

# Exploring the Role of Social Media in Disaster Management: A Case Study of the 2021 South Kalimantan Flood

Muhammad Nizar Hidayat<sup>a,1,\*</sup>, Fahrianoor<sup>b,2</sup>, Siswanto<sup>c,3</sup>

<sup>abc</sup>Department of Communication Lambung Mangkurat University, Jl. Brigjen Hasan Basry, Banjarmasin and 70123, Indonesia

<sup>1</sup>nizar.hidayat@ulm.ac.id; <sup>2</sup>fahrianoor@ulm.ac.id; <sup>3</sup>siswanto@ulm.ac.id

\* Corresponding author



## ARTICLE INFO

### Article history

Received: June 10, 2024

Revised: July 24, 2024

Accepted: October 24, 2024

### Keywords

Big Flood 2021

Risk Mitigation

Social Media

South Kalimantan

## ABSTRACT

The emergence of social media has opened huge potential for risk mitigation in disaster management. However, the big flood in 2021 that swept almost the entire South Kalimantan territory has left some questions about the relations between social media and risk mitigation despite the prevalence of social media users in the region. This article sought to describe the utilization of social media in disaster management in South Kalimantan, especially in Banjar Regency, Hulu Sungai Tengah Regency (HST), and Tabalong Regency before, during, and after the big flood. The data are gathered by conducting systematic interviews with stakeholders, observation, and collecting related information from the internet. As the result, it was evident that social media platforms like Facebook, WhatsApp, and Instagram played critical roles where traditional communication systems failed or were nonexistent. In Banjar, external volunteers utilized these platforms to coordinate aid and disseminate crucial information, in contrast, the initial disregard for digital communications in HST highlighted the challenges of media literacy and trust in digital platforms, while the case of Tabalong serves as a model for other regions, demonstrating how leveraging local knowledge and social media can create a resilient and responsive community.



DOI: <https://doi.org/10.12928/channel.v12i2.847>

This is an open-access article under the [CC-BY-SA](#) license



## INTRODUCTION

In the age of digital connectivity, social media platforms have evolved beyond their initial purpose of fostering social interactions and have become essential tools in disaster risk management and response strategies. The major flood that struck South Kalimantan in January 2021 serves as a compelling case study of this transformative role. South Kalimantan is a region prone to natural disasters due to its geographical and climatic conditions. The unprecedented flooding event in January 2021 affected thousands of residents, resulting in significant displacement and damage, particularly in Hulu Sungai Tengah Regency, Banjar Regency, and Tabalong Regency (BNPB, 2021a, 2021b).

In Hulu Sungai Tengah (HST), floodwaters engulfed homes and disrupted lives as water levels rose dangerously high and quickly. Urgent evacuations were necessary. The infrastructure was severely impacted, with critical facilities such as schools and health centers inundated, disrupting essential community functions and services. In Banjar Regency, the situation was dire, with thousands of households submerged underwater. The rapid onset of flooding caused substantial displacement, forcing many residents to seek temporary shelter and resulting in the loss of belongings and livelihoods. The agricultural sector, the backbone of the local economy, suffered extensive damage, with crop losses exacerbating the community's plight and creating long-term economic challenges. Tabalong Regency faced similar catastrophic conditions, with washed-away roads and collapsed bridges cutting off vital transport routes. This made it challenging to deliver emergency aid and conduct rescue operations. The floodwaters not only damaged property but also caused significant environmental issues, such as water contamination and an increased risk of waterborne diseases, posing additional health



threats to the population (Fahrianoor & Hidayat, 2022).

Traditional disaster response mechanisms were overwhelmed, highlighting the urgent need for innovative approaches to disaster management. In this context, social media emerged as a pivotal platform, providing new means of communication and coordination that were essential for effective disaster response. The scale of the disaster in the affected regions underscored the critical importance of effective communication and coordination to manage the crisis. Despite the calamity, social media platforms remained accessible to many individuals in the area, playing a key role in bridging the information gap. These platforms enabled real-time updates and facilitated community-led support networks, which were instrumental in organizing grassroots relief efforts and amplifying calls for assistance to reach wider audiences, including international aid organizations.

Previous research has demonstrated that social media has become an integral tool in disaster management, offering unique capabilities that enhance communication, coordination, and information gathering during crises. As shown by Sari et al. (2023) and Xiao et al. (2015), social media platforms like Twitter, Facebook, and Instagram serve as critical communication tools during disasters. They facilitate rapid information dissemination, helping to establish situational awareness and mobilize resources. Various stakeholders—including residents, government agencies, and humanitarian groups—use these platforms to broadcast and receive real-time updates about crisis events (Mavrodieva & Shaw, 2021; Susanti et al., 2023). Other researchers have developed frameworks and models to better integrate social media into disaster management practices. Gray, Weal, and Martin (2019) propose a conceptual framework based on a comprehensive literature review and case study analysis, which aids in understanding the dynamic use of social media across different disaster phases. Similarly, Ngamassi, Ramakrishnan, and Rahman (2016) suggest a prescriptive framework that organizations can utilize to enhance their social media strategies throughout various stages of disaster management.

The use of social media in disaster management offers several benefits, but it also presents challenges. Key issues include data reliability, privacy concerns, and the digital divide, all of which create significant obstacles. Xiao et al. (2015) also highlight spatial and demographic biases that can impact the reliability of social media data used for situational awareness. Additionally, the spread of misinformation and “fake news” can lead to confusion and impede effective disaster response (Mavrodieva & Shaw, 2021). On a positive note, several case studies illustrate the practical applications of social media in real-world disaster scenarios. For example, during Hurricane Sandy, social media was widely utilized for emergency communication and community engagement (Alexander, 2014). Likewise, the use of Twitter and other platforms during the 2011 Tohoku earthquake in Japan demonstrated how social media can serve as a vital tool for information sharing and support networks (Landwehr & Carley, 2014). The ethical implications of social media use in disaster management deserve attention as well. The privacy of individuals and the importance of disseminating accurate information are critical considerations (Alexander, 2014). As social media continues to evolve, disaster management practices must adapt, possibly implementing regulations to maximize the benefits while minimizing risks.

