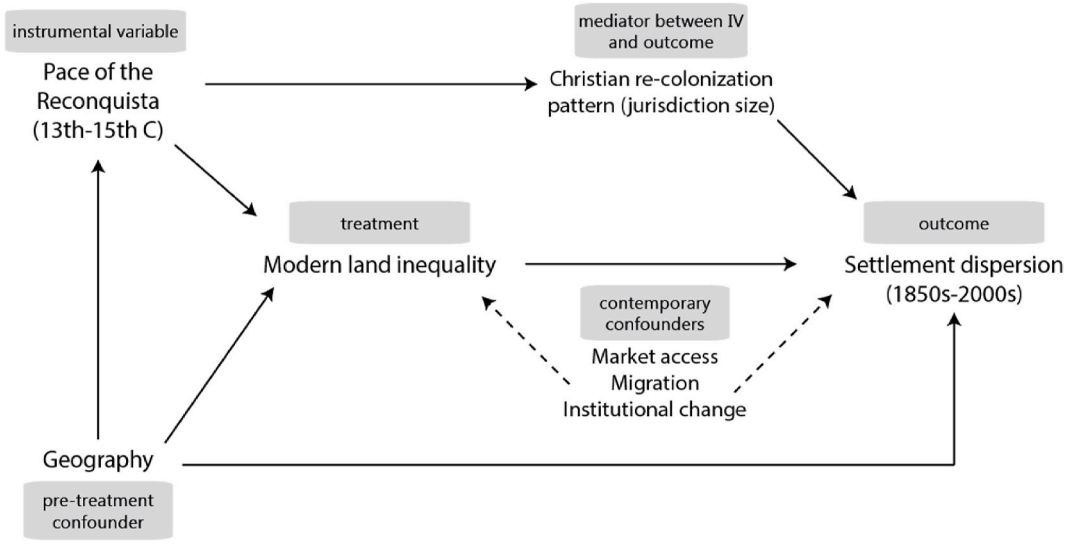

Fig. 7. Directed acyclic graph (DAG) summarising our simple model.
Note: the dashed lines represent causal chains for latent variables which we cannot properly observe.

in fact, cultivated areas rose only from 43 % to 46 % between 1910 and 1960 (Zambrana, 2006). The limited population increase that we observed was probably due less to migrations from villages to farmhouses and more to the natural increase of existing peasant families who were fragmenting their properties. Dispersed settlements plunged into a production crisis that stifled their growth and, as of the 1930s, began to force transfers to other settlements. As time went on, land became poorer in quality, less productive, and more susceptible to degradation (Infante-Amate et al., 2016). Andalusian agriculture was already undergoing a productive crisis due to the exhaustion of the pre-industrial model, leading to yield stagnation (González de Molina et al., 2015). Consequently, dispersed populations, which had spread to marginal areas, suffered a greater impact. Indeed, our model in section 4 showed that the least productive areas (i.e. those with more acute moisture deficit) tended to be home to dispersed settlements and thus were at the forefront of overall rural population change. Cities, on the other hand, continued to provide further job opportunities and services.

3) Between c. 1950/60 and 2000. For the first time in modern history, the rural population declined in absolute terms, while the urban population continued to increase at unprecedented rates. Between 1960 and 1986, Andalusian cities grew by 2.5 % per year while villages fell by 0.5 % and scattered nuclei by 1.5 %. These trends continued, though less markedly, during the last two decades of the twentieth century. Thus, the rural exodus that was unfolding in other parts of Europe reached southern Spain (Collantes and Pinilla, 2011). At the beginning of the twenty-first century, over two thirds of the Andalusian population lived in cities and only an insignificant part lived in scattered nuclei. The history of this process is well known and has been studied in detail by other authors (García-Sanz, 1997; Young, 2013; Collantes and Pinilla, 2019; Li et al., 2019) who agree on the following notable points: (i) The gap between the urban and rural worlds grew significantly. Cities offered greater economic opportunities, but also a wide range of public services and a cultural offer that encouraged village population transfers (Li et al., 2019). (ii) On the other hand, the mechanisation of agriculture increased labour productivity in the countryside and, as a result, reduced the demand for agricultural labour – which was displaced to other sectors of the economy.

