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Beyond closure: Just transition, environmental values and vital expectations in post- coal Spain

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ABSTRACT

This article compares environmental sensitivity, life expectations, and perceptions of the Just Transition between Spanish municipalities affected and unaffected by decarbonization. In the context of coal mine and thermal power plant closures, it analyzes public attitudes through a nationally representative survey (n=1,800) that includes an oversampling of post-industrial territories. Based on three synthetic indicators, the results systematically compare affected and non-affected populations. The findings reveal a sociological paradox: despite displaying a more pessimistic view of the present and future, and expressing greater disagreement with the institutional mechanisms of the Just Transition, decarbonized municipalities maintain equal or even higher levels of environmental concern than the national average. This suggests that adherence to ecological values can coexist with criticism of the specific territorial implementation of climate policies. The study engages with debates on energy justice, the ecology of discontent, and post-extractive adaptive capacity. It offers empirical evidence to rethink the legitimacy frameworks of green transitions and challenges the assumption that structural decline necessarily leads to ecological disengagement, contributing to a more nuanced understanding of post-industrial subjectivities within the framework of climate justice.

1. Introduction

Localities whose economy was sustained for decades around coal have been deeply impacted by Just Transition (JT) processes, especially in Spain, where the rapid dismantling of coal infrastructures has been one of the most accelerated in Europe. These areas have been forced to close mining-industrial infrastructures that constituted their main source of employment and collective identity. According to Royal Decree 1112/2007, some 140 municipalities in Spain were classified as directly affected by mining and another 83 as indirectly affected, encompassing major basins such as León, Teruel and Asturias. This adds up to more than 1.2 million people - around 2.5% of the Spanish population - living in territories subject to decarbonisation processes. The Spanish case stands out for its speed (most closures occurred between 2010 and 2021) and for its top-down planning structure, which has generated tensions regarding legitimacy, participation, and recognition.

The consequences have been remarkable: loss of employment, weakening of the economic and social fabric, accelerated depopulation and erosion of local identities. These effects refer to what Guattari (1996) defined as a simultaneous affectation of the three ecologies - material, social and mental - compromising both living conditions and the symbolic frameworks of belonging and future.

In this context, it is worth asking whether these territories develop attitudes of resistance, scepticism or disaffection towards environmental values. The literature has documented that ecological adherence is conditioned by variables such as educational level, ideology or type of habitat (Diekmann & Franzen, 2019; Vidal et al., 2021) although it has also pointed out the gap between environmentalist discourse and effective action, especially in rural or vulnerable environments (Dobson, 2007; Valencia et al., 2010).

From this perspective, it is debated whether those who assume the costs of the energy transition tend towards scepticism or whether, on the contrary, they develop counter-hegemonic forms of moral adherence to environmentalism (Bell et al., 2024; Muzzerall, 2024). In the Spanish

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case, the data are ambivalent: some studies reveal a strengthening of electoral support for the proponents of JT (Bolet et al., 2023), while others point to feelings of abandonment, eco-anxiety or environmental guilt (Heffron and McCauley, 2017).

This study seeks to address this debate by empirically comparing the attitudes of affected and unaffected territories in three key dimensions: environmental sensitivity, perception of the Just Transition, and life expectations. The aim is to establish whether affected municipalities (hereafter SA) show lower ecological adherence, greater distrust towards the transition, or a more pessimistic view of the future, and to what extent these differences are explained by structural or symbolic factors.

For this purpose, a national survey was conducted with an overrepresentation of areas affected by mine closures or thermal power plants. In total, 1,807 questionnaires were applied (807 in SA municipalities). After weighting, the effective sample size was adjusted to 1,000 representative cases.

The research is guided by the following questions:

1. To what extent do perceptions about the closure of coal infrastructures differ between affected and unaffected territories?
2. Are there significant territorial differences in environmental sensitivity?
3. What is the role of sociodemographic and structural variables in explaining these differences?
4. Is there a greater sense of life pessimism in municipalities undergoing decarbonisation processes?

These questions are structured around three indicators:

1. Opinion on JT
2. Environmental sensitivity
3. Life expectations (assessment of the past, present and future)

The theoretical starting model (Fig. 1) assumes that there is a bidirectional relationship between ecological sensitivity and life expectations, mediated by the structural conditions of the territory. This relationship is neither linear nor univocal: environmental values can influence the way in which the future is projected, while historical experiences of loss can reconfigure - or erode - adherence to environmentalist discourses. It is thus a field where the ecological, the social and the symbolic are intertwined.

2. Theroretical background

2.1. Just Transition and its territorial impacts

Just Transition (JT) emerged in the 1980s as a trade union proposal aimed at reconciling the closure of polluting industries with the protection of workers and dependent communities (Oei et al., 2020). Since then, it has evolved to become consolidated as a public policy framework with international legitimacy incorporated into state regulations and multilateral agreements (Just Transition Research Collaborative, 2018; Morena et al., 2020;International Labour Organization, 2015).

In 2015, the International Labour Organisation (ILO) formulated guidelines to guide decarbonisation processes with social equity criteria, endorsed by the Government of Spain in 2018 (International Labour Organization (ILO), & Fundación CONAMA 2018), with the aim of mitigating the impacts derived from the closure of mines and thermal power plants. However, their implementation has generated ambivalent responses. While some territories identify opportunities in green reconversion, others experience socio-economic deterioration, depopulation and institutional disarticulation. Sociology has analysed these processes from structural perspectives - linked to employment, policies or infrastructures - and also from interpretative approaches focusing on affective ties, collective imaginaries and territorial narratives (Sovacool et al., 2023; Beckfield et al., 2023).

Recent studies underline that decarbonisation alters not only infrastructures but also senses of place and social bonds (Mayer, 2019). JT should therefore be understood as a comprehensive transformation that redefines local identities and collective capacities, connecting with the adaptive capacity approach, which focuses on how communities reorganise under structural shocks through agency, flexibility and social cohesion (Sutrisno et al., 2024).

From the energy justice paradigm (Heffron and McCauley, 2017), JT implies not only equity in the distribution of costs and benefits, but also procedural legitimacy and symbolic recognition. This is demonstrated by studies on the closure of extractive industries, which highlight their not only economic but also socio-cultural character, transforming livelihoods, governance and local identities (Bainton and Holcombe, 2018).