In South Kalimantan, the use of social media during the floods was diverse and impactful. Platforms like Facebook, Twitter, and Instagram were effective not only for disseminating information and early warning signals but also for coordinating rescue operations and distributing aid. Community groups, local government agencies, and non-governmental organizations utilized these tools to connect with large audiences quickly and efficiently. The real-time nature of social media provided immediate updates on the situation, which was crucial in a rapidly changing disaster scenario (Carr & Hayes, 2015; Cheng et al., 2016).

Social media has significantly transformed communication during disaster management, establishing a two-way communication channel between affected communities and response teams. It has become an essential tool for meeting communication needs, changing how information is shared and how stakeholders interact with each other. The shift from traditional one-way communication to a more interactive, two-way model is particularly important. This change allows organizations, the public, and individuals to engage in meaningful dialogue, share their experiences, and quickly disseminate crucial information during disasters (Li, 2014; Veil et al., 2011).

The participatory nature of social media facilitates real-time updates and feedback, which are vital during crises where timely information can save lives (Abedin et al., 2014; Gardiner et al., 2023). By monitoring social media platforms, emergency management agencies can collect real-time data about the situation, including the disaster’s severity and impact (Hazarika et al., 2021; Sawaneh et al., 2023). Additionally, social media helps build connections among community members, local organizations, and emergency services, fostering collective preparedness and response efforts (Kim & Kang, 2010). Sharing personal stories and experiences on social media can also create a sense of belonging and support among individuals affected by disasters, which is crucial for their psychological well-being (Fan et al., 2020). Furthermore, social media influencers can effectively amplify messages and mobilize resources, as demonstrated in various disaster relief campaigns (Yan & Pedraza-Martinez, 2019).

The use of social media in disaster contexts is supported by several theoretical frameworks. One particularly relevant concept is “community resilience,” which emphasizes how communities leverage available resources to confront and recover from adversities (Ferro-Azcona et al., 2019). Social media plays a significant role in transforming traditional communication hierarchies, enabling communities to become more resilient and better equipped to self-organize and

respond dynamically to threats. Additionally, theories related to “media ecology” provide insight into the environmental factors that influence communication processes during disasters. They suggest that media serves not just as channels for information but also as environments that shape human interactions and organizational structures in times of crisis (Setyastuti et al., 2021).

The case of South Kalimantan illustrates the challenges of using social media in disaster management. Issues such as misinformation, the digital divide, and the reliability of online communications pose significant obstacles that must be addressed to fully harness the potential of these platforms in future disaster situations. This research aims to analyze how stakeholders in three regencies (HST, Banjar, and Tabalong) utilized social media in the risk mitigation process during the major flood of 2021.

## METHOD

The research methodology used to examine the role of social media in risk mitigation during the 2021 flood in Hulu Sungai Tengah, Banjar, and Tabalong Regencies is based on qualitative inquiry (Crano et al., 2014; Kadarisman et al., 2023). This approach was selected to provide a comprehensive understanding of the dynamics and impact of social media during the disaster, enabling an in-depth exploration of user behaviors, community responses, and official communications. We focused on specific subdistricts (Kecamatan) in each regency that were significantly affected: Subdistrict Simpang Ampat in Banjar Regency, Subdistrict Hantakan in Hulu Sungai Tengah, and Subdistrict Haruai in Tabalong Regency.

The primary data for this study were collected through three main qualitative techniques: semi-structured interviews, content analysis of social media platforms, and participant observations. Each method was designed to gather rich, detailed data reflecting various aspects of social media usage during the flood. Interviews were conducted with key informants, including local government officials from disaster management departments (Badan Penanggulangan Bencana Daerah/BPBD), community-based disaster management (Unit Penanggulangan Bencana Swadaya/UPBS), and active social media users from the affected areas. Participants were selected based on their involvement in disaster response activities and their engagement on social media during the flood. The interview guide was developed to explore topics such as the types of social media used during the disaster, the nature of information shared, the effectiveness of social media communications, and the challenges users faced. Each interview lasted approximately 60 minutes and was recorded with the participants' consent. This analysis helped us understand the types of information disseminated, community responses, and the effectiveness of social media as a tool for emergency communication. To gain a better understanding of the flood's overwhelming impact, observations were conducted in August 2022 across the three regencies by visiting community centers and local government offices where post-disaster activities were coordinated.

Data analysis was performed using a thematic analysis approach, which helped identify patterns and themes related to social media usage during the flood (Bigo & Martin-Maze, 2014). Transcripts from interviews and field notes from observations were reviewed multiple times to develop a deep understanding of the data. Initial codes were generated by identifying recurring words, phrases, sentiments, and concepts across the datasets. These codes were then grouped into potential themes and sub-themes that represented larger patterns linked to the research objectives. The generated themes were reviewed and refined to ensure they accurately reflected the dataset and were both coherent and distinctive. This process involved reiteratively checking back with the dataset to confirm whether the themes captured the insights related to social media usage during the disaster. The final step involved writing up the findings, utilizing vivid examples from the data to narrate how social media was employed during the flood in South Kalimantan.

## FINDINGS AND DISCUSSION

The analysis of social media usage across Banjar, Hulu Sungai Tengah, and Tabalong regencies during the big flood of January 2021 revealed varied and distinct patterns of engagement, each adapting to their unique challenges and resources.

### A. Banjar Regency

Banjar Regency, located in the South Kalimantan province of Indonesia, features a diverse landscape that includes dense tropical forests and extensive river systems that are susceptible to flooding. The significant flooding event in 2021 in Banjar Regency highlights the vulnerabilities and adaptive strategies used during natural disasters. This period was particularly challenging, as the floods caused a complete shutdown of electricity and cellular communications, isolating affected communities from external support and resources. The catastrophic flooding led to a total loss of electricity and cellular service in vast areas, resulting in acute isolation for the affected regions. This disruption rendered local government operations nearly ineffective, complicating essential processes such as evacuation and the distribution of vital supplies. Both residents and government officials found themselves cut off from the outside world, struggling to coordinate any form of response without basic communication tools.

