

## 🔗 Social Media Debate and Criticisms in the Postdisaster Context: Attribution of Responsibility after the Pedrógão Grande Wildfire

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**ABSTRACT:** The causal attribution of extreme events poses a communicative challenge in connecting global climate change and local vulnerabilities. Alongside improved insights into climate models and sensitivities, enhanced understanding is needed of the social and discursive dynamics that shape the attribution of responsibility in extreme events and disasters. This article examines how responsibilities are attributed in the public debate on the 2017 Pedrógão Grande fire disaster, considered the worst disaster in Portugal’s recent history. It presents two studies that focus on the social media debate between 2017 and 2023. Study 1, examining  $N = 512$  Facebook posts, offers a descriptive overview of the networked public debate, identifying the main patterns. Study 2, analyzing a subset of  $N = 176$  posts that involve conflict and criticism, focuses on the distribution of responsibilities to various causal factors and explores how the relationships between climate change and local vulnerabilities were articulated. The results of study 1 indicate that blame was attributed predominantly to national authorities and politicians, with only a few explicit references to climate change. However, study 2 reveals a more nuanced concatenation of various causes and responsibilities where global and structural issues are connected to concrete actions and responsibilities. Therefore, it is concluded that, in the communication of extreme events and disasters, attention should be paid not only to the number or share of the causes mentioned but also to the storylines and discourses that connect those causes and responsibilities.

**SIGNIFICANCE STATEMENT:** This article investigates how the most deadly wildfire disaster in Portugal’s recent history was debated on social media and how the causes and responsibilities were variably attributed. The results highlight the importance of understanding not only “who” is held responsible but also “how” local and global factors are articulated in the postdisaster debate. As in other deadly disasters, political blame and the government’s responsibility remain in the foreground of the social media debate. However, in some posts, this responsibility is connected and extended to many other causes and agencies, offering local narratives of the problems and vulnerabilities that connect to global and structural issues. The paper thus argues that tensions between global climate change and local vulnerabilities should be seen as a matter of discursive links between various layers of agency and evidence, to which communicators must be attentive. Due to its focus on a single extreme event case and one digital platform, the generalizability of the findings may be limited.

**KEYWORDS:** Climate attribution; Forest fires; Extreme events; Vulnerability; Societal impacts; Communications/decision making

### 1. Introduction

Global climate change often features in public discourse through news events that are regarded as its consequences. This makes extreme weather events (EWEs) and their attribution a key topic at the science–public interface. The complex “causal” connections between EWEs and climate change constitute a recent field of climate science called extreme event attribution (EEA) (Lusk 2017; Otto 2023). With the already established scientific groundwork and the prospects of learnable climate models, weather forecasts that incorporate EEA may soon become a reality (Huang et al. 2024). Much less is known about how EEA processes operate in public discourse. This paper aims to contribute to the study of how EWEs are interpreted and communicated in public discourse and their connection to climate change.

On the one hand, there is a clear interest in the link between EWEs and climate change (e.g., Üzelgün 2022; Ettinger et al. 2023; Osaka et al. 2020), driven by the view of public attention EWEs receive as valuable opportunities for public engagement in climate-relevant action. By rendering psychologically distant risks here and now, EWEs such as droughts and wildfires take part in occasioning “teachable moments” (Ettinger et al. 2023). If transformed into “focusing events,” gathering the relevant stakeholders around issues of common concern, such moments may come to recalibrate policy and cultural norms (Cottle 2023; Molder and Calice 2023). This suggests that, once established, attributions to climate change may endow EWEs with a dislocatory impetus (Behagel and Mert 2021), potentially legitimizing more stringent policymaking and bolstering new forms of citizenship, empathy, and solidarity.

On the other hand, there is the worry that attributing the responsibilities and liabilities around the impacts of EWEs to

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global climate may deflect attention away from much-needed policies addressing local vulnerabilities (Lahsen and Ribot 2022; Lusk 2017; Otto 2023). Since it is the local choices and socioeconomic conditions that transform EWEs into disasters, attributing the impacts only to the generic–global frame of climate change can be detrimental to local action and policies (Lahsen and Ribot 2022). However, focusing only on local responsibilities, which easily takes the form of political blame, may also lock the societal debate into existing cleavages (e.g., Karyotakis 2021), exacerbating division and competition for resources. As ruptures that significantly impact local communities and economies, disasters and a restricted focus on political responsibility can also obscure climate-relevant action in mitigation and adaptation.

This raises the question of whether there is a right balance between attributing responsibility to local and global actors. There is a need for a dual focus on both the global and the local. But how? We argue that research should concentrate, rather than balance, on the discursive relations between climate dynamics and local vulnerabilities. This means to ask whether and how connections between particular EWEs (a flood, a wildfire) and climate change are established in the societal debate. In other words, what causal relationships characterize public attention in postdisaster contexts? Investigating whether and how climate change and structural issues become part of the societal debate in the aftermath of EWEs, it would be possible to advance risk and disaster communication and postdisaster recovery and policies. This also may inform the efforts in EEA toward a common framework involving both climate change and local vulnerabilities (Otto 2023).

To address these questions, this paper focuses on the 2017 Pedrógão Grande wildfire in central Portugal, examining the social media debate on the Facebook platform between 2017 and 2023. The next section briefly reviews how extreme wildfire events are communicated and become part of our mediated and networked society (Cardoso 2024). Then, a summary of the key features and significance of the Pedrógão Grande wildfire is provided. Next, we set forth our theoretical and methodological framework, grounded in argumentative and narrative perspectives. After setting forth our research questions and methods, study 1 quantifies some main characteristics of the social debate on Pedrógão Grande. Study 2 then offers qualitative detail and examples of the salient criticisms, attributions, and accusations that comprise the debate. We discuss how, in the attribution of responsibilities, the shift between general and specific was used as a discursive resource to endow criticisms with elevated balance and force. Last, we discuss the implications for both the communication of EEA and future studies.