The Just Transition literature emphasizes the need to combine environmental justice with labor justice, ensuring that affected communities are not abandoned in the decarbonization process (Eisenberg, 2019; Jordan, 2024). Similarly, Mark et al, (2024) emphasize that the transition to low-carbon economies will only be legitimate if it ensures decent employment and encourages community participation in planning alternatives.

Although their ecological benefits—such as improved air quality or reduced emissions—are widely recognised at the global level, decarbonisation policies are often perceived locally through the prism of loss, especially in communities historically dependent on extractive industries. This dissonance generates ambivalent perceptions, where climate awareness coexists with scepticism towards a transition that is seen as distant, imposed, or territorially unfair. Recent studies have highlighted the emotional geographies and affective dimensions of these transitions (Mayer, 2019), emphasising how decarbonisation can disrupt senses of place and community attachment. Furthermore, the legitimacy of green policies often depends on their spatial justice and symbolic recognition (Sovacool et al., 2023), as well as the ability of local actors to participate meaningfully in shaping transition trajectories (González-Hidalgo and Zografos, 2021).

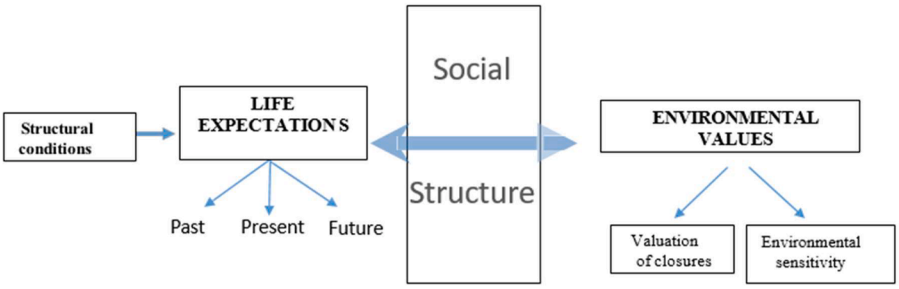

Fig. 1. Logic of the hypotheses guiding the research.
Source: Own elaboration

3. Ecological citizenship, environmental values and social structure

The increasing centrality of environmental issues in public agendas has been accompanied by a sustained expansion of pro-environmental values, partly associated with post-materialist cultural shifts (Inglehart, 2015; Baiardi & Morana, 2021), driven by institutional policies and cultural transformations (Milfont & Schultz, 2016; Baigorri & Caballero, 2018). In Spain, recent studies confirm a high level of citizen concern for the environment (IDEARA, 2021), although not always translated into sustainable practices.

Sociology has identified four major structural dimensions that explain the complexity of the phenomenon:

1. Expansion of environmentalism. Ecological values have spread into rural areas, interpreted through constructionist (elite-led cultural diffusion) and materialist (post-material needs) frameworks (Knickel et al., 2000; Vanhulst, 2012; Diekmann & Franzen, 2019).
2. Attitudinal heterogeneity. While environmentalist discourse predominates, there is a gap between declared values and actual behaviour, with low levels of action and political engagement (Kollmuss and Agyeman, 2002:Valencia et al., 2010), a dissonance conceptualised as "adherence without action" (Muzzerall, 2024).
3. Environmentalism as symbolic capital. Advocacy may serve as moral distinction or social prestige rather than conviction, explaining symbolic engagement without behavioural translation (Stoutenborough, 2020; Gómez-Román et al., 2021).
4. Structural determinants. Age, ideology, education and class shape ecological attitudes (Liere & Dunlap, 1980; Vidal et al., 2021), while gender and habitat show less consistent patterns (Casaló et al., 2019; Kenny, 2021).

In SA municipalities, these structural and symbolic factors intersect with industrial decline. Memories of work and community redefinition interact with ecological discourse, producing ambivalent responses—ranging from resistance (MacNeil & Beauman, 2022) to symbolic commitment via eco-guilt (Heffron and McCauley, 2017; Bell et al., 2024).

Recent literature highlights that the post-coal transition is only viable if the social values that mediate the acceptance of climate policies and mine closures are understood (Finucane, 2024). Riggs (2025) underscores the need for inclusive values-based approaches that recognize the diversity of environmental sensitivities within communities. The inclusion of items on personal and work-related sacrifices addresses this fundamental tension: the dilemma between protecting the environment and sustaining the local economy (Measham, 2024).

4. Life expectations, subjectivity and the ecology of malaise

Beyond material conditions, life expectations play a central role in shaping attitudes towards sustainability. As Guattari (1996) argues, human experience is articulated in three interrelated ecologies - material, social and mental - whose disruption, as occurs after the closure of strategic industries, can generate collective perceptions of loss, uprooting or injustice.

This framework has been operationalised by studies linking subjective well-being with job stability, community capital and life horizon (Sirgy, 2001; Vallejo-Martín & Moreno, 2016). In territories affected by Just Transition (JT), these elements tend to deteriorate simultaneously, weakening the willingness to accept ecological policies that are perceived more as threats than solutions. However, this malaise does not necessarily lead to apathy or denialism. Often, ambivalent responses emerge: rejection when the transition is experienced as imposed or disconnected from the territory, and symbolic adherence to ecological values expressed as environmental guilt, even in the absence of conditions that allow its practice (Heffron and McCauley, 2017).

Muzzerall's (2024) study of Canada illustrates this: fossil sector workers distrust JT and hold optimistic expectations about traditional fuels, more out of fear and dispossession than a rejection of environmentalism. In these cases, resistance is aimed at distributional means and effects, not environmental ends. In Spain, Bolet et al. (2023) find a partly different pattern: in many decarbonised municipalities, support for the government that promoted JT (PSOE) was reinforced, suggesting that institutional recognition and symbolic redress can generate legitimacy even in adverse contexts. Also Dickson and Hobolt (2025) and Kleer et al. (2024) confirm that sustainability remains a dominant normative value in Europe, even in the face of the rise of negationist discourses.

An example of these tensions is the NIMBY (Not In My Back Yard) phenomenon (Gibson, 2005): abstract support for renewables that coexists with concrete opposition when their implementation affects the immediate environment. This attitude does not imply denialism, but rather legitimate defences of the territory in the face of sacrifices perceived as inequitable. Attitudes towards JT should be read from a perspective that articulates material structures, life trajectories and symbolic frameworks. As De Juan et al. (2014) and Bazzani (2023) point out, expectations function as emotional filters - pride, nostalgia or disappointment - through which public policies are interpreted in post-industrial contexts.