Interviews with officials from the Simpang Empat subdistrict and affected residents provided crucial insights into the initial stages of this disaster. One local official described the situation.

*“The complete blackout of both power and cellular service plunged the affected areas into informational darkness, severely delaying initial response efforts.” (Abdul Basit, official of the Simpang Empat subdistrict, personal interview, 2022).*

The absence of electricity and functional communication networks prevented even basic information about the flood’s extent, evacuation routes, and relief operations from being disseminated or received, leaving residents and officials in a perilous state of uncertainty and unpreparedness.

The breakthrough in this difficult situation came from the involvement of external volunteers from neighboring regions where the infrastructure remained intact. These volunteers quickly mobilized to establish makeshift communication lines using social media platforms such as Facebook and WhatsApp. By creating online groups and communication channels, they were able to relay critical information back to the affected areas and coordinate relief efforts more effectively. This external assistance played a vital role in bridging the information gap and initiating organized rescue and relief operations, highlighting the essential function of social media as an emergency communication tool during disasters.

The crucial role of external volunteers during the flooding in Banjar Regency cannot be overstated. With their access to functioning communication networks, these individuals became key coordinators of aid at a time when local systems were incapacitated. They efficiently utilized social media platforms to set up online groups and communication channels, which served as essential hubs for managing the logistics of relief efforts. This digital command center allowed for the swift organization and prioritization of needs, ensuring that help was directed to where it was most urgently required.

In detailed interviews, the Simpang Empat subdistrict official emphasized how reliant Banjar’s relief efforts had become on external volunteers.

*“We depended heavily on our counterparts in adjacent cities to manage logistics and call for more help using social media,” (Abdul Basit, official of the Simpang Empat subdistrict, personal interview, 2022).*

These volunteers served as a vital link between isolated areas and the outside world, utilizing platforms like Facebook and WhatsApp not only for communication but also for mobilizing resources. Their ability to share real-time needs and updates played a crucial role in streamlining the relief process, ensuring a more efficient allocation of resources and personnel to areas in urgent need.

The coordinated efforts of these external volunteers were essential in delivering aid and organizing rescue operations from outside the disaster-struck zones. By leveraging their intact infrastructure, they were able to coordinate large-scale operations, including the delivery of food, medical supplies, and other necessities, as well as deploying rescue teams to the most affected areas. The success of these operations highlighted the importance of robust external support networks and underscored the potential of social media as a powerful tool in disaster management and response.

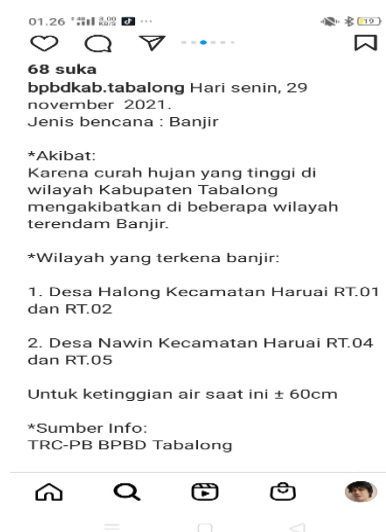


Fig. 1. Disaster information dissemination on BPBD’s Instagram Account

The interviews conducted after the floods in Banjar Regency revealed significant shortcomings in the local government's disaster response capabilities. Many officials openly admitted their unpreparedness for such a large-scale disaster.

*"Our preparedness for such a massive natural disaster was found wanting," (Abdul Basit, official of the Simpang Empat subdistrict, personal interview, 2022).*

This candid admission highlights a broader issue of inadequate disaster planning and resource allocation, which left local authorities struggling to manage the crisis effectively.

Compounding these difficulties was a sudden communication blackout that severely hindered the ability to coordinate evacuation efforts and distribute essential supplies. The lack of preparedness and capability within the local government necessitated a heavy reliance on external assistance. In this context, digital platforms played a critical role, serving as vital tools for connecting the needs of the affected communities with available help.

External volunteers and organizations utilized social media to orchestrate much of the relief effort, demonstrating the effectiveness of these platforms in modern crisis management. Facebook was extensively used to raise awareness and mobilize support from broader communities, which was crucial in gathering necessary resources. Meanwhile, WhatsApp facilitated real-time, direct communication, which was vital for managing the immediate needs of those affected by the disaster.

*"People in unaffected areas were crucial in coordinating the rescue efforts before the official teams could even reach us," shared a resident during an interview, emphasizing the role of social media in bridging the critical time gap (Vita, personal interview, 2022).*

## **B. Hulu Sungai Tengah (HST) Regency**

In Hulu Sungai Tengah (HST) Regency, an analysis of social media usage during the 2021 flood reveals a complex scenario characterized by initial disbelief followed by a critical reliance on technology during a natural disaster. The response in HST illustrates the intricate relationship between digital communication, geographical diversity, and community reaction during emergencies.

In the days leading up to the catastrophic flood, numerous messages warning of the impending disaster circulated widely on social media platforms like WhatsApp and Facebook. These warnings aimed to alert and prepare local communities by detailing the potential severity of the flood and offering suggestions for preliminary safety measures. However, despite the urgency and clarity of these alerts, many residents did not heed the warnings. This digital dissemination represented a modern approach to disaster preparedness, leveraging social media's widespread use to quickly inform and mobilize at-risk communities.

Regrettably, many residents' responses were marked by skepticism and dismissal. A significant portion of the community treated the warnings with distrust, viewing them as exaggerated or entirely fabricated.

*"Many in our community did not take the alerts seriously, thinking these were just rumors; no substantial preparations were made," (Sahri Ramadhan, Head of Hantakan Subdistrict, personal interview, 2022).*

This skepticism resulted in inadequate preparatory measures, as residents, conditioned by previous false alarms or general disbelief in the reliability of such information, chose to remain in place instead of following the advisories provided.

