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TWEETING THROUGH THE FLOODS: SOCIAL MEDIA NARRATIVES, SENTIMENTS, AND PUBLIC MOBILIZATION DURING PAKISTAN'S 2022 FLOODS

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Abstract:
The 2022 Pakistan floods caused unprecedented humanitarian and infrastructural devastation, affecting millions and drawing global attention. Social media platforms, particularly Twitter, emerged as critical tools for information dissemination, public engagement, and disaster response. This study investigates social media narratives, sentiments, and public mobilization during the floods, analyzing 150,000 tweets collected between July and September 2022. Using a mixed-methods approach that combines thematic narrative analysis, sentiment classification, and mobilization tracking, the study examines how users construct disaster narratives, express emotions, and coordinate relief efforts. Findings reveal that Twitter users predominantly highlighted humanitarian impacts, government accountability, and climate justice**,** with negative sentiments peaking during the disaster's onset and positive sentiments emerging alongside volunteer and donation campaigns. Tweets combining blame narratives with actionable appeals achieved the highest engagement, illustrating the interplay between framing, emotional expression, and public mobilization. The study contributes to disaster communication scholarship by demonstrating the transformative role of social media in crisis response, climate advocacy, and public accountability. Recommendations are offered for leveraging digital platforms to enhance disaster preparedness and collective action.
Keywords: Pakistan floods, social media, Twitter, disaster communication, sentiment analysis, public mobilization, climate justice, humanitarian narratives, crisis framing

Introduction

Extreme weather events have intensified across the globe over the past decade, with climate change amplifying the frequency and severity of floods, droughts, and heatwaves (IPCC, 2022). Among the most devastating disasters of recent years was the 2022 Pakistan Flood, which affected nearly one-third of the country, displaced more than 33 million people, and caused widespread damage to infrastructure, agriculture, and public health (UNDP, 2022). The magnitude of destruction prompted global attention, not only through traditional news media but also across digital platforms, where millions of users documented their experiences, appealed for help, raised donations, and shaped public narratives in real time. These digital traces, especially on Twitter (now X), represent a rich information source for understanding how societies communicate and mobilize during large-scale humanitarian crises.

Social media has transformed disaster communication by enabling decentralised, immediate, and participatory information flows (Houston et al., 2015). In contrast to traditional top-down

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

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Volume No: 02 Issue No: 03 (2025)

communication from governments and news organizations, platforms like Twitter allow ordinary users to share on-the-ground updates, express emotions, correct misinformation, and coordinate community-led responses (Vieweg et al., 2010). During natural disasters, Twitter often becomes a hybrid public sphere where emotional expression, political commentary, eyewitness reporting, and calls for aid converge (Olteanu et al., 2015). As a result, analysing Twitter activity during a crisis reveals not only the informational dynamics of disaster communication but also broader patterns of public solidarity, political criticism, and humanitarian engagement.

Pakistan provides a particularly salient context for studying social media communication during disasters. Despite infrastructural limitations, Pakistan has seen rapid social media adoption, with more than 46 million users across platforms and millions engaging actively during national emergencies (PTA, 2022). In previous disasters, such as the 2010 super floods and the 2020 Karachi urban flooding, Twitter played a crucial role in disseminating situational awareness, exposing governance failures, and mobilising volunteers (Mir & Paracha, 2021). The 2022 floods amplified this digital activity on an unprecedented scale. Hashtags such as #PakistanFloods**,** #FloodRelief2022**,** #HelpPakistan,
and #ClimateJusticeForPakistan trended globally for weeks, drawing attention from humanitarian organizations, the international community, celebrities, Pakistani diaspora networks, and climate activists (Zaheer, 2023). The platform became a real-time archive of public emotions, including grief, anger, fear, hope, and solidarity (Adnan et al., 2019; Aslam et al., 2020, 2024; Faizullah et al., 2021; Riaz et al., 2021).

Within crisis communication research, three areas are especially important for understanding social media behaviour: narratives, sentiments, and public mobilization. First, narratives reflect how individuals and institutions construct meaning around a disaster—who is responsible, who is suffering, and what needs to be done (Sellnow & Seeger, 2013). Narratives shape public perception and influence how societies interpret the causes and consequences of floods. Second, sentiment reflects collective emotional responses, which can affect social cohesion, trust in institutions, and the willingness to participate in relief efforts (Stieglitz & Dang-Xuan, 2013). Third, mobilization captures how social media users encourage others to donate, volunteer, or amplify awareness campaigns. Digital mobilization is increasingly significant because online behaviour often translates into offline action, especially during humanitarian crises (Reuter & Kaufhold, 2018).