The closure of a mine or power plant is not only an economic change: it is a symbolic event that reconfigures identities, social ties and senses of place (Komu, 2019). In this framework, ecological adherence can take on new meanings: an expression of resilience, a form of symbolic reparation or an attempt at reconciliation with an extractive past that is also associated with well-being.

From this perspective, the "ecology of malaise" does not deny environmentalism but redefines its conditions of legitimacy. As Sutrisno et al. (2024) argue, post-industrial adaptive capacity depends not only on material resources but also on relational capital, collective agency, social learning and institutional flexibility.

The variables that assess whether communities perceive themselves as better or worse off than in the past, how they describe the present situation, and how they project the future for subsequent generations are directly related to the social and psychological impact of energy transition processes. These measures reflect both nostalgia for a past of greater employment and uncertainties about the future, factors that influence the acceptance or rejection of closures (Mark et al., 2024). Gagen (2024) argues that planned mine closure represents both a threat and an opportunity: a threat because it generates unemployment and social dislocation, and an opportunity because it can boost economic and social resilience if appropriate policies are implemented. Expectations about the past, present, and future therefore act as key indicators of communities' adaptive capacity.

In summary, energy transitions do not only entail material transformations but also symbolic shifts that affect the ecologies of recognition (Fraser, 2013), narrative legitimacy (Sovacool et al., 2023), and the territorial agency of communities (González-Hidalgo and Zografos, 2021). This paper builds on these contributions to explore how vital distress, skepticism toward the Just Transition, and environmental sensitivity are configured in tension between structural conditions and value repertoires. From this perspective, we approach the concept of the ecology of discontent (Gallagher et al., 2017) not merely as a symptom of loss, but as an analytical category that helps to understand the dissonance between collective goals (such as decarbonization) and local experiences of weakening and dispossession.

5. Methodology

The methodological strategy aims to assess whether environmental attitudes and opinions in municipalities affected by decarbonisation (SA) differ significantly from those observed in Spanish society as a whole.

The empirical information comes from a survey in two complementary phases. On the one hand, in August 2023, 807 face-to-face surveys were conducted in nine municipalities previously identified as affected by the closure of coal-based operations (mines and thermal power plants). The sample design applied quotas by sex and age.

For identification of affected municipalities, we relied on the most comprehensive classification of coal-mining areas established by the Spanish Ministry of Industry (Spanish Government 2007[1]), which was also used to define eligibility for national revitalization programs. A municipality qualified as "affected" if it had reported at least 1,000 coal-related jobs in 1984—a threshold set to capture substantial dependence on the sector. In addition, inclusion required exposure to significant employment risks linked to mine closures planned during the 1990s. This definition integrates both direct employment in coal-related activities and the broader socioeconomic exposure of municipalities, thereby encompassing indirect local employment and lasting developmental legacies. Using this classification, we identified 126 affected mining municipalities. From these, we selected 9 municipalities: As Pontes (Galicia), La Robla, Villablino, Guardo (Castilla-León), Langreo, Mieres, Tineo (Asturias), Andorra and Ariño (Aragón).

On the other hand, in May 2024, a telephone survey was carried out to 1,000 people representative of the Spanish population. The sampling quotas included sex, age, size of municipality and geographical area. Both phases used a common questionnaire except for slight variations, which allowed the construction of an integrated database for comparative analyses. In the conservative scenario (p=q, with a confidence level of 95%), the total error is a maximum of ±4,76%.

Due to infrastructural limitations in the selected coal-dependent municipalities—most of them small rural towns with limited telephone access—telephone interviews were not a viable method. Instead, we conducted face-to-face surveys applying sex and age quotas according to official census data for each town. In contrast, the national sample was collected via CATI (computer-assisted telephone interviews) using stratified quotas by sex, age, and region.

To ensure comparability between both samples, we conducted a post-hoc validation by comparing the economic activity status of respondents with data from the Spanish Labour Force Survey (INE, Q2 2023). For instance, the discrepancy between employed respondents in the local sample and the national figure was 4.45%. We include this in our estimate of non-sampling error. Similar cross-checks were conducted for education and political positioning. These measures helped ensure internal coherence and analytical robustness across the two groups, despite the difference in data collection modes.

The design of the survey variables was informed by key theoretical and empirical literature on environmental attitudes and just transition. Items related to perceptions of coal phase-out, quality of green employment, and participatory governance were developed drawing from Eisenberg (2019), Jordan (2024), and Mark et al. (2024). Constructs associated with environmental concern, willingness to make personal sacrifices, and attitudes toward different energy sources were based on the environmental values framework (Finucane, 2024; Riggs, 2025; Measham, 2024). Finally, variables concerning life prospects and expectations of wellbeing were inspired by Mark et al. (2024) and Gaggen (2024).

All variables were operationalised into closed-ended items and subjected to a pre-testing phase in two pilot municipalities, allowing the research team to refine question wording, remove ambiguities, and reduce potential bias in the phrasing of value-laden or politically sensitive topics.

The identification of "affected municipalities" follows the classification established by the Spanish Ministry of Industry to define eligibility for coal phase-out revitalization programs. A municipality qualified as "affected" if it had at least 1,000 coal-related jobs in 1984 and was significantly exposed to employment risk due to mine closures initiated in the 1990s. This approach integrates both direct and indirect employment impact, as well as broader socioeconomic dependencies. Based on this criterion, we selected five representative municipalities across four provinces (A Coruña, Asturias, León, Aragón, and Teruel), all with a historical concentration of coal-mining activity.

Table 1 details the questions for each indicator on a Cantril scale from 0 to 10 that improves sensitivity to slight variations, facilitates intuitive interpretation and is suitable for multivariate models (Bisquerra et al; 2015). All questionnaire items were measured using a Cantril-type scale from 0 to 10, where 0 indicates complete disagreement and 10 indicates complete agreement. This scale is widely understood in the Spanish context due to its similarity to academic grading standards and facilitates nuanced response patterns. It also improves analytical sensitivity for multivariate analyses such as linear regression and factor analysis. To increase the internal validity of attitudinal constructs, some items were reverse-worded, including the statement "climate change is exaggerated." This design choice improves scale robustness by detecting response consistency and reducing acquiescence bias. In our analysis, these items were standardized where necessary to maintain interpretative clarity across tables. A detailed explanation has been added to Table 7 to clarify scale direction and item meaning.