The consequences of this negligence resulted in a community that was woefully unprepared when the floodwaters began to rise. Homes were not fortified, evacuation plans had not been reviewed or rehearsed, and essential supplies had not been stockpiled. This lack of preparation exacerbated the chaos and hardship when the disaster finally struck, overwhelming local response efforts and heightening the overall impact of the flood. The initial disbelief in the accuracy of social media warnings not only hindered individual preparedness but also impaired the collective ability to respond effectively to the crisis. This situation underscores the critical need to enhance disaster communication strategies to build trust and prompt decisive action among vulnerable populations.

The unpreparedness had severe consequences as the floodwaters rose, creating a domino effect of complications that hindered survival and rescue efforts. As the flood intensified, critical infrastructure failed; electricity and cellular networks went offline across the affected areas. This sudden loss of communication plunged the communities into darkness and silence at a crucial time when information flow was most needed. The impact of this disconnection was immediate and debilitating, preventing emergency calls, updates on rising water levels, and coordination among residents and rescue teams. One resident vividly described the situation.

*"On the day the floodwaters reached us, everything went down; we were cut off from the world, unable to even call for help," (Fina, personal interview, 2022).*

This testimony highlights the dire situation that unfolded as the community struggled without the basic utilities that most people take for granted.

With conventional communication methods rendered ineffective by the flooding, local government and volunteers were forced to innovate to establish lines of communication. In the absence of cellular and internet connectivity, radio waves became the primary medium for emergency communication. Radios, often considered obsolete in the digital age, proved invaluable during this crisis. Local emergency teams and amateur radio operators collaborated to set up makeshift communication networks that could operate independently of the traditional power grid and telecommunication infrastructure. These radio networks enabled the transmission of critical information about safe zones, evacuation routes, and where to find assistance, becoming a lifeline for those trapped by the floodwaters.

The reliance on radio communication played a crucial role in coordinating relief and rescue operations while showcasing the resilience and adaptability of the affected communities and their leaders. Emergency teams and volunteers utilized radio broadcasts to organize evacuation efforts, guide rescuers to the most critically impacted areas, and coordinate the distribution of aid. This adaptation to the circumstances ensured that, despite the severe limitations imposed by the flood, essential aid and instructions could still reach those in need. The shift to radio communication demonstrates that effective emergency preparedness involves not only having the right tools but also the ability to think critically and adapt quickly to changing conditions on the ground.

Interviewees highlighted the significant challenges presented by Hulu Sungai Tengah's (HST) diverse topography, which includes a mix of plains, swamps, and mountainous regions. This variety in landscape not only enhances the region's beauty but also introduces complex hurdles in disaster response efforts. The geographical features can hinder the speed and efficiency of emergency operations, particularly when swift access is critical. Budi Haryanti, Head of HST's Badan Penanggulangan Bencana Daerah (Local Disaster Management Agency), elaborated on these challenges.

*"The geographical diversity of HST complicates our response efforts. Reaching the more remote and diverse areas quickly during emergencies continues to be a formidable challenge," (Budi Haryanti, personal interview, 2022).*



**Fig. 2.** WhatsApp group consisted of local stakeholders for sharing information

The complexity of the situation often leads to delayed response times, which can worsen the impact of disasters like floods. Alongside these geographical challenges is the issue of limited resources available to local government agencies. During extensive crises, such as the flooding in HST, the resources quickly became depleted, stretching response efforts thin and making it increasingly difficult to manage the disaster effectively across all affected areas. The limited number of personnel and emergency supplies, combined with the challenging terrain, meant that some regions might not receive timely assistance.

*"Our resources are finite, and when multiple areas are simultaneously affected, prioritizing where and how to allocate these resources becomes a challenge in itself," (Sahri Ramadhan, Head of Hantakan Subdistrict, personal interview, 2022).*

However, the scenario began to change as news of the flooding spread beyond the affected areas. Social media platforms like WhatsApp and Facebook became essential tools for mobilizing support and resources. These digital channels enabled a wider reach, engaging communities and volunteers from unaffected regions who were eager to help. This surge of aid was crucial in strengthening the strained local response efforts.

*“Once we got the word out, there was a significant influx of support coordinated via social media, focusing on the most critical rescue missions and where relief was needed most urgently,” (Achmad Nusi, volunteer coordinator, personal interview, 2022).*

External volunteers, connected through social media, played a pivotal role in this enhanced response strategy. They used the platforms not only to collect and distribute resources but also to strategically guide emergency efforts. Real-time updates from individuals within the flooded areas, communicated via radio, were shared on social media to inform external volunteers about the most urgent needs and specific areas requiring immediate attention.

*“Social media allowed us to create a dynamic response plan, adapting quickly as new information came to light through our radio communications,” (Achmad Nusi, volunteer coordinator, personal interview, 2022).*

These collaborative efforts exemplify the powerful synergy between traditional and modern communication technologies during disaster management. While radio provides reliable communication within the affected areas, social media broadened the scope of engagement, allowing a larger pool of resources to be mobilized quickly and efficiently. This dual approach maximized the impact of the response efforts, ensuring that aid could reach even the most secluded areas.

The use of social media in disaster response, as demonstrated during the HST flooding, highlights its critical role in modern emergency management strategies. It underscores the need for continued integration of these platforms into disaster preparedness and response plans, ensuring that when traditional systems are overwhelmed or fail, there is a robust backup in place to facilitate effective communication and coordination. The experience in HST provides valuable lessons on leveraging digital tools to enhance the resilience and responsiveness of communities facing natural disasters.

### C. Tabalong Regency

In Tabalong Regency, the community has developed a unique and effective approach to managing hydro-meteorological disasters, particularly floods, which are common due to the region’s geographic and climatic conditions. The locals have a deep understanding of the natural signs that precede such events, knowledge that has been passed down through generations and has become an integral part of their disaster preparedness strategy. This traditional wisdom is enhanced by modern technology, especially the use of social media platforms, which significantly improves the community’s ability to respond to and manage disaster situations efficiently. The combination of ancestral knowledge and modern communication tools allows Tabalong to maintain a high level of readiness and mitigate the potential impacts of floods.

