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Giorgia Scognamiglio, Jakob Nitschke and Giorgia Bressan



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Socio-Environmental Conflicts in the European Mountain Areas: Insights from the Global Atlas of Environmental Justice

Giorgia Scognamiglio, Jakob Nitschke and Giorgia Bressan

AUTHOR'S NOTE

GS served as the corresponding author and contributed to the Conceptualization, Literature review, Writing – Original Draft (Section 2, 5), and Writing – Review & Editing, Supervision. **JN** contributed to the Conceptualization, Data curation, Formal analysis, and Visualization, Writing – Original Draft (Sections 3-4), and Writing– Review & Editing. **GB** contributed to the Conceptualization, Formal analysis, Writing – Original Draft (Sections 1, 4, 5), Writing – Review & Editing, Supervision. All authors have read and approved the final manuscript.

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Introduction

- 1 Mountains, shaped by morphological, climatic and anthropological features, are not the privileged spaces where people live and make their living. However, they host key assets on which societies depend, making them deeply integrated into globalized markets (Perlik, 2019). European mountains, for instance, have long been a source of energy: once providing wood as fuel, they became major producers of hydroelectricity in the 20th century, playing an instrumental role in the transition to renewable energy

(Frolova *et al.*, 2015). The Vajont dam disaster in the Italian Alps, where a landslide during the initial filling caused catastrophic flooding (Casagrande, 2014), illustrates how mountain resources sustain distant lowland industries and populations while exposing upland territories to disproportionate risks. This interdependence underscores asymmetric relations: mountains supply energy, water, raw materials and leisure opportunities, while urban centres concentrate the benefits. At the same time, socio-economic transformations, with shifts from primary-sector livelihoods to services and tourism, has intensified competing claims on land and resources, creating tensions between old and new stakeholders (Smethurst, 2000). These dynamics often manifest as conflicts, where economic interests, ecological concerns, and community claims collide.

- 2 Although scholarly attention to mountain regions as sites of conflict is increasing, it remains fragmented and largely case-study-based. This paper aims to advance this field by systematically exploring socio-environmental conflicts in the European mountain regions—a term widely used in the literature to describe collective struggles over the use, control, and distribution of environmental resources and harms. More specifically, we adopt the concept of “ecological distribution conflicts” (Martinez-Alier, 2002; Temper *et al.*, 2018), which frames conflicts as collective responses to perceived injustices. The analysis draws on the Global Atlas of Environmental Justice (EJAtlas)¹, a collaborative inventory documenting such conflicts worldwide. Although widely used in environmental justice research (Temper *et al.*, 2018), we apply it here specifically and systematically to mountain territories. The main objective is to characterize the key types, drivers, and actors involved in socio-environmental conflicts across Europe’s mountain ranges. The analysis focuses on the specific dynamics of mountain regions themselves, approached as distinctive socio-ecological contexts. Mountain landscapes across Europe reflect centuries of human–environment interactions that have produced diverse territorial configurations (Gløersen *et al.*, 2004). We hypothesize that this heterogeneity—in elevation, climate, demographic patterns, and land uses—also shapes conflict characteristics. To test this hypothesis, we investigate their spatial distribution in relation to land use, urbanisation and protected areas. Beyond empirical insights, the study also reflects on the contribution of EJAtlas for studying conflicts in mountains, overcoming fragmented approaches based on case studies.
- 3 The paper is structured as follows: in Section 2, a literature review on the mountains as regions of conflicts is presented and discussed; section 3 describes the data and the analytical approach; section 4 presents the results, focusing on key conflict characteristics and spatial patterns across Europe’s mountain ranges; section 5 concludes with a discussion of opportunities and limitations.

Mountains as Regions of Conflicts

- 4 Mountain areas have long been conceptualized as marginal spaces—geographically remote, ecologically and economically fragile, politically peripheral, and culturally distinct (Chand and Leimgruber, 2021; Smethurst, 2000). Yet, their role as suppliers for water, energy production, extractive industries, tourism and recreation has increasingly placed them at the centre of global development agendas (Perlik, 2015; 2019). These agendas—driven by state agencies, corporations, and urban elites, and legitimized through discourses of climate action, “green” development, and public

