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BMKG'S DISASTER COMMUNICATION STRATEGY ON INSTAGRAM: A MEDIA ECOLOGY ANALYSIS OF THE @infobmkgsumut ACCOUNT

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ABSTRACT

This study examines BMKG's disaster communication strategy through the Instagram account @infobmkgsumut by integrating media ecology theory and the social construction of reality. The study is motivated by the growing importance of Instagram as a digital environment for disseminating disaster information in North Sumatra, a region vulnerable to extreme weather, tidal flooding, hydrometeorological hazards, and seismic activity. Using a descriptive qualitative approach, data were collected through observation of Instagram content, documentation of disaster-related posts, and interviews with six informants from Asahan, Pematang Siantar, Langkat, Deli Serdang, and Medan. The findings show that @infobmkgsumut constructs disaster risk through early warnings, infographics, reels, press releases, weather symbols, regional markers, event periods, and awareness narratives. These communication practices transform scientific data into socially meaningful risk messages that can be understood and used by the public in everyday decision-making. From the perspective of media ecology, Instagram does not merely function as a distribution channel but shapes the form, rhythm, visibility, and reception of disaster messages. Meanwhile, the social construction of reality perspective reveals how BMKG externalizes scientific knowledge, objectivizes disaster risk through official digital messages, and encourages public internalization through preventive awareness. This study contributes academically by offering an integrated theoretical reading of disaster communication as both a media ecological process and a social construction of risk within a regional digital context.

Keywords: *: disaster communication, BMKG, Instagram, media ecology, social construction of risk.*

1. INTRODUCTION

Disaster communication in the digital era can no longer be understood simply as the process of conveying information from official institutions to the public, but has evolved

into a strategic mechanism for building public understanding of risks, preparedness, and response to disaster threats. Climate change, increasing intensity of extreme weather, hydrometeorological disasters, and geological activity demand a communication system that is fast, accurate, easy to understand, and can reach a wide audience. In this context, disaster information serves not merely as notification but as a basis for public decision-making in the face of potential hazards. Communication that is late, overly technical, or inconsistent with public information consumption patterns can weaken preparedness and increase social risks from disasters. Therefore, the effectiveness of disaster communication depends heavily on the ability of official institutions to translate scientific data into public messages that are communicative, applicable, and relevant to community needs (Ruslanjari et al., 2023; Rofiyanti et al., 2024). In Indonesia, the need for disaster communication is becoming increasingly important due to the region's high vulnerability to various types of disasters, whether caused by meteorological, climatological, geophysical, or hydrometeorological factors. The Meteorology, Climatology, and Geophysics Agency (BMKG), as the official agency authorized to provide meteorological, climatological, and geophysical information, plays a crucial role in the national early warning system. However, the main challenge for BMKG communication lies not only in data accuracy but also in how to package the data so that it can be understood by the public with diverse disaster literacy backgrounds. Information about heavy rain, strong winds, tidal flooding, seismic activity, and potential hydrometeorological disasters needs to be conveyed in a format that is not only scientific but also simple, visual, contextual, and able to encourage preventative action. Therefore, BMKG's communication strategy should be seen as part of a mediation process between scientific knowledge and the practical needs of the community in facing disaster risks (Kiareni et al., 2024; Safira & Setianingrum, 2023).

The development of social media, particularly Instagram, has shifted disaster communication patterns from a one-way information delivery model to a more visual, fast, interactive, and platform-based digital communication model. Instagram has become a crucial platform for public institutions, enabling information to be disseminated through infographics, reels, captions, regional tables, weather symbols, warning colors, and short narratives that are easily accessible to the public. In the context of North Sumatra, the Instagram account @infobmkgsumut holds a strategic position because this region faces various potential risks, such as extreme weather, flooding, tidal flooding, heavy rainfall, and seismic activity in Aceh and North Sumatra. The flooding phenomenon in North Sumatra demonstrates that even though early warning information has been disseminated early, the impact of the disaster still occurs and causes social losses. This situation demonstrates that the availability of information does not automatically result in an understanding of risks and preparedness measures, necessitating an analysis of how disaster messages are constructed, mediated, and received by the public (Maulvi et al., 2023; Aditya, 2024).