The theoretical model is structured around three dependent variables extracted through blocks of questions grouped in synthetic scales: 1) Opinion on Just Transition; 2) Environmental sensitivity and 3) Life expectations. Each block has been transformed into a single indicator with a scale from 0 to 100, allowing for direct comparison and multivariate analysis. Their construction formulas are detailed below:

- **Opinion on Just Transition**. It is compiled using the arithmetic mean of the standardised scores of its items, scaled from 0 to 100:

$$Opinion\ TJ = \frac{\sum x_i}{n} x100$$

Table 1
Dependent variables and components.

Group	Variable/question
Opinions on the TJ	Extent of agreement with the closure of coal-based operations (mines and thermal power plants).
	Policies to fight climate change will create more new jobs in compared to those that will be destroyed
	Policies to combat climate change will create good quality jobs (in terms of income, security and quality of work).
	People have been able to participate in the design of solutions and alternatives.
	Projects are being thought with and for the people.
	Impact of the closure on the municipality (county)
Environmental values	Degree of concern about climate change:
	Level of agreement that environmental problems are being exaggerated
	My personal level of involvement in environmental advocacy is low/high:
	How much I am willing to sacrifice in defence of the environment:
	The defence of the planet requires sacrifices that result in the loss of local jobs.
	Degree of agreement with the use of renewable energy sources
	Degree of agreement with the use of non-renewable energy sources
Life expectations	Are we better or worse off than when these thermal power plants were active?
	How would you describe the current situation of this town.
	Future generations will live worse, the same, or better.

[1] Spanish Government. Royal Decree 1112/2007, of August 24, establishing the aid regime for the development of infrastructure in the coal mining regions. Official Gazette of the Spanish Government (BOE), No. 207, August 30, 2007. Preprint at (2007).

- **Environmental sensitivity**. Inspired by and (Dietz et al., 2005), pro-environmental variables (V⁺) are summed and contravariables (V-) are subtracted and normalised on the scale [0, 100] with the following algorithm:

$$Sensitivity = \frac{\sum V^{+} - \sum V^{-} + V_{Min}}{V_{Max} - V_{Min}} \times 100$$

$$Vmin = 20 \; and \; Vmax = 50$$

- **Life expectations**. One of the main methodological contributions of this study is the construction of a synthetic and scaled indicator of life expectations that allows us to quantify the subjective horizon of the respondents on a scale of 0 to 100. This indicator - based on the standardised difference between perception of the past and expectation of the future - is replicable in other post-industrial contexts, and provides a useful tool for analysing the link between life trajectories, collective subjectivity, and ecological transition.

$$EV = \frac{(Futur - (10 - Past))}{Range_{Max}} x100$$

Since the range can go from -100 to 100, it is transformed to the interval [0, 100] for ease of comparison using the scaling formula where: [a, b] = [-100, 100] and [c, d] = [0, 100].

$$Life\ Expentance = c + \frac{(EV - a)(d - c)}{(b - a)}$$

Likewise, as independent variables, socio-demographic variables are included, the operationalisation of which is summarised in Table 2. The categories and subdivisions presented in Table 2, including age groups, education levels, and social class classifications, follow the conventions established in the literature on social stratification and survey design (Boudon & Bourricaud, 1982; Babbie, 1975; De Vaus, 1982). The age groupings (18–34, 35–54, 55+) reflect commonly used divisions in demographic research that correspond to key phases of adulthood and labour market involvement.

Table 2
Socio-demographic variables.

Gender (2 categories):	Male, Female
Age (three categories):	18 to 39, 40 to 64 and 65 and over.
Level of Instruction:	No studies, Compulsory, Post-compulsory non-university, university,
Social class (Goldthorpe, 1987)	Senior professionals, Self-employed, Administrative, commercial and manual tasks
Ideological positioning:	Self-location: Far Left (value 0-1), left (2-4), centre (5), right (6-8), extreme right (9-10),
Economic-labour link with the coal industry	Worked at the coal industry; did not work, but a member of the household did; did not work, but her employment depended on her; No employment relationship
Territorial scope:	Municipalities affected, Municipalities not affected
Attachment to the municipality	Scale 0 10
Size of the municipality of residence.	2,000 inhab. or less; 2001 to 10,000 inhab.; 10,001 to 50,000 inhab. 50.0001 to 400.000 inhab.; More than 400.000 inhab.
Urban area membership (INE classification)	Urban, Rural

The analysis is based on four methodological levels: 1) Descriptive statistics for each dependent and independent variable; 2) Distribution of frequencies and contextualised interpretation of the composite indicators; 3) Segmentation analysis, by means of comparison of means and tests of significance AND 4) Multiple linear regression models, to explain the variances of each dependent indicator.

The categorization of municipalities into urban and rural areas follows the Functional Urban Areas (FUAs) classification established by Spain's National Statistics Institute (INE), based on OECD and Eurostat guidelines. This framework includes urban cores and their commuting zones, effectively encompassing suburban contexts. (Pérez et al., 2020).

6. Results

6.1. The just transition under scrutiny: legitimacy, participation and territorial perceptions

The first axis of analysis examines citizens' opinions on Just Transition (JT), based on a battery of six items shown in Table 3. The comparison between affected and unaffected municipalities shows statistically significant differences in all variables, verified by the Mann-Whitney U test ($p < 0.05$ in all cases).

Non-affected municipalities express more agreement with the closure of thermal power plants and rate the job creation and the quality of the new jobs more positively with averages above the threshold of 5. In contrast, affected municipalities give lower scores, around 4.5-4.8.

The differences are accentuated in the items referring to participation and the community focus of the projects. The average score on whether the transition is being considered "with and for the people" is 3.59 in unaffected municipalities and only 2.50 in affected municipalities. Particularly critical is the assessment of the territorial impact of closures with an average of only 1.72 in the municipalities directly involved.

A synthetic indicator of opinion on the TJ (0-10 scale) was constructed from these items, with mean scores of 4.65 in unaffected municipalities and 3.45 in affected municipalities. Its distribution, although close to normality, does not pass the Kolmogorov-Smirnov test, so non-parametric tests were used. Fig. 2 shows this distribution.

To identify the factors associated with this assessment, a multiple linear regression model was applied (Table 4), which explains 8.4% of the variance. Significant predictors include: territorial affectation (belonging to an affected municipality is associated with a significantly more critical opinion); political ideology (left-wing respondents rate the implementation of the TJ worse); employment link with the plant (those who worked directly or indirectly in the closed industry show more rejection) and gender (women are slightly more critical). The other variables (age, social class, education, size of municipality, attachment or urban area) show no significant effects.