interest—reshape mountain landscapes, economies, and social relations, reflecting power asymmetries over land control, resource access, and decision-making (Perlik, 2015; Gal, 2016; Ribot and Peluso, 2003). In these geographies of power, lowlands demand resources while highlands are expected to provide them, often subordinating local development to external needs (Perlik, 2019). Local assets, once sustaining livelihoods, are increasingly transformed into “global goods” (Zoomers and Otsuki, 2017) consumed elsewhere, turning mountains into “frontiers of extraction”². (Zoomers and Otsuki, 2025). This strategic role, combined with ecological fragility, isolation, and symbolic capital, makes them distinctive territories of conflict. Large-scale projects and infrastructures often trigger “conflictual territorialization” (Grimault, 2021) when external logics collide with local values. In this context, mobilizations can be interpreted in terms of “ecological distribution conflicts” (Martinez-Alier, 2002; Temper *et al.*, 2018)—collective actions responding to perceived environmental injustices related to the uneven distribution of environmental harms and benefits. From this perspective, mountain areas emerge not as passive backdrops, but as contested socio-ecological frontiers where competing interests, values, and territorial imaginaries collide (Chambru *et al.*, 2024): they are seen as energy landscapes for corporations, protected areas for conservation agencies, recreation spaces for tourists, and/or living landscapes for local communities. This evolving dynamic has contributed to growing recognition of environmental justice in mountain regions, calling for a fairer distribution of benefits and burdens and the meaningful inclusion of local voices in shaping territorial futures (Gal, 2016).

- 5 While mountain research has traditionally focused on physical and ecological processes, offering partial and often depoliticized accounts, a growing body of literature calls for greater attention to the political, economic, and cultural dimensions of mountain environments and inhabitants (Smethurst, 2000). Recent studies portray mountains as hotspots of diverse conflicts arising from competing land-use claims—including agriculture, conservation, tourism, and urban expansion—that intensify pressures on limited resources (Zou *et al.*, 2022). Terje Skjeggedal, Frode Flemsaeter and Vegard Gundersen (2021) identify three main dimensions: conflicts between local and national priorities; tensions between production and recreation (e.g., extractive industries versus tourism); and the rise of new user groups like urban-based recreationists, which reshapes access and power relations. Documented examples include hydropower plants (Romerio, 2008; Frolova *et al.*, 2015), wind farms (Agustni and Serena, 2011) and pipelines (Hunsberger and Larsen, 2021). Frequently framed within national decarbonization strategies, scholars show how they are often developed without adequate local consultation and are therefore perceived as environmentally and socially disruptive (Grimault, 2021). Tourism developments are also well documented as sources of conflict—particularly ski resorts (e.g., Sulpice, 2024; Bourdeau, 2021), recreational housing and other tourism-related activities (e.g., Perlik, 2011; Sacareau, 2009)—which contribute to environmental degradation and reinforce uneven planning regimes (Williams and Fennell, 2002). Other recurrent cases concern extractive industries (e.g., Szabo *et al.*, 2022; Morrone *et al.*, 2011), transport and logistics infrastructures (e.g., Sutton, 2013; Marincioni and Appiotti, 2009), and nature conservation policies—especially those involving protected areas (e.g., Overvåg *et al.*, 2016; Rechciński *et al.*, 2019). The latter, while intended to preserve biodiversity, can restrict land access, generating tensions with communities dependent on these territories for subsistence, livelihoods, or cultural practices. These conflicts are well

documented in the Global South—particularly in the Himalayas, Andes, and sub-Saharan mountain ranges—where indigenous populations, whose knowledge and practices are rarely included in official planning, disproportionately bear the impacts (Carranza *et al.*, 2020; Smethurst, 2020). Similar dynamics are increasingly visible in Europe, as shown by the resistance to the expansion of the Natura 2000 network, often perceived as externally imposed and economically detrimental (Grodzinska-Jurczak and Cent 2011; Strzelecka *et al.*, 2021). Moreover, the geographical representation of mountain ranges in the literature is uneven. In Europe, research has largely concentrated on the Alps, leaving other ranges such as the Carpathians, the Balkans, the Apennines, and the Pyrenees comparatively underexplored. Conversely, in non-European contexts, the Himalayas and the Andes have received far greater attention. This imbalance risks obscuring important regional variations in conflict drivers, actors, and outcomes.