### *a. Mediatization of wildfires*

To inform the study of social media discourses, three general insights can be drawn from the literature on national media portrayals of wildfires. The first insight concerns the news media's focus on the unfolding drama (Figueiredo et al. 2024; Undurraga et al. 2022) rather than offering a broader spatiotemporal framework of interpretation. Second, the national political context emerges as the privileged site of interpretation, the locus of

responsible agency, and the focus of the causes and liabilities involved, such as governmental neglect, governance of firefighting, and accusations of arson (Baykal Fide 2022; Figueiredo et al. 2024; Walker et al. 2020). Third, especially in contexts of election and political tension, this focus on the causes and liabilities may be exploited for political disparagement (Undurraga et al. 2022), taking the form of a quest for a scapegoat, directing attention away from a global outlook and proactive policy actions (Hovardas 2014; Karyotakis 2021). All three aspects were observed in a recent study of Portuguese media portrayals of wildfires (Figueiredo et al. 2024), which highlights the “enormous relevance attributed by the media narratives to a set of government and civil-protection-related agents” (p. 20).

Overall, event-driven media reporting seems to offer two salient frames: the first and more dominant frame of political responsibility and blame and the frame of risk mitigation and forest management. They can be seen as diagnostic (cause oriented) and prognostic (policy oriented) news frames (Baykal Fide 2022; Walker et al. 2020). EEA adds to the axis comprising these two frames—the axis from cause to policy and a second axis of global–local responsibilities. Although the frames of climate change help offer a more adequate picture of EWEs and ensuing disasters, they also tend to diffuse responsibilities in a broader narrative, which is sometimes too generic to be relevant to local policies (Lahsen and Ribot 2022; Lusk 2017; Otto 2023). Our interest in this study lies in the tension between the local or territorial frames and the broader frame of global climate and associated policy concerns.

The abovementioned studies of national media typically employ frame analysis and deal with media gatekeeping mechanisms. Since gatekeeping on social media platforms operates as a constant negotiation between users and the platform algorithms (Cardoso 2024), the study of social media discourse has the advantages of a potentially more open-ended societal debate, both in time and across positions, involving a potentially broader distribution of voices and concerns. However, most studies of social media interaction focus only on the disaster or its immediate aftermath, intending to contribute to effective crisis communication and disaster management (e.g., Gardiner et al. 2023; Liu et al. 2021). While such studies are certainly important, there is a need for social media research focusing on “context-specific politics of disaster framings” (Lahsen et al. 2020, p. 228), along with “a longitudinal set of studies that scrutinize public discourses around climate mitigation, adaptation, disaster management, and resilience” (p. 229).

One of the few studies in this field (Berglez and Al-Saqaf 2021) indicates that three main factors drive EEA in social media discourse: the extreme event factor, the media-driven science communication factor, and the digital-action factor. The first refers to the mediated presence of the EWE and the precipitating disaster(s), the second refers to the links established by the scientific and boundary organizations, and the third refers to the platform users' choices. This means that social media communication intersects with the news media ecology to a significant extent, as the culturally more relevant news pieces are inserted into platforms by users (Al-Saqaf and Berglez 2019; Veltri and Atanasova 2017).

A question that generated conflicting findings concerns the attribution of different types of EWEs to climate change. In [Al-Saqaf and Berglez \(2019\)](#), floods appear far more attributed to climate than droughts and heat waves, suggesting the relevance of the impact on human systems in evoking diagnostic frames. However, in [Molder and Calice \(2023\)](#), wildfires appear to be attributed to climate more, despite the significantly higher volume of coverage and economic impacts associated with hurricanes. Research is required to address the interaction of many factors, such as the severity of the human impact, news media dramatization, recurrence/novelty of the EWE, and concomitance with other events. Studies cited above, looking at databases, comparing several types of EWEs across many years with the lens of automated tools may offer only generic insights. In this regard, we agree with [Lahsen et al. \(2020, p. 228\)](#) that context-specific politics of disaster framings can provide a basis for a better understanding of the dynamics of extreme event attributions in public discourse. We therefore focus on an extreme wildfire case to examine the attribution of responsibilities.

#### *b. 2017 Pedrógão Grande wildfire*

Forests are the main land use in Portugal, occupying about 37% of its territory ([APA 2020](#)). More than 90% of Portugal's forests are privately owned and are, mostly, production forests ([Feliciano et al. 2015](#)). In 2022, forest-based products accounted for 9.1% of Portugal's total national exports ([Biond Forest Fibers 2022, p. 17](#)). Additionally, forest biomass is one of the main energy sources, corresponding to about 10% of the country's total final energy consumption ([APA 2020, p. 29](#)). Portuguese forests, especially on the mainland, can thus be regarded as sociotechnical and energy landscapes.

The year 2017 was disastrous, with 21 002 occurrences and a burnt area of 540 630 ha, representing a fivefold increase from the average burnt area in the preceding 10 years ([Magalhães et al. 2021](#)). This record increase was captured by both climate-forcing-only and climate-fire models ([Turco et al. 2019](#)), suggesting the relevance of climatic variables. A key transformative event was the Pedrógão Grande fire, in June 2017, which became the most-deadly disaster in the country's recent history. Due to the death toll, the fire event became a key reference in Portugal's disaster preparedness and risk mitigation debates ([Beighley and Hyde 2018](#)). Following significant public contestation over the disaster risk mitigation strategies and response systems, the Portuguese government adopted a commitment-based crisis response strategy ([Pereira and Nobre 2019](#)), revised a series of plans and policies, and launched a since-uninterrupted national campaign. According to [Beighley and Hyde \(2018\)](#), forest management in Portugal thereby entered a new era. The revision of the Regional Forest Landscape Plans came afterward in 2019. A monumental tribute to the fire victims, inaugurated on the sixth anniversary of the event, signals the significance of the Pedrógão Grande fire in cultural memory.