This integration of traditional and technological approaches is particularly evident in how the local community monitors the environment. Residents are trained from a young age to observe subtle changes in their surroundings, such as unusual patterns in river water levels or the behavior of wildlife, which may indicate an impending flood.

*“Our community can often predict when a flood is going to happen just by observing the natural environment. This early awareness helps us prepare adequately,” (Rustam Nuryadi, local elder, personal interview, 2022).*

This proactive monitoring enables the community to initiate preparedness measures well before a disaster occurs, ensuring that everyone is alerted and ready to act promptly, thereby reducing the risks associated with floods.

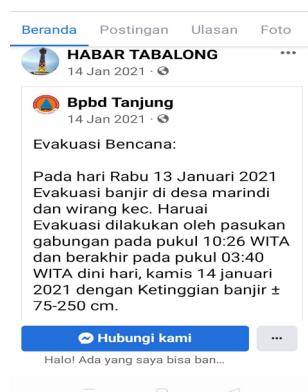


Fig. 3. Facebook channel for local information sharing

The role of social media in disseminating information quickly and broadly is vital. When local leaders or observers detect early signs of a flood, they use platforms such as WhatsApp, Facebook, and Twitter to alert the community. These alerts include warnings about the impending disaster, as well as preparedness tips and evacuation plans if needed. This immediate sharing of information ensures that all community members receive critical updates in real-time, allowing for a coordinated and efficient response. The testimony from community elders highlights how these digital tools have become essential for translating traditional practices into actionable strategies that enhance the safety and well-being of all residents during flood events.

In Haruai, a sub-district of Hulu Sungai Tengah, local leaders have recognized the importance of effective communication during emergencies and have taken proactive steps to improve it. One impactful initiative has been the creation of official WhatsApp groups that include various local stakeholders, such as emergency responders, government officials, and community leaders. These groups serve as a rapid communication channel, enabling the swift dissemination of information crucial for managing crises. Hantakan Subdistrict Head elaborated on this during an interview, stating,

*“The WhatsApp groups we’ve established at the sub-district level are instrumental in disseminating information quickly and efficiently across the community” (Handi Yuniardi, Hantakan Subdistrict Head, personal interview, 2022).*

This approach has streamlined communication processes and ensured that all key players are consistently informed and prepared to act in a unified manner.

Once crucial information about impending or active emergencies, such as floods, is shared within dedicated WhatsApp groups, it quickly spreads beyond direct messaging to reach broader platforms. The information is redistributed through social media channels like Facebook and Instagram, allowing it to reach a wider audience, including the public and other stakeholders not in the initial messaging groups. This method of cascading information ensures that every segment of the community receives timely and accurate updates, which are essential for initiating coordinated emergency responses. The strategic use of these platforms significantly enhances the community’s ability to react collectively and effectively, ensuring that critical actions like evacuations and aid distributions are well-coordinated.

Reflecting on the transformative impact of these digital tools, the Secretary of Tabalong BPBD highlighted the efficiency and speed at which information now flows within the community.

*“Social media platforms, particularly WhatsApp, have transformed how we manage disaster communication. Information flows more freely and quickly, allowing us to respond to our community’s needs promptly” (Rahmadi, Secretary of Tabalong BPBD, personal interview, 2022).*

This sentiment underscores the pivotal role that social media has come to play in modern disaster management strategies. By leveraging these digital platforms, Haruai has not only improved its emergency preparedness but has also strengthened its overall resilience to disasters, setting a valuable example for other communities facing similar challenges.

In addition to these digital communication strategies, Tabalong has established community-based disaster management units known as UPBS (Unit Penanggulangan Bencana Swadaya). These units play a critical role in distributing and disseminating official government information while gathering data about the affected areas and the specific assistance required.

*“Our UPBS acts as a hub for all disaster-related information. They ensure that aid reaches where it’s most needed and that our response is well-coordinated,” (Rahmadi, Secretary of Tabalong BPBD, personal interview, 2022).*

The sub-district head offices, which are typically not affected by floods, serve as command centers where information is centralized and coordination efforts are directed.

*“Our office became the headquarters during a disaster. It’s where all the planning and coordination happens, ensuring that our responses are effective and timely,” (Handi Yuniardi, Sub-district Head, personal interview, 2022).*

#### **D. The Use of Social Media in Disaster Management**

The use of social media in disaster management, as observed during the 2021 flood in Banjar, Hulu Sungai Tengah (HST), and Tabalong Regencies, provides valuable insights into the advantages and limitations of digital communication tools in enhancing disaster preparedness and response. The experiences of these regions, while varied, collectively demonstrate the transformative role of social media in overcoming traditional communication barriers and strengthening community resilience.

In Banjar Regency, social media played a crucial role as an alternative communication channel, especially when traditional infrastructures failed. This observation aligns with similar instances from other disasters, such as the 2015



Nepal earthquake (Arora, 2022). When local communication infrastructures are compromised, social media platforms like Facebook and WhatsApp have proven invaluable. For example, during the 2015 Nepal earthquake, social media facilitated rapid information dissemination and aid coordination. Research has indicated that these platforms were vital in connecting affected individuals with external assistance, leading to a more organized disaster response. Likewise, in Banjar Regency, social media enabled quick mobilization of resources and information, significantly impacting disaster management efforts.

Social media is also a powerful tool for community mobilization, allowing individuals to actively participate in disaster response. It enables the formation of ad-hoc networks that can undertake specific tasks, such as distributing supplies and rescuing trapped individuals. Online communities emerged swiftly during the crisis and played a vital role in delivering humanitarian aid, showcasing the platforms' ability to empower citizens to take initiative in crisis situations (Mavrodieva & Shaw, 2021). This empowerment was evident in Banjar Regency, where local communities effectively used social media to organize and execute relief operations.