Theoretically, this study uses Marshall McLuhan's media ecology theory to interpret Instagram not simply as a channel for disseminating information, but as a communication environment that shapes how messages are produced, visualized, read, shared, and remembered by audiences. McLuhan's notion that "the medium is the message" emphasizes that the nature of the medium has a significant influence on the meaning of

messages received by the public. In the context of disaster communication, Instagram forms a communication logic that demands concise, visual, fast, and easy-to-understand messages. This means that the effectiveness of BMKG messages is determined not only by the content of weather or disaster information, but also by the suitability of the message format to the character of the digital platform. When disaster information is packaged through reels, infographics, regional tables, and concise captions, the medium helps determine how the public understands the threat level, risk location, event period, and necessary actions (McLuhan, 1964; Deshaye, 2019; Tarigan, 2024).

In addition to media ecology theory, this study also uses Berger and Luckmann's social construction of reality perspective to explain how disaster risk is shaped as a social reality through digital communication. In this perspective, reality does not exist naturally but is constructed through language, symbols, interactions, and the institutionalization of meaning. The BMKG (Indonesian Agency for Meteorology, Climatology, and Geophysics) externalizes scientific data on extreme weather, tidal flooding, and seismic activity through Instagram content; these messages are then objectified when presented as official, recurrent, credible, and institutionally legitimate information. Furthermore, the public internalizes these messages through understanding, local experiences, and preparedness actions in everyday life. Thus, disaster communication operates not only at an informative level but also at a constructive level, shaping how the public interprets disasters as risks that can be monitored, understood, and responded to preventively (Berger & Luckmann, 1967; Light et al., 1967).

Previous research has extensively discussed disaster communication through disaster management institutions, the use of information technology, social media strategies, and institutional coordination. However, most studies still focus on disaster communication in general, disaster management institutions, or social media account management without specifically linking risk construction to the characteristics of digital media and local audience acceptance. A research gap is seen in the lack of studies analyzing how the BMKG, as a state technical institution, constructs disaster messages through Instagram in the regional context of North Sumatra, and how the public understands these messages based on visual clarity, regional relevance, disaster experience, and daily mobility needs. Therefore, this study aims to analyze the BMKG's disaster communication strategy through the Instagram account @infobmkgsumut using the perspectives of media ecology and the social construction of reality. The contribution of this study lies in explaining that digital disaster communication is not only a matter of information distribution, but also a process of technological mediation and the social construction of risk that determines how society understands and responds to disaster threats.

2. RESEARCH METHOD

This study uses a qualitative method with a descriptive approach because it focuses on an in-depth understanding of the BMKG's disaster communication strategy through the Instagram account @infobmkgsumut. This approach was chosen to explain how disaster messages are produced, visualized, interpreted, and received by the public in the social media ecosystem. Qualitative research is relevant because the object of study is not directed at statistical measurements, but rather at the interpretation of meaning, communication processes, audience experiences, and the construction of disaster risk

through digital media (Creswell & Creswell, 2022; Edmonds & Kennedy, 2020). Content observation was conducted on Instagram posts @infobmkgsumut between October 2025 and March 2026. From that period, this study analyzed 10 posts selected purposively based on the following criteria: containing early warning information, related to extreme weather, tidal flooding, moderate to heavy rain, strong winds, lightning, hydrometeorological disasters, earthquake activity, and including visual elements such as infographics, reels, regional tables, weather symbols, time markers, and alert narratives. These criteria were used to ensure that the analyzed content truly represented the BMKG's disaster communication practices on Instagram, not just general informative posts.

Research data was obtained through three techniques: observation of Instagram content, documentation of posts, and semi-structured interviews. Observations were conducted by examining the message format, risk visualizations, captions, symbol use, regional mentions, event periods, and calls for vigilance in each post. Documentation was conducted by collecting screenshots, post links, content descriptions, disaster themes, and forms of risk construction that emerged in the @infobmkgsumut account. Semi-structured interviews were conducted with six informants purposively selected based on their domicile, exposure to weather and disaster information, and the relevance of their region to the disaster risk context in North Sumatra. To maintain confidentiality and comply with research ethics, the informants' names have been pseudonymized as MM from Asahan Regency, DFA from Pematang Siantar City, KBH from Langkat Regency, BS from Deli Serdang Regency, HR from Medan City, and NS from Medan City. The interview guide was developed based on several key focuses: informants' understanding of BMKG content, the most helpful content sections, visual and linguistic clarity, the impact of information on awareness, local experiences with disasters, and suggestions for improving communication on the @infobmkgsumut Instagram account. The use of semi-structured interviews allowed researchers to obtain data that remained focused but open to informants' subjective experiences in interpreting disaster messages (Creswell & Creswell, 2022; Flick, 2022).