[Pereira and Nobre \(2019\)](#) examine crisis communication around Pedrógão Grande as a case of managing (dis)trust in the government. The dynamic between risk-resilience policy-making and public attention and contestation has been a key

issue, as wildfire risks and events are continuous in Portugal. Even in the same year of 2017, other fires in the same territory claimed more forest land, and fire events continued to occupy space in the public agenda ([Figueiredo et al. 2024](#)). In short, wildfire has been a national priority in Portugal, and this priority has become part of the national political agenda since 2017 ([Magalhães et al. 2021](#)).

#### *c. Postdisaster positioning: Storylines and criticisms*

Thanks to the advances in information and communication technologies, remembering has become an everyday collective activity ([Harré and Moghaddam 2014, p. 130](#)). This elevates one of its central aspects: People do not just retrieve a memory but actively make the memory part of a new context and questions. For example, a memory can be integral to an accusation or insinuation. To study this doubly relational aspect of collective remembering on social media platforms, we draw on positioning theory (PT) and argumentation theory (AT).

We draw on PT to attend to the relationship between the parties involved in a piece of text. PT pays close attention to attribution of responsibilities, rights, and duties. Accordingly, positions “are nothing but clusters of rights, duties, and obligations to perform or to require the performance of certain kinds of acts” ([Harré and Slocum 2003, p. 109](#)). Positions are taken and attributed in conversations, with the interdependent forces of speech acts and storylines. Speech acts, such as requests and apologies, ground the analysis to the immediate context of interaction, while storylines open that restricted context to other, established patterns of interaction, such as the teacher–pupil or the villain–victim. They may be relatively connected to the conversational and social context of a debate ([Harré and van Langenhove 1999, p. 17](#)). The triad of positions/speech acts/storylines offers an interpretative framework of how people manage their relationships.

We draw on AT to attend to the second relation, between an expression and its semantic vicinity—e.g., an accusation and other accusations in the same text. AT is specifically tuned to how speech acts operate as premises and inferences to one another and how they can be taken for granted as part of the common ground onto which a debate is built ([Lewiński and Mohammed 2016](#)). The chains or sequences of reasons can be both epistemic and practical. As a practical example, in climate change policy debate, it is commonplace (i) to call for technology transfer, (ii) to mitigate carbon dioxide emissions, and (iii), in turn, to decarbonize the economy ([Rodrigues et al. 2019; Üzelgün and Pereira 2020](#)). To construct such sequenced means–ends relations and other forms of complex argumentation, indispensable resources are the argumentative content knowledge ([Goodwin 2019](#)), the topical knowledge, and established positions of a controversy.

The two theories can be aligned with each other, as both draw on speech acts as core building blocks and develop different but largely translatable sets of tools to address the complexity in everyday interactions. An example is the notion of criticism. AT pays specific attention to criticisms, systematizing the study of their level, focus, force, and the norms they rely on ([Krabbe and van Laar 2011](#)). In the context of our study,

TABLE 1. Main categories of study 1 and their frequencies.

Categories	Definition	<i>N</i>
Impacts	Posts on the first impact of fire, people affected, material losses, humanitarian aid, and condolences	229
Tributes	Posts shortly/simplely referring to the event, reminders	107
Criticisms	Posts with a critical feature, or explicit conflict, questioning the causes, consequences, liabilities	176
Total		512

criticism can be regarded as a basic storyline—like instruction, defeat—that stabilizes the threefold dynamic approach of PT. Different types of criticism will engender different positions. They may polarize the debate, identify scapegoats, and mobilize the authority of science, mitigating or accentuating conflicts such as rural–urban, citizen–government, or culture–nature. In such endeavors, shifts between the appeals to concrete and abstract values are common, and a position that calls for more profound change is more likely to resort to abstract values (Perelman and Olbrechts-Tyteca 1969).

#### d. Research questions

This research aims to contribute to the study of public interpretations of EWEs, and their connection to climate change, by focusing on the extreme wildfire case of 2017 Pedrógão Grande. To examine the social media debate around the fire disaster, both study 1 (quantitative) and study 2 (qualitative) will address the following questions:

- RQ1. What are the salient trends and characteristics in the social media debate on the Pedrógão Grande fire? What issues and conflicts manifest centrally on the Facebook discussions in the disaster’s aftermath?
- RQ2. Who are the main players/actors mentioned in the posts and how are the rights and responsibilities distributed to those actors? To whom and how is the “blame” attributed?
- RQ3. To what extent and how does climate change feature in the social media debate on the Pedrógão Grande fire? How is it linked to the local issues and vulnerabilities?

## 2. Social media debate on the Pedrógão Grande fire

To collect the relevant corpus of social media communication, a custom keyword search was conducted for all Facebook posts on public groups using the company’s insights tool, CrowdTangle.<sup>1</sup> Facebook was the most widely used media platform in Portugal during the time covered by the study. Using the keywords “Pedrógão Grande” AND “Incêndio” OR “Fogo” (two terms for “fire” in Portuguese), and limiting the query to between 17 June 2017 and 31 October 2023, a total of  $N = 1428$  posts were collected in a spreadsheet format.

After an initial reading and experimental coding process of about 10% of the posts, carried out by both authors separately, a simple coding grid was jointly established and stabilized, and the second author then applied the coding procedure. This initial procedure eliminated more than half of the posts for the

following reasons: repeated posts, inaccessible/removed posts, and irrelevant posts. The remaining  $N = 512$  posts constitute the corpus of study 1, which aimed to offer a descriptive overview of the social media debate on the Pedrógão fire.