Overall, the perception of Just Transition is mediated by structural (territory, employment) and ideological factors. The low score should not be read as a rejection of the ecological objective, but as a criticism of the implementation procedures and the absence of territorial justice. The following section analyses whether this institutional disaffection

Table 3
Means of the Just Transition opinion indicator items: comparison between affected and unaffected Municipalities.

	Affects		
	No	Yes	Dif (sig.)
My level of agreement with closing fossil fuel based operations (mines/plants)	5,59	4,66	0,93 (<0,001)
Policies to combat climate change will create more new jobs compared to those that will be destroyed	5,32	4,72	0,60 (<0,001)
Policies to combat climate change will create good quality jobs (in terms of income, job security and quality of the working environment).	5,52	4,77	0,75 (<0,001)
People have been able to participate in the design of solutions and alternatives.	3,44	2,08	1,36 (<0,001)
Is the transition being thought through with and for the people?	3,59	2,50	1,09 (<0,001)
Impact of these closures on municipalities (comarcas)	4,16	1,72	2,44 (<0,001)

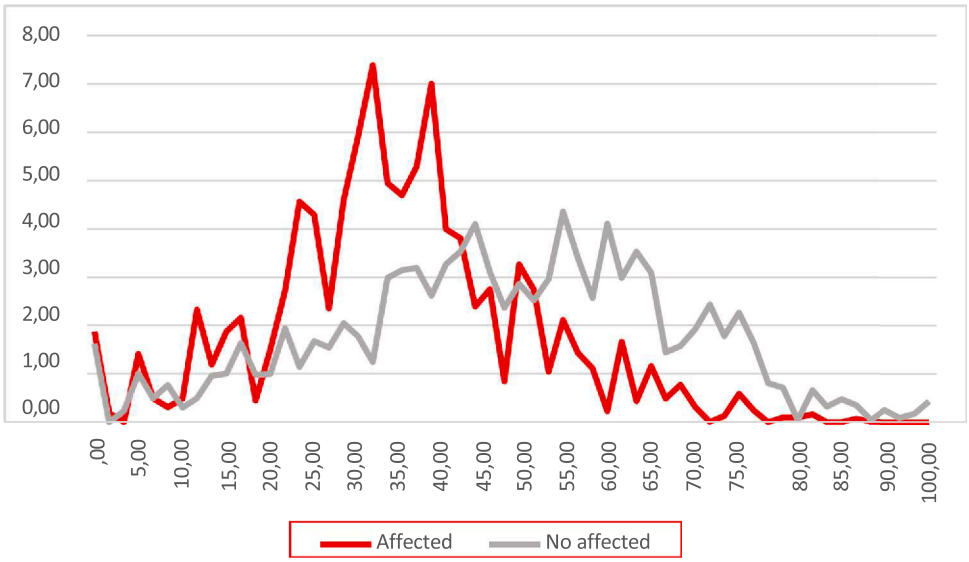

Fig. 2. Distribution of the synthetic indicator of opinion on Just Transition.

Table 4
Results of the multiple linear regression model on the Just Transition opinion indicator.

Unstandardised coefficients			Standardised coefficients Beta	t	Sig.
Model B		Error			
(Constant)	1,976	,667		2,961	,003
Gender:	,276	,137	,072	2,014	,044
Age range	-,030	,100	-,011	-,296	,767
Level of education	,076	,107	,029	,713	,476
Social class	,056	,095	,024	,583	,560
Ideological positioning	-,261	,058	-,158	-4,495	<,001
Worked Central	,255	,074	,143	3,428	<,001
Attachment recoded	,119	,080	,053	1,482	,139
Size of municipality	,004	,067	,002	,060	,952
Affected municipalities	,422	,133	,142	3,167	,002

a. Dependent variable: Opinion on the TJ

also extends to environmental sensitivity.

6.2. Environmental sensitivity after closure

A key question in post-coal territories is whether structural decline and institutional distrust are accompanied by lower levels of environmental concern. To explore this, we analysed seven items related to climate change attitudes (Table 5), comparing municipalities affected and unaffected by decarbonisation. This allows us to assess whether discontent with the Just Transition is linked to weaker ecological sensitivity, or whether pro-environmental values persist even in contexts marked by loss and scepticism.

Table 5
Means of the items of the indicator of opinion on environmental sensitivity: comparison between affected and non-affected municipalities.

	Municipalities affected	Not affected	Significance Man-Whitney U
Concerns	7,99	7,53	0,032
Exaggerate	2,59	4,03	<0,001
Implies	6,90	6,80	0,063
Sacrifice	7,27	6,94	<0,001
Planet	5,49	4,93	<0,001
Renewables	8,49	8,35	0,078
Non-renewable	4,35	4,40	0,009

Source: Elaborated with INNOREJUST Survey data.

Contrary to the initial hypothesis, the affected municipalities not only do not show less environmental sensitivity, but in several items their scores are significantly greener. Particularly noteworthy is the lower acceptance of the idea that environmental problems are exaggerated (mean 2.59 vs. 4.03), suggesting greater climate awareness.

The synthetic indicator of environmental sensitivity, scaled from 0 to 100, confirms this trend: mean of 6.8 (SD= 1.4) in affected municipalities compared to 6.3 (SD= 1.5) in unaffected ones. Both groups show a slightly asymmetrical distribution to the right, with a slightly greater skew among those affected (Fig. 3).

To explore the factors associated with this sensitivity, a multiple linear regression model was applied (Table 6), which explains 14% of the total variance. Political ideology is the main predictor: the further to the right a person is, the lower their ecological sensitivity. Gender (higher sensitivity among women), age (higher among those over 40) and social class (higher among the middle and upper classes) also have positive effects. On the other hand, territorial effect, educational level, employment link to industry and size of municipality are not significant.

6.3. Vital expectations in municipalities affected by decarbonisation: a lost past, a fragile present and an uncertain future

Life expectations are measured through three indicators: retrospective assessment of the past, perception of the present and expectations about the future. As Table 7 shows, the affected municipalities have significantly lower scores on all items: idealisation of the past (1.55 compared to 5.06), assessment of the present (3.82 compared to 6.70) and future expectations (2.83 compared to 4.81). This threefold difference reveals a collective experience of structural decline.

From these items, a synthetic indicator of life expectations was constructed, standardised from 0 (pessimism) to 100 (optimism). The average in affected municipalities is 22.4, compared to 49.1 in unaffected municipalities, a gap of 27 points that indicates a marked difference in the perception of well-being and projection of the future (Fig. 4).