Additionally, social media can address the limitations often encountered with local government responses during disasters. Government agencies may become overwhelmed or unable to promptly reach certain areas. Social media helps bridge these gaps by providing a platform for real-time information and support. These platforms were essential in overcoming obstacles caused by bureaucratic delays and inefficiencies, ensuring that aid and information reached those in need quickly (Giri & Vats, 2019). In Banjar Regency, social media facilitated faster and more efficient communication and coordination compared to what could have been achieved through official channels alone.

In the case of Hulu Sungai Tengah (HST), initial skepticism toward digital communications during disaster scenarios highlights significant barriers to effective disaster management, such as a lack of community trust and media literacy. This stands in contrast to experiences from other disasters, like Hurricane Sandy, where social media played a critical role in disseminating real-time updates and coordinating responses. The skepticism in HST regarding digital alerts during disasters indicates a serious trust issue, which can critically undermine the effectiveness of disaster response efforts. Trust in information sources is paramount in effective disaster management, as it directly affects the public's willingness to follow emergency directives. A study emphasizes the importance of trust between media, emergency managers, and the community, suggesting that building and maintaining trust is essential for ensuring that accurate and timely information reaches the public (McLean, 2011). In contexts like HST, where digital communications are often met with suspicion, there is a crucial need to develop trust-building initiatives that can enhance community engagement during crises.

Media literacy plays a vital role in how communities perceive and act on information during disasters. Higher media literacy can empower communities to critically evaluate the credibility of information, allowing them to distinguish between reliable updates and misinformation. Research on the role of social media during Hurricane Sandy indicated that communities with higher media literacy were more capable of leveraging social media for effective communication and resource mobilization (Mavrodieva & Shaw, 2021). Consequently, enhancing media literacy in HST could significantly improve the community's ability to utilize digital platforms for disaster response and recovery.

The initial disregard for digital alerts in HST reveals a broader issue of public education regarding the utility and credibility of digital communications in disaster management. Effective public education programs are essential for informing communities about how to access, interpret, and utilize digital data for safety. Studies suggest that public education efforts should focus on demonstrating the reliability and essential nature of digital communications during emergencies, which could help change public perceptions and increase the acceptance of digital alerts during crises (Metha et al., 2017).

The disaster management approach in Tabalong Regency exemplifies the successful integration of traditional knowledge with modern technology, similar to practices observed in Japanese tsunami preparedness. Tabalong Regency has effectively combined traditional knowledge with modern technological tools, such as WhatsApp, for disaster management. This integration allows for rapid dissemination of information and efficient coordination of response efforts, which is critical in disaster-prone regions. A similar approach is seen in coastal and small island communities within Indonesia, where traditional knowledge of hydro-meteorological hazards is integrated with scientific methods to enhance disaster resilience. This process encompasses observation, documentation, validation, and categorization of local knowledge for practical application (Hiwasaki et al., 2014).

The use of official WhatsApp groups in Tabalong Regency facilitates active community participation and engagement in disaster preparedness, mirroring practices in Japan, where community drills and technological solutions are regularly employed to prepare for tsunamis. Additionally, Japanese traditional architectural wisdom, which incorporates disaster mitigation techniques into building designs, underscores the deep-rooted integration of local knowledge and modern technology in disaster preparedness (Okubo, 2016).

Combining traditional insights with modern technological tools results in more resilient and responsive disaster management systems. In Tabalong Regency, this integration enhances the effectiveness of disaster response, as community members are both familiar with traditional practices and capable of utilizing modern communication tools for real-time

updates. Similar benefits are observed in the Srong traditions of Simeulue Island, Indonesia, where indigenous knowledge about tsunami risks is applied alongside modern warning systems to improve community resilience (Rahman et al., 2017).

The insights gained from the experiences in Banjar, HST, and Tabalong enhance the broader discussion on the role of social media in disaster management. Firstly, the cases emphasize the importance of infrastructure resilience and the necessity for alternative communication strategies. For example, the use of radio waves in HST can be critical when conventional communication systems fail. These findings suggest that disaster preparedness plans should incorporate multi-layered communication strategies that combine both digital technologies and traditional methods. This approach ensures coverage for different disaster phases and scenarios.

Secondly, the effective use of social media in Tabalong to promote community-led initiatives and leverage traditional signs for early warnings indicates that disaster management practices should increasingly focus on local capacities and knowledge. This implies a shift towards more decentralized and community-driven approaches in disaster management, utilizing local networks and technologies to enhance effectiveness and responsiveness.

Lastly, the research highlights the necessity of ongoing education and drills that incorporate social media as a reliable tool for disaster communication. This would help address the skepticism observed in HST, fostering a more informed and responsive community, as demonstrated by the proactive measures taken in Tabalong.

Overall, the experiences of Banjar, HST, and Tabalong during the 2021 flood provide valuable lessons on the integration of social media into disaster management practices. These regions illustrate the diverse applications and critical importance of digital tools in improving community resilience and disaster response. The comparative analysis with previous studies further strengthens the argument for a nuanced, integrated approach that considers both technological and traditional methods tailored to local contexts and capacities. This research contributes to the expanding body of literature advocating for the evolution of disaster management towards more technologically integrated and community-focused strategies.

## CONCLUSION

This study has highlighted the crucial role that social media platforms played during the 2021 floods in South Kalimantan, Indonesia. The findings from the three regencies—Banjar, Hulu Sungai Tengah (HST), and Tabalong—revealed distinct patterns in the use of social media for disaster communication, coordination, and community mobilization.

In Banjar, external volunteers and local organizations effectively utilized social media platforms such as WhatsApp and Facebook to coordinate rescue and relief efforts when traditional communication systems failed. In HST, however, a general mistrust of digital warnings and low digital literacy among residents led to delays in disaster preparedness and response, exacerbating the impact of the floods. In contrast, Tabalong demonstrated a successful integration of social media with traditional local knowledge, resulting in improved community readiness and responsiveness.