Study 1 registered the name of the “user” posting the piece (individual, group/association, politician, media organization), the “visual element” (photograph, video, no visual), the “source” of the content posted (news media, website, another post, public/private initiative, local/self-testimony, government, expert), the “main actor” in the post (victim/local population, government, opposition, fire, public/private initiative, other), “climate change” (mentioned, unmentioned), and “land and forest policies” (mentioned, unmentioned). We also tried to code for the “storyline” and the “central message” associated with the main actor. However, having failed to register these categories consistently, we left such interpretative analysis to a later point.

Besides these descriptive categories, the posts were also coded into three categories according to their relation to the event: 1) disaster: posts dealing with disaster emergency aid and information, which are typically posted during the event; 2) memory: posts commemorating and reminding the disaster, in the form of condolences or short mentions; and 3) criticism: posts involving policy/political claims and criticisms. This categorization draws on the notions of primary and secondary impact (Martin et al. 2016; Machado et al. 2005), in the sense of distinguishing the immediate consequences of the event (e.g., material losses), from the secondary consequences (e.g., reconstruction efforts), which open some space for reflection and criticism.

After the quantitative outline provided by study 1, which will be reported in the next section, study 2 focused on those posts categorized under “criticism” ( $N = 176$ ; see Table 1). This category identified what may be called the public political debate on the Pedrógão Grande fire, excluding condolences, remembrances, solidarity campaigns, and news communication. With this exclusion, the pursuit of study 2 was to follow the argumentative aspects of the debate over an extended period. The unit of analysis was the post including its textual and visual modes. The analysis pivoted on the organization and presentation of criticisms, paying specific attention to the causal relations and attribution of responsibilities, using the toolset introduced above.

#### a. Study 1: The social media debate

To provide a descriptive overview of the main trends and issues in the public debate following the 2017 Pedrógão Grande fire, this study focuses on  $N = 512$  Facebook posts. Figure 1 shows how the posts are distributed across the 6 years after the disaster. It shows that the posts are concentrated in the first weeks after the fire: 238 of the posts were created in June 2017,

<sup>1</sup> We are thankful to Dr. José Moreno for his technical supervision of the extraction process.

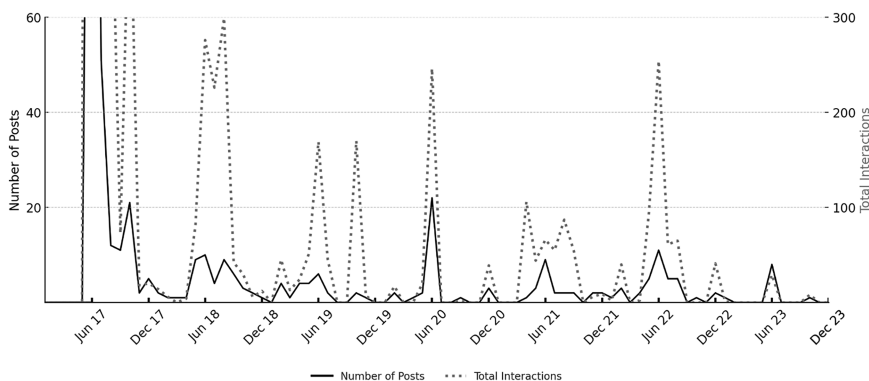


FIG. 1. Monthly distribution of the number of publications and total interactions, 2017–23.

with almost 6000 interactions, and 51 posts were created in July 2017 with almost 500 interactions (impossible to project without flattening the figure). The debate is then largely subsided, mostly to be revisited in June of each year and the developments like other wildfires, the court hearings, and the legislations and policies that followed up.

To achieve a deeper understanding of this distribution, we use three categories according to the ways the posts relate to the disaster (Table 1). The category impacts registers the posts on the primary impact, including news reporting, aid, and humanitarian appeals. Concentrated on the first week(s) of the disaster, these posts help the summoning of the public as well as the construction of the event's significance. They may be said to lack the distance to interpret the event, as they focus on reporting the event. The second category, tributes, registers the posts motivated to keep the disaster in the cultural memory, mainly in the form of tributes and remembrances. By definition, these posts are made when the fire is "reduced" to a memory. While ritual gestures may play a significant role in controversies and redistributing postdisaster responsibilities, the posts coded for this category did not have the textual scope to drive such inferences. Those posts that kept a simple reference to the incident in interpreting new events were also coded for this category. The key actors in this category are the victims, and key terms can be listed as solidarity and revitalization. Like the first category, what these posts do not involve is some interpretation or interrogation of the event, e.g., causes and liabilities.

The third category, criticism, involves those posts that have a critical distance and position to the fire event, questioning the causes, consequences, reasons, and those responsible. In line with previous findings (Figueiredo et al. 2024), the key actors are politicians, mainly the figures and institutions linked to the government. As this category is more relevant for our purposes, study 2 will focus specifically on these posts. We now continue our descriptive outline.

#### 1) THE GROUPS IN WHICH THE CONTENT WAS POSTED

The following are the names of the groups that hosted the major part of the debate and the respective percentages: "Pedrógão Grande on Facebook" (8.9%), "Forest Policy in Portugal" (6.3%), "Indignation and Revolt" (5.82%), "Politics

for All" (5.3%), "Justice and Citizenship" (4.8%), "Pedrógão Grande News" (4.8%), "Proud to be a Firefighter" (4.2%), "Castanheirense" (designating the people of a town affected by fire, 4.2%), "Democracy and Citizenship" (4.2%), "Marinha Grande" (town close to Pedrógão Grande, 3.7%), "Movement Outraged by the Fires in Portugal" (3.2%), and Sacavém (town close to Pedrógão Grande, 3.2%). These names suggest that the key venues for debate were mostly 1) politically pronounced, by concepts such as justice, democracy, and policy; and 2) mostly local and territorially motivated, around the localities impacted.