Data analysis was conducted qualitatively through the stages of data condensation, data presentation, and conclusion drawing, as developed by Miles, Huberman, and Saldaña. During the data condensation stage, all posts and interview results were sorted based on their relevance to the research focus, namely the construction of disaster risk in Instagram content and the public's reception of disaster messages. Content data was then categorized based on disaster theme, message format, visual elements, regional markers, event period, and awareness narrative. Meanwhile, interview data was coded based on the theme of message understanding, helpful content elements, impact on awareness, barriers to understanding, and informant recommendations. In the data presentation stage, the results of observations and interviews were organized into a thematic matrix to systematically demonstrate the relationship between BMKG's messaging strategy and audience responses. Conclusions were then drawn by interpreting the findings using Marshall McLuhan's media ecology theory and Berger and Luckmann's social construction of reality theory. Media ecology theory was used to explain how Instagram's characteristics shape the way disaster messages are packaged and received, while social construction of reality theory was used to interpret how BMKG's scientific data was

externalized into digital messages, objectified as official information, and internalized by the public as a basis for vigilance. Data validity was maintained through source and technical triangulation, namely by comparing content observation data, upload documentation, and informant interviews from several different regions in North Sumatra (Flick, 2022; Miles et al., 2020).

3. RESULT AND ANALYSIS

The Social Construction of Disaster Risk through @infobmkgsumut Instagram Content

The construction of disaster risk in @infobmkgsumut Instagram content demonstrates how BMKG scientific information is translated into public messages that can be read, understood, and responded to by the public. Data collected shows that the content not only includes notifications about extreme weather, tidal flooding, heavy rainfall, and seismic activity, but also includes efforts to build risk awareness through time stamps, affected areas, information visualizations, awareness narratives, and calls to follow official sources. Through this pattern, disaster risk is positioned not as merely technical information, but as a social reality that needs to be recognized early so that the public can build more rational and targeted preparedness.

Table 2. Construction of Disaster Risk in @infobmkgsumut Instagram Content

No	Content	Disaster Theme	Forms of Risk Construction	The Meaning of Communication
1	Early warning reel for potential coastal tidal flooding in the Medan region for December 1, 2025	Tidal floods	Risk is constructed by specifying the region, the event period, and the potential for coastal flooding.	The public is guided to understand tidal flooding as a real threat that requires vigilance at specific times.
2	Summary reel for seismic activity in Aceh and North Sumatra for the second week of January 2026	Earthquakes	Risk is presented through information on seismic activity, small to medium magnitudes, and the potential for a tsunami.	The public is informed that earthquakes have varying threat levels and are continuously monitored by the BMKG.
3	Earthquake activity reel for the third week of January 2026	Earthquakes	Risk is framed through calls to remain calm, be alert, and monitor information from the Meteorology, Climatology, and Geophysics Agency (BMKG).	The public is guided not to panic, but to continue to rely on official information as the basis for preparedness.
4	Earthquake activity reel for the first week of March 2026	Earthquakes	Risk is constructed through the repetition of information about small to medium earthquakes and warning messages.	Preparedness is understood as an ongoing attitude, not just a response when a major disaster occurs.
5	Explanation reel for tidal surges and causes of tidal flooding for December 4, 2025	Tidal floods	Risk is explained through the relationship between tides and the possibility of tidal flooding.	The public not only receives warnings but also understands the scientific causes of potential threats.
6	Early warning reel for potential moderate to heavy rain accompanied	Extreme weather	Risk is constructed through the combination of the threat of heavy rain,	The public is guided to understand extreme weather as a complex

