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Research Article

Tourism Dynamism without Demographic Recovery? The Socio-economic Evolution of the Villuercas-Ibores-Jara UNESCO Global Geopark (Spain, 2011–2025)

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Abstract: To what extent, in which dimensions and with what internal geography has the socio-economic trajectory of a depopulating rural territory changed since its designation as a UNESCO Global Geopark? This article addresses the question for the Villuercas-Ibores-Jara Geopark (VIJ, Cáceres, Spain) over 2011–2025. A bitemporal design covers its nineteen municipalities with thirty-six harmonised indicators from official sources: the Socioeconomic Atlas of Extremadura, the Employment Observatory of the Servicio Extremeño Público de Empleo (SEXPE) and social security affiliation records. It combines provincial benchmarking, a rule-based municipal typology tested against alternative thresholds, and a descriptive comparison with two designated and two non-designated comarcas. Hiring in accommodation and food services (NACE 55+56), the branches most exposed to tourism, grew severalfold from a very low base and more than tripled its share of all new contracts. Registered unemployment fell at about the provincial pace and less than in the two non-designated comarcas. Population fell by 16 %, ageing deepened and municipal trajectories diverged in direction. Employment in these branches is concentrated in Guadalupe, whose Royal Monastery was a pilgrimage centre and World Heritage site long before designation, and it shows no detectable association with the distribution of geosites. The evidence documents sectoral activation without demographic recovery but does not isolate an effect attributable to the Geopark. The article offers a replicable municipal-scale template for evaluating geoparks and shows how comarcal aggregates can credit designation with change anchored in pre-existing attractors.

Keywords: UNESCO Global Geopark; depopulation; endogenous development; territorial resilience; tourism; rural labour market; Extremadura

Highlights:

- Hospitality hiring (NACE 55+56) grew by 264 % in 2011–2025, from a very low base.
- Population fell by 16 % while ageing deepened in most municipalities.
- Hospitality jobs cluster in Guadalupe, with no detectable link to geosite distribution.

1. Introduction

The UNESCO Global Geoparks Programme is one of the most distinctive instruments of contemporary rural territorial development, integrating geoconservation, education and socio-economic dynamism (Henriques & Brilha, 2017; Zouros, 2016). Empirical evidence of its impact, however, remains limited: descriptive case studies abound, while longitudinal analyses grounded in continuous official statistics at the municipal scale are scarce (Ferreira & Valdati, 2023;

UNESCO, 2020). This gap is particularly acute in depressed rural contexts, where the relevant question is not whether a geopark "works" in the abstract, but to what extent and in which dimensions it can modulate structurally adverse trajectories.

Extremadura has a population density below 26 inhabitants/km² and an ageing index well above the national average (172.6 against 148.1 people aged 65 and over per 100 aged under 16 in 2025; Instituto Nacional de Estadística, 2025b). It contains some of the most demographically regressive *comarcas* (sub-provincial districts) of Spain (Collantes & Pinilla, 2011). Within it, the Villuercas-Ibores-Jara Geopark (VIJ), designated in 2011 and recognised as a UNESCO Global Geopark in 2015, covers nineteen municipalities, about 2,547 km² and a population that did not exceed 14,500 inhabitants in 2011 (5.7 inh/km²). Its starting conditions are among the weakest in Extremadura, which makes it a demanding test of what the geopark model can achieve. The term "rural periphery" refers here to the position of the comarca as a whole within Spain and Extremadura (low density, distance from urban labour markets, weak service endowment), not to the location of particular municipalities within the Geopark.

Previous research on the VIJ has addressed resident perception (Cortijo Cercas & Pulido Fernández, 2016), the geotourist profile (Sánchez Rivero et al., 2019; Sánchez-Martín et al., 2019), geoeducation (Fernández Álvarez, 2020) and tourism functionality (Pareja-Pareja et al., 2024). No study has yet provided a longitudinal multidimensional analysis of the comarca as a whole based on homogeneous official sources. This article addresses that gap through a replicable design that combines internal municipal benchmarking, comparison with the province and the region, and a typology of municipal trajectories.

The article distinguishes between interpretive propositions, drawn from the literature and used to organise the discussion, and working hypotheses, which the data can test descriptively. There are three propositions. Geoparks in rural contexts may act as selective catalysts, with effects concentrated in tourism and in services linked to the territorial brand rather than in age structure or migration (P1). The intensity of any such effect may depend on the prior territorial base, so that designation amplifies existing processes and inequalities (P2). Economic activation and demographic recovery may follow different courses (P3). An observational design cannot test these propositions as causal claims; they frame the interpretation of the results.

Three working hypotheses are examined. H1: socio-economic improvement over 2011–2025 is concentrated in five municipalities grouped here as gateway municipalities (Cañamero, Castañar de Ibor, Deleitosa, Guadalupe and Logrosán)—identified before the analysis based on their territorial functionality and geostrategic positioning as historical sub-comarcal service hubs and logistical nodes, a classification corroborated through consultation with the Geopark management—without reversing the regressive trend of the comarca. H2: change is more marked in economic and labour-market indicators than in demographic ones. H3: intra-comarcal heterogeneity widened over the period.

Section 2 reviews the literature, Section 3 presents the data and methods, Section 4 reports the results, Section 5 discusses them and Section 6 concludes.

2. Literature Review: Geoparks, Depopulation and Endogenous Development

2.1. UNESCO Global Geoparks as Instruments of Rural Development

UNESCO Global Geoparks (UGGps) are single, unified geographical areas where sites and landscapes of international geological significance are managed through an approach that integrates protection, education and sustainable development (UNESCO, 2020). The programme was formally incorporated into UNESCO in 2015, extending the geopark concept from geoconservation towards territorial development (Henriques & Brilha, 2017; Zouros, 2016).

Research on UGGps has grown rapidly and has turned towards socio-economic impact, governance and community participation (Ferreira & Valdati, 2023; Nyulas et al., 2025).

Empirical work has moved from descriptive accounts towards quantitative designs. Nugraha and Fauzi (2025) use machine learning to separate geopark-related variables from wider trends in the Gunung Sewu UGGp (Indonesia). Pérez-Calderón et al. (2022), in a study of the Spanish network that includes the VIJ, find that perceived development outcomes vary across geoparks with governance, accessibility and prior economic structure, and Carrillo-Hernández et al. (2024) report similar mechanisms in rural Colombia.

Community-level evidence shows that benefits are unevenly perceived. In the Kinabalu UGGp (Malaysia), residents perceive economic benefits most widely, whereas educational and environmental benefits accrue mainly to those di-

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rectly engaged with the geopark (Louis et al., 2025). In the VIJ, educational activities have been documented by Fernández Álvarez (2020) and Guillén-Peñafiel et al. (2022), and more recently through village-scale dissemination such as the Geopaca mascot programme (López Caballero et al., 2025), although their socio-economic spill-overs have not been evaluated.

2.2. Tourism Geography, Rural Restructuring and Endogenous Development in Southern Europe

Geoparks draw on the endogenous-development paradigm (Stöhr, 1981; Vázquez-Barquero, 2002), which holds that sustainable territorial trajectories must mobilise locally specific resources such as natural and cultural heritage, local knowledge and community institutions. Heritage- and nature-based tourism has long been promoted on this basis as a means of diversifying rural economies in structural decline (Farsani et al., 2011; Lane, 1994; Pulido Fernández et al., 2011).

Recent reviews show that the relationship between tourism and rural development is contingent rather than mechanical. Among the core themes of rural-tourism research, Pato and Duque (2025) identify the tension between economic exploitation and cultural preservation and the conditions under which tourism supports community resilience. Tourism geography has likewise adopted frameworks in which territorial effects depend on institutional capacity, accessibility and complementary policies (Carson, 2018).

The relationship between tourism and depopulation is particularly pressing in southern Europe, where rural shrinkage is intense and geoparks are densely represented; the VIJ is one of eighteen Spanish geoparks (UNESCO, 2026). In Extremadura, Ruiz-Ballesteros et al. (2025) find that community-based tourism is not associated with demographic reversal, although it relates to visibility, services and the quality of life of remaining residents. Research on internal migration adds that residential decisions combine employment with lifestyle, environmental and community considerations (González-Leonardo et al., 2022; Stockdale, 2016).

Quantitative studies elsewhere counsel caution. Zhang and Zhang (2026) find an inverted U-shaped relationship between tourism specialisation and rural revitalisation across Chinese cities, and Folgieri et al. (2025) place tourism within a wider portfolio of place-based instruments for Europe's peripheral regions.

