

COMMENT

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# The DANA disaster: unraveling the political and economic determinants for Valencia's floods devastation

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## Abstract

On October 29, 2024, the DANA (*Depresión Aislada en Niveles Altos*) floods devastated the Spanish region of Valencia, resulting in 224 fatalities, extensive infrastructural destruction, and profound physical and mental health impacts. This analysis examines how political neglect, systemic corruption, and historical policy legacies exacerbated the disaster's consequences. Corruption-driven urbanization of flood-prone areas during Spain's real estate boom (1997–2007), coupled with the systematic reduction of critical emergency infrastructure and inadequate emergency response protocols, highlights a political agenda misaligned with public welfare. The political discourse following the disaster has been marked by a lack of accountability, with public outrage culminating in mass protests. As Valencia confronts the aftermath, Spain faces a critical moment to demonstrate whether it can uphold democratic principles, prioritizing public welfare, and addressing the institutional and political-economic deficiencies exposed by the DANA floods.

**Keywords** DANA, Flash floods, Climate change, Global warming, Health policy, Urban planning, Public health

In October 2024, the Spanish region of Valencia faced its most devastating meteorological event of the century. The DANA (*Depresión Aislada en Niveles Altos*), or “cold drop”, is a weather phenomenon typically characterized by intense rainfall and flash flooding. However, in 2024, it escalated into an unprecedented catastrophe, claiming 232 lives, including 224 in the autonomous province of Valencia [1]. As the waters receded, they revealed not only widespread damage but also pressing questions about the role of political and economic decisions in exacerbating the disaster's impact. As a new year begins, it is crucial to critically reflect on such events to draw lessons that might help prevent future tragedies.

This article examines the economic and political factors that contributed to the high death toll from the DANA floods, highlighting shortsighted policy decisions and the lasting effects of past policies. Specifically, we explore how critical mechanisms, such as (i) corruption-driven

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urbanization in flood-prone zones, (ii) systematic dismantling of emergency response infrastructure, and (iii) a history of mismanagement, created the conditions for a disaster that could have been mitigated.

### Valencia: a region at risk

Situated on Spain's eastern coast, the province of Valencia is highly susceptible to extreme weather events. The region experiences prolonged dry spells interrupted by intense rainfall, with interior mountains forcing Mediterranean air to rise, leading to condensation and heavy precipitation that flood low-lying coastal areas via seasonal waterflows [2, 3]. Global warming has further amplified these risks, as polar warming increases jet stream deviations, introducing cold air into lower latitudes and intensifying weather phenomena like the DANA [4, 5]. According to the National Meteorology Agency, October 2024 recorded the highest rainfall in Spain's history, with stations in Valencia's interior municipalities registering over 770 L per square meter within 24 h, surpassing the region's typical annual rainfall within just eight hours [6].

The city of Valencia, the capital of the region, and surrounding municipalities lie on a flat alluvial plain adjacent to a riverbed, making them particularly vulnerable to flooding during heavy upstream rainfall [7]. The region has a well-documented history of floods, including the 1957 Turia River overflow, which claimed 81 lives in Valencia city, and the 2019 floods that resulted in six deaths in Alicante [2, 8].

### Political and economic determinants of the DANA flood impact before and during the disaster

While the severity of the DANA flash floods was directly influenced by exceptionally intense rainfall, political and economic decisions likely exacerbated the disaster's impact [9–11]. The following analysis explores these interconnected contributing factors, beginning with the political legacy of urban planning policies preceding the floods, followed by the immediate decisions made during the crisis, the missteps in early disaster response and recovery efforts, and ultimately the deeper political context in Spain.

#### Unregulated urban expansion in flood-prone areas

Following the 1957 flood in the city of Valencia, the Turia River was rerouted via a 12-kilometer-long canal south of the city center to shield the capital from future flooding [12]. However, this so-called “*Southern Solution*” plan failed to account for the incipient expansion of southern municipalities such as *Torrent*, *Picanya*, *Paiporta*, *Benetússer*, *Sedaví*, *Massanassa*, and *Catarroja* – areas severely impacted by the 2024 floods. These communities remained highly exposed to flash floods from seasonal watercourses such as *la rambla del Poyo*

[13], highlighting the unequal distribution of protective infrastructure [14, 15]. As the regional capital and wealthiest city, Valencia benefited from flood defenses, while smaller neighboring municipalities faced chronic neglect, exacerbating economic inequalities both within the region and the city itself.