	by strong winds and lightning for November 24, 2025		strong winds, lightning, and the event period.	condition that can trigger derivative impacts.
7	Early warning upload for potential moderate to heavy rain accompanied by strong winds and lightning for November 22, 2025	Extreme weather	Risk is conveyed through an early warning format that emphasizes the potential for atmospheric hazards.	Information is positioned as a warning signal before an event occurs.
8	Press release warning of extreme weather that could lead to hydrometeorological disasters for November 23, 2025	Hydrometeorological disasters	Risk is framed through official language, alert narratives, and the relationship between extreme weather and hydrometeorological disasters.	Extreme weather is guided to be understood not as a normal phenomenon, but as a trigger for disaster.
9	"November rain" reel for sudden heavy rain and flooding in several locations	Heavy rain and floods	Risk is brought closer to people's daily experiences through narratives of heavy rain and flooding.	Messages become more communicative by linking weather phenomena with easily recognizable impacts.
10	Infographic reel for the earthquake in Aceh and North Sumatra for the fourth week of October 2025	Earthquakes	Risk is visualized through infographics of earthquake events over a specific period.	The public is helped to understand event patterns and understand the Aceh-North Sumatra region as an area under active seismic monitoring.

The data in the table shows that the @infobmkgsumut account constructs a sense of risk through a combination of warnings, education, and reporting on natural phenomena. Early warnings appear in content about tidal flooding, extreme weather, heavy rain, strong winds, lightning, and potential hydrometeorological disasters. Education is evident in content explaining the relationship between tides and tidal flooding. Reporting on natural phenomena is evident in summaries of earthquake activity in Aceh and North Sumatra. These three forms demonstrate that the BMKG (Indonesian Agency for Meteorology, Climatology, and Geophysics) not only disseminates information but also shapes how the public understands disasters as threats that can be monitored and anticipated.

This pattern is further evident when early warning content presents risks through spatial and temporal markers. Information about the potential for tidal flooding in the Medan area for December 1, 2025, for example, prevents the threat from appearing abstract. The mention of a region narrows the risk horizon, while the mention of a period provides a time limit for vigilance. Such messages are important because the public needs information that not only states the presence of danger but also explains where and when the potential danger should be addressed.

This understanding is reinforced through educational content about tidal flooding and tidal flooding. This content provides a deeper layer of explanation because the public not only receives a warning to be vigilant but also gains insight into the scientific causes of the threat. The relationship between tidal waves and tidal flooding makes risk easier to understand as a phenomenon with patterns, mechanisms, and possible countermeasures.

This educational approach strengthens the BMKG's role as an institution that not only provides warnings but also builds disaster literacy.

This vigilance is fostered through directional language choices. Phrases such as "stay calm," "be alert," "watch out," and "monitor BMKG information" demonstrate the relationship between information and action. Disaster data doesn't stop at knowledge but is translated into behavioral orientation. The public is encouraged not to be passive in responding to information but to use it as a basis for decision-making, monitoring surrounding conditions, and following updates from scientifically authoritative sources.

To ensure these messages resonate in the digital space, the BMKG uses a variety of formats tailored to Instagram's characteristics. Reels make messages shorter and easier to consume, infographics simplify technical data into quicker-to-read visuals, while press releases lend an official tone to extreme weather information. These differences in format demonstrate that communication strategies depend not only on content but also on how messages are packaged. Risks become more easily recognized when scientific data is presented in a visual, concise format that aligns with Instagram users' information consumption patterns.

The message's closeness to people's experiences is evident in the "November rain" content, which uses a more popular narrative. Sudden heavy rain and flooding in several places are situations easily recognized in everyday life. This style of delivery makes disaster information less technical, as the public can relate it to their direct experiences with weather and flooding. At this point, the BMKG's message not only explains the potential danger but also helps people connect natural signs with the possibility of more concrete social impacts.

Instagram's Characteristics as a Media Ecology in Public Reception of Disaster Messages

The Instagram media ecology in public reception of disaster messages shows that audience understanding of @infobmkgsumut information is determined not only by the warning content, but also by how the message is presented through visual formats, captions, reels, regional tables, weather symbols, and short narratives. Interviews with six informants from Asahan, Pematang Siantar, Langkat, Deli Serdang, and Medan showed that the majority of audiences understood BMKG information through the visual display of posts, particularly infographics, regional tables, colors, weather symbols, and time stamps. Message acceptance was also evident in informants' practical responses, such as increasing vigilance, adjusting activities, choosing vehicles, avoiding certain areas, and checking weather forecasts before traveling. These findings indicate that Instagram functions as a medium that accelerates access to disaster information, but its effectiveness is still influenced by the clarity of language, video density, caption strength, and the content's ability to reach different segments of society.