2.3. Depopulation, Territorial Resilience and the Peripheralisation Debate

Rural depopulation is among the most persistent territorial problems in Europe. A systematic review of policy assessments published since 2000 concludes that anti-depopulation interventions have had limited and short-lived effects when not embedded in broader territorial frameworks (Loras-Gimeno et al., 2025). If dedicated policies have struggled to alter demographic trajectories, a single territorial instrument cannot reasonably be expected to reverse them.

As active populations contract, the capacity of rural communities to maintain infrastructure, services and institutions erodes in a self-reinforcing cycle (Budhathoki et al., 2026), and ageing raises a demand for care that depopulated areas struggle to meet (Zamfirescu-Mareș & Corman, 2025).

Resilience frameworks treat adaptation, rather than a return to a previous state, as the relevant outcome (Boschma, 2015; Martin & Sunley, 2015). The OECD (2025) proposes a place-based framework built on specific assets, tradeable specialisation, access to urban markets and natural resources, and the European Parliament (2025) calls for integrated strategies that combine diversification, connectivity, services and territorial branding rather than single-sector solutions.

In Spain, San-Martín González and Soler-Vaya (2024) find that accessibility, services and sectoral diversification are the strongest predictors of demographic stabilisation in small rural municipalities of the Valencia Region, whereas tourism specialisation alone is insufficient. Li et al. (2019) identify diversified livelihoods, market-oriented institutions and strong social capital as the factors that sustain rural communities facing decline. Studies in Japan and Poland show that economic resilience and rural vitality can be sustained while population declines, which separates sustaining vitality under decline from reversing decline itself (Mróz & Zwęglińska-Gałecka, 2026; Nishimura, 2026).

Three terms are used here with distinct meanings. Demographic recovery denotes a reversal of population loss; demographic stabilisation, a halt to loss without reversal; and demographic resilience, the capacity of a population to sustain its functions, such as services, institutions and generational renewal, under continued decline. The question in the title concerns recovery. The category labels of the typology describe observed trajectories and do not measure

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resilience in this sense. Because rural studies have often treated territories as homogeneous blocks and obscured internal differences (Collantes & Pinilla, 2011; Rodríguez-Pose, 2018), the analysis is conducted at municipal scale.

2.4. Analytical Gaps and Contribution of the Study

This review identifies three gaps. First, longitudinal, municipal-scale analyses of geoparks over extended periods remain scarce; most studies are cross-sectional or perception-based (Ferreira & Valdati, 2023; Nyulas et al., 2025). Second, the contingency of tourism's demographic effects is rarely examined within a single territory (Ruiz-Ballesteros et al., 2025; Zhang & Zhang, 2026). Third, few studies place a UNESCO Global Geopark within the debate on rural resilience and peripheralisation (Li et al., 2019; OECD, 2025).

The VIJ, which combines low density, structural ageing and a fragile productive base, allows the three gaps to be addressed together. The study asks to what extent, in which dimensions and with what intra-comarcal geography the socio-economic trajectories of the nineteen VIJ municipalities changed between 2011 and 2025, and how far that change can be attributed to designation rather than to pre-existing conditions and wider trends.

3. Materials and Methods

3.1. Study Area and Research Design

The VIJ lies in the south-east of the province of Cáceres (Extremadura, Spain) and comprises nineteen rural municipalities covering about 2,547 km² (Figure 1). It joined the European and Global Geoparks Networks in 2011 and became a UNESCO Global Geopark in 2015, when the UNESCO programme was created; it is one of eighteen Spanish members of the network (UNESCO, 2026).

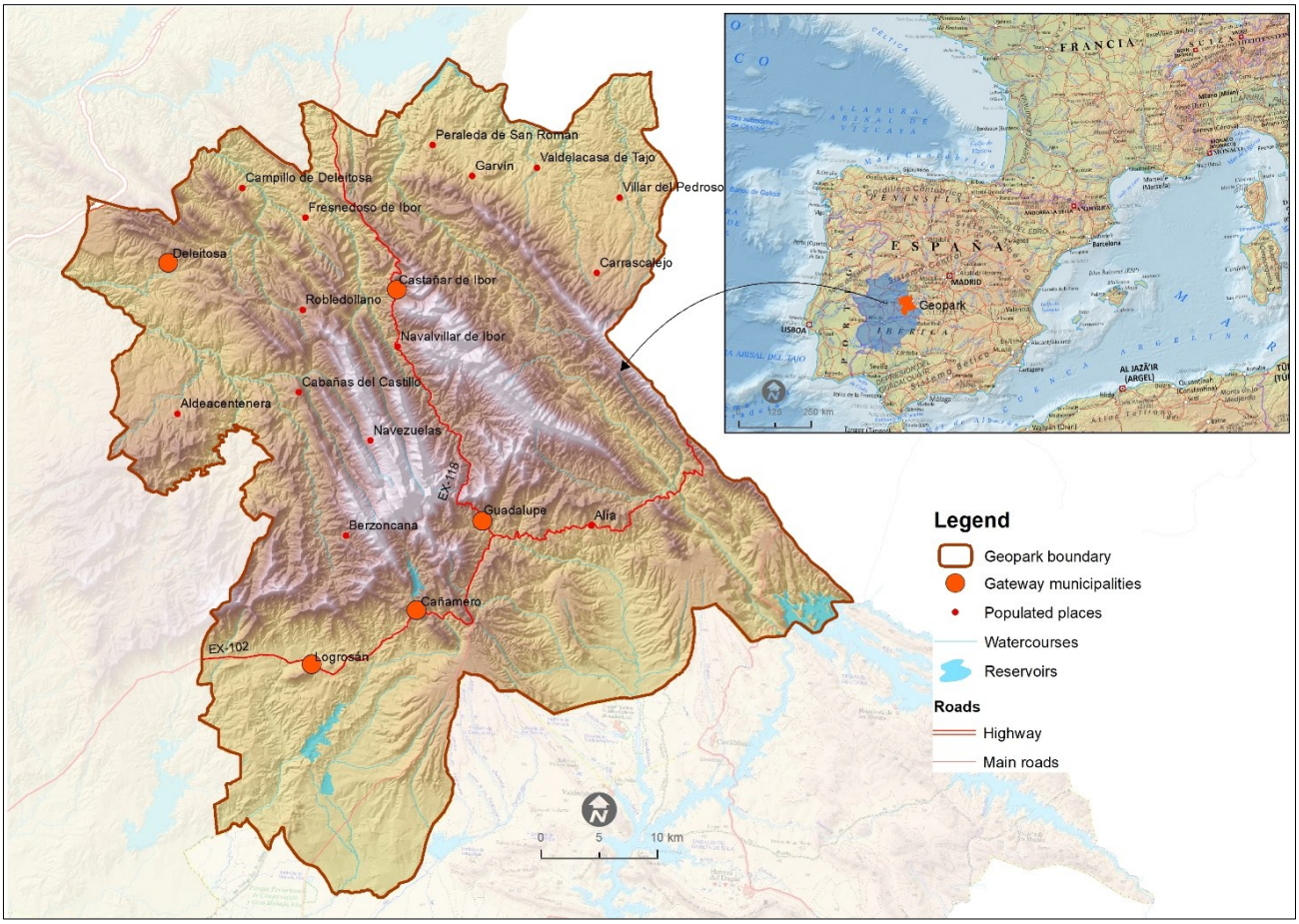


Figure 1. Location of the Villuercas-Ibores-Jara UNESCO Global Geopark, its nineteen municipalities, the five gateway municipalities and the main road network. Source: author's own elaboration.

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The study uses a bitemporal design (2011 and 2025) at municipal scale. The main source is the Socioeconomic Atlas of Extremadura, editions 2011 and 2025, published by the Statistical Institute of Extremadura (IEEX). It is complemented by records of the Employment Observatory of the Servicio Extremeño Público de Empleo (SEXPE) for December 2011 and December 2025 and by the Provincial Labour Market Reports of the Servicio Público de Empleo Estatal (SEPE, 2012, 2026) for the provincial labour-market benchmarks. Social security affiliation by municipality and by division of the Statistical Classification of Economic Activities in the European Community (NACE) is used for December 2025. The 2025 figures are observed data: the 2025 edition of the Atlas (published in March 2026) is compiled from consolidated registers, and the SEXPE records close on 31 December 2025. The two reference years fall in different phases of the economic cycle, 2011 close to the post-2008 peak in unemployment and 2025 in a phase of recovery, so the comparison captures cyclical recovery together with structural change.