Urban planning in Valencia has historically prioritized private interests over public safety. As Juli Pausas, a researcher from the University of Valencia, described, “*The intensity of the DANA does not align with the severity of the tragedy*”, pointing to an urban model driven by financial gains with limited attention to resilience [9]. During Spain's real estate boom (1997–2007), rapid urban expansion led to extensive construction in flood-prone areas, including land previously classified as non-developable, despite well-documented flood risks [16]. Between 2003 and 2006 alone, over 50 million square meters of non-developable land were reclassified outside official urban plans, with an additional 90 million square meters pending approval by 2006 [16]. Uncontrolled urban expansion, which neglected green spaces, led to the rapid proliferation of impervious surfaces such as roads and buildings, reducing natural water absorption and eliminating buffers that could have mitigated excess water and alleviated pressure on overwhelmed drainage systems [17, 18]. As a result, flooding exposure increased by over 250% by 2011 following the collapse of the real estate bubble [19].

#### Corruption and governance failures in urban planning

Unregulated urbanization has been widely recognized by socio-environmental scholars as a major driver of flood disaster risk [19–21]. Inefficiencies of municipal authorities responsible for hazard management, including civil protection agencies and urban planning departments, combined with the lack of regulatory enforcement by regional and national authorities, amplify public exposure to natural disasters [19–22]. This phenomenon, known as *institutional vulnerability*, describes how these institutions, as social systems responsible for disaster preparedness, are highly susceptible to external pressures, with corruption being one of their greatest weaknesses [19, 23].

In Valencia, institutional vulnerability has played a central role in urban expansion into flood-prone areas, disregarding long-term environmental assessments and contributing to the catastrophic consequences during the October 2024 floods. From the mid-1990s to 2011, the Valencian Community was governed by a single right-wing party, which dominated the regional parliament and most local councils, securing absolute majorities and enabling opaque governance structures to flourish [20]. A deeply entrenched political-clientelist network permeated municipal and regional institutions across Valencia,

fostering corrupt land-use practices during the real estate boom [20].

The prevailing socio-economic context during this period prioritized speculative development over environmental sustainability, with urban growth perceived as a guarantee of economic prosperity. The political-clientelist network in Valencia functioned as a mutually reinforcing system of exchanges between municipal public officials, private real estate developers, and political elites [20, 24]. Corrupt practices, including bribery, kickbacks, and the manipulation of public contracts, became part of many land reclassification processes [20].

Private real estate developers routinely incentivized municipal public officials to approve zoning changes and land-use modifications that permitted construction in previously non-developable flood-prone areas. Municipal officials, including mayors, city council members, and urban planning regulators, would employ mechanisms such as *modificaciones puntuales* (express modifications) and *homologaciones modificativas* (modificative homologations) to bypass legally mandated reviews and public consultations, expediting urban expansion driven by private interests rather than public welfare [16].

The 2013 Ley de Costas, which reduced protected coastal zones from 100 m to 20 m in urban areas, further facilitated construction in vulnerable coastal regions [25]. Enacted in a context of high urban pressure and impoverished local councils, this legislation enabled local governments to attract investment and tourism-driven development. As a result, Valencia's Mediterranean coastline, one of the most heavily developed tourist destinations in the world, saw a sixfold increase in buildings within a single decade [19], further exacerbating vulnerability to climate-related events.

Following the collapse of the real estate bubble in 2008, more than 80 corruption cases were uncovered in local councils across the Valencian Community, exposing a system of bribery, fraud, and abuse of power [20]. High-profile investigations such as Brugal (2010) and Gürtel (2009) and the later exposed Caso Azud (2017) implicated not only municipal officials but also high-ranking regional politicians, including the regional president and over 160 senior political figures accused of influence peddling, bribery, money laundering, and falsification of documents related to reclassification deals [20, 24, 26, 27].

The impact of corruption on disaster preparedness and response is not unique to Valencia but has also been studied in international contexts [21, 28–32]. For instance, Gustavo García-López and Fernando Tormos-Aponte have examined how political clientelism shapes disaster recovery efforts, showing that post-disaster aid distribution frequently follows patronage networks rather than addressing the most deprived populations [30, 32, 33]. According to the authors, after Hurricane María (2017)

in Puerto Rico, energy restoration and disaster aid were allocated based on political influence rather than need, prioritizing wealthy and politically connected areas while marginalized communities remained without power for months. As seen in Valencia, Puerto Rico, and other natural disaster events, corruption and political clientelism in disaster governance are major drivers of institutional inefficiency, leaving vulnerable communities disproportionately exposed to environmental hazards.