The practical implications of these findings underscore the importance of enhancing digital literacy within vulnerable communities. Governments and disaster response organizations should invest in training programs that teach residents how to effectively use social media platforms for risk mitigation. Additionally, fostering trust in digital communication and creating partnerships with local leaders can improve community participation and engagement during crises. This study also emphasizes the need for government agencies to incorporate social media into formal disaster management frameworks to ensure timely and coordinated responses.

From a theoretical perspective, this research contributes to the growing body of literature on the intersection of social media and disaster management, particularly in developing regions. The study highlights the importance of digital platforms not only as communication tools but also as vital components of community resilience. Furthermore, it offers insights into how combining traditional knowledge with modern technology can create more adaptive and responsive communities in the face of natural disasters. This contributes to the theory of community-based disaster management by illustrating the value of integrating local knowledge with technological advancements.

## ACKNOWLEDGMENT

We would like to express our heartfelt gratitude to the Lembaga Penelitian & Pengabdian Kepada Masyarakat (LPPM) at Universitas Lambung Mangkurat in Banjarmasin for their generous funding and support of this research. The financial and academic assistance provided by LPPM was essential to the successful completion of our study, allowing us to thoroughly investigate the role of social media in disaster risk mitigation during the 2021 flood in South Kalimantan.

Additionally, we appreciate the contributions of all those involved in supporting this research. This includes our colleagues who offered valuable insights and critiques that significantly enhanced the quality of our work, as well as the local government officials and community leaders in the Banjar, Hulu Sungai Tengah, and Tabalong regencies for their cooperation and openness. We are also grateful to the residents of these communities who shared their experiences and challenges during the flood. Every contribution was vital to the comprehensiveness and depth of our findings.

## REFERENCES

- Abedin, B., Babar, A., & Abbasi, A. (2014). Characterization of the Use of Social Media in Natural Disasters: A Systematic Review. *2014 IEEE Fourth International Conference on Big Data and Cloud Computing*, 449–454. <https://doi.org/10.1109/BDCloud.2014.17>
- Alexander, D. E. (2014). Social Media in Disaster Risk Reduction and Crisis Management. *Science and Engineering Ethics*, 20(3), 717–733. <https://doi.org/10.1007/s11948-013-9502-z>
- Arora, S. (2022). Post-disaster communities on social media: Citizen participation in crisis communication after the Nepal earthquake, 2015. *Journal of Applied Communication Research*, 50(1), 1–18. <https://doi.org/10.1080/00909882.2021.1964572>
- Bigo, D., & Martin-Maze, M. (2014). Report on Theory and Methodology for Mapping of Societal Security Networks. *SOURCE: Societal Security Network*, 313288.
- BNPB. (2021a). *10 Kabupaten/Kota Terdampak Banjir di Kalimantan Selatan*. <https://bnpb.go.id/berita/-update-10-kabupaten-kota-terdampak-banjir-di-kalimantan-selatan>
- BNPB. (2021b). [Update]—*Sebanyak 7 Kabupaten/Kota Terdampak Banjir di Kalimantan Selatan*. 17 Januari 2021. <https://bnpb.go.id/berita/-update-sebanyak-7-kabupaten-kota-terdampak-banjir-di-kalimantan-selatan>
- Carr, C. T., & Hayes, R. A. (2015). Social Media: Defining, Developing, and Divining. *Atlantic Journal of Communication*, 23(1), 46–65. <https://doi.org/10.1080/15456870.2015.972282>
- Cheng, J. W., Mitomo, H., Otsuka, T., & Jeon, S. Y. (2016). Cultivation effects of mass and social media on perceptions and behavioural intentions in post-disaster recovery – The case of the 2011 Great East Japan Earthquake. *Telematics and Informatics*, 33(3), 753–772. <https://doi.org/10.1016/j.tele.2015.12.001>
- Crano, W. D., Brewer, M. B., & Lac, A. (2014). *Principles and methods of social research*. Routledge. <https://www.taylorfrancis.com/books/mono/10.4324/9781315768311/principles-methods-social-research-william-crano-marilynn-brewer-andrew-lac>
- Fahrianoor, F., & Hidayat, M. N. (2022). Optimizing The Utilization of Social Media In The Application of Regulations And Public Awareness Culture of Hydrometeorological Disasters In South Kalimantan. *International Journal of Multiscience*, 3(03), 7–21. <https://www.multisciencejournal.com/index.php/ijm/article/view/293/230>
- Fan, C., Jiang, Y., & Mostafavi, A. (2020). Emergent social cohesion for coping with community disruptions in disasters. *Journal of The Royal Society Interface*, 17(164), 20190778. <https://doi.org/10.1098/rsif.2019.0778>
- Ferro-Azcona, H., Espinoza-Tenorio, A., Calderón-Contreras, R., Ramenzoni, V. C., País, M. de las M. G., & Mesa-Jurado, M. A. (2019). Adaptive capacity and social-ecological resilience of coastal areas: A systematic review. *Ocean & Coastal Management*, 173, 36–51. <https://doi.org/10.1016/j.ocecoaman.2019.01.005>
- Gardiner, S., Chen, J., Abreu Novais, M., Dupré, K., & Castley, J. G. (2023). Analyzing and Leveraging Social Media Disaster Communication of Natural Hazards: Community Sentiment and Messaging Regarding the Australian 2019/20 Bushfires. *Societies*, 13(6), Article 6. <https://doi.org/10.3390/soc13060138>
- Giri, D., & Vats, A. (2019). Social Media and Disaster Management in India: Scope and Limitations. In A. Al-Masri & K. Curran (Eds.), *Smart Technologies and Innovation for a Sustainable Future* (pp. 349–356). Springer International Publishing. [https://doi.org/10.1007/978-3-030-01659-3\\_41](https://doi.org/10.1007/978-3-030-01659-3_41)
- Gray, B. J., Weal, M. J., Martin, D., Gray, B. J., Weal, M. J., & Martin, D. (2019). *Social Media and Disasters: Applying a New Conceptual Framework to the Case of Storm Desmond* (social-media-and-disasters) [Chapter]. <https://Services.Igi-Global.Com/Resolvedoi/Resolve.aspx?Doi=10.4018/978-1-5225-6195-8.Ch033>; IGI Global. <https://www.igi-global.com/gateway/chapter/www.igi-global.com/gateway/chapter/207598>
- Hazarika, B., Rea, A., Mousavi, R., & Chen, K. (2021). The impact of social media on disaster relief effort – recovery coordination for Hurricane Harvey. *Global Knowledge, Memory and Communication*, 70(6/7), 558–576. <https://doi.org/10.1108/GKMC-05-2020-0062>
- Hiwasaki, L., Luna, E., Syamsidik, & Shaw, R. (2014). Process for integrating local and indigenous knowledge with science for hydro-meteorological disaster risk reduction and climate change adaptation in coastal and small island communities. *International Journal of Disaster Risk Reduction*, 10(Part A), 15–27. <https://doi.org/10.1016/j.ijdr.2014.07.007>
- Kadarisman, A., Bakti, I., Agustin, H., & Mulyani, H. S. (2023). The Concept And Methodology Of Environmental Communication Strategies In UNESCO Global Geoparks To Support Sustainable Development Goals. *Journal of Survey in Fisheries Sciences*, 1668–1687. <http://sifisheriessciences.com/index.php/journal/article/view/908/411>
- Kim, Y.-C., & Kang, J. (2010). Communication, neighbourhood belonging and household hurricane preparedness. *Disasters*, 34(2), 470–488. <https://doi.org/10.1111/j.1467-7717.2009.01138.x>