#### 2) THE USER POSTING THE PIECE

"Individual" user is by far the most frequent category (89.8%) in the type of users. This indicates both the user-based composition of the abovementioned Facebook groups and the predominance of individual interactions in the dissemination of disaster information and social debate. The second salient category is "group/association" (4.9%), the majority of which are voluntary firefighting associations posting their status and emotions. The rest of the posts were by politicians (2.8%) and media (2.2%).

#### 3) THE VISUAL ELEMENT

Slightly more than half of the posts (52.7%) involve at least one visual, mostly a photograph of the wildfire, 5.1% contain video, and 42.2% do not have any visuals. Among publications with visual elements, in 25.8% of the pieces, the visual was judged to have a central place in the post.

#### 4) THE SOURCE OF THE CONTENT POSTED

News media content dominates the posts examined (34.8%), followed by reposted Facebook content (24.6%). About 10.7% of the posts involve links to outside Facebook, typically to online petitions, blogs, and YouTube videos. About 13.5% of the pieces refer to public/private initiatives, including associations, companies, and public institutions. While 5.8% of the posts refer to government sources, 5.5% refer to experts. Notably, only 4.5% of the posts rely on local or self-testimonies. This suggests that the Facebook debate on the Pedrógão disaster was heavily

linked to other media, with little “original” input uploaded to the platform.

#### 5) THE MAIN ACTOR IN THE CONTENT POSTED

The main actor was defined as the entity that plays the central role in the action described in the text and may represent the main cause, motive, or agent that triggers the narrated event. The most salient categories identified as main actors in the posts are the national/local government (35.5%) and victims/local population (29.5%). Together constituting almost two-thirds of all posts, these two categories can be seen as two key characters dominating the social media debate on Pedrógão Grande. While the victims or local population are obvious actors in a disaster context, the significantly higher number of posts featuring the government as the main actor suggests the responsible agency in containing the disaster. Of the  $N = 182$  posts coded for this category, the majority took issue with the national government ( $N = 114$ ) and a minority featured the various local governments ( $N = 68$ ) active in the fire-affected territories. Adding to these figures the posts centrally featuring the political parties of the opposition ( $N = 26$ ), the number of posts involving “politicians” gets even higher, confirming that the Pedrógão Grande incident turned into a national political debate. Other coded categories can be consulted in Table 2.

#### 6) CLIMATE CHANGE

Of the  $N = 512$  posts, only  $N = 16$  mention climate change (3.1%). The limited number of posts connecting the fire event and climate change, together with the primacy of the national political actors mentioned above, may indicate that while Pedrógão Grande transformed into a national-scale disaster, the debate did not exceed the national political framework. However, a further look at the posts for mentions of weather phenomena, including phrases like “extreme heat,” “wind gusts,” and “weather conditions,” yielded  $N = 68$  (13.3%) of the posts. This suggests that while explicit references to climate change were almost absent, attributions to extreme or unusual weather may be a significant part of the social media debate.<sup>2</sup>

#### 7) LAND-USE AND FOREST POLICIES

The  $N = 83$  posts involve mentions of land-use and forestry policies (16.2%). Compared to the limited space climate issues were offered, this relatively high number of posts suggests that there was considerable political debate focused on the local-/national-level policy and measures. Study 2 will zoom in this policy and political debate to examine whether this focus involves extended frames of global climate and environmental policies.

<sup>2</sup> It is important to note that the present study operates with the mere presence of the figures in posts, which should not be confused with attributions to extreme weather. As will be exemplified below in Example 3, not all of the posts that mention extreme weather attribute the fire event to weather conditions.

TABLE 2. Main actor code categories and frequencies.

Main actor	Frequency	Percentage (%)
National/local government	182	35.55
Victims/local population	151	29.49
Opposition party	26	5.08
Public/private initiative	68	13.28
Fire	42	8.21
Expert	18	3.52
Other	25	4.87
Total	512	100

#### b. Study 2: Criticisms and attributions of responsibility

In reporting this study, we offer exemplary extracts<sup>3</sup> of the  $N = 176$  posts the previous study categorized as involving explicit conflict or criticism (Table 1). Looking more closely at how the criticisms were organized in this smaller corpus of Facebook posts on the Pedrógão Grande fire, we identified that the vast majority (about 70%) took the national political scene as the background. They attributed responsibility and blame to political figures or politics broadly. In most cases, the political conflict was concrete, accusing the government, the prime minister, or other figures of national politics. There were also some—fewer—cases of generic criticism, without concrete targets. The first example is one of the latter. It is dated 18 August 2022, but it shares a post from 18 June 2017, the day after the onset of the Pedrógão Grande fire. The user’s only remark, before the shared post, is “The text is 5 years old but so up to date. The desk specialists have done nothing.” Under this remark, without any visuals, it presents the following post:

Example 1. 18 August 2022

What happened in Pedrogão Grande was announced years ago. The systematic abandonment of the rural world (magazine cover fancy) has long predicted a disgrace of this magnitude. Responsibility for what happened is, therefore, ours! All of it, without exception! All the country. From Lisbon to Castro Marim. From Porto to Velha de Rodão.

It’s our fault because for years we’ve been voting for idiots who promised the development of the interior through sports pavilions all abandoned today, roundabouts where no one passes.