### **Defunding and inefficient emergency response infrastructure**

Compounding the failures in urban planning, the inadequacy of early warning systems and the ineffectiveness of emergency response mechanisms further exacerbated the impact of the 2024 floods. Following the 2023 regional elections, the Valencian government, led by Carlos Mazón, dismantled the Valencian Emergencies Unit, a specialized coordination body established after the 2019 floods, arguing that it was a “superfluous expense” [11]. With a budget of €9 million in 2023, this unit was specifically trained to accelerate responses during large-scale crises. Its elimination likely contributed to the delayed and inadequate response to the 2024 DANA floods, with some sources directly linking the absence of coordinated emergency management to the increased severity of the disaster and high death toll [11, 18, 34].

The political decisions surrounding the immediate disaster response further revealed critical flaws in communication, coordination, and crisis management systems. On the day of the floods, the Spanish National Meteorology Agency upgraded the weather alert to red for northern and southern Valencia at least eight hours before the flash floods [35]. Similarly, the *Confederación Hidrográfica del Júcar*—the governmental agency responsible for managing water resources in the region—issued multiple real-time alerts regarding rising water levels and emergency scenarios. However, national media claimed that the Valencian government failed to act promptly, instead referring to an “information blackout” during the critical hours leading up to the flood, alongside uncertainty over whether regional or central institutions had the authority to activate the response [36–40]. In fact, at 1:00 PM (approximately seven hours before the floods) Valencian President Carlos Mazón held a press conference claiming the storm would dissipate by 6:00 PM [41]. This statement, made while emergency services were issuing alerts about rising river levels, provided misleading information and created a false sense of security among the public.

The mass emergency cell phone alert (ES-alert) was not issued by the Valencian government until 8:11 PM on October 29, 2024, when floodwaters had already reached catastrophic levels. By this time, many areas

were already inundated, and numerous residents were trapped or deceased [42]. While early warnings could not have prevented infrastructure damage, timely alerts urging residents to move to higher floors could have significantly reduced the loss of life. In affected areas such as *Païporta*, *Catarroja*, and *Alfajar*, residents were unaware of the imminent flash floods due to the lack of rainfall in their vicinity, leading many to attempt moving their vehicles from underground garages or remain in ground-floor level apartments [43–45]. Older adults were disproportionately affected, as many lived in ground-floor units and were unable to evacuate in time as waters reached up to 1.8 m in height within seconds. More than half of the fatalities—a total of 104 people—were individuals over the age of 70 [46]. These systemic failures underscore the urgent need for improved inter-agency coordination, robust public alert systems, and stronger political accountability to ensure timely and effective disaster response.

#### **Austerity, neoliberalism, and the erosion of disaster preparedness**

The impact of austerity policies on disaster preparedness is evident in the region of Valencia, where fiscal conservatism has often taken precedence over social welfare and public safety [47], as illustrated by the events discussed in the previous section. Following the 2008 financial crisis and subsequent recession, during which GDP declined by 5.2% and unemployment surged from 8.6% in 2007 to 25.7% by 2013, Spain enacted austerity-driven budget cuts that significantly reduced public spending on critical services, including healthcare, social protection, and civil protection programs essential for disaster preparedness [48, 49].

The long-term effects of such policies have been particularly pronounced in regions governed by conservative parties for extended periods, such as Madrid and Valencia, where city administration has been guided by neoliberal principles [50]. As a result, underfunded emergency response infrastructures have weakened the capacity of local governments to respond to crises, as seen during the DANA floods and previously the COVID-19 pandemic [51, 52].

Paradoxically, these austerity measures coexisted with neoliberal urban economic strategies, which funneled public resources into speculative real estate developments, mega-events, and large-scale infrastructure projects, while neglecting essential public services [50, 53]. In Valencia, right-wing governments prioritized investments in high-profile projects until 2012, including the America's Cup (~€2.06 billion), the City of Arts and Sciences (~€1.3 billion), and the Formula 1 Street Circuit (~€235 million), leading to massive public debt and diverting funds from critical social infrastructure [50, 54].

By 2012, the Valencian regional government had accrued the highest debt-to-GDP ratio among Spain's autonomous regions, at approximately 30% [55]. For example, in the Formula One fiasco, the government invested over €200 million in an unprofitable racing event, sustaining it with public funds for five years despite continuous financial losses, leading to several corruption indictments [56].

This prioritization of high-profile projects over essential public investments has had profound consequences for disaster preparedness and emergency response. The hidden vulnerabilities of this economic model became visible during the 2024 floods, as underfunded public services, fragmented institutions, and growing inequalities in access to protection measures left municipalities surrounding the regional capital unprotected against environmental hazards, and increasingly exposed to climate-related disasters.