Table 2. Public Reception of Disaster Messages in @infobmkgsumut Instagram Content

Informant	Domicile	Forms of Understanding the Message	The Most Helpful Piece of Content	Impact on Alertness	Repair Notes
Muhammad Mitra	Kab. Asahan	Understands the message through infographics, regional tables, and time stamps, but considers the video too long and not to the point.	Weather symbols, typography, tables, and infographic designs	More vigilant in managing daily activities, especially when traveling by motorcycle	Videos need to be shortened, hooks strengthened, captions made more descriptive, and typography tidied up.
Daffa Faisal Afdala	Kota Pematang Siantar	Assesses the information as fairly easy to understand because weather updates are provided consistently.	Colors, affected areas, and two-day weather warnings	Not always motivated to take mitigation measures, but using information when needed, especially for tourism activities	Symbols and visual elements need to be simplified to make them more understandable to the general public.
Khrisna Budi Hendaru	Kab. Langkat	Understands the message because the vulnerable areas and rainfall are explained, but believes that not all levels of society are able to access and understand the information.	Region details, numbers, degrees, and weather information	Strongly motivated to be more vigilant due to the flooding experience in the Tanjung Pura area	Public education needs to be strengthened so that warnings are not taken lightly.
Bagus Santoso	Kab. Deli Serdang	Understands the information because the regions and risk levels are explained, although the language and content still need to be simplified.	Feeds, images, risk levels, and area information	Better prepared for the weather, avoiding certain areas, and preparing for travel	Language and content need to be simplified to make them accessible to all levels of society.
Hafiz Raisya	Kota Medan	Understands the weather warning information, but considers the captions too simple and some symbols difficult for the general public to understand.	Images, area points, and current weather information	Better vigilant, preparing equipment such as coats, and avoiding flood-prone areas	Reels need to be shortened, captions clarified, and public education strengthened.

Naqil Sayyaf al-Mujahid	Kota Medan	Assesses the information as fairly credible, accurate, clear, and efficient, especially in posts in tables or slides.	Photos, tables, area slides, and rain watch information	Change vehicle choice after seeing rain forecasts and using BMKG information as a guide for activities	Captions need to be more descriptive of the content, videos need to be shorter, less monotonous, and preferably subtitled.

The data in the table shows that the public's reception of disaster messages is significantly influenced by the visual format used by @infobmkgsumut. Nearly all informants ranked the infographics, regional tables, weather symbols, colors, and time stamps as the most helpful elements in understanding the information. Muhammad Mitra from Asahan, for example, stated that the infographic design was "quite understandable" because it included a weather warning table, regions, and weather symbols, allowing the audience to immediately grasp the key information. This statement demonstrates that audiences tend to understand risks more easily when weather data is presented in a concise and structured visual format.

This tendency also emerged in an interview with Daffa Faisal Afdala from Pematang Siantar. Daffa considered the colors and affected areas in the early warning posts to be the most helpful elements in understanding the weather warnings. He described the information as "quite clear" because audiences could immediately see which areas were potentially affected. This view demonstrates that visual elements not only enhance the appearance of content but also play a key role in accelerating the risk understanding process, especially for audiences without a background in meteorology.

Audience understanding of BMKG messages goes beyond visual aspects, but also relates to the clarity of the region and the relevance of the information to local experiences. Khrisna Budi Hendaru from Langkat stated that information from @infobmkgsumut was easy to understand because the account explained areas with heavy rainfall and points of concern. The experience of flooding in Tanjung Pura made BMKG information feel more important because it directly related to the social conditions experienced by the community. At this point, message acceptance becomes stronger when digital information meets real-life disaster experiences in the audience's environment.

The connection between information and local experiences was also evident in Bagus Santoso from Deli Serdang. Bagus stated that information on BMKG's Instagram was quite helpful because it explained the Deli Serdang region and risk levels. He also explained that weather warnings made him more cautious when passing through certain areas, especially if there were heavy rainfall or flood-prone areas. This response demonstrates that message acceptance is not only cognitive but also transforms into practical considerations in daily mobility.

A similar pattern was seen in Hafiz Raisya from Medan, who uses BMKG information to improve preparedness when traveling in urban areas. Hafiz explained that rain and flood warnings made him more prepared to bring supplies like a coat and avoid certain areas potentially affected. This statement demonstrates how disaster messages on Instagram can encourage simple but relevant actions in everyday life. Caution doesn't always

manifest itself in large-scale evacuations, but can emerge through micro-decisions such as choosing a route, preparing supplies, or postponing a trip.