The Atlas and the SEPE reports are openly accessible. Registered unemployment by municipality is published by the SEXPE Employment Observatory; for December 2025 it is openly available by sex, age and educational level (with values below five suppressed), whereas no municipal breakdown for December 2011 is available on the Observatory's website. The comarcal labour-market figures used here come from the Observatory's labour market reports for the Mancomunidad Integral Villuercas-Ibores-Jara, whose nineteen municipalities coincide with those of the Geopark. These reports were supplied by the SEXPE on request and include series that are not openly available, notably registered unemployment and new contracts by sector and by NACE-2009 division (two digits). The SEXPE has authorised the publication of the data in these reports in aggregated form, which is how they are used in this study. Table 1 lists the thirty-six indicators; the municipal series and derived results are reported in Tables S1–S8, and the processing scripts are available as described in the Data Availability Statement.

3.2. Variables and Comparability Protocols

Variables were selected for theoretical relevance and homogeneous availability in both editions. The thirty-six indicators fall into six blocks of ten, six, four, four, four and eight variables (Table 1). Four Atlas-2011 variables (Tourism Index, Commercial Index, Restaurants and Bars Index, tourism-linked population) have no homogeneous equivalent in 2025 and were replaced by two proxies, the number of commercial activities and the Economic Activity Index. These proxies capture the size of the local commercial base, not tourism intensity, and their equivalence with the 2011 variables is therefore only partial. They are not used to measure tourism; tourism is measured directly through new contracts in NACE 55+56 and affiliation. The substitution affects only the commercial axis of the typology, and varying the commercial threshold by ±10 percentage points changes no classification (§3.3). Three further variables (Service Offer, Accessibility, Educational Level) were excluded because their methodology changed between editions; the educational dimension is covered by SEXPE registers.

Operational definitions follow the Atlas glossary. Disposable household income per capita refers to net disposable income at the municipal level imputed by the IEEX from regional fiscal microdata. The Industrial Index and the Social Welfare Index are those published in the Atlas. The Industrial Index gives each municipality's share of the regional yield of the business tax (Impuesto sobre Actividades Económicas) on industrial activities (Extremadura = 10,000) and, in the 2025 edition, refers to 2023. As a relative share it can change abruptly in small municipalities (in Alía it falls from 58.5 to 0.1), so it is reported for reference only and is not used in the typology or in the assessment of the hypotheses. The Social Welfare Index is a synthetic index scaled to the regional mean (Extremadura = 100). The municipal unemployment rate is registered unemployment as a share of the working-age population (aged 15–64 in the 2011 edition and 16–64 in the 2025 edition), because the active population is not available at municipal scale. The age bracket differs between editions, so the levels are only approximately comparable, and the ratio is not the survey-based unemployment rate of the Labour Force Survey. The trend index is defined as (population aged 0–4 / population aged 5–9) × 100. SEXPE labour-market variables are comarcal aggregates for the Mancomunidad (the sum of the nineteen Geopark municipalities) taken from the Observatory's reports: registered unemployment stocks at 31 December by sex, age and educational level, and registered unemployment and cumulative annual flows of new contracts by sector and by NACE-2009 division (two digits; the source lists the twenty divisions with most cases).

Nominal income variables are deflated with the national Consumer Price Index (CPI) of the Instituto Nacional de Estadística (general index, base 2021), which rose by 30.7 % between December 2011 and December 2025 (cumulative change computed from the December index values of 91.762 and 119.942; Instituto Nacional de Estadística, 2026). Sectoral classification follows NACE Rev. 2 (CNAE-2009), in force in both years, so no remapping was required. Comarcal

aggregates are simple sums for stock and flow variables; rates are recomputed from the summed numerators and denominators, and income per capita and normalised indices are population-weighted means. The variables used in the typology and in the correlations have no missing values, so every coefficient is computed on all nineteen municipalities unless stated otherwise.

Table 1. Thematic blocks and selected variables

Thematic block	No. vars.	Main variables
B1. Demography and territory	10	Total population, density, mean age, trend index, child/youth/ageing/dependency/femininity ratios, % foreigners
B2. Natural and migratory movement	6	Natural growth, birth, mortality and fertility rates, migration balance, migration rate
B3. Economy and income	4	Disposable household income per capita, GDP per capita, unemployment rate (share of working-age population), market share
B4. Productive structure	4	Commercial activities, Economic Activity Index, Industrial Index (reported for reference only), new contracts by NACE division (SEXPE)
B5. Equipment and welfare	4	Social Welfare Index, Socio-economic Level Index, broadband, bank branches
B6. Labour market (SEXPE)	8	Registered unemployment (total, sex, age, educational level, NACE), annual new contracts, share of open-ended contracts, contracts/person

Source: author's own elaboration.

3.3. Analytical Strategy

The analysis proceeds in four phases. The first describes the thirty-six indicators for the nineteen municipalities in both years with standard measures of central tendency and dispersion. The second compares the VIJ with the province of Cáceres and with its own 2011 baseline. Because these benchmarks cannot separate territory-specific change from wider trends, a descriptive comparison with four comarcas of the same province is added (§4.4). Two are UNESCO-designated territories of the UNESCO Environmental Corridor of Extremadura (Corredor Medioambiental Unesco, CMU), as delimited by Sánchez-Oro Sánchez et al. (2022): the Biosphere Reserves of Monfragüe (designated 2003) and Tajo-Tejo Internacional (2016). The corridor's fourth territory, La Siberia, lies in the province of Badajoz and is excluded to keep a single provincial frame. The other two, Miajadas-Trujillo and Sierra de Montánchez-Tamuja, are not designated. The designated peers resemble the VIJ in density and settlement structure, so they allow designation types to be compared but not designation with its absence; the non-designated comarcas supply that contrast but are denser. All five units are measured with the same source (IEEX Atlas, 2011 and 2025) and the same aggregation rules. New contracts by NACE division could not be included, because the SEPE publishes municipal breakdowns by activity only for municipalities above 20,000 inhabitants and none of the five comarcas contains one. With five units the comparison is descriptive and supports no causal inference.

The third phase builds a municipal typology on four axes: change in population, in nominal disposable household income per capita, in the number of commercial activities and in the ageing index. Explicit decision rules are applied instead of a cut on a clustering dendrogram, because the sample is small (n = 19) and micro-municipalities produce percentage changes dominated by size. Municipalities losing 25 % or more of their population are classed as demographic collapse. Those losing less than 5 % are classed as dynamic-resilient, unless their commercial activities fell by 50 % or more, in which case they are classed as stable regressive. The remaining municipalities, with intermediate losses, are classed as regressive with economic resilience if nominal income grew by 15 % or more, and as moderately regressive otherwise. The category labels are shorthand for these rules: dynamic-resilient, for instance, denotes a near-stable

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population without a halving of the commercial base, and includes two municipalities whose commercial activities fell (Navezuelas, −16.7 %; Peraleda de San Román, −33.3 %). The thresholds are substantive and pragmatic choices, not statistically derived values. The 5 % cut-off separates near-stability from loss, and 25 % marks the loss of one inhabitant in four, well above the comarcal mean of 16 %. The 50 % cut-off marks the disappearance of at least half the commercial base, and 15 % is roughly twice the comarcal nominal income growth of 6.6 %. The income axis is nominal because the Atlas publishes municipal income in current euros. Deflating every value by the same national CPI (+30.7 %) would shift all municipal changes without altering their ranking, so the axis identifies relative positions within the comarca rather than gains in purchasing power. No municipality with an intermediate population loss records real income growth, so economic resilience denotes a comparatively favourable nominal trajectory, not a real gain. A sensitivity analysis varied each threshold (collapse at −20, −25 and −30 %; stability at −3, −5 and −7 %; commercial change at −40, −50 and −60 %; income growth at 10, 15 and 20 %) across all 81 combinations (Table S5). On average 16.3 of the 19 municipalities keep their category, eleven never change, all five categories occur in every combination, and the commercial and income thresholds alter no assignment. The collapse threshold is the most influential: at −20 % Aldeacentenera and Valdelacasa de Tajo join the collapse group, and at −30 % four municipalities leave it. At −3 % for the stability threshold, Navezuelas and Peraleda de San Román move to regressive with economic resilience. As a further check, an agglomerative hierarchical clustering on the same standardised axes (Ward's criterion, squared Euclidean distance; Figure S2) reproduces the main divide between micro-municipalities and the rest of the comarca but not the exact categories, because it weights all four axes equally. The labels used throughout are those of Table 2.