- 6 Spatial factors—topography, remoteness, settlement patterns, and land uses—further shape where and how conflicts emerge and are contested (Zimmer and Basset, 2003). The siting of contested activities—whether in densely settled valleys, agricultural terraces, or high-altitude uninhabited areas—can influence environmental impacts and opposition forms. Zou *et al.* (2022) found that land-use conflicts are often concentrated around urban centres and areas of high agricultural or ecological value, where competing interests intersect. Similarly, Jiang *et al.* (2021) show that elevation and population density affect the intensity and spatial distribution of conflicts. Despite their importance, such spatial dynamics remain underexplored, especially in the European context.
- 7 Overall, despite the growing interest in socio-environmental conflicts in mountain areas, research remains fragmented and case study-based. Most studies focus on emblematic struggles or specific conflict types, with limited systematization or comparative approaches. The Global Atlas of Environmental Justice (EJAtlas) offers therefore a valuable tool to address these gaps. Developed through collaborations among scholars, activists, and civil society organizations, it documents environmental conflicts worldwide, providing data on type, intensity, actors, environmental and social impacts, and outcomes (Temper *et al.*, 2018). This enables comparative analysis, helping to identify patterns not visible in single-case studies, while also amplifying the voices of marginalized groups and grassroots movements often excluded from official development narratives. The EJAtlas has been primarily used to analyze national or regional trends, and sectoral conflicts (e.g., mining, waste, energy) (Temper *et al.*, 2018), but has also revealed links between environmental conflicts and global production networks through spatially explicit approaches (Gemmiti *et al.*, 2023; Certomà *et al.*, 2024). Yet, its potential to support large-scale, comparative research on geographically specific areas—such as mountain regions—remains largely untapped.

Data Sources and Analytical Approach

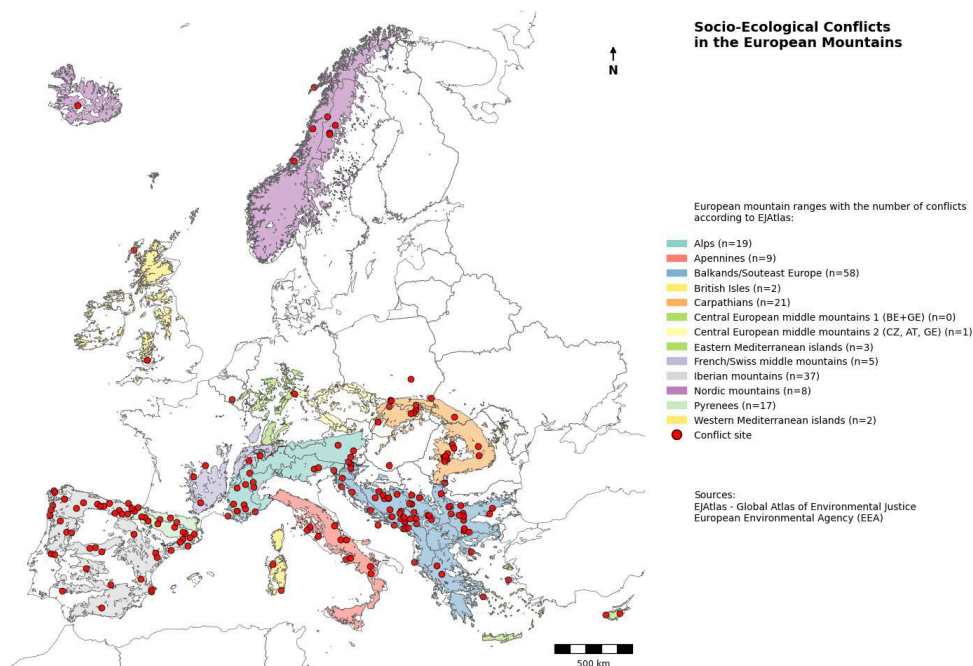
- 8 To examine socio-environmental conflicts in European mountain areas and address gaps in the literature, this study combines the Global Atlas of Environmental Justice (EJAtlas) (Temper *et al.*, 2018) with the European mountain delineation of the European Environment Agency (EEA), complemented by additional territorial variables.