Despite growing scholarship on digital communication during disasters, there is limited systematic research focusing on the 2022 Pakistan Floods. Existing studies on Pakistan's disaster communication have examined media framing (Aslam & Shabir, 2020), political discourse during natural disasters (Yousaf & Bukhari, 2021), or climate-change awareness (Ali & Zubair, 2022). However, empirical studies analysing Twitter narratives, sentiments, and mobilization patterns during the 2022 flood crisis remain scarce. Given the unprecedented scale of digital activity during the floods, an in-depth analysis is both timely and necessary.

Moreover, Pakistan’s 2022 floods were not only a humanitarian emergency but also a major global climate event. International organizations frequently referred to the disaster as a symbol of “climate injustice,” arguing that Pakistan, contributing less than 1% to global carbon emissions, was suffering disproportionately from climate-induced catastrophes (UNEP, 2022). This framing also appeared widely on Twitter, where activists, climate experts, and global citizens used the floods to advocate for climate reparations, loss-and-damage financing, and accountability from industrialized nations (Zaheer, 2023). Thus, analysing Twitter discourse

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 03 (2025)

reveals broader geopolitical and environmental justice narratives beyond immediate disaster reporting.

Social media research also highlights the dual role of platforms like Twitter: while they enable rapid information sharing, they can also amplify misinformation and political polarization (Vosoughi, Roy, & Aral, 2018). In Pakistan, political parties and opinion leaders frequently use Twitter to construct competing narratives about governance, disaster preparedness, and state responsibility (Khan & Safdar, 2021). During the 2022 floods, political contestation intensified online as users debated government negligence, corruption, resource mismanagement, and delayed international response. Understanding these competing framings is critical because they shape public trust and influence how citizens evaluate crisis leadership.

Given these dynamics, this study aims to systematically examine social media narratives, emotional sentiments, and public mobilization efforts on Twitter during Pakistan's 2022 floods. Using a mixed-method approach that combines computational sentiment analysis with qualitative thematic analysis, this research explores:

- How users constructed meaning and responsibility around the floods
- How emotional patterns evolved during different stages of the disaster
- How Twitter facilitated or hindered public mobilization for relief efforts
- How political, humanitarian, and climate justice narratives intersected

The findings of this study contribute to three major scholarly fields: disaster communication**,** environmental communication, and digital media studies. First, the study advances understanding of how communities use social media during climate-induced disasters in the Global South, a region often underrepresented in digital communication research. Second, it enriches environmental communication literature by revealing how online publics link extreme weather events to climate justice, global responsibility, and systemic inequalities. Third, the study extends digital media scholarship by demonstrating how emotional intensity, collective storytelling, and network dynamics shape humanitarian mobilization during crises(Ahmad et al., 2021; Hussain et al., 2021).

Practically, the insights generated can inform governments, NGOs, and humanitarian organizations about effective digital communication strategies during future disasters. Understanding how people express needs, share resources, and mobilize support can strengthen disaster preparedness, improve emergency messaging, and enhance public engagement during crises.

In sum, the 2022 Pakistan floods produced a vast digital footprint that provides unique opportunities to understand how citizens, institutions, and global audiences respond to climate-driven disasters in real time. By exploring social media narratives, sentiments, and mobilization patterns, this study sheds light on the evolving role of platforms like Twitter in shaping collective memory, accountability, and humanitarian action in the age of climate change.

2. Literature Review

2.1 Social Media and Disaster Communication

Social media platforms, particularly Twitter, have transformed disaster communication by enabling real-time information sharing, public engagement, and decentralized coordination (Vieweg et al., 2010; Houston et al., 2015). Unlike traditional media, which conveys information in a top-down manner, social media allows citizens to act as information producers, sharing eyewitness reports, situational updates, and urgent appeals for aid (Imran et al., 2016). This participatory nature creates a "digital humanitarian space" where information flows rapidly and can directly influence relief and policy responses (Reuter & Kaufhold, 2018).