The fourth phase examines bivariate associations with Pearson and Spearman coefficients, the latter as a non-parametric check given the small sample and the presence of outliers. Both are reported with two-tailed p-values based on the t distribution with $n - 2$ degrees of freedom ($n = 19$ unless stated); tied values receive average ranks in the Spearman coefficients, and permutation tests with 20,000 permutations gave the same conclusions. With nineteen observations only coefficients of about $|r| \geq 0.46$ reach $p < 0.05$, so the absence of a significant correlation is not evidence that no association exists. Correlations are read as descriptions of pattern strength, not as tests of causal links. The hypotheses are assessed descriptively: H1 by whether the gateway municipalities outperform the rest on population change, typology category and tourism specialisation; H2 by whether relative change in labour-market and income indicators exceeds demographic change; and H3 by whether dispersion across municipalities, measured by the coefficient of variation and the standard deviation of levels, increased between 2011 and 2025.

4. Results

The results are presented in four blocks: aggregate demographic and labour-market change (§4.1), sectoral change in hiring (§4.2), intra-comarcal heterogeneity and the municipal typology (§4.3), and the comparative benchmark (§4.4).

4.1. Aggregate Demographic and Labour-Market Evolution

Between 2011 and 2025 the comarca fell from 14,477 to 12,150 inhabitants (−16.07 %), about three times the regional loss (−5.2 %, from 1,109,367 to 1,051,638 inhabitants; Instituto Nacional de Estadística, 2025a). Comarcal density fell from 5.7 to 4.8 inh/km² over an area of 2,546.6 km²; the unweighted mean of the nineteen municipal densities, which gives equal weight to small municipalities, fell from 7.2 to 6.1 inh/km². The population-weighted mean age rose by 2.8 years, from 50.08 to 52.84, and the share of people aged 85 and over grew from 5.6 % to 7.4 %.

Population decline is general but uneven. Sixteen municipalities lost population, from −4.2 % in Navezuelas to −30.8 % in Carrascalejo (Table S1). The three with apparent growth are Garvín and Campillo de Deleitosa, both with fewer than 120 inhabitants in 2011, and Cabañas del Castillo (394 inhabitants in 2011); in all three the change amounts to a few tens of people.

The four most populous municipalities in 2011 (Guadalupe, Logrosán, Cañamero and Castañar de Ibor) lost between 11.4 % and 17.7 % of their population. No statistically significant association was detected between initial size and subsequent loss ($r = −0.17$, $p = 0.49$; $\rho = −0.11$, $p = 0.66$), and these four held 50.9 % of the comarcal population in 2025, against 49.5 % in 2011 (Table S1).

Registered unemployment in the SEXPE records (stocks at 31 December) fell from 1,420 to 625 people between 2011 and 2025 (−56.0 %; Tables S3 and S4). The IEEX Atlas, which divides registered unemployment by the working-age population (reference month of each edition), allows a comparison with the province on the same definition. In this

series registered unemployment in the VIJ fell from 1,205 to 646 (−46.4 %; Table 3), against −43.2 % in the province of Cáceres; these counts refer to the reference month of each edition (June in the 2025 edition) and therefore differ from the December SEXPE stocks given above. The aggregate rate fell from 14.5 % to 9.4 % in the VIJ (−5.1 percentage points) and from 14.5 % to 9.2 % in the province (−5.4 points; differences are computed from unrounded values). The VIJ therefore started at the provincial rate and ended marginally above it. The unweighted mean of the nineteen municipal rates, which gives each municipality equal weight, fell from 16.5 % to 10.7 %. Part of the fall reflects the contraction of the population at risk of unemployment rather than job creation: in the same series the working-age population implied by the Atlas rates fell by 17.1 %. Part of this contraction reflects the change in the age bracket rather than population loss. Had unemployment in this series fallen only in proportion to the working-age population, it would have declined from 1,205 to about 999 people rather than to 646. Roughly 37 % of the observed fall can thus be attributed to demographic contraction and 63 % to other factors, including employment growth and the macroeconomic cycle. This decomposition assumes a constant unemployment rate within a shrinking population and is an approximation.

Nominal disposable household income per capita rose by 6.6 % and GDP per capita by 13.0 %, which correspond to real changes of −18.4 % and −13.5 % once deflated by the CPI. The Socio-economic Level Index relative to Extremadura fell from 106.7 to 93.9 and the Social Welfare Index by 2.6 %, so the VIJ lost the slight advantage over the regional average that it held in 2011.

Taken together, these results are consistent with H2: change is more visible in labour-market and income indicators than in demographic ones. The fall in unemployment combines demographic contraction, the macroeconomic cycle and possibly territory-specific factors, which this design cannot fully separate.

4.2. Sectoral Transformation and Contractual Quality

The sectoral composition of unemployment and of new contracts changed markedly. Sectoral shares of unemployment and of contracts are computed from the sector tables of the same Mancomunidad reports (Table S8), and those of individual NACE divisions from Table S2. Construction, which accounted for 29.5 % of unemployment and 30.9 % of contracts in 2011, fell to 11.1 % and 11.0 % in 2025, after the end of the property cycle. Services rose from 52.3 % to 76.3 % of unemployment and from 30.6 % to 41.6 % of contracts, and hiring in crop and animal production (NACE 01) grew by 37.6 % in absolute terms.

New contracts in NACE 55 (accommodation) rose from 126 to 328 and in NACE 56 (food and beverage service activities) from 97 to 484 (Table S2). Together, the two divisions rose from 223 to 812 contracts a year (+264.1 %), and their share of all new contracts from 4.7 % to 17.1 %. The percentage increase is large because the base was very small: the change amounts to 589 additional contracts a year in a comarca of about 12,000 inhabitants. Nor are contracts the same as jobs. If the comarcal ratio of 1.79 contracts per contracted person in 2025 applies to these divisions, the 812 contracts correspond to about 450 people, and the 388 workers affiliated in these divisions in December 2025 (§4.3) imply roughly two contracts per affiliated worker. Full-time-equivalent employment cannot be estimated from these sources. Relative to the province, the change is nonetheless distinctive: hospitality accounted for 9.1 % of contracts in Cáceres in 2011 (SEPE, 2012), almost twice the VIJ share of 4.7 %, and for 14.3 % in 2025 (SEPE, 2026), below the VIJ's 17.1 %. The shift is consistent with growth in visitor-serving activity, but the design cannot attribute it to the Geopark.

Contract quality changed with the 2021–2022 labour reform. The share of open-ended contracts rose from 4.1 % to 32.9 %, almost the same as the provincial value (32.4 %; SEPE, 2026), which points to the national regulatory change rather than to a local effect. The ratio of contracts per person rose from 1.51 to 1.79, indicating more turnover in the remaining temporary segments, consistent with the seasonality of agriculture and rural tourism.

The sectoral evidence shows selective growth in accommodation and food services, the branches most exposed to visitor demand, but it does not by itself bear on H1, which concerns where improvement occurred (§4.3). This growth combines three components: the labour reform, the post-crisis recovery and any territory-specific contribution. Only the growth of NACE 55+56 relative to the province points to a local component, and §4.3 shows that this component is concentrated in Guadalupe.

4.3. Intra-Comarcal Heterogeneity, Disparities and Municipal Typology

Over the period, municipal trajectories differed widely in direction. Table 2 summarises the typology.

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Table 2. Municipal typology of trajectories, 2011–2025

Category	N	Municipalities	Defining features
Dynamic-resilient	4	Cabañas del Castillo, Campillo de Deleitosa, Navezuelas, Peraleda de San Román	Population change of −5 % or higher; commercial activities not reduced by half (from −33 % to +100 %)
Stable regressive	1	Garvín	Population change of −5 % or higher; commercial activities reduced by half or more (−75 %)
Regressive with economic resilience	1	Robledollano	Population loss of 5–25 %; nominal income growth of 15 % or more
Moderately regressive	8	Aldeacentenera, Cañamero, Castañar de Ibor, Deleitosa, Guadalupe, Logrosán, Valdelacasa de Tajo, Villar del Pedroso	Population loss of 5–25 %; nominal income growth below 15 %; includes all five gateway municipalities
Demographic collapse	5	Alía, Berzocana, Carrascalejo, Fresnedoso de Ibor, Navalvillar de Ibor	Population loss of 25 % or more

Source: author's own elaboration based on the Socioeconomic Atlas of Extremadura and SEXPE.