It then continues for seven more paragraphs, repeating the same rhetorical format “It’s our fault because. . .,” exploring the tension between the urban (littoral) and rural (inland) Portugal, and emphasizing political responsibilities. While the depopulation of Portugal’s inland, one of the reasons very often connected to the magnitude of the fire disasters, is a rather particular national issue, the responsibility is attributed to a generic subject. That is, the “systematic abandonment” of the country’s interior is (i) a long process causing a “disgrace,” (ii) “our fault,” extending to “all the country” or culture, and (iii) because we have been voting for “idiots,” extending virtually to all politicians.

<sup>3</sup> Parts of the exemplary extracts are underlined to highlight the indicators of our inferences about the attribution of responsibilities.

When we return to the user who shared this post after 5 years, we find in her short criticism the same generic target. The actor(s) who did “nothing” 5 years after the fire, the “desk specialists,” may refer to all white-collar workers in Portugal, policymakers, or bureaucracy in general. In such posts that establish a conflict between the public and political elites in general, the criticism operates on national politics, but the temporal context covers years or decades, and the responsibilities tend to dissolve in national culture. The divide between the irresponsible politicians and the victimized public indicates a deep-rooted discontent with the political order and a distrust in politics overall. Still, the attribution of responsibility does not take the form of blame, involving any particular actor. It bears some similarities to what we identified as abstract “is–ought” criticisms, which distinguish between the actual (the case) and the virtual (what should be done), without identifying any locus of responsibility.

What follows is an example of those criticisms that point out issues, offering diagnoses broadly and abstractly and refraining from positioning against any actor or agency. It is believed that, due to this broad overview, the post is among the most liked and shared posts in the corpus:

Example 2. 18 June 2017

Dry thunderstorms, 45 degrees in the shade, and winds gusting over 150 km/h created the inferno, the perfect storm, with flames over 60 m high. It's not the fault of the firefighters, nor of Costa [the Prime Minister], nor of any other politician in his place. If we want to find those responsible for this tragedy, which isn't over yet, we'll have to dig deeper. We will have to change an entire model of life and planning. The desertification of the rurals; the economic devaluation of indigenous forest; monocultures; the work of agricultural machinery in the heat; the fears and resulting huge fences that become obstacles to human movement; the lack of road maintenance; the festivities that insist on having pyrotechnics during the summer.

The list extends, but the claim is clear: We need to “dig deeper” and “change an entire model of life and planning.” Once such an abstract and overarching claim is set forth, a reasonable critic is almost obliged to unpack and offer some specificities. Such a position is advanced with a huge list of “particular” issues, most of them still posed in a generic manner (e.g., monocultures), waiting to be “filled in” resorting to the relevant argumentative content knowledge (Goodwin 2020). One may say that in simply mentioning or listing those issues, the critic assumes the responsibilities that are sometimes structural (e.g., economic devaluation of indigenous forests) and other times local (e.g., lack of road maintenance). However, in the absence of explicit discursive indicators, such responsibilities are dissolved into a generic frame of what “is” and what “ought be” done and the ambiguous agency of “we.” In other words, instead of exploring the listed issues, the critic appeals to the positions shaping the ongoing societal debate. This address to the societal debate itself endows the criticism with its metalevel character (Krabbe and van Laar 2011).

It is not possible to identify an explicit link or hierarchy between the listed issues; one can say the first on the list would have more priority for the critic than, say, the sixth issue. In

this regard, the problem mentioned first, the “desertification of the rurals,” refers in this debate to the depopulation of the agricultural and forest communities. Also listed in the first place in our first example, the “abandonment” of the rural world is the most salient issue in our corpus.

Connections to climate change are made implicitly, if at all, through weather extremes, i.e., conditions that “created the inferno.” One may claim to find a causal attribution in this reconstruction. At the risk of reading too much between the lines, one may also say that when we dig deeper to find “systemic” solutions, a hydrocarbon-based growth economy and a wrecked climate could appear as underlying causes. However, in the absence of further clues than “45 degrees in the shade,” the efforts to connect the listed issues with climate and “chang[ing] an entire model of life” remain a task and a problem for the analyst. It is safer to categorize the post as a generic call for change, seeking in the disaster deeper motivations to change more than a minister or mayor.

As mentioned above, the criticisms without a specific target of attribution characterized a minor part of the posts. It is possible to contrast the generality of the criticisms exemplified above, with the specificity of the target in the third example. On 23 June 2017, a week after the fire, a post in the group Justice and Citizenship targets the government and the Portuguese Institute for Sea and Atmosphere (IPMA), by designating their relationship as “cynical and indecorous”:

Example 3. 23 June 2017

I've tried to avoid discussing political responsibility for the Pedrogão Grande fire: it's early days, I have little information and I'd rather not run the risk of being unfair. But this much is abuse.

The government initially tried the classic media strategy of damage containment, downplaying what was happening. So far, this was in line with the cynicism typical of almost all governments in such circumstances. And the likelihood of success in this communication operation would have been very high, had it not been the case that it was impossible to downplay the scale of the human catastrophe.

The government quickly turned the needle and now spends all its time trying to consolidate the idea that exceptional and unpredictable weather conditions have occurred and no one can be prepared for the unknown. In this attempt at manipulation (. . .), the scientific credibility of the theory that absolutely exceptional and unpredictable weather conditions have occurred (. . .) plays an essential role. (. . .) By lending itself to pure political manipulation like the one that has been set up, (. . .) IPMA diminishes itself and undermines its credibility, contributing to the distrust of ordinary people toward a state that is completely beholden to the political convenience of the government.

The post starts by constructing a contrast between a reasonable critic, who is aware of the risks of “discussing political responsibility” in the “early days” of a disaster, and an actor who abuses such a reasonable critic. Next, the responsibility and doings of two well-specified agents are exposed: the government and the IPMA. Accordingly, the government carried out a “communication operation,” regarded as “typical,” to downplay the scale of the disaster. When the containment of the “damage” to the image of the government was no longer

possible, this communication “strategy” was updated to certify the event as exceptional. It is in “this attempt at manipulation” that IPMA enters the plot, precisely to certify, as the voice of science, “the theory that absolutely exceptional and unpredictable weather conditions have occurred.”