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 03 (2025)

Empirical studies indicate that social media is particularly effective during sudden-onset disasters, including floods, earthquakes, and cyclones, as users post real-time updates on local conditions, infrastructure damage, and human suffering (Stieglitz & Dang-Xuan, 2013). For example, research on the 2010 Pakistan super floods demonstrated that social media amplified citizen-led relief efforts and facilitated public scrutiny of government response (Mir & Paracha, 2021). Similarly, analyses of the 2013 Typhoon Haiyan in the Philippines and the 2015 Nepal earthquake highlighted the role of Twitter in enabling rapid disaster coordination and disseminating life-saving information (Olteanu et al., 2015; Vieweg et al., 2010).

2.2 Narratives and Framing in Crisis Communication

Narratives are central to understanding public interpretation of disasters. According to Sellnow and Seeger (2013), crisis narratives shape meaning by framing the causes, consequences, and responsibilities associated with an event. Social media enables multiple, often competing narratives to coexist, reflecting diverse perspectives from citizens, NGOs, journalists, and policymakers. These narratives can influence public perception, emotional response, and mobilization (Houston et al., 2015).

Disaster narratives often include blame attribution, highlighting government inefficiency, infrastructure neglect, or individual/community-level actions (Khan & Safdar, 2021). In Pakistan, floods are frequently framed within political and governance contexts, linking environmental vulnerability to systemic failures in water management, urban planning, and climate adaptation (Ali & Zubair, 2022). Social media provides a platform for contesting these narratives, offering marginalized voices an opportunity to highlight inequities and demand accountability.

2.3 Sentiment Expression on Social Media

Emotions expressed on social media during disasters, such as fear, anger, grief, or hope, are critical for understanding collective public response (Stieglitz & Dang-Xuan, 2013). Sentiment analysis in crisis communication research reveals patterns of emotional intensity, which can predict engagement and participation in relief activities (Imran et al., 2016). Strong negative emotions, such as outrage or frustration, often trigger higher information sharing, while positive emotions like solidarity foster mobilization for collective action (Bruns et al., 2012).

Prior studies highlight that sentiment varies temporally, with peak negative emotions occurring immediately after disaster onset and gradually shifting toward solidarity, resilience, and calls for aid (Olteanu et al., 2015). During the 2010 Pakistan super floods, social media users expressed a mix of despair over loss of life and infrastructure and hope through collective action and donations, illustrating the dual role of emotion in disaster communication (Mir & Paracha, 2021).

2.4 Social Media and Public Mobilization

Social media platforms have been linked to both online and offline mobilization during disasters. Users coordinate volunteer efforts, organize fundraising campaigns, and disseminate relief information through hashtags, shared links, and community networks (Reuter & Kaufhold, 2018; Stieglitz et al., 2018). Hashtags like #PakistanFloods or #FloodReliefserve as rallying points, aggregating information and guiding collective action. The effectiveness of mobilization often depends on message clarity, perceived urgency, and network influence, including the participation of opinion leaders, celebrities, and NGOs (Bruns et al., 2012).

Research also demonstrates that social media can reveal patterns of inequality in disaster response, as communities with higher digital literacy or network access are better able to mobilize resources and amplify their voices (Houston et al., 2015). In Pakistan, digital

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 03 (2025)

disparities, combined with socio-political complexities, influence the reach and impact of social media-based disaster mobilization (Zaheer, 2023).

2.5 Research Gaps

Although disaster communication research has grown, several gaps remain regarding the 2022 Pakistan floods:

1. Limited focus on Twitter narratives during floods in Pakistan, despite the platform's centrality to disaster reporting and public engagement.
2. Scarce research linking sentiment analysis with public mobilization, leaving the relationship between emotional expression and relief coordination underexplored.
3. Few comparative analyses of narratives, sentiments, and mobilization patterns, particularly during large-scale climate-induced disasters in the Global South.

This study addresses these gaps by combining narrative analysis, sentiment analysis, and mobilization tracking to provide a holistic understanding of social media activity during the 2022 floods.

3. Research Questions

The study is guided by the following research questions:

RQ1: How do Twitter users construct narratives around the 2022 Pakistan floods, including blame, responsibility, and disaster impacts?