Figure 2 projects the municipalities onto the plane of population change and income change. Because it uses two of the four axes, the stable regressive case (Garvín), separated from the dynamic-resilient group by its commercial contraction, cannot be distinguished in this plane.

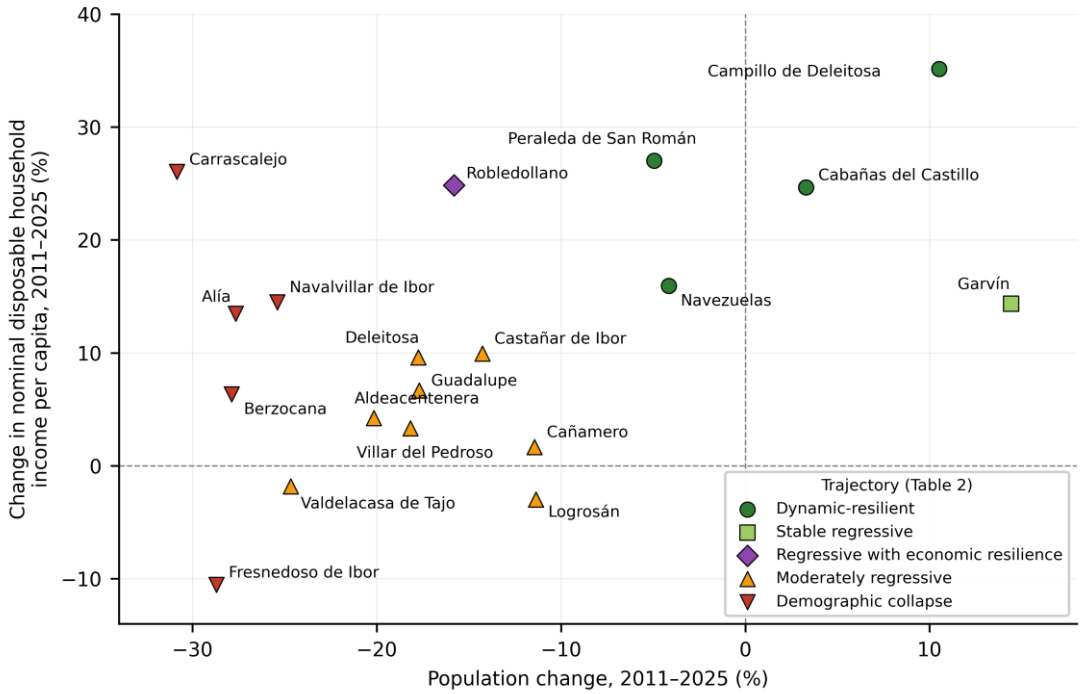


Figure 2. Municipal trajectories, 2011–2025: percentage change in population (horizontal axis) and in nominal disposable household income per capita (vertical axis). Colours show the categories of Table 2. Source: author's own elaboration.

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Figure 3 maps four dimensions at municipal scale: population change, change in the unemployment rate, tourism specialisation of employment and the distribution of geological heritage.

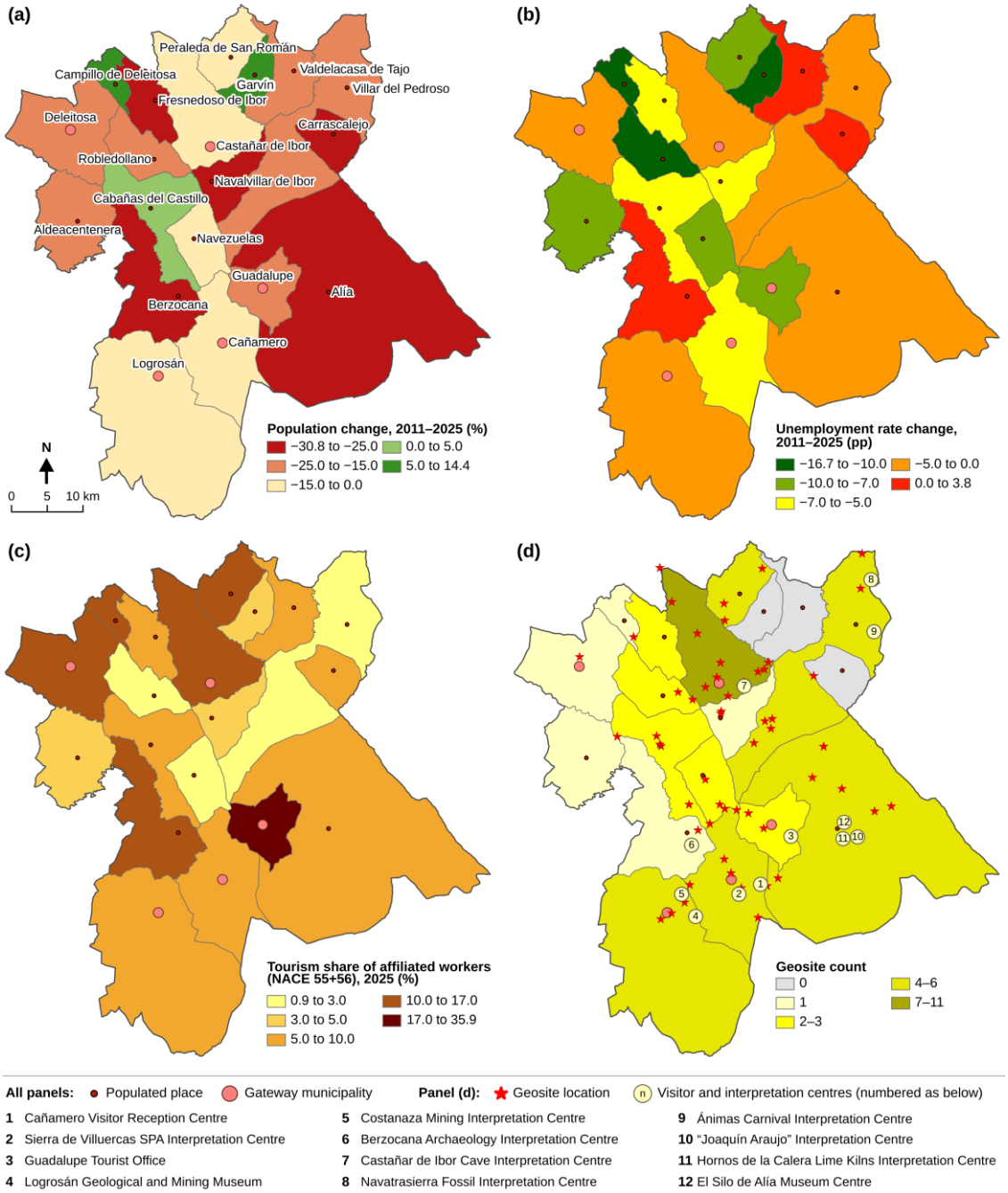


Figure 3. Demographic, labour-market and tourism indicators and geotourism resources in the 19 municipalities of the Villuercas-Ibores-Jara UNESCO Global Geopark. **(a)** Population change, 2011–2025 (%); **(b)** change in the registered unemployment rate, 2011–2025 (pp); **(c)** workers affiliated to social security in NACE 55+56 as a share of all affiliated workers, December 2025 (%), shown as lower bounds because the source suppresses components below five; **(d)** number of geosites per municipality, with the location of the geosites and of the visitor and interpretation centres (numbered 1–12; see key). Populated places and gateway municipalities are shown in every panel, and municipality names are given in panel (a). All panels share the same scale and orientation. Notes: pp, percentage points; SPA, Special Protection Area. In (d), each geosite is counted in its primary municipality. Sources: author's own elaboration from the IEEX Socioeconomic Atlas of Extremadura, 2011 and 2025 editions (a, b; Table S1), social security affiliation records, December 2025 (c; Table S6), and the geosite inventory and visitor-centre network of the Geopark (d).

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Four observations follow from Table 2 and Figure 3. First, three of the four dynamic-resilient municipalities (Cabañas del Castillo, Campillo de Deleitosa and Peraleda de San Román) had fewer than 400 inhabitants in 2011, so their position rests on small absolute numbers. Navezuelas (697 inhabitants in 2011) is the exception: it records the smallest population loss in the sample (−4.2 %) with appreciable income growth, which makes it the clearest case of near-stabilisation in the comarca and one that only qualitative work could explain. Second, all five gateway municipalities fall in the moderately regressive category. They retain service functions, and three of them expanded their commercial base (Cañamero +98.0 %, Logrosán +73.9 %, Castañar de Ibor +52.2 %), but all five lost population. Third, the demographic-collapse group comprises five municipalities of 321 to 998 inhabitants in 2011. Fourth, population change and income change are positively correlated in Pearson form ($r = +0.47$, $p = 0.04$) but not significantly in rank form ($\rho = +0.36$, $p = 0.13$), so the association depends on the measure used and is not robust. No statistically significant association was detected between commercial change and population change ($r = −0.25$, $p = 0.31$; $\rho = −0.26$, $p = 0.29$). These coefficients do not show that economic activity and demographic retention are decoupled; they show only that, across nineteen municipalities, the two did not move together in a detectable way.