Intriguingly, the “theory” about exceptional weather seems to belong to the government. The IPMA merely “lends itself” to the government’s “pure political manipulation.” That is, by offering evidence of the extreme weather conditions that contributed to the scale of the disaster in a manner and timing that is convenient for the government, IPMA becomes part of a government plot and “undermines its credibility.” This reversal and complex of agency in proposing, certifying, and defending the theory of extreme weather can be seen as part of the long-lasting controversy on the politicization of climate science (see Üzelgün et al. 2016). What characterizes this example is the criticism of the government’s attempt at deflection of responsibility: The disaster’s connection to exceptional weather conditions is rejected, along with the IPMA, because it relieves the government of responsibility. It is not clear to what extent climate science is discarded here. As the post seems to discard the very notion of exceptional weather without any qualification or concession, we can say the scientific discourse on EEA is regarded as “political manipulation.” The critic seems to require, without any view of the evidence, a scientific institution to differ from the political authority. This may be one popular or “lay” version of the legitimate criticism raised by Lahsen and Ribot (2022). In this version, the disaster seems to operate as a confirmation of how crippled the system is.

The analysis presented above suggests that an intense focus on specific actions and institutions (e.g., IPMA) without recourse to a more generic level (e.g., climate extremes, climate science) may render an otherwise legitimate criticism unreasonable. The complex interplay of the climate, weather, science, government, and other loci of responsibility will be discussed in the final section.

The next example was posted in a group entitled “If the Environment Talked” (Se o Ambiente Falasse), which declares itself as “a space to debate the environment in Portugal.” The user signed the 15-paragraph-long post with his name, city, and the date (21 March, Global Forest Day). Entitled “National Dendrophobia,” the post commences arguing that Portuguese people like only small trees in the city and in the rural world only those that yield wood rapidly. The trees are then “pruned (mutilated) to exhaustion” and “burned regularly.” The author refers at this point to a “great agronomist and forester” who wrote about “National Dendrophobia” in Portugal in 1959. While dendrophobia may be understood as a fear of trees, it is duplicated with the unusual term “dendroclasty.”<sup>4</sup> According to the author

of the post, national dendroclasty (dendroclastia) reached its peak in 2018, in the aftermath of the Pedrógão Grande fire, with a governmental “paper” that follows the decree law 124/2006 and its “modern” appendix, DL 10/2018:

Example 4. 22 March 2018

The aforementioned 2006 decree law was already so dendrophobic and nonsensical that no one paid it much attention and it spent 12 years gathering mold. . . ; but in 2018 the government resurrected it and made an appendix to it, followed by the aforementioned “paper” that reaches the absurd: cut down everything that is trees and bushes, 50 m around isolated houses and 100 m around settlements.

In circulating designations like “dendrophobic,” the post thus takes a strong position in the heated debate about the government’s 2018 measures to keep the roadsides and settlements “clean.” There is indeed evidence that firebreaks and vegetation management may involve more nuanced approaches than in the legislation (Cui et al. 2019). The responsibility here is thus clearly attributed to the government, with further nuances:

Example 4 (continued)

What about the bushes? Bee food, biodiversity refuge, soil defense guarantee against erosion, cattle grazing; are they also for eradication? Are we going to continue, for another year, to spend money on planes, other fire-fighting equipment and compensation just to protect the assets of companies, i.e., the forests exploited, directly or indirectly, by cellulose companies? Cellulose that burns in summer and . . .

The post then continues, using Global Forest Day as a kairotic resource, to emphasize the difference between a monoculture plantation and a forest. In this contrast, eucalyptus is regarded as “cellulose,” a private asset “that burns in summer” and consumes public funds for protection, while authentic species are recognized with their great “local,” “familiar,” and ecological values. The misdeed ascribed to “the legislator” is then to “eradicate” those values by “only thinking about defending the eucalyptus.” Like in the previous example, here, if the government is the prime responsible actor in the broader national dendrophobia, this is due to its (vicious) relation to another underlying cause—a species that yields cellulose fast.

Again, it is possible to identify a complex of specific and generic issues/causes that underlie the fire disaster and that are connected in a particular way: The government’s legislation is the primary and specific target. If unpacked, behind the contestation of this legal act, we find a high-yielding tree species (specific), its misuse or exploitation (generic), cellulose companies (generic), the use of firebreaks—50 m—that amount to “eradication” of local value (specific), a particular (mis)understanding of the notion of forest (specific), associated with a fire suppression regime (generic), and, ultimately, a national culture of fear of the bushes (generic) exacerbated by the fire disaster—and the legislation institutionalizing it.

<sup>4</sup> The invented term is derived from Greek dendron (tree) and klan (to break). It can also be connected to various notions of an iconoclast, e.g., against trees as natural beings, against trees being symbols of worship.

TABLE 3. Clusters of causal attributions.