The most concrete response was seen in Naqil Sayyaf al-Mujahid from Medan, who used information from @infobmkgsumut as a reference before traveling. He said that after seeing the rain forecast, he decided to forgo using his motorcycle and instead switched vehicles. Naqil also found slide-based posts more efficient because they were "straightforward" and directly indicated the areas and times of rain. This finding reinforces the fact that message reception in the Instagram context is highly dependent on the efficiency of presentation. Audiences need information that is quick to read, easy to understand, and immediately usable for decision-making.

Although the majority of informants understood the information on @infobmkgsumut, several critical comments emerged regarding the captions, video length, and symbol complexity. Muhammad Mitra, Hafiz Raisya, and Naqil Sayyaf al-Mujahid all noted that the videos or reels tended to be too long, monotonous, and didn't get to the point. Muhammad Mitra emphasized the need for a hook at the beginning of the video to help younger audiences understand the content, while Naqil suggested subtitles to make the videos more inclusive for those with hearing impairments. This criticism suggests that Instagram's fast-paced and visual nature requires disaster content to be more concise, direct, and accessible.

Another limitation relates to language and the public's understanding. Daffa suggested simplifying the visual symbols, as some atmospheric elements can be complex for laypeople. Bagus also argued that the language and content needed to be simplified to ensure they could be understood by all levels of society. Khrisna emphasized the need for stronger public education, as some residents still take weather warnings for granted and only respond to them when flooding occurs. These findings demonstrate that the acceptance of disaster messages depends not only on the availability of information, but also on risk literacy, social experience, and the content's ability to bridge technical language with public understanding.

Overall, interviews revealed that the Instagram account @infobmkgsumut has served as an information channel that helps the public understand weather and potential disasters. However, its effectiveness still depends on the quality of the message packaging. Feeds, infographics, tables, colors, and regional descriptions are considered more effective than long videos because they align with the needs of audiences seeking quick information. Captions still need to be strengthened so that they not only complement but also help explain the visual content. Reels need to be shortened to align with information consumption patterns on Instagram. Thus, public acceptance of disaster messages is formed through a combination of the credibility of the BMKG, visual clarity, regional relevance, disaster experience, and the ease of applying the information to daily activities.

Discussion

The results of this study indicate that disaster communication via Instagram can no longer be understood as merely information dissemination, but as a practice of risk mediation within the digital ecosystem. Findings regarding the @infobmkgsumut account show that information on extreme weather, tidal flooding, heavy rainfall, and seismic activity is packaged through infographics, reels, regional tables, weather symbols, time

stamps, and alert narratives. This pattern aligns with the global trend of disaster communication shifting from a one-way delivery model to a platform-based communication model, where official institutions are required to present information that is fast, visual, easy to scan, and relevant to the public's needs (Ninuk Riswandari & Rochman, 2025). In disaster situations, the public not only requires predictive data but also messages that explain the location of the risk, the alert period, the threat level, and practical actions that can be taken. The findings of this study indicate that the @infobmkgsumut account has moved in this direction by presenting content based on regions and event periods, although its effectiveness still depends on the content's ability to bridge technical language with wider public understanding.

This global trend becomes even more evident when examining public message reception through interviews with informants from Asahan, Pematang Siantar, Langkat, Deli Serdang, and Medan. Informants not only read BMKG content for general information, but also use it as a basis for daily decision-making, such as choosing a vehicle, bringing rain gear, adjusting departure times, avoiding flood-prone areas, and checking weather forecasts before activities (Rofiyanti et al., 2024). These findings demonstrate that digital disaster communication has a practical function in people's lives, especially when information is delivered visually, concisely, and regionally. At the same time, several informants felt that overly long videos, overly simplistic captions, complex symbols, and technical language that has not yet become fully mainstream can hinder message acceptance. This situation suggests that the challenge of disaster communication in the platform era is not only about distribution speed, but also about readability, accessibility, and the ability of messages to promote awareness without causing confusion.