- 9 The EJAtlas is the largest existing global inventory documenting ecological distribution conflicts and environmental justice struggles. Initiated in 2012, the EJAtlas has systematically collected and mapped over 4296 cases by January 2025. Data collection occurs through a collaborative online platform where entries submitted by researchers, activists, journalists, and NGOs undergo rigorous review and moderation before publication by the editorial team at the Institute of Environmental Science and Technology, at the Autonomous University of Barcelona (ICTA-UAB). As a participatory, crowdsourced dataset, the EJAtlas offers an important advantage for the study of “ecological distribution conflicts” (Martinez-Alier, 2002; Temper *et al.*, 2018): it foregrounds local perspectives on subjective issues often absent from official sources. At the same time, its collaborative origin entails limitations, including incomplete or heterogeneous information, uncertainty about the temporal development of the conflicts, and potential selection and reporting biases³.
- 10 To operationalize our analysis, we extracted the geographic coordinates and associated qualitative information of conflicts from the EJAtlas and combined them with several geographical layers. This integration enabled a spatial analysis of conflict characteristics within mountain regions. The concept of a mountain lacks a universally accepted definition in the literature, yet the analysis required a clear definition of what areas can be characterised as such. We adopted the delineation developed by the European Environment Agency (EEA)⁴ and attributed the conflicts to the different mountain ranges. To ensure analytical clarity we excluded the points that could not be clearly attributed to a specific single mountain range. Also, the conflicts located in Turkey were not considered to maintain a consistent European geographical scope⁵.
- 11 The analysis also made use of territorial variables that describe the regions in which conflicts are taking place, including the presence of protected areas, land use, and the degree of urbanization. Protected areas were identified through the Natura 2000 network, the European Union’s system of sites safeguarding threatened species and habitats. Land use was taken from Corine Land Cover 2018, summarized into five categories: artificial surfaces, agricultural areas, forests and semi-natural areas, wetlands, and water bodies. Urbanization levels were obtained from the DEGURBA dataset, which classifies local administrative units (LAUs) as cities, towns and suburbs, or rural areas based on contiguity and population density. While the conflict dataset covers the European continent as a whole (see Fig.1), the integration with territorial variables reflects the coverage of EU-based datasets. Their geographical extent includes much of continental Europe but not all countries⁶. As a result, conflicts located outside this coverage remain in the overall dataset but could not be associated with territorial variables, making a territorial characterization impossible for those cases.
- 12 Conflicts were explored through descriptive and spatial analysis. Conflict points were intersected with the mountain delineation and territorial layers to identify their location in relation to land cover, protected areas, and urbanization levels. Descriptive statistics were applied to examine distributions by conflict type, actors, and socio-environmental impacts, while spatial patterns were analyzed across mountain ranges. Visualizations (maps, tables, and word clouds) were produced to synthesize and communicate the findings.

Conflicts in the European Mountains

- 13 The final sample includes 182 conflicts across 12 distinct mountain ranges (Figure 1). The highest numbers are in the Balkans/Southeast Europe (58), the Iberian Mountains (37) and the Carpathians (21). The Alps (19) and the Pyrenees (17) also show notable conflict activity, while the remaining ranges each record fewer than 10 cases. By country, Spain leads with 46 conflicts, followed by France (16) and Italy (14). In the Balkans, Serbia, Bosnia and Herzegovina, Bulgaria, Montenegro, and Romania, each counts 10–12 cases. The findings are presented along two main lines of analysis: first, the key characteristics of socio-environmental conflicts in the European mountains (i.e., types, impacts, and actors); and second, the spatial variations in conflict types and descriptions.