The regression analysis (Table 8) reveals that the variable with the greatest explanatory weight is the territorial effect: unaffected municipalities systematically present more optimistic expectations, with a

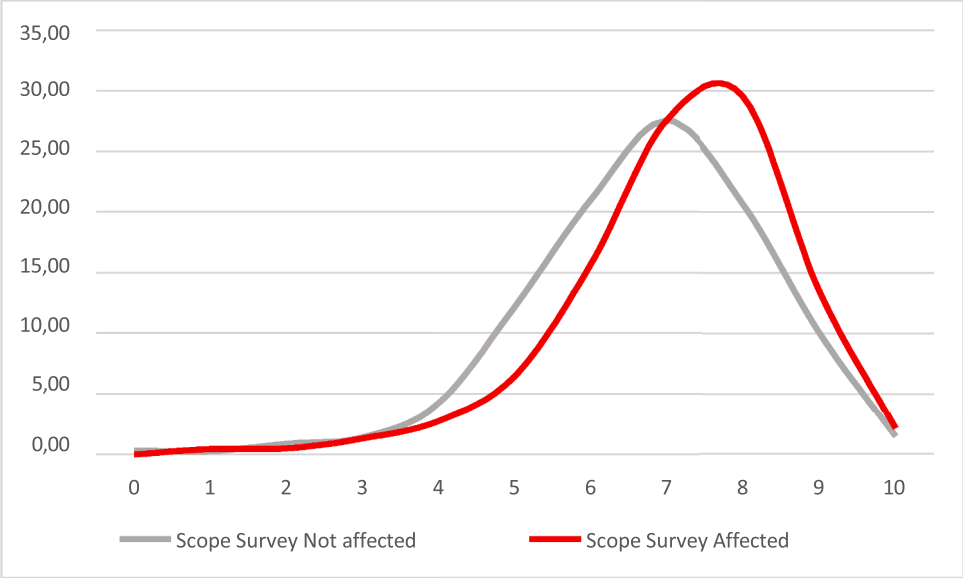

Fig. 3. Distribution of the environmental sensitivity indicator.

Table 6
Results of the multiple linear regression model on the indicator of environmental sensitivity.Coefficients[a].

Unstandardized Coefficients				Standardized Coefficients	t	Sig.
Model B			Std. Error	Beta		
1	(Constant)	49,494	1153,264		,043	,966
	Gender:	3,470	1,076	,111	3,226	,001
	Age range	1,895	,763	,086	2,483	,013
	Level of education	-,688	,836	-,033	-,823	,411
	Social class	1,837	,747	,095	2,461	,014
	Ideological scale	-2,331	,235	-,341	-9,920	<,001
	Worked Central	,679	,696	,034	,975	,330
	Size of municipality	-,619	,490	-,043	-1,265	,206
	Attachment	,409	,270	,053	1,518	,129
	Affected municipalities	3,594	384,419	,000	,009	,993

[a] Dependent Variable: Sensitivity

In short, environmental sensitivity is not eroded in decarbonised municipalities. On the contrary, some indicators show an equal or greater internalisation of ecological values. This reinforces the idea that criticism of the Just Transition does not imply environmental denialism, but rather disagreement with the procedures or with the territorial distribution of its effects.

Table 7
Means of the life expectancy indicator items: comparison between affected and non-affected municipalities Affected.

No		Yes	Diff (sig.)
Are we better or worse off than when these thermal power plants were active?	5,06	1, 55	3,51 (<0,001)
How would you describe the current situation of this town.	6,70	3,82	2,88 (<0,001)
Future generations will live worse, the same, or better.	4,81	2,83	1,98 (<0,001)

contribution of 16.6% of the variance explained. This is followed by ideological positioning, which adds 2.4% of the variance explained.

Left-wing voters tend to be more pessimistic than right-wing voters on this specific indicator; attachment to the municipality, whose greater intensity correlates with better expectations, contributing 1.1%; and disengagement from the closed industry, which contributes an additional 0.4%, indicating that those who had some direct or indirect relationship with the central government tend to show higher levels of pessimism. Overall, the model explains 20.7% of the variance of the indicator. This evidence reinforces the idea that the structural conditions of the territory have a decisive influence on the way in which people interpret their past, value their present and project their future.

6.4. Interrelations between structural conditions, life expectations and environmental attitudes

To conclude the empirical analysis, the relationship between the three key dimensions of the study - environmental sensitivity, perception of Just Transition (JT) and life expectations - is explored in dialogue with the structural condition of belonging to an affected municipality. This section allows us to assess whether these variables respond to a common framework of meaning or whether they act relatively autonomously (Table 9).

The strongest link is between life expectations and opinion on Just Transition (r= 0.617), suggesting that greater hope for the future is associated with a more favourable assessment of the transition process. In a complementary way, territorial affectation shows a strong correlation with life expectations (r = 0.541), which reinforces the structural impact of closures on the subjective horizon. In contrast, environmental sensitivity maintains low correlations with the other dimensions: it is positive but moderate with regard to the opinion on TJ (r = 0.313), very weak with expectations (r = 0.096), and even slightly negative with territorial involvement (r = -0.115). These data indicate that ecological values are relatively decoupled from structural conditions or life distress and can be maintained even in adverse scenarios.

Overall, the results partially confirm the proposed model: while life expectations and opinion on JT respond to a shared structural logic, environmental sensitivity operates with greater autonomy. This supports the hypothesis of an ambivalent environmental sensitivity, capable of sustaining ecological values even when there is scepticism towards the institutional policies that represent them.