- Landwehr, P. M., & Carley, K. M. (2014). Social Media in Disaster Relief. In W. W. Chu (Ed.), *Data Mining and Knowledge Discovery for Big Data: Methodologies, Challenge and Opportunities* (pp. 225–257). Springer. [https://doi.org/10.1007/978-3-642-40837-3\\_7](https://doi.org/10.1007/978-3-642-40837-3_7)
- Li, L. X. (2014). Involvement of Social Media in Disaster Management during the Wenchuan and Ya'an Earthquakes. *Asian Journal for Public Opinion Research*, 1(4), 249–267. <https://doi.org/10.15206/ajpor.2014.1.4.249>
- Mavrodieva, A. V., & Shaw, R. (2021). Social Media in Disaster Management. In R. Shaw, S. Kakuchi, & M. Yamaji (Eds.), *Media and Disaster Risk Reduction: Advances, Challenges and Potentials* (pp. 55–73). Springer. [https://doi.org/10.1007/978-981-16-0285-6\\_4](https://doi.org/10.1007/978-981-16-0285-6_4)
- McLean, H. E. (2011). *Trust, Journalism and Communities in a Crisis: Relationships between Media and Emergency Managers* [Griffith University]. <https://research-repository.griffith.edu.au/items/74ce48a3-388f-567a-b9fb-2cc5625fa352>
- Metha, A. M., Bruns, A., & Newton, J. (2017). Trust, but verify: Social media models for disaster management. *Disasters*, 41(3), 549–565. <https://doi.org/10.1111/disa.12218>
- Ngamassi, L., Ramakrishnan, T., & Rahman, S. (2016). Use of Social Media for Disaster Management: A Prescriptive Framework. *Journal of Organizational and End User Computing (JOEUC)*, 28(3), 122–140. <https://doi.org/10.4018/JOEUC.2016070108>
- Okubo, T. (2016). Traditional wisdom for disaster mitigation in history of Japanese Architectures and historic cities. *Journal of Cultural Heritage*, 20, 715–724. <https://doi.org/10.1016/j.culher.2016.03.014>
- Rahman, A., Sakurai, A., & Munadi, K. (2017). Indigenous knowledge management to enhance community resilience to tsunami risk: Lessons learned from Smong traditions in Simeulue island, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 56(1), 012018. <https://doi.org/10.1088/1755-1315/56/1/012018>
- Sari, E. A., Setiawan, R. A. D., & Jandevi, U. (2023). Social Media in Electoral Communication: A Case Study of Strategic Initiatives by Bantul Election Commission for the 2024 Elections. *CHANNEL: Jurnal Komunikasi*, 11(2), Article 2. <https://doi.org/10.12928/channel.v11i2.377>
- Sawaneh, I. A., Fan, L., & Sesay, B. (2023). Application of Social Media Tool in Disaster Management in Disaster-Prone Communities in Freetown, Sierra Leone. *Open Journal of Applied Sciences*, 13(06), 858–873. <https://doi.org/10.4236/ojapps.2023.136069>
- Setyastuti, Y., Hanief, L., & Mahmudi, N. (2021). Disaster Communication and Information Literacy of Mothers in Facing Flood Disasters in Banjar Regency. *Library Philosophy and Practice (e-Journal)*. <https://digitalcommons.unl.edu/libphilprac/6559>
- Susanti, T., Anom, E., & Iswadi, I. (2023). Optimizing Public Communication in the Digital Era: A Case Study of the Ministry of Communication and Information Technology in Indonesia. *CHANNEL: Jurnal Komunikasi*, 11(2), Article 2. <https://doi.org/10.12928/channel.v11i2.468>
- Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A Work-In-Process Literature Review: Incorporating Social Media in Risk and Crisis Communication. *Journal of Contingencies and Crisis Management*, 19(2), 110–122. <https://doi.org/10.1111/j.1468-5973.2011.00639.x>
- Xiao, Y., Huang, Q., & Wu, K. (2015). Understanding social media data for disaster management. *Natural Hazards*, 79(3), 1663–1679. <https://doi.org/10.1007/s11069-015-1918-0>
- Yan, L. (Lucy), & Pedraza-Martinez, A. J. (2019). Social Media for Disaster Management: Operational Value of the Social Conversation. *Production and Operations Management*, 28(10), 2514–2532. <https://doi.org/10.1111/poms.13064>