#### **When the waters receded: political and societal responses**

Recovery efforts in the early days after the DANA disaster in Valencia were severely hindered by a lack of timely and coordinated emergency planning, exacerbating long-term consequences for affected communities. Deflection of political responsibilities between regional and national governments was also evident throughout the process. During the escalating crisis, Valencia's president Mazón tried to shift the blame onto the Spanish government and the Military Emergencies Unit (UME) for delays—a claim refuted by the UME commander [57].

Neither the regional nor central government declared a state of alarm, as was done during the COVID-19 crisis [58]. The central government's reluctance to classify the disaster as a Level 3 emergency of national interest restricted large-scale resource mobilization, leading to bottlenecks in aid distribution and potentially delaying responses to inadequate temporary housing and immediate mental health interventions for displaced residents [58, 59].

The day after the tragedy, President Carlos Mazón requested military support from the central government, initially deploying only 500 troops, a number that increased to 1,200 within 48 h and 10,000 after three days [57, 60]. However, the incremental nature of these efforts, prompted only after mounting social and political pressure, left the response fragmented and largely insufficient [61]. The failure to implement a coordinated recovery strategy likely prolonged the humanitarian crisis and exacerbated social inequalities, as deprived populations are more likely to face disproportionate barriers to accessing financial aid and new temporary or stable housing.

Delays in relief distribution can further compound mental health impacts, worsening trauma associated



with financial losses and prolonged reconstruction efforts [62]. Such delays have directly affected those impacted by the DANA floods. Despite public commitments by the national government to allocate 16 billion euros in aid, reports indicate that nearly two months after the disaster, only 5% of the 30,000 claimants had received funds [63].

In response to government inaction, a strong grassroots movement emerged, with communities self-organizing to fill the void left by delayed official responses. In the immediate aftermath, up to 100,000 volunteers from community organizations, civil society groups, and neighboring municipalities, as well as individuals from other regions of Spain, played a critical role in disaster relief. Self-coordinated volunteers relocated displaced residents, cleared debris, provided food, restored essential services, and created emergency landmark maps using digital platforms such as WhatsApp, phone calls, and social media [64].

The prompt civil society-led response to a natural disaster exemplifies the concept of *autogestión* or self-governance, in which local social capital and collective identity become instrumental in mitigating disaster impacts [65]. Daniel Aldrich's extensive research on community resilience in disaster recovery highlights that grassroots mobilization not only facilitates immediate relief but also challenges entrenched power structures by advocating for participatory decision-making and equitable resource distribution [65]. While mutual aid networks can temporarily compensate for state failures, they also underscore the urgent need for structural governance reforms, a critique that has similarly been applied in the United States [66]. However, despite their role in enhancing immediate recovery and fostering local empowerment, grassroots responses face inherent limitations such as constrained resources, scalability, and coordination, requiring state support and policy changes to ensure long-term disaster preparedness [67].

Valencian and Spanish civil society strongly amplified demands for political accountability and action through three large-scale demonstrations calling for the resignation of Valencian President Carlos Mazón. These protests, each with approximately 100,000 participants, reflected deep societal grievances, with slogans such as, “*We still demand justice*” and “*Our president continues to lie*”. Two months after the disaster, during a demonstration on December 29, 2024, protesters continued to emphasize the avoidable loss of life, claiming: “*Many lives were lost, and it could have been avoided*” [68]. Despite widespread public condemnation, the government remained unresponsive, and President Mazón retained his position without consequence.

## The DANA 2024 impact

The devastating impact of the 2024 DANA floods had far-reaching consequences for the Valencia region and its residents. The floods severely damaged infrastructure, including roads, railways, bridges, and public buildings, with repair costs estimated at €2.6 billion [69]. The economic toll was significant, particularly in tourism and agriculture, with over 1,800 businesses destroyed, 4,500 damaged, and insurance claims totaling at least €3.5 billion, contributing to job losses and economic instability [70]. Valencia's tourism industry, a pillar of the regional economy, experienced immediate cancellations and long-term reputational damage, while the agricultural sector, known for its citrus and rice production, suffered extensive crop destruction and long-term soil degradation. In total, more than 325,000 people were affected, with over 75,000 in the “*zona cero*”, the most heavily impacted area [71].