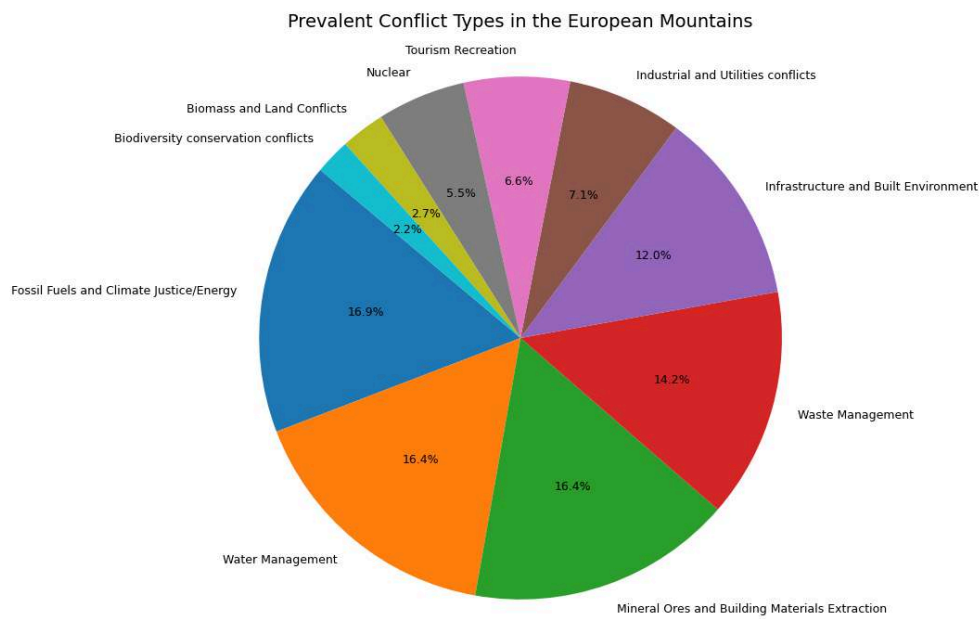
Figure 1: Map of the socio-environmental conflicts in the European mountain areas



Authors' elaboration on EJAtlas (<https://ejatlas.org/>) and EEA mountain delineation (EEA, 2010).

- 14 Conflict types are dominated by Fossil Fuels and Climate Justice/Energy (17%), Water Management (16%), Mineral Ores and Building Materials Extraction (16%), followed by Waste Management (14%) and Infrastructure and Built Environment (12%) (Figure 2). Conflicts related to Industrial and Utilities and Tourism Recreation represent roughly 7% each. Smaller shares concern Nuclear, Biomass and Land Conflicts, and Biodiversity Conservation. These patterns suggest that while energy and resource management issues dominate, conflicts are varied and are not driven by single issues.

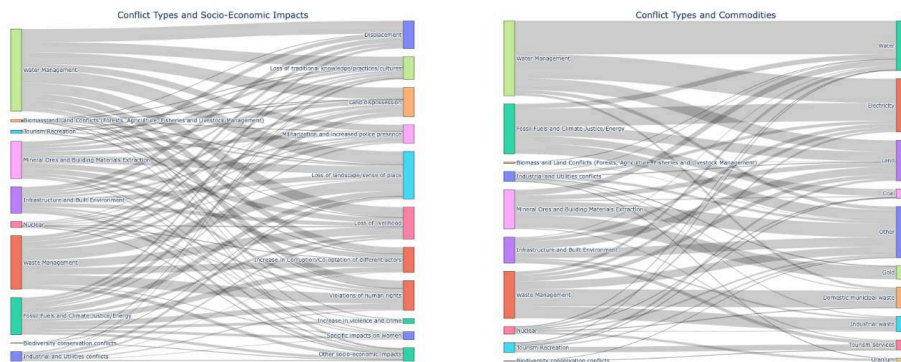
Figure 2: Distribution of conflict types in the European mountain areas



Authors' elaboration on EJAtlas (<https://ejatlas.org/>) and EEA mountain delineation (EEA, 2010).

- 15 Socio-economic impacts are widely distributed across conflict types (Figure 3). Loss of landscape/sense of place was mentioned in 48 cases, while other impacts—loss of livelihood, dispossession, rights violations, displacement, loss of traditional knowledge, increase of corruption—each appear in 22–30 cases in many different types of conflicts. Figure 3 also shows interesting links between conflict types and involved commodities. Many water management conflicts are connected to electricity production, either in the form of dams, or other electricity production techniques. Most conflicts involve conflicts around land, while a significant portion of extractive conflicts over metals and minerals are linked to water distribution.

Figure 3: Flow diagram of conflict types to the related socio-economic impacts and to involved commodities



Authors' elaboration on EJAtlas (<https://ejatlas.org/>) and EEA mountain delineation (EEA, 2010).