The labour market also changed in composition. Women's share of registered unemployment rose from 49.4 % to 60.6 %, close to the provincial figure (60.1 %; SEPE, 2026), which points to a regional pattern. Unemployed people aged sixty or over rose from 7.6 % to 27.2 % of the total, while young people are largely absent from the registers, a pattern consistent with youth out-migration. The share with upper secondary education or vocational training rose from 13.6 % to 22.9 %, but 11.8 % still have no formal education or have not completed primary education, a group in which men predominate (44 of 74 in 2025; Table S4).

Tourism employment, measured here as social security affiliation in NACE 55+56, is concentrated to a degree that the comarcal aggregate of §4.2 conceals. Guadalupe accounts for 198 of the 388 workers affiliated in NACE 55+56 across the comarca, 51 % of the total with 14 % of the population, and these divisions represent 35.9 % of its local affiliation against 12.1 % for the comarca. With Cañamero and Logrosán, three municipalities hold 69 %. At the other end, Robledollano records 0.9 % and Navezuelas 2.2 % (Figure 3c; Table S6).

The distribution of tourism employment does not match that of geological heritage. The correlation between tourism specialisation and the number of geosites is close to zero ($r = −0.04$, $p = 0.86$; $\rho = −0.05$, $p = 0.83$) and remains so when Guadalupe is excluded ($r = +0.03$, $p = 0.92$; $n = 18$). These coefficients, like the others that involve tourism specialisation, are computed on the lower-bound values of Table S6, in which components suppressed by the source are counted at their minimum. Castañar de Ibor has the most geosites (ten) and a specialisation of 11.9 %; Guadalupe has two and reaches 35.9 %; Villar del Pedroso has six and records 2.8 %.

A plausible explanation for this concentration, which this study does not measure directly, is an attractor that predates the Geopark. The Royal Monastery of Santa María de Guadalupe has been a World Heritage site since 1993, and its statue of the Virgin made it a centre of pilgrimage for Spain and Latin America for centuries (UNESCO World Heritage Centre, n.d.). It continues to draw religious and cultural visitors (Robina-Ramírez & Pulido-Fernández, 2021). Accommodation supply points the same way: Guadalupe has a state-run Parador, opened in 1965 in the former monastic hospital (Paradores de Turismo de España, n.d.), and a guesthouse run by the monastery (Hospedería), and it accounts for 116 of the 133 workers affiliated in accommodation (NACE 55) in the comarca (Table S6). On this evidence, tourism employment shows no detectable spatial association with the municipal distribution of geosites, which argues against a simple geosite-led spillover and matches instead the pre-existing attractor of Guadalupe. The data are compatible with two readings that this design cannot separate: that the Geopark added little to a demand already anchored in religious and monumental heritage, or that geosites act as a dispersed, complementary resource whose returns accrue where accommodation and food services were already established.

No statistically significant association was detected between tourism specialisation and population change ($r = −0.02$, $p = 0.95$; $\rho = +0.01$, $p = 0.97$) or change in the unemployment rate ($r = +0.10$, $p = 0.68$; $\rho = +0.26$, $p = 0.29$). This should not be read as evidence that tourism had no demographic effect. With nineteen municipalities, a single 2025 measure of specialisation and no counterfactual, a modest effect would go undetected. Deleitosa illustrates the ambiguity. It has the second-highest specialisation (16.9 %), all of it in food services and none in accommodation, which suggests roadside catering on a through route, and it lost 17.7 % of its population; whether its losses would have been larger without that employment cannot be determined here.

Taken together, the results do not support H3 in its original form. Across the nineteen municipalities the coefficient of variation was stable or fell between 2011 and 2025 for income per capita (9.6 % and 9.7 %), the unemployment rate

(37.1 % and 35.9 %), mean age (9.3 % and 8.1 %) and the Social Welfare Index (16.2 % and 12.7 %). The standard deviation, which does not depend on the mean, also fell for the unemployment rate (6.1 to 3.9 points), mean age (4.9 to 4.5 years) and the Social Welfare Index (14.8 to 11.8), and rose only for nominal income (€1,048 to €1,175), broadly in line with nominal growth (Table S1). The share of population in the four largest municipalities rose only slightly. What differs widely is the direction of change (Table 2) and the location of tourism employment, which is concentrated in one municipality in 2025 but lacks a municipal baseline for 2011. H1 is not supported in its original geographical formulation. Socio-economic improvement is not consistently concentrated in the five gateway municipalities: all five lost population and fall in the moderately regressive category, only Guadalupe and Deleitosa exceed the comarcal level of tourism specialisation among the gateway municipalities, and commercial expansion, although largest in absolute terms in Cañamero and Logrosán, also occurred in several non-gateway municipalities.

4.4. Comparative Benchmark: The VIJ within the UNESCO Environmental Corridor and against Non-Designated Comarcas

The provincial benchmark shows that the VIJ departs from the provincial average but cannot separate effects of the Geopark from conditions common to inland Extremadura. Table 3 therefore compares the VIJ with the two other designated territories of the province and with two non-designated comarcas (§3.3). With five aggregate units and no pre-designation trends, the comparison can show whether the VIJ stands out, not why.

Table 3. Comparative benchmark: the VIJ, the UNESCO Environmental Corridor of Extremadura and two non-designated comarcas, 2011–2025

Indicator	**VIJ (UGGp, 2011)**	**RB Monfragüe (2003)**	**RB Tajo-Tejo Int. (2016)**	**Miajadas-Trujillo**	**Sierra de Montánchez-Tamuja**
Designation	Global Geopark	Biosphere Reserve	Biosphere Reserve	None	None
Province	Cáceres	Cáceres	Cáceres	Cáceres	Cáceres
Municipalities (no.)	19	14	14	21	21
Population 2011	14,477	12,397	15,534	35,152	19,489
Population 2025	12,150	11,363	12,596	30,958	16,835
Population change (%)	−16.07	−8.34	−18.91	−11.93	−13.62
Density 2011 (inh/km²)	5.7	6.8	6.0	15.2	21.1
Density 2025 (inh/km²)	4.8	6.3	4.9	13.4	18.2
Registered unemployed 2011 (no.)	1,205	1,225	1,284	3,628	1,989
Registered unemployed 2025 (no.)	646	658	695	1,858	967
Change in registered unemployment (%)	−46.39	−46.29	−45.87	−48.79	−51.38
Unemployed / total population 2011 (%)	8.32	9.88	8.27	10.32	10.21

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Indicator	VIJ (UGGp, 2011)	RB Monfragüe (2003)	RB Tajo-Tejo Int. (2016)	Miajadas-Trujillo	Sierra de Montánchez-Tamuja
Unemployed / total population 2025 (%)	5.32	5.79	5.52	6.00	5.74
Nominal net disposable income p.c. 2011 (€)	11,112	11,470	11,467	11,589	11,031
Nominal net disposable income p.c. 2025 (€)	11,850	12,195	12,058	11,935	12,344
Nominal income change (%)	+6.64	+6.32	+5.15	+2.99	+11.90
Mean age 2011 to 2025 (years)	50.1 → 52.8	44.9 → 48.4	47.7 → 52.2	44.5 → 48.8	46.4 → 51.0
Population aged 65+, 2011 to 2025 (%)	33.8 → 34.2	25.2 → 26.7	30.1 → 32.7	24.4 → 27.2	27.4 → 30.3

Note. RB = Biosphere Reserve; UGGp = UNESCO Global Geopark. Comarcas follow the IEEX territorial classification. Income figures are nominal, population-weighted means of all municipalities. In the 2025 edition, the municipalities without an individual INE value (Campillo de Deleitosa in the VIJ and Higuera de Albalat in Monfragüe) carry a common value in the Atlas. Deflated by the CPI (+30.7 %, §3.2), all five units record real losses. Changes are computed from unrounded values. Unemployment refers to the reference month of each Atlas edition and is not directly comparable with the December SEXPE series in §§4.1–4.2. Years in parentheses give the year of UNESCO designation. Delimitation details and the values for La Siberia are given in Table S7. Source: author's own elaboration from the IEEX Socioeconomic Atlas, editions 2011 and 2025.