Beyond the staggering death toll of 224 residents, the public health impact will be disproportionately severe among vulnerable populations. While official public health assessments remain unavailable, regional institutions and society must prepare to address the long-lasting physical, social, and mental health impacts. Previous research shows that post-traumatic stress disorder (PTSD) is common among those who experience forced evacuation, destruction of homes, or loss of loved ones, with symptoms including flashbacks, nightmares, and emotional numbness [72, 73]. Displacement can disrupt social support systems, leading to feelings of isolation and loneliness, particularly among older adults who may lose contact with neighbors or caregivers [73, 74]. A recent report from the European Environment Agency [73] highlights that older adults are highly susceptible to mental and physical health complications, especially when relocated abruptly or forced to live in damp, unsafe housing. Similarly, children face an elevated risk of PTSD, anxiety, and depression, often experiencing behavioral changes, developmental delays, and increased vulnerability to waterborne diseases such as *E. coli* and *Salmonella* [73]. Low-income communities and rural populations can be disproportionately affected due to limited access to recovery resources, lack of flood insurance, and forced displacement, further deepening pre-existing social inequities.

## Final remarks: deeper causes and reflections on resilience

A critical question arising from this analysis is how long-standing political legacies have shaped the conditions enabling corrupt urbanization practices, lack of political accountability, and the evident erosion of welfare principles during and after the DANA floods. These events cannot be fully understood in isolation but must be

examined within the broader historical and political context that has shaped Spain's contemporary governance structures.

In his book *Democracy Without Justice in Spain: The Politics of Forgetting*, Omar Encarnacion [75] provides an extensive analysis of how Spain's democratic transition was uniquely constrained by the very structures of the preceding authoritarian regime. Unlike other democratic transitions in Southern Europe, Latin America, or post-communist states, Spain's shift from dictatorship was not the result of civil war, social upheaval, or external intervention. Instead, it was orchestrated from within, led by reformists within the Francoist government, while existing state institutions remained largely intact [76]. This internal transformation left the institutional-bureaucratic structures largely unchanged, resulting in the continuity of practices and personnel from the authoritarian era, which was marked by a lack of transparency and accountability within the democratic framework [75].

The negotiated "Pact of Forgetting" during the transition aimed to move past the Civil War and Francoism, but it also created a space where accountability for past actions was limited and a culture of impunity could take root [75]. This pact resulted in a broad amnesty law granting immunity for political crimes committed before 1977, shielding perpetrators of corrupt practices and human rights abuses from the Franco regime from prosecution [75]. The institutionalized impunity established through the Pact of Forgetting shares similarities with dysfunctions in Spain's post-authoritarian politics, including opaque political bargaining and corruption among public officials, as evidenced by the decades-long corrupt urban development practices in the province of Valencia and President Mazón's refusal to resign despite widespread democratic calls for accountability.

Beyond historical legacies, persistent political polarization between Spain's two major parties, the People's Party and the Socialist Party, has further obstructed meaningful governance reforms aimed at enhancing transparency and implementing unified welfare policies, including civil protection measures for natural disasters. Successive governments, regardless of political affiliation, consistently deprioritized critical flood mitigation projects, including long-standing proposals since 2001 to redirect water flows in southern Valencia through alternative drainage routes outside urban areas [10].

In the wake of the DANA floods, citizens in Valencia are demanding political accountability, calling for transparency and the prioritization of public welfare over partisan and economic interests to protect them from future natural disasters, as global warming intensifies the severity of extreme weather events.

Despite decades of research showing a strong technical understanding of natural hazards, disasters continue

to be exacerbated by governance failures and institutional inefficiencies, unfolding with tragic regularity [77]. Rather than prioritizing increasingly detailed scientific data, efforts should focus on fostering the political will and institutional accountability necessary to implement established mitigation measures that save lives, protect vulnerable communities, and reduce future disaster losses.

## Conclusion

The health impacts of the DANA floods are not confined to the immediate aftermath. Prolonged displacement, financial strain, and the challenges of rebuilding destroyed houses and businesses will contribute to long-lasting mental health impacts and an economic burden in the region of Valencia. The potential for subsequent extreme weather events due to climate change requires comprehensive preparedness and resilience strategies. Investment in disaster-resilient infrastructure and urban planning must be prioritized in policy agendas and budget allocations to mitigate the future impact of similar events.

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## Author contributions

P.G.H. and C.M. conceptualized the manuscript. P.G.H. drafted the main manuscript text. C.M. critically reviewed the manuscript content. D.Y. participated in the collection of relevant literature sources. All authors reviewed the manuscript. The views expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions.

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## Data availability

No datasets were generated or analysed during the current study.

## Declarations

### Ethics approval and consent to participate

This commentary reflects the perspectives of the authors, informed by publicly available media reports, published literature, and their own experience. The first author visited the flood-affected area in Valencia two months after the disaster and engaged in informal conversations with residents to better understand the events. However, all information included in this manuscript was derived from public secondary sources and does not involve data linked to individual identities or personal information. Consequently, ethical approval was not required or sought for this work.

### Consent for publication

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### Competing interests

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