- 16 The analysis of involved actors reveals that the conflicts are primarily situated between civilians and companies: 152 cases involve enterprises (73 domestic, 80 foreign).

| | | | |
|--|----|--|------|
| Alps | 19 | Infrastructure and Built Environment | 31,6 |
| | | Water Management | 26,3 |
| | | Mineral Ores and Building Materials Extraction | 10,5 |
| | | Nuclear | 10,5 |
| | | Biodiversity conservation conflicts | 5,3 |
| | | Other | 15,8 |
| Apennines | 9 | Fossil Fuels and Climate Justice/Energy | 55,6 |
| | | Infrastructure and Built Environment | 22,2 |
| | | Waste Management | 22,2 |
| Balkans/Southeast Europe | 58 | Waste Management | 25,9 |
| | | Water Management | 22,4 |
| | | Fossil Fuels and Climate Justice/Energy | 12,1 |
| | | Tourism Recreation | 10,3 |
| | | Infrastructure and Built Environment | 8,6 |
| | | Other | 20,7 |
| British Isles | 2 | Fossil Fuels and Climate Justice/Energy | 50 |
| | | Mineral Ores and Building Materials Extraction | 50 |
| Carpathians | 21 | Mineral Ores and Building Materials Extraction | 28,6 |
| | | Waste Management | 23,8 |
| | | Water Management | 19 |
| | | Tourism Recreation | 9,5 |
| | | Biodiversity conservation conflicts | 4,8 |
| | | Other | 14,3 |
| Central European middle mountains 2 (CZ, AT, GE) | 1 | Fossil Fuels and Climate Justice/Energy | 100 |
| Eastern Mediterranean islands | 3 | Fossil Fuels and Climate Justice/Energy | 33,3 |

| | | | |
|-------------------------------|----|--|------|
| | | Infrastructure and Built Environment | 33,3 |
| | | Mineral Ores and Building Materials Extraction | 33,3 |
| French/Swiss middle mountains | 5 | Mineral Ores and Building Materials Extraction | 40 |
| | | Fossil Fuels and Climate Justice/Energy | 20 |
| | | Infrastructure and Built Environment | 20 |
| | | Nuclear | 20 |
| Iberian mountains | 37 | Mineral Ores and Building Materials Extraction | 24,3 |
| | | Fossil Fuels and Climate Justice/Energy | 18,9 |
| | | Nuclear | 13,5 |
| | | Water Management | 13,5 |
| | | Industrial and Utilities conflicts | 10,8 |
| | | Other | 19,0 |
| Nordic mountains | 8 | Fossil Fuels and Climate Justice/Energy | 50 |
| | | Mineral Ores and Building Materials Extraction | 25 |
| | | Industrial and Utilities conflicts | 12,5 |
| | | Water Management | 12,5 |
| Pyrenees | 17 | Industrial and Utilities conflicts | 17,6 |
| | | Infrastructure and Built Environment | 17,6 |
| | | Waste Management | 17,6 |
| | | Fossil Fuels and Climate Justice/Energy | 11,8 |
| | | Mineral Ores and Building Materials Extraction | 11,8 |
| | | Other | 23,6 |
| Western Mediterranean islands | 2 | Fossil Fuels and Climate Justice/Energy | 50 |
| | | Infrastructure and Built Environment | 50 |

Authors' elaboration on EJAtlas (<https://ejatlas.org/>) and EEA mountain delineation (EEA, 2010).

- 19 About 30 of the 182 observed conflicts occur within Natura 2000 sites. Most of them are located in Spain (9), followed by France and Bulgaria (3 each). The remaining cases are scattered across other Balkan and Mediterranean countries, with one or two conflicts each. The highest number of reports from Natura 2000 sites is found in the Iberian mountains, followed by the Balkans/South-East Europe. Although limited in number, these cases are notable given that protected areas are generally expected to have a limited anthropogenic presence. The most common types of conflicts within Natura 2000 areas are related to Tourism and Recreation (6), which is under-represented in the overall dataset, followed by Water Management and Mineral Ores and Building Materials Extraction (5).
- 20 Land-cover analysis shows that over 40% of conflicts occur in forests, 28% in built-up areas, and nearly 20% in agricultural land. Forest conflicts are most common in the Balkans and Iberian Mountains, while built-up areas prevail in the Alps and Carpathians. When the data are classified by type of conflicts and the Infrastructure and Built Environment and Waste Management category are considered, the majority of the reports fall in the artificial areas. With regards to the degree of urbanization, over 65% of cases fall in rural areas, with the remainder split almost equally between suburbs and cities. Bulgaria is an exception, where most conflicts occur in cities or suburbs (7, in total), and only 3 in rural LAUs. By conflict type, the sequence urban-rural is maintained, except for waste management, which is concentrated in suburban (55%) and urban (33%) contexts, indicating its tendency to emerge closer to population centres.