Category	Causes
Cultural	Lack of land registry; outdated land-use planning; land-ownership dispersion
Government	Maintenance of infrastructure; failing public services; power lines; lack of care for the inland
Demographic	Depopulation; migration to coastal cities; aging population
Industry	Fast-yield crops; low-maintenance crops; eucalyptus; monocultures; changing meaning and value of forest
“Fuel”	Bad vegetation management; abundance of flammables; lack of “cleaning”
Climate	“Downburst,” extreme heat; extreme winds, drought; climate change
Crime	Arson; pyromania; lack of protection; insufficient forest guardship

### 3. Conclusions

We now summarize and discuss the main findings and implications of the two studies together. First, in the 7 years of social media debate after the Pedrógão Grande fire disaster, the key actor(s) and the main address of criticisms were the government and the politicians at large. This confirms the trends observed in other countries and contexts (Hovardas 2014; Undurraga et al. 2022; Walker et al. 2020). In relation to this point, and responding to the first research question, the central conflict was between a victimized people, especially the people of the “interior” Portugal, and the politicians, sometimes incompetent and other times villainous. Political blame had several targets, extending from specific figures like the prime minister to all the Portuguese politicians or all political culture. Most of the criticisms used the shift between the specific and the general as a discourse pattern or strategy, aligning several actors, contexts, and issues for constructing a powerful diagnosis and a consistent critical position. We will discuss this point further below.

The concoction of various targets and criticisms is also evident in the blame attributed to the government vis-à-vis its various agencies/responsibilities before and after the disaster. Lack of land-use planning, disregard for the country’s inland, low levels of disaster preparedness, and failure of disaster response systems are among the first group of responsibilities, and attempts to cover up the disaster’s extent, corruption in disaster aid, lack of transparency in aid distribution, and lack of significant policy change are among the second group. Such criticisms were available in the very same message, evoking different authorities and responsibilities, sometimes aligned also with other issues that fall outside the category of political responsibility. This resonates with the media coverage of disaster events, which often differentiates between national and local governments, assigning a more negative position to federal than local authorities (Ali and Gill 2022).

Second, climate change was very seldom used in the social media debate on the Pedrógão Grande fire. However, this does not mean that attribution to climatic phenomena was completely absent. It was rather implicit in the posts that use extreme weather as a token for climate change. The implication here for further studies on extreme weather attribution discourse concerns the limits of the use of the keyword “climate.” While it may be useful for detecting direct or explicit attributions, relying solely on the keyword will miss indirect or implicit attributions, the significant part of climate-relevant attribution discourse in our corpus.

Third, in the relatively smaller space left from the discourse of political responsibility and blame, the fire disaster was attributed

to a variety of causes (Table 3). These attributions were not neatly distributed across different posts, users, or years; rather, the same post many times involved an alignment or hierarchy of various targets and issues. As we exemplified, it is possible to encounter in one post that the Portuguese government is to blame, due to recent legislation that threatens the Portuguese rural world, which is due to an unreasonable understanding and application of firebreaks, itself due to both a (mis)understanding of what a forest is, and a one-sided focus on eucalyptus, which is due to it being a high-yielding tree species, exploited by cellulose companies, whose costs for fire suppression are shouldered by public funds, while a national culture of fear of the forests is exacerbated by each fire disaster. Snapshots of complex responsibility attribution, indicating such cascading causal relationships, are reported in several other disaster contexts (Baykal Fide 2022; Hovardas 2014; Lidskog et al. 2019).

The difference between the findings from our study 1 and study 2 may call into question the postdisaster political blame discourse, a salient finding in the literature focusing on the aftermath of EWEs (Ali and Gill 2022; Figueiredo et al. 2024; Hovardas 2014; Karyotakis 2021; Undurraga et al. 2022). Study 1, focusing on the content, confirmed that political responsibility and blame have a significant role in postdisaster contexts. Drawing only on the content analysis, the mediated debate on the Pedrógão Grande fire may be depicted as locked into two main actors, a debate on political accountability with limited reference to other causal factors. However, paying attention to argumentative detail, study 2 indicated that disaster attribution discourse operates with complex causal constructions, connecting several actors, issues, and layers of responsibility. This has significant implications for further studies. The risk is to reduce complex political and discursive relationships to the government’s liabilities: The primacy of state actors may overshadow other relevant factors such as companies and structural and cultural factors. In this regard, the exclusive coding of categories of attribution may fail to capture the complex relations of discursive blame and causal attribution. In relation to this, theoretically guided interpretative analyses, for instance, with a narrative or argumentative focus, could yield more depth than content analysis.

This study thus calls for more detailed attention to causal claims and attributions in public discourse, especially in disaster contexts that may be associated with a policy window (Brundiers and Eakin 2018). Systematic treatment of causal claims and relationships may inform policy not just in addressing local vulnerabilities but also in how they play out in and transform the long-term global trends. In other words, to be able to identify whether attributions to climate change are “inadequate”

or “misleading” (Lahsen and Ribot 2022, p. 7), we call for more attention to how the multifold connections between several levels of specificity are organized in attribution discourse. Identifying how various actors, issues, and criticisms are aligned in varied sequences, networks, or hierarchies of responsibility may inform an integrated framework for addressing the trade-offs between multiple temporal and spatial scales. The present study is limited in this regard; a more systematic treatment of discursive arrangement of the objects of attribution, e.g., a method for examining complex causal claims, is a goal for the future.

Whether it will stage as the cultural dissolution or the technological conquest of climate, extreme weather will likely be an interface open to the possibility of a cosmopolitan vision (Beck 2011). The public salience of the connections to general and structural issues like climate change is thus consequential for re-envisioning land-use, economic, and insurance policies, as well as regional resilience. To open the societal debate on EWEs and disasters to broader concerns of climate and sustainability without jeopardizing local concerns and exigencies, communicators should pay more attention to the connections between the various layers of agency, issues, responsibilities, and evidence involved. While each weather disaster case would afford its own concatenation of the various issues and responsibilities, the patterns common to different EWEs and economies may help better understanding, communicating, and addressing the impending disasters.

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*Data availability statement.* The data used in this study are available in open access on the Figshare platform, through the following link: <https://doi.org/10.6084/m9.figshare.29133086>. The repository brings together the coded database of the Facebook publications analyzed, as well as the code dictionary that describes the variables and categories applied in the analysis.

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