The comparison does not show a socio-economic advantage associated with designation. The VIJ lost 16.07 % of its population, within the range of the designated territories (from 8.34 % in Monfragüe to 18.91 % in Tajo-Tejo Internacional) and more than the two non-designated comarcas (11.93 % and 13.62 %), so designation does not order the five units. Initial age structure orders them more closely: the share of population aged 65 and over in 2011 is negatively associated with subsequent population change ($r = -0.74$, $p = 0.15$; $\rho = -0.80$, $p = 0.10$; $n = 5$), but with five units this coefficient carries no inferential weight. Ordering the designated territories by length of designation produces a similar gradient, which is confounded with age structure and rests on three cases; it is not evidence that designation slows depopulation.

The VIJ recorded the smallest increase in the share of population aged 65 and over (+0.4 percentage points, against 1.5 to 2.9 points elsewhere) and in mean age (+2.8 years). This reflects saturation rather than rejuvenation: with 33.8 % of its population above 65 in 2011, the VIJ already stood four to nine points above the other units.

Registered unemployment fell by 46.39 % in the VIJ, almost the same as in Monfragüe (46.29 %) and Tajo-Tejo Internacional (45.87 %). The two non-designated comarcas fell further (48.79 % and 51.38 %). In levels, the VIJ had the second lowest unemployment relative to population in 2011 (8.32 %, after Tajo-Tejo Internacional at 8.27 %) and the lowest in 2025 (5.32 %).

Nominal net disposable income per capita grew by between 5.15 % and 6.64 % in the three designated territories, against 2.99 % and 11.90 % in the non-designated pair. The VIJ led the designated group but grew much less than Sierra de Montánchez-Tamuja.

The closeness of the designated territories on unemployment and income admits two readings that the design cannot separate: a common development regime associated with designation, or a shared structural profile (very low density, high natural value, no intermediate towns) that led to designation in the first place. The second seems more plausible, but testing it would require a larger sample and pre-designation trends.

Over 2011–2025 the VIJ showed no systematic advantage over its designated peers or the non-designated comarcas on the aggregate demographic, labour-market and income indicators. The evidence assembled here distinguishes it only by the sectoral change in hiring (§4.2), which the indicators in Table 3 cannot capture.

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Three caveats apply. Miajadas-Trujillo includes two towns of more than 8,000 inhabitants, whose retentive capacity may explain part of its smaller loss; Tajo-Tejo Internacional was designated in 2016, midway through the period; and the sectoral series of new contracts is not available for the comparison comarcas (§5.6).

5. Discussion

5.1. Geographical Significance: Tourism Activation, Local Diversification and Demographic Decline

The results combine three changes. Hospitality hiring grew strongly from a very low base. The local economy diversified to a limited extent, with commercial activities growing by 52–98 % in three gateway municipalities while construction fell from 31 % to 11 % of contracts. Demographic decline continued, with a 16 % loss of population and a 2.8-year rise in mean age. Geographically, sectoral activity became concentrated in a few centres, above all Guadalupe, without spreading across the comarca, while the rest of the territory continued to lose population.

This pattern fits the contingent reading of tourism in depopulating areas (Ruiz-Ballesteros et al., 2025; San-Martín González & Soler-Vaya, 2024; Zhang & Zhang, 2026), in which tourism can diversify a local economy and sustain particular segments of the labour market without changing the demographic balance. The VIJ adds a spatial qualification. Within a single geopark, the location of tourism employment matched a pre-existing attractor more closely than the geological resource on which the designation rests. A comarcal aggregate would have suggested a geotourism effect that the municipal data do not support, which is why evaluations of geoparks need municipal-scale evidence.

In the terms set out in §2.3, the VIJ shows neither demographic recovery nor stabilisation: only Navezuelas and the micro-municipalities approach stabilisation, and the comarca as a whole lost one inhabitant in six. The indicators can show only in part whether it has demographic resilience, in the sense of functions sustained under decline. The gateway municipalities kept, and in three cases expanded, their commercial functions while losing population, which is consistent with functional resilience at the level of service centres; the smaller municipalities show no comparable sign. Economic activity can therefore increase without demographic recovery, and the gap between the two widens when the economic gains concentrate in a few centres. In my reading this is the main conceptual lesson of the case.

5.2. The Selective-Catalyst Proposition in the Light of the VIJ Evidence

Studies of geoparks elsewhere report that development outcomes vary with governance, accessibility and prior economic structure (Ferreira & Valdati, 2023; Pérez-Calderón et al., 2022), and the VIJ evidence is consistent with that dependence on prior conditions.

In the VIJ, the growth of hospitality hiring, the consolidation of interpretive facilities and an active geosite network coincided with designation, but the evidence does not show that designation produced the growth. The selective-catalyst proposition (P1) therefore remains a hypothesis that this case neither confirms nor rules out. What the case does document is sectoral activation within continued demographic and income decline, in what is plausibly one of the most fragile territorial bases among Iberian geoparks.

The case also shows a problem of attribution that is likely to recur wherever designations overlap. Guadalupe holds a World Heritage inscription from 1993 and a pilgrimage tradition that is centuries older, and the Geopark was superimposed on both in 2011. In such layered territories, tourism outcomes cannot be credited to the most recent label without evidence that separates the demand each designation attracts. A complementary relationship is also plausible: geosites and interpretive facilities near Guadalupe may lengthen stays that the monastery initiates, which would fit the comparatively long average stay recorded in the VIJ (§5.5). Testing this would require municipal visitor or overnight-stay data that are not available for the period studied.

5.3. Structural Constraints and Dependence on the Territorial Base

Whatever the Geopark contributed, it operated on an unfavourable base: a thin productive fabric, distance from metropolitan labour markets and limited institutional networks (P2). Under these conditions any territorial instrument is more likely to help retain existing activity in particular places than to transform the comarca, and the VIJ results are compatible with that limited role.

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This is not an assessment of the Geopark's management. The fall in unemployment and the opening of new commercial activities in some gateway municipalities coincide with designation, but they are accompanied by the contraction of the working-age population, the seasonality of tourism employment (1.79 contracts per person) and a real fall in income of about 18 %. Registered unemployment fell at about the provincial pace (−46.4 % against −43.2 % in the number of unemployed; −5.1 against −5.4 percentage points in the rate) and less than in the two non-designated comarcas (§4.4). The labour market improved in some segments while the age structure and the migration balance kept their regressive course (P3; Loras-Gimeno et al., 2025; Ruiz-Ballesteros et al., 2025).

5.4. Geoparks within Broader Territorial Policy Frameworks

The VIJ evidence supports the view that change coinciding with designation should be read as part of wider territorial dynamics shaped by structural conditions and public policy. Geoparks alone can hardly act as instruments of structural transformation in peripheral rural regions, and their contribution depends on their integration in broader policy frameworks (European Parliament, 2025; OECD, 2025; Rodríguez-Pose, 2018).

A geopark does not allocate investment: the sectoral distribution of public and private investment in its territory depends on regional, national and European frameworks. Its influence is indirect, through visibility, branding, education and the attraction of projects, and its performance has to be read within the wider policy mix. Two such instruments overlap with the end of the period. Extremadura adopted a law on the demographic and territorial challenge in 2022 (Ley 3/2022, 2022). In December 2022 the Spanish government approved a Tourism Sustainability Plan ("Grand Tour Territorios UNESCO") of €7 million, funded by NextGenerationEU, for the three UNESCO territories of the province taken together (the VIJ and the two Biosphere Reserves), to be implemented over three years from 2023 (Diputación de Cáceres, 2022; Secretaría de Estado de Turismo, 2022). Both are further confounders that this design cannot separate.

The persistence of population loss indicates that economic activity alone is unlikely to stabilise the population. Policies that attract and retain residents, especially younger cohorts, through housing, basic services and digital connectivity, and policies that support entrepreneurship, business succession and local value chains, address constraints that lie beyond a geopark's reach.

Three implications follow for geoparks in depopulating peripheries. First, geopark strategies should be coupled with housing and service policies in the municipalities where visitor-related labour demand already exists. Second, joint programming and shared indicators between geopark bodies and regional employment and rural-development agencies would help translate sectoral change into territorial outcomes. Third, the monitoring and revalidation of UNESCO Global Geoparks would benefit from municipally disaggregated longitudinal indicators that can separate change linked to a geopark's own resources from change anchored in pre-existing attractors, a distinction that comarcal averages conceal.