Conclusion

- 21 This paper explored socio-environmental conflicts in European mountain areas by intersecting data from the Global Environmental Justice Atlas (EJAtlas) with the European Environment Agency's (EEA) mountain delineation. Situating conflicts in space allowed for a more granular understanding of conflict types, actors, and impacts within European mountains. A key contribution lies in the use of the geographic coordinates to identify whether conflicts occur in upland areas and to assign them to specific ranges, enabling a spatially explicit reading of conflicts that foregrounds the distinctive characteristics of mountain territories.
- 22 Our findings highlight recurring conflicts over energy production, extractive industries, and infrastructure, alongside widespread concerns about landscape degradation and the erosion of local identity—issues that resonate strongly in academic debates (Grimault, 2021; Forget *et al.*, 2021; Chambru *et al.*, 2024). These patterns support conceptualizations of European mountains as “frontiers of extraction” (Zoomers & Otsuki, 2017), reflecting their strategic role in global resource flows (Perlik, 2019). The under-representation of tourism-related conflicts, despite their prominence in the literature, points to reporting bias in participatory inventories. Mining, energy, and waste projects usually involve clear, immediate ecological harms and visible mobilizations that are easily codified as “environmental conflicts”, while tourism conflicts often unfold through gradual socio-spatial transformations (Perlik, 2011) less likely to be framed as environmental injustices. This is reinforced by the widespread

normalization of tourism as an engine of rural/mountain development (Bourdeau, 2021; Sulpice, 2024).

- 23 Conversely, the prominence of waste management conflicts—especially in the Balkans and Carpathians—in our dataset contrasts with their marginality in the mountain conflict literature. This reflects a tendency of mountain studies to privilege “mountain-specific” conflicts, while treating waste as an urban issue. Yet, our results reveal mountains as not only extraction but also disposal frontiers for urban and industrial waste, exposing territorial inequalities whereby peripheral areas absorb the externalities of metropolitan development. The concentration of conflicts in anthropized valleys and peri-urban mountain areas further challenges imaginaries of mountains as pristine and remote, highlighting them instead as hybrid socio-ecological systems (Gal, 2016; Chambru *et al.*, 2024). Their visibility suggests that mobilization could be facilitated by population density and civic networks, in contrast to remote areas where degradation may proceed with limited contestation (Zimmer & Basset, 2003; Zou *et al.*, 2022). Finally, while scholarship often focuses on the Alps, our analysis underscores the importance of looking beyond them to lesser-studied regions such as the Iberian Mountains, the Balkans, the Carpathians, and the Pyrenees.
- 24 Given the exploratory nature of this study, we do not make causal claims, nor do we compare mountain with non-mountain conflicts. However, by focusing on a precise spatial context, the analysis highlights “mountain” as a heterogeneous socio-ecological space where elevation, climate, remoteness, demographics, resources, and symbolic value converge to shape distinctive conflict dynamics. This has direct implications for territorial planning and European environmental policy, where mountains should not be treated merely as peripheral or resource-supplying areas, but as contested and dynamic territories requiring context-sensitive governance and approaches that manage multi-functional and multi-scalar pressures, integrate local voices, and address environmental justice.
- 25 The study does have limitations. First, we relied on a clear-cut definition of “mountain,” necessary for spatial analysis, though alternative definitions might produce different case selections. Second, we assumed the accuracy of geographic coordinates and limited our analysis to point locations, excluding surrounding areas that may also be affected. While this simplifies territorial complexity, it was necessary for a pan-European analysis. Third, the spatial variables analyzed—protected areas, urbanization, and land cover—were selected for their relevance in the literature and the availability of datasets covering most of Europe. Conflicts in countries not included in these datasets could not be characterized for these variables. Importantly, however, the data we used were consistent and comparable across borders, allowing for meaningful cross-country comparisons. Finally, the EJAtlas represent only a subset of existing conflicts, subject to reporting bias and incomplete entries. In particular, the database primarily documents conflicts between local communities and actors operating at larger scales (e.g., governments, corporations, financial institutions), while those between local actors themselves fall outside its scope. As noted by Gian Pietro Zaccomer and Giorgia Bressan (2020), the characteristics of contributors—particularly their residency—can also shape what types of conflicts are reported. Caution is therefore required in interpreting geographical variations.
- 26 Despite these caveats, our analysis demonstrates the value of situating socio-environmental conflicts in mountains within a clear spatial framework. By intersecting