Fig. 5 summarises the empirical correlations between the three dimensions analysed, allowing us to clearly observe how Structural Condition has a particular impact on Life Expectations, while Environmental Sensitivity remains relatively autonomous with respect to these determinants. A clear correlation can be observed between Structural

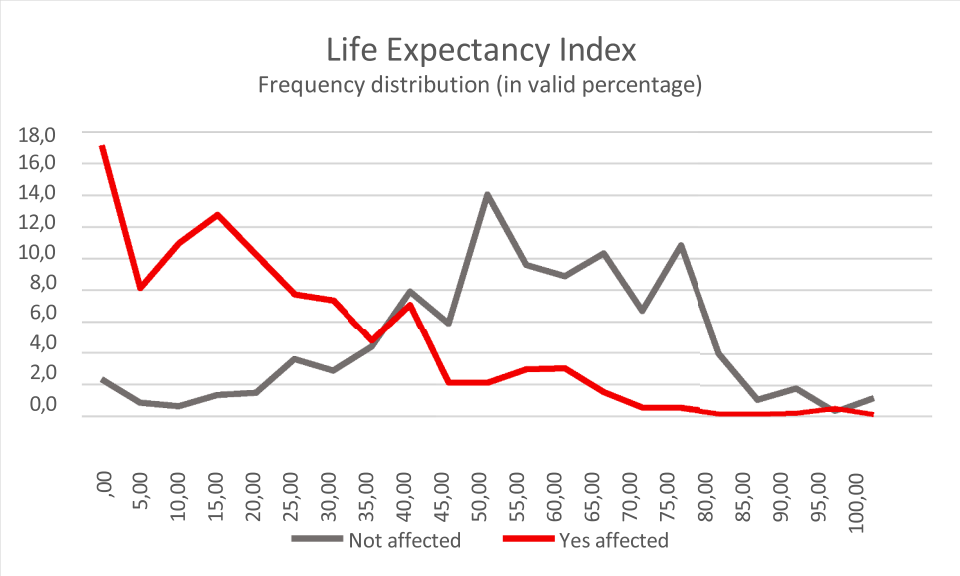

Fig. 4. Distribution of the synthetic indicator of life expectations.

Table 8
Results of the multiple linear regression model on the life expectancy indicator Coefficients[a].

Unstandardized Coefficients				Standardized Coefficients Beta	t	Sig.
ModelB			Std. Error			
1	(Constant)	-114,848	13,677		-8,397	<,001
	Gender:	-,228	3,049	-,002	-,075	,940
	Age range	3,248	2,154	,049	1,508	,132
	Level of education	4,545	2,389	,072	1,903	,057
	Social class	,207	2,146	,004	,096	,923
	Ideological scale	-3,364	,658	-,163	-5,112	<,001
	Worked Central	3,881	1,619	,089	2,398	,017
	Size of municipality	-2,036	1,735	-,048	-1,174	,241
	Attachment	2,490	,755	,108	3,300	,001
	Urban Area	,118	4,126	,001	,029	,977
	Affected municipalities	27,518	2,837	,412	9,701	<,001

[a] Dependent Variable: EV

Conditions and Life Expectations (0.54) as well as between the latter and Opinion on TJ (0.62) but not with Environmental Sensitivity (0.10, which registers a low correlation. This reinforces the idea of a dissociation between evaluative environmentalism and political perception of transitions.

7. Discussion

The relationship between life expectations and environmental sensitivity -the central theoretical node of this paper- has been outlined in previous contributions (Guattari, 1996; Sirgy, 2001; Sanz, 2013; Pijpers, 2018; Komu, 2019; Cicuéndez-Santamaría, 2024), although it has rarely been quantified. This study makes progress in this direction by showing that in municipalities affected by decarbonisation, expectations for the future are significantly more pessimistic, without this leading to less environmental concern. On the contrary: ecological sensitivity is maintained or even exceeds the national average.

The three dimensions analysed - life expectations, perception of the Just Transition (JT) and environmental sensitivity - respond to a common structural experience. The closure of coal mines meant the loss of an economic and identity support. As a result, the past is redefined as a stable time, while the present and the future are tinged with uncertainty. This reading contrasts with that offered by the unaffected municipalities, both in statistical and symbolic terms. The data also reveal a particularly critical view of the JT among the affected municipalities, centred on three aspects: a lack of participation, poor procedural justice and the perception of poorly managed negative impacts. These criticisms do not so much question the ecological aims as the means employed and the lack of territorial recognition.

Table 9
Matrix of correlations between environmental sensitivity, life expectations, opinion on Just Transition, and territorial impact Correlations.

Sensitivity			TJ_100	Life expetance	Affected municipalities
Sensitivity	Pearson Correlation	1	,313**	,096**	-,115**
	Sig. (2-tailed)		<,001	<,001	<,001
	N	1804	1420	1627	1804
TJ_100	Pearson Correlation	,313**	1	,617**	,334**
	Sig. (2-tailed)	<,001		<,001	<,001
	N	1420	1473	1397	1473
LE	Pearson Correlation	,096**	,617**	1	,541**
	Sig. (2-tailed)	<,001	<,001		<,001
	N	1627	1397	1732	1732
Affected municipalities (Structural conditions)	Pearson Correlation	-,115**	,334**	,541**	1
	Sig. (2-tailed)	<,001	<,001	<,001	
	N	1804	1473	1732	1969

** . Correlation is significant at the 0.01 level (2-tailed).

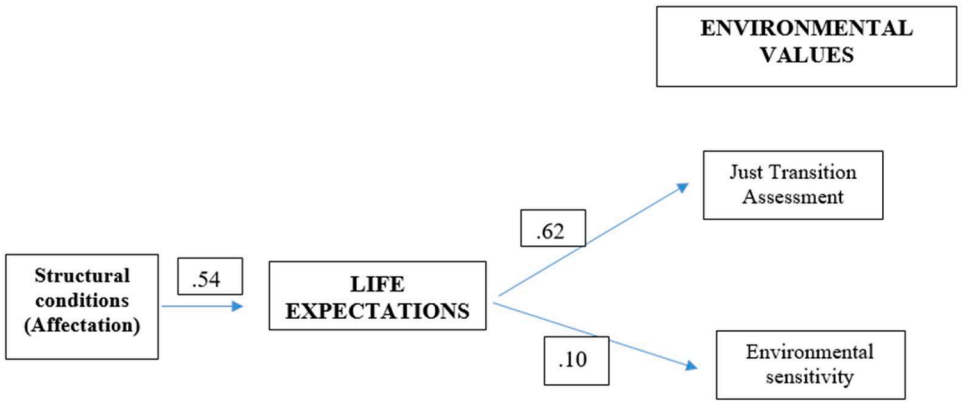

Fig. 5. Synthetic scheme of empirical correlations between the key variables of the analytical model.
Source: Own elaboration

The most relevant finding is the persistence of high environmental sensitivity even in contexts of discontent. This dissociation between ecological adherence and acceptance of JT points to an ambivalent environmental citizenship (Muzzerall, 2024), critical of procedures but not of principles. This is not denialism, but an opposition that emerges from the experience of loss and a transition perceived as imposed. At the individual level, structural malaise does not translate into emotional decline. Variables such as life satisfaction, attachment to territory or level of happiness do not show significant differences between groups, which allows us to relativise the idea of an emotionally devastated community. Criticism of the transition appears rather as a political response to symbolic and distributive exclusion.