These accounts, nonetheless, have overlooked the fact that this evolution was not only a mere shift of 'people' to the city: as we have shown in this work, scattered settlements were the epicentre of the process. The abandonment of dispersed settlements accounted for two thirds of the rural population's decline. It is likely that a sizable part of the population that left the *cortijos* moved not only to cities but also to villages; and some of the people who lived in the villages went to the cities. The information we have at our disposal does not allow us to quantify the flows among settlements. The question one must ask is: why did scattered settlements concentrate most of the decline? While the gap between the urban and rural worlds increased in terms of services and economic opportunities, this gap was much greater in the case of the *cortijos*. Scattered settlements were isolated at all levels. In addition, the mechanisation of land transport (with cars and motorcycles) made it possible to continue labouring the remoter agricultural frontiers while living in more distant population nuclei. It allowed living in villages again, while continuing to work the land (Infante-Amate et al., 2016). Villages were more resilient. In the second half of the twentieth century, despite significant shortcomings, villages began to have a basic infrastructure of public services which made them much more attractive than that of the *cortijos*. The latter had become completely isolated.

5) Since 2000. The turn of the century opened a new phase characterised by a fall in urban municipality growth rates and a renewed dispersed settlement boom. In fact, the growth rates of each type of settlement have been analogous to those of the pre-industrial period. Scattered settlements have been growing by over 1.5 %, faster than cities, with just under 1 %. For their part, villages are presenting a slight drop. Nevertheless, these trends do not alter the settlement pattern that became consolidated in the second half of the twentieth century, in which cities predominate. Similar settlement expansion rates actually mask completely different realities compared to the pre-industrial world. Growth in cities has fallen due to widespread population stagnation. In addition, many urban municipalities have already occupied their entire territorial area, so they have continued to expand to other annexed municipalities, sometimes through dispersed settlements. In fact, today, most scattered settlements are located in urban municipalities, that is, next to highly populated nuclei. Therefore, they presumably act as peri-urban areas. A second factor explaining the expansion of dispersed settlements is the urban boom and the proliferation of second homes. Scattered settlements have grown on the coast as well as in the surroundings of large cities. The most obvious case is that of Malaga, the most touristic area,

where dispersed settlements have seen a population increase, from 19.5 % to 24.8 % of the total population between 2000 and 2017.

The functionality of the new dispersed settlements today is very different from that observed until the mid-twentieth century. While they used to be strongly linked to agricultural activity, settlements are now associated with peri-urban or holiday areas. New scattered settlements are, like the agrotowns of the past, at the boundary between the rural and urban worlds.

6. Conclusions

In this paper, we analysed the historical evolution of the population and rural settlements in southern Spain, an area characterised by numerous scattered nuclei in mountain areas and by agrotowns in the Valley. While there is a large literature on the importance of these rural habitats, we did not know how large their populations have historically been. According to our results, villages (the main nuclei of rural municipalities) are the most widespread form of rural settlement and are present across the Andalusian territory. Although Andalusia's rural population went through a process of rise (until the mid-20th century) and fall, the total village population has remained relatively stable. Most population change has been concentrated in a different type of habitat: dispersed settlements. These were generally structured as a group of a few dwellings, or even just one familial dwelling, but they accounted for most rural population growth until the mid-20th century and for most of its decline since. Throughout the 19th century, new agricultural frontiers were cultivated in places ever more distant from the population nuclei, and this encouraged permanent settlement near the new agricultural plots. We find that dispersed habitats were more common in mountainous regions and that structural agrarian inequality, instrumented with the pace of the medieval Reconquista, made dispersed communities less able to flourish. The Reconquista beginning in 1212 in Andalusia was faster in the Valley, leading to a less planned settlement and to larger municipalities and more concentration of landownership. The Valley, characterized by the presence of latifundia and by better natural conditions for agriculture, concentrated most agrotowns, the third kind of rural habitat we identify. Agrowtons were large population centres, town-like by their size but with overwhelmingly agrarian economies and occupational structures. They grew to represent up to 10 % of Andalusian rural popualtion until the mid-20th century. These habitats remain highly populated, but their economies are no longer rural and have thus become simply cities.

Today, in Andalusia and elsewhere, the rural world is not only losing its inhabitants but also its diversity. Andalusian rural population is now based almost entirely on villages, that is, on sparsely inhabited nuclei that are agrarian in nature. It was not always this way. Over the last two centuries, in addition to accounting for a larger share of population, the rural world had a much greater morphological and functional diversity.

CRediT authorship contribution statement

Juan Luis Martínez de la Fuente: Conceptualization, Data curation, Formal analysis, Writing – review & editing. **Juan Infante-Amate:** Conceptualization, Data curation, Methodology, Writing – original draft. **Emiliano Travieso:** Investigation, Methodology, Writing – review & editing.

Declaration of Competing interest

none.

Data availability

Data will be made available on request.

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