participatory data with a spatial definition of mountain areas and territorial variables, the study shows how conflicts cluster in specific ranges, how they are shaped by territorial characteristics, and how they reveal mountains as contested socio-ecological frontiers, where extractive, infrastructural, and waste-related projects driven by external actors intersect with local values, livelihoods, and imaginaries. These findings can serve as a baseline for more detailed, comparative studies, both within Europe and globally, helping to bridge political ecology, mountain studies, and environmental justice research. To capture the full spectrum of conflict dynamics in mountain regions, future work should bring participatory inventories into dialogue with case-based research. Future work could further explore the dynamics of mobilization in urbanized valleys, compare patterns across continents, or examine underrepresented conflict types. In this way, the study contributes to a broader and more nuanced understanding of socio-environmental conflicts in mountain regions while opening promising avenues for future research.

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NOTES

1. Available online: <https://ejatlas.org/>, consulted on November 2nd, 2025.
 2. This notion refers to the opening of new territories and the intensification of existing ones for resource exploitation, driven by global demands that reshape local socio-ecological systems (Zoomers and Otsuki, 2025).
 3. For an in-depth discussion of the advantages and disadvantages of the data set: Temper et al., 2018.
 4. This data set classifies regions above 2,500 meters automatically as mountainous. For areas below this threshold, the EEA used slope steepness and local elevation range (LER) within a 7 kilometers radius to identify mountainous terrain. Additionally, European mountain landscapes often extend below 300 meters—such as in the coastal Mediterranean ranges—areas at lower altitudes exhibiting significant local elevation variation are included as well. Areas below 10 square kilometers of either isolated mountain ranges, or non-mountain enclaves inside of ranges were reclassified to ensure continuity.
 5. The European geographical scope used in the analysis follows a conventional geographical definition of Europe that, beyond purely morphological criteria, reflects historical, cultural, and geopolitical constructions, and identifies the Bosphorus Strait as the dividing line between Europe and Asia (see Varotto, 2025).
 6. The Natura 2000 dataset does not include the United Kingdom, Ukraine, Norway, Switzerland, and a number of Balkan countries. Corine Land Cover 2018 excludes Ukraine, while DEGURBA does not cover the United Kingdom, Ukraine, and several Balkan states.
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ABSTRACTS

Mountain regions are increasingly recognized as contested socio-ecological spaces where global development agendas, environmental concerns, and local livelihoods intersect. Although there is growing scholarly attention to mountain regions as sites of conflict, this remains largely fragmented and case study-based. This paper offers a systematic analysis of socio-environmental conflicts in European mountain regions, a term widely used in the literature to describe collective struggles over the use, control, and distribution of environmental resources and harms. The analysis draws on 182 cases identified by combining the Global Atlas of Environmental Justice (EJAtlas) with the European Environment Agency's delineation of mountain areas. The study characterizes the main types, drivers, and actors involved and explores their spatial patterns in relation to land use, urbanization, and protected areas. Findings show a predominance of conflicts over energy production, water management, extraction, and waste, which often involve local communities opposing corporate actors. These conflicts frequently centre on landscape degradation and the erosion of local identities, reflecting tensions between external resource demands and local territorial values. Geographically, significant clusters emerge in the Balkans, the Iberian Mountains, and the Carpathians, underscoring the need to move beyond the traditional Alpine focus of mountain research and the value of a broad spatial perspective. Overall, the study highlights European mountains as both extractive and disposal frontiers, underscoring the importance of integrating environmental justice perspectives and local agency into mountain governance and territorial policy.

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Keywords: european mountain areas, socio-environmental conflicts, ecological distribution conflicts, GIS, EJAtlas

AUTHORS

GIORGIA SCOGNAMIGLIO

 **IDREF** : <https://idref.fr/292657641>

Department of Methods and Models for Economics, Territory and Finance, Sapienza University of Rome

JAKOB NITSCHKE

 **IDREF** : <https://idref.fr/284879096>

Department of Methods and Models for Economics, Territory and Finance, Sapienza University of Rome

GIORGIA BRESSAN

 **IDREF** : <https://idref.fr/292658346>

 **ORCID** : <https://orcid.org/0000-0003-4316-7698>

Department of Humanities and Cultural Heritage, University of Udine