RQ2: What emotional sentiments (positive, negative, neutral) are expressed by Twitter users during the floods, and how do these sentiments vary over time?

RQ3: How do Twitter users mobilize public action, including appeals for donations, volunteer coordination, and information dissemination?

RQ4: How do narratives, sentiments, and mobilization strategies interact to shape overall public discourse on the floods?

RQ5: What are the implications of Twitter-based communication for disaster response, accountability, and public awareness in Pakistan?

4. Methodology

4.1 Research Design

This study adopts a mixed-methods design, combining quantitative sentiment analysis with qualitative thematic analysis to examine Twitter discourse during the 2022 floods. This approach allows for a comprehensive understanding of narratives, emotions, and mobilization strategies.

4.2 Data Collection

4.2.1 Platform and Time Frame

Twitter was selected due to its widespread use for disaster communication. Data were collected between July 1, 2022, and September 30, 2022, covering the onset, peak, and recovery phases of the floods.

4.2.2 Sampling Strategy

Tweets were collected using relevant hashtags: #PakistanFloods, #FloodRelief2022, #HelpPakistan, and #ClimateJusticeForPakistan. Retweets were included to capture dissemination patterns. A total of N = 150,000 tweetswere retrieved through Twitter's API, after filtering for:

- English and Urdu language tweets
- Tweets containing disaster-related content
- Exclusion of advertisements, spam, and bot-generated content

4.3 Data Analysis

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

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Volume No: 02 Issue No: 03 (2025)

4.3.1 Narrative/Thematic Analysis

A qualitative coding framework was developed based on prior research (Sellnow & Seeger, 2013; Houston et al., 2015). Tweets were coded for:

- Disaster impacts (human, infrastructure, environmental)
- Blame and responsibility (government, individuals, NGOs, international community)
- Calls for action (donations, volunteer mobilization, awareness campaigns)
- Climate justice or systemic narratives

Intercoder reliability was tested on 10% of the sample, with Cohen's Kappa = 0.82.

4.3.2 Sentiment Analysis

Sentiment classification (positive, negative, neutral) was performed using machine learning–based lexicon analysis and validated against manual coding of 1,500 tweets. Temporal analysis tracked sentiment shifts over the three months.

4.3.3 Mobilization Analysis

Tweets were analyzed for explicit calls to action, including:

- Donations and fundraising appeals
- Volunteer coordination
- Information sharing (shelter, medical aid, flood warnings)

Frequency and retweet patterns were examined to determine amplification and engagement.

4.4 Ethical Considerations

Publicly available tweets were used, and user anonymity was maintained. No private data or direct messaging content was collected, following ethical guidelines for social media research (Townsend & Wallace, 2016).

5. Results

A total of 150,000 tweets were analyzed after data cleaning, including spam removal and language filtering. Findings are organized according to the research questions.

5.1 Narrative Patterns (RQ1)

Analysis revealed that Twitter users constructed multiple narratives around the floods:

- **Humanitarian Impact:** 61% of tweets focused on human suffering, including displacement, injury, and loss of life.
- **Infrastructure and Environmental Damage:** 48% highlighted destruction of homes, roads, bridges, crops, and rivers.
- **Blame Attribution:** 39% assigned responsibility, primarily to government agencies (24%) and systemic failures (15%), while 8% blamed citizens for insufficient preparedness.
- **Climate Justice:** 17% linked floods to global climate change, highlighting Pakistan's vulnerability despite low emissions.

Tweets frequently combined multiple narratives. For example, humanitarian appeals often included blame on government inaction or references to climate justice.

5.2 Sentiment Analysis (RQ2)

Sentiment analysis revealed the following distribution:

- **Negative sentiments:** 57% (anger, frustration, sadness)
- **Neutral sentiments:** 28% (informational tweets without emotional content)
- **Positive sentiments:** 15% (hope, solidarity, appreciation for aid)

Temporal trends showed that **negative sentiment peaked in early August 2022**, corresponding with the flood's highest impact phase. Positive sentiments increased toward September, coinciding with recovery efforts and mobilization campaigns.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES

ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 03 (2025)

5.3 Public Mobilization (RQ3)

Mobilization analysis revealed:

- **Donation appeals:** 42% of tweets encouraged financial contributions to NGOs or relief funds.
- **Volunteer coordination:** 21% organized on-ground help or shelter support.
- **Information dissemination:** 37% shared updates about flood-affected areas, emergency contacts, and safety measures.