Designation may also have effects that these indicators do not capture, such as a stronger territorial identity, governance networks and educational activity, documented for the VIJ by Fernández Álvarez (2020) and Guillén-Peñafiel et al. (2022). Such effects may support territorial attractiveness, since residential choices also respond to environmental quality and ways of life (González-Leonardo et al., 2022; Stockdale, 2016), but they do not translate automatically into population growth or economic diversification and complement material conditions and policy rather than replacing them.

5.5. Field Evidence on the Geotourism Niche

Independent field evidence from the CMU study (Sánchez-Oro Sánchez et al., 2022) adds information on visitors that administrative records do not contain. It comprises 406 visitor questionnaires collected across the four corridor territories between June and October 2022 (105 in the VIJ), a survey of 82 governance informants and four focus groups, one of them held in Cañamero in November 2022. These data form a single cross-section, so they describe demand in 2022 and cannot show change over 2011–2025.

Three findings are relevant. First, the VIJ recorded the longest average stay of the four territories: 80 % of respondents stayed overnight, with a mean of 2.5 nights, against 2.4 in La Siberia, 2.3 in Monfragüe and 1.7 in Tajo-Tejo Internacional. This is consistent with overnight demand for the accommodation and food services in which hiring grew, but it does not corroborate that growth.

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Second, 75.7 % of VIJ respondents named the territory as the destination of their trip rather than a stopover, and 47.1 % cited nature-based tourism and hiking as their main motivation, followed by historical and artistic heritage (16.3 %). These figures refer to the VIJ as a whole; without a breakdown by municipality they cannot show whether nature-motivated visitors account for the concentration of employment in Guadalupe. The market is domestic: 90.4 % of visitors live in Spain, with residents of Madrid (32.7 %) almost matching those of Extremadura itself (33.7 %).

Third, participants in the Cañamero focus group identified the distinctiveness of the geological heritage as the territory's main strength and described comarcal governance as an established practice that includes residents and local businesses, while noting that it is weaker in highly touristic municipalities such as Guadalupe. They named the shortage of language skills and the concentration of visitors at a few sites as constraints. These accounts show how local actors understand the geotourism niche; they do not measure its weight in the local economy.

5.6. Limitations and Future Research

The design has five main limitations. First, it identifies associations, not causal effects. Without a counterfactual the VIJ trajectories cannot be attributed to designation, and the comparison in §4.4 is descriptive. The two endpoints lie in different phases of the economic cycle and intermediate years were not analysed, so the changes reported combine structural and cyclical components. The bitemporal window was chosen by design: the two dates bracket the designation, and several Atlas indicators changed definition between editions (§3.2). The provincial and comarcal benchmarks share the same endpoints, so the relative comparisons are made over an identical window, and the decomposition in §4.1 quantifies the demographic component of the labour-market change. The financial crisis, COVID-19, NextGenerationEU funds and the 2021–2022 labour reform also overlap with the period.

Second, administrative records (registered unemployment, new contracts, the business tax register) may underrepresent informal activity, family businesses and seasonal work in rural tourism (Lane, 1994), which would understate tourism activity. The commercial axis of the typology also relies on 2025 proxies that are only partly equivalent to the 2011 Atlas variables (§3.2).

Third, intangible dimensions such as identity, governance quality and social cohesion are not observed directly (Louis et al., 2025; Pérez-Calderón et al., 2022).

Fourth, no structured fieldwork or resident interviews were conducted for this study. The interpretation draws on the author's long familiarity with the territory, which dates back to the original designation proposal (Pulido Fernández et al., 2011), on published qualitative work and on the third-party field evidence discussed in §5.5.

Fifth, the comparison in §4.4 lacks the sectoral series of new contracts, which the SEXPE provides only on request and which could not be obtained for the comparison comarcas within the revision period. Affiliation records allow employment in NACE 55+56 to be mapped municipally (Figure 3c), but they measure a stock at one date rather than the annual flow of contracts, which is why the comarca records 17.1 % of contracts but 12.1 % of affiliated workers in these divisions.

Three avenues follow: mixed-methods designs that add resident and business perspectives; quasi-experimental comparisons across geoparks with similar starting conditions, for example with synthetic controls; and follow-up beyond 2025, including affiliation series that would yield a municipal time series of tourism employment and help separate geosite-related from monastery-related demand.

6. Conclusions

This article has examined the socio-economic trajectory of the Villuercas-Ibores-Jara Geopark between 2011 and 2025 at municipal scale. Over the period, hospitality hiring grew severalfold from a very low base and became a larger part of the local labour market, unemployment fell and commercial activity expanded in some gateway municipalities. Unemployment nevertheless fell at about the provincial pace and less than in the two non-designated comarcas; real income declined; and population fell by 16 % while ageing deepened. Of the three working hypotheses, only H2, that change would be more marked in economic than in demographic indicators, is consistent with the results; H1 and H3 are not supported.

The evidence documents this trajectory more firmly than it explains it. Tourism employment is concentrated in Guadalupe, whose monastery has drawn pilgrims and visitors for centuries, and shows no detectable association with the distribution of geosites. The VIJ also showed no systematic advantage over designated or non-designated comarcas

on aggregate indicators. The data therefore do not allow the observed change to be attributed to the Geopark, and the selective-catalyst proposition remains an open hypothesis.

The article makes three contributions. Empirically, it provides a multidimensional longitudinal evaluation of the VIJ from homogeneous official sources and a replicable municipal typology tested against alternative thresholds. Conceptually, it separates demographic recovery, stabilisation and resilience, and shows that sectoral activation and demographic change can follow different courses within the same territory. Methodologically, it shows that comarcal aggregates can credit a geopark with change anchored in pre-existing attractors, so that municipal-scale data are needed to evaluate such designations.

For policy, the results suggest that geoparks in depopulating areas need complementary housing, service and employment policies if sectoral activity is to translate into population retention. These conclusions rest on administrative indicators, a municipal scale and an observational design, which together limit what can be inferred about causes.

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Conflicts of Interest: The author declares no financial conflict of interest and discloses the following non-financial relationships. The author is employed by the Diputación de Cáceres, the provincial council that promotes and manages the Geopark, in a post and department unrelated to cartography and to the Geopark, and collaborates with the Universidad de Murcia. In 2011, in an earlier post at the Diputación, he prepared cartography for the designation proposal on an occasional basis, and he co-authored the article that proposed the Geopark (Pulido Fernández et al., 2011). He has never held a position in the Geopark, been contracted by it or received remuneration from it. The Geopark management was consulted only to confirm the list of gateway municipalities (§1) and took no part in the design of the study, the analysis, the interpretation of the results or the decision to publish.

Data Availability Statement: The harmonised municipal indicators that support the findings of this study are provided in Tables S1–S8 of the Supplementary Material, and the processing scripts are available from the corresponding author on reasonable request. The IEEX Socioeconomic Atlas of Extremadura, the SEPE Provincial Labour Market Reports and the municipal registered unemployment data of the SEXPE Employment Observatory for December 2025 are openly accessible through their institutional portals. The comarcal labour-market aggregates for December 2011 and December 2025 come from the Observatory's reports for the Mancomunidad Integral Villuercas-Ibores-Jara, whose municipalities coincide with those of the Geopark. These reports were supplied by the SEXPE on request, and some of their series, such as those by NACE-2009 division, are not openly available. The SEXPE has authorised the publication of their data in aggregated form, and they are reported only at that comarcal scale (Tables S2–S4 and S8, and §4.2). The municipal figures in Tables S1 and S6 come from openly accessible sources.

Supplementary Material: Supplementary material is provided as a separate file and includes: Table S1 (eight key indicators for the 19 municipalities, 2011 and 2025, including the Industrial Index, reported for reference only); Table S2 (cumulative new contracts by NACE-2009 division); Table S3 (registered unemployment by age and sex); Table S4 (registered unemployment by educational level); Table S5 (sensitivity of the typology to alternative thresholds); Table S6 (social security affiliation in NACE 55+56 by municipality, December 2025); Table S7 (comarcal delimitations and values for La Siberia); Table S8 (registered unemployment and new contracts by sector, 2011 and 2025); Figure S1 (small multiples of six key indicators); and Figure S2 (dendrogram of the hierarchical-clustering robustness check). Supplementary materials for this article are available on the journal's website here.

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