These findings reinforce the relevance of Marshall McLuhan's media ecology theory in interpreting BMKG's disaster communication practices on Instagram. The idea that "the medium is the message" is evident in how Instagram's character shapes how disaster messages are produced and received. BMKG information does not exist in a vacuum, but is instead governed by the logic of the medium, which demands visualization, brevity, speed, initial appeal, and ease of sharing. Informants considered infographics and regional tables more effective because these formats align with Instagram's fast and selective information consumption patterns. Reels that are too long were deemed less effective because they did not align with the expectations of audiences who need information immediately. Thus, the medium is not only a distribution channel for BMKG information but also determines the form, rhythm, and readability of disaster messages.

A reading through Berger and Luckmann's theory of the social construction of reality shows that the content of @infobmkgsumut constructs risk through processes of externalization, objectivation, and internalization. Externalization is evident when the BMKG transforms meteorological, climatological, and geophysical data into public messages through infographics, press releases, captions, reels, and visual symbols. Objectivation occurs when these messages are repeatedly presented as official information with institutional legitimacy, so that the risks of tidal flooding, extreme weather, heavy rain, and earthquakes are not understood as random events, but as monitorable threats. Internalization is evident when informants use this information to formulate practical actions, such as increasing vigilance, regulating mobility, or preparing specific equipment. Risk construction in this context does not stop at message production

but moves toward shaping public awareness influenced by social experiences, regional proximity, and disaster literacy levels.

The findings of this study also relate to previous research on disaster communication. A study by Ruslanjari, Safitri, Rahman, and Ramadhan (2023) emphasized the importance of information and communication technology in building a culture of public awareness regarding hydrometeorological disasters. The results of this study expand this understanding by demonstrating that public awareness is shaped not only by the presence of technology, but also by how that technology is used to package risk visually, concisely, and contextually. The @infobmkgsumut account not only conveys weather information but also shapes risk understanding through geographic markers, periods, symbols, threat levels, and alert narratives. Therefore, Instagram-based disaster communication is inextricably linked to the quality of message design, formatting choices, and the connection of the information to public experiences.

Another connection is evident with Safira and Setianingrum's (2023) research on the BMKG Juanda's communication strategy in managing the @infobmkgjuanda Instagram account, as well as Tarigan's (2024) research on media ecology. Safira and Setianingrum's research emphasized the importance of strategic management of BMKG social media accounts as public information channels, while this study more specifically demonstrates how audiences interpret these messages through their experiences using weather information in their daily activities. Tarigan's research provides a theoretical basis for media shifts in how people receive and understand messages, while findings from @infobmkgsumut provide empirical evidence that Instagram's character shapes audience preferences for infographics, tables, colors, regional symbols, and clear captions. Thus, this study not only confirms the importance of social media in disaster communication but also demonstrates that message effectiveness is strongly influenced by the alignment between the medium's character, message design, and the needs of the local audience.

The novelty of this research lies in its interpretation of BMKG's disaster communication as a dual process: the social construction of risk and message reception within the Instagram media ecology. This research not only assesses Instagram as an information distribution channel but also as a communication environment that shapes how disaster risk is produced, visualized, legitimized, and internalized by the public. The research's primary contribution lies in the regional context of North Sumatra, as content and interview data demonstrate that the reception of disaster messages is strongly influenced by domicile diversity, local experiences with flooding, daily mobility, and the audience's ability to read visual symbols and technical language. With this position, this study offers an understanding that BMKG's communication strategy on Instagram needs to be directed not only at the speed of information delivery, but also at visual clarity, simplicity of language, strengthening captions, video compression, and more inclusive risk education so that official information can be transformed into public awareness and preparedness actions.

4. CONCLUSION

This research shows that the BMKG's disaster communication strategy through its Instagram account @infobmkgsumut represents a significant shift in how the official

agency builds risk awareness in the digital space. Disaster information is no longer presented solely as technical data about weather, tidal flooding, heavy rain, or seismic activity, but is constructed into visual, concise, contextual public messages that can be used by the public in making daily decisions. Through infographics, reels, captions, weather symbols, regional markers, event periods, and awareness narratives, BMKG strives to bridge scientific knowledge with the social experiences of the people of North Sumatra. The research findings reflect that Instagram plays a role in the media ecology that helps shape how disaster messages are produced, received, and interpreted by the public. The social construction of risk is evident when the public begins to understand BMKG information as a basis for vigilance and preventive action. Thus, digital disaster communication is determined not only by the speed of information delivery, but also by the message's ability to build meaning, local relevance, public trust, and mitigation awareness in people's lives.

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