Tweets containing calls to action received higher engagement (average retweets = 62, likes = 148) than informational tweets (average retweets = 24, likes = 79).

5.4 Interaction Between Narratives, Sentiment, and Mobilization (RQ4)

Regression and network analyses indicated:

- Tweets combining blame narratives with humanitarian appeals generated the highest engagement.
- Positive sentiment tweets were more likely to include volunteer coordination and mobilization hashtags.
- Negative sentiment tweets often criticized government response but did not consistently translate into offline action.

These results highlight the **interplay between emotional expression, narrative framing, and public engagement** on Twitter during disasters.

5.5 Implications for Public Discourse (RQ5)

The data suggest that Twitter acted as a platform for:

- Amplifying citizen voices in humanitarian crises
- Facilitating real-time mobilization and donations
- Shaping climate justice narratives globally

However, the reliance on hashtag campaigns also created information silos, where some affected regions received more attention than others.

6. Discussion

This study demonstrates the centrality of social media in disaster communication during the 2022 Pakistan floods, with several key insights:

6.1 Multi-dimensional Narratives

Consistent with Sellnow and Seeger (2013), narratives on Twitter were multi-layered, blending humanitarian appeals, blame attribution, and climate justice frames. Unlike traditional media, which may emphasize government or institutional failures, social media narratives allowed citizens, NGOs, and international audiences to co-create meaning and highlight underrepresented concerns.

6.2 Emotional Expression and Temporal Dynamics

Negative sentiments dominated early in the disaster, reflecting shock, grief, and anger (Stieglitz & Dang-Xuan, 2013). The gradual rise in positive sentiments reflects collective resilience, solidarity, and hope, aligning with prior findings on emotional adaptation during crises (Imran et al., 2016). This underscores the dynamic nature of public sentiment in digital disaster contexts.

6.3 Mobilization and Online Engagement

The study confirms that Twitter facilitates practical public mobilization during disasters, consistent with Reuter and Kaufhold (2018). Tweets combining narratives of suffering with actionable requests achieved the highest engagement, demonstrating that framing and emotional intensity directly influence mobilization potential. Positive sentiment was

particularly effective in mobilizing volunteers and donations, while negative sentiment primarily fueled political criticism.

6.4 Role in Climate Justice Advocacy

A notable finding is the emergence of climate justice narratives, linking Pakistan's flooding to global responsibility for greenhouse gas emissions. This aligns with international climate communication scholarship emphasizing the intersection of disaster reporting and environmental advocacy (Boykoff & Boykoff, 2007; Ali & Zubair, 2022). Social media thus functions as a platform not only for immediate crisis response but also for long-term awareness-raising and advocacy.

6.5 Theoretical Implications

The study extends framing theory (Entman, 1993) to digital disaster communication by showing how narratives, sentiment, and mobilization interact to create meaning in online spaces. Twitter facilitates citizen-led reframing, allowing multiple stakeholders to negotiate responsibility, agency, and ethical evaluations. It also demonstrates the episodic vs. thematic framing dynamic (Iyengar, 1991), as users framed individual flood events episodically while linking them to broader climate and governance issues.

7. Conclusion

The 2022 Pakistan floods illustrate the transformative role of Twitter in disaster communication, revealing three main conclusions:

1. **Narrative diversity:** Social media allows multiple voices to construct narratives around humanitarian suffering, blame, and climate justice.
2. **Sentiment-driven engagement:** Emotional content shapes the likelihood of public mobilization, with positive sentiments driving actionable outcomes.
3. **Mobilization potential:** Twitter effectively facilitates donation campaigns, volunteer coordination, and information dissemination, though geographic and digital divides affect reach.

These findings highlight social media's dual function as both a **real-time disaster response tool** and a **platform for climate advocacy and accountability**. Policymakers, NGOs, and disaster management authorities can leverage these insights to enhance communication strategies, improve public engagement, and foster inclusive digital mobilization during future crises.

Future research should examine **cross-platform comparisons**, **longitudinal analysis of sentiment evolution**, and **offline impacts of online mobilization**, especially in the Global South, where climate vulnerability is high.

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