This decoupling may be due to relative economic resilience or, as Cicuéndez-Santamaría (2024) points out, to the partial autonomy of ecological values from social structures. Attachment to the previous way of life coexists with abstract acceptance of environmentalism, giving rise to a hybrid form of environmental citizenship (Bhardwaj, 2023). Community agency becomes key. Adaptive capacity, understood as the ability to reorganise life paths and collective decisions, depends on asset mobilisation, social learning and institutional flexibility (Sutrisno et al., 2024). In the absence of these conditions, the process may be perceived as technocratic and exclusionary.

The Spanish case is paradigmatic. The accelerated closure of power plants has generated a citizenry that supports climate goals but distrusts the procedures. This paradox coincides with what Paterson (2016) calls intergenerational normative recomposition, and with the notion of "weak adherence" (Valencia et al., 2010), in which post-materialist values coexist with persistent material priorities (Inglehart, 2015; Neumayer, 2009). What is at issue, therefore, is not the need to act in the face of climate change, but how this transition is managed and what role is given to those who lose most in the process. JT will only be such if it redistributes not only benefits, but also voice and recognition.

Although focused on Spain, this pattern can be observed in other post-industrial contexts subject to accelerated energy transitions. The paradox identified - ecological attachment combined with institutional distrust - invites us to rethink climate governance from a situated, relational and territorial perspective.

These findings suggest that discontent in post-coal municipalities is not rooted in a rejection of environmental goals per se, but in the perceived asymmetry of effort and reward. Many respondents accept the ecological objectives of the transition in principle, yet perceive its implementation as technocratic, distant, or territorially unjust. This ambivalence reflects a key distinction: adherence to sustainability as a normative value can coexist with distrust in the distributive and procedural mechanisms through which it is applied (Sovacool et al., 2023).

In the Spanish case, this is particularly evident. The rapid closure of power plants and mines has triggered a mismatch between institutional ambitions and local experiences of dispossession. This reinforces the importance of procedural legitimacy, symbolic recognition, and participatory governance, especially in territories where employment, identity, and extractive infrastructures were historically intertwined.

Policy implications emerge from this analysis: (1) the need for stronger participatory mechanisms to align transition measures with local expectations, (2) the importance of combining material compensation with symbolic recognition, and (3) the risk of conflating ecological agreement with political support for current Just Transition designs.

Although the focus is on Spain, this paradox—ecological adherence combined with institutional distrust—may resonate in other post-industrial contexts undergoing accelerated energy transitions. It challenges policymakers to rethink green transitions not only as technical or economic shifts but as deeply social and symbolic processes.

8. Conclusions

This article has examined how environmental sensitivity, life expectations, and perceptions of the Just Transition vary between Spanish municipalities affected and unaffected by decarbonization. Contrary to common assumptions, the findings reveal that while post-coal territories express greater pessimism about their future and deeper discontent with institutional mechanisms, their environmental sensitivity remains equal to or even higher than the national average. This suggests that socio-territorial resentment does not necessarily erode ecological values.

More specifically, affected municipalities show sustained criticism of Just Transition (JT) mechanisms, focused on a lack of participation, insufficient compensation, and the technocratic character of its implementation (Sovacool et al., 2023; Beckfield & Evrard, 2023). They also express more pessimistic life expectations, where the past is re-evaluated as a time of stability and prosperity, and the future is marked by uncertainty and loss, reflecting what Guattari (1996), Sirgy (2001) and Sanz (2013) conceptualise as an “ecology of malaise.”

However, this structural pessimism does not translate into lower levels of subjective satisfaction or ecological disengagement. The most notable result is the persistence—or even reinforcement—of environmental concern. This suggests the existence of an ambivalent form of ecological citizenship (Muzzerall, 2024): critical of the means but not the ends. This challenges normative theories of ecological citizenship (Dobson, 2007) and nuances post-materialist assumptions (Inglehart, 2015; Neumayer, 2010) by demonstrating that environmental values can persist even in contexts of structural vulnerability and without necessarily supporting current climate policies (Bhardwaj, 2023; Dickson & Hobolt, 2025).

These findings suggest that discontent in post-coal municipalities is not rooted in a rejection of environmental goals per se, but in the perceived asymmetry of effort and reward. Many respondents accept the

ecological objectives of the transition in principle, yet perceive its implementation as technocratic, distant, or territorially unjust. This ambivalence reflects a key distinction: adherence to sustainability as a normative value can coexist with distrust in the distributive and procedural mechanisms through which it is applied (Sovacool et al., 2023).

In the Spanish case, this is particularly evident. The rapid closure of power plants and mines has triggered a mismatch between institutional ambitions and local experiences of dispossession. This reinforces the importance of procedural legitimacy, symbolic recognition, and participatory governance—especially in territories where employment, identity, and extractive infrastructures were historically intertwined. As Sutrisno et al. (2024) argue, adaptation in post-industrial settings requires more than economic compensation: it depends on community agency, social learning, and institutional flexibility.

Finally, these results allow for a reinterpretation of the "ecology of malaise" (Gallagher et al., 2017), not as an anti-environmental backlash, but as a complex tension between normative commitment to sustainability and lived experiences of exclusion. In terms of Fraser (2013), what we observe is a deficit of symbolic recognition in climate policy design, where procedural and distributive justice remain unbalanced. The coexistence of environmental concern with territorial disaffection reveals the need to strengthen the narrative legitimacy of green transitions (Sovacool et al., 2023), especially in territories disproportionately affected by structural change.

Future research could delve deeper into the mechanisms that allow environmental values to persist in adverse contexts. Longitudinal studies would be especially useful to observe how these attitudes evolve over time as JT policies unfold. Qualitative approaches could also help unpack the symbolic and affective dimensions of ecological adherence in communities experiencing structural loss.

Comparative studies across national contexts could clarify how historical, institutional and cultural variables shape responses to decarbonization. In addition, examining how generational, gendered or occupational identities intersect with environmental and territorial perceptions would provide a more nuanced understanding of post-industrial subjectivities under climate stress.

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Data availability statement

The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author(s).

CRediT authorship contribution statement

Alexia Sanz-Hernández: Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Manuel García Docampo:** Writing – original draft, Visualization, Formal analysis, Data curation. **Xaquín S. Pérez Sindín:** Resources. **María Andrade-Suárez:** Writing – review & editing, Supervision.

Conflicts of interest

The authors declare no conflicts of interest.

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