

From loudspeakers to smartphones: understanding youth perspectives on disaster risk communication in sadar block, balasore, odisha, india

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Abstract

Digital Media or Social Media play an important role during the cyclones in disseminating the important information, early warning, alerts and real-time updates to the users. However, the existing research on disaster or risk communication remains high in countries like Japan, Australia and the United States. The research objective of the study is to understand the role of media (traditional and digital) in disaster risk reduction from the youth of Balasore Sadar Block of Balasore district, Odisha, India. This study is quantitative in nature using a 5-point Likert scale as the tool. The survey was conducted with 394 respondents between 15-29 from the five vulnerable

villages of the block using the multistage sampling. The Risk Communication theory is used as the theoretical framework in the research, and it also aligns with the Sustainable Development Goals like 3, 9, 10, 11, and 13. The results reflect that the maximum number of youth are using smartphones with internet facilities and relying on digital media for cyclone alerts, but to tackle the fake news, they cross-check it with the regional news channels or with the government authorities. The use of a weather app like SATARAK is absent, which is a concern about the lack of digital literacy and awareness among them.

Keywords:

Disaster Risk Reduction

Risk Communication

Youth

Social Media

Balasore

Introduction:

Today, disaster management is not only about enhancing the physical vulnerabilities, but it is also important to know how the information is processed and disseminated during the disaster. The relationship between disaster communication, social media and youth has gained importance in the cyclone-prone

regions such as Odisha. With the rapid expansion of digital access, youth actively create, interpret and circulate the content, which helps them to share the early warning to the people before the cyclone hits. Disaster communication helps in the rescue, relief and recovery, digital connectivity in reducing the risk, which can improve the coordination among people (Verma et al., 2025).

Globally, India is the country where 270 million active users are on Facebook (Bhuvana & Aram, 2020), and it has been recorded that now over 1 billion people are subscribers of the internet in early 2026, which is the largest digital ecosystem among all the nations. Over 57 percent these users are residing in the rural areas of India (The Hindu Bureau, 2026) and because of affordable smartphones and internet data connections like 3G, 4G and 5G rural population is active on social media. The Jio revolution of 2016 became one of the reasons for the rapid digital expansion, which transformed India's telecommunication. According to the Telecom Regulatory Authority of India (TRAI), Jio expanded its network to the Rural areas of India, which played a crucial role in bridging the digital divide (Majumdar & Das, 2019).

Because of extensive digital connectivity, social media is having more practical and immediate function during any disaster. It has been observed that social media users usually get the first information through platforms like Facebook and Twitter, sometimes before the official government alerts (Bhuvana & Aram, 2020). In the 21st century, it is important to understand and adapt how communication technology is used to save lives in real time.

India is one of the highly vulnerable countries for cyclone. With time, the frequency and intensity of cyclones have increased. Between 1970 and 2019, India experienced 117 cyclones, which account for nearly 18 to 20 per cent of the worldwide cyclone impact (PTI, 2021). Since 2019, India has witnessed 27 cyclones through the last quarter of 2025, which have wreaked havoc on coastal areas (Barua, 2025) and affected around 45 million people in India (Wani, 2024).

Odisha is the eastern state of India with a 480 km long coastal line (Sarkhel et al., 2019), and because of its geographical location, it is vulnerable to frequent cyclones, floods and cyclonic storms (Verma & Tripathi, 2024). The state has witnessed some highly devastating cyclones like the 1999 Super Cyclone or Paradip Cyclone, Cyclone Phailin in 2013, Cyclone Fani in 2019, Cyclone Yaas in 2021, which made heavy damage to the livelihood, agriculture and infrastructure. But with time, Odisha has worked on the early warning systems, evacuations, and preparedness to withstand the cyclones originating from the Bay of Bengal.

Over time, social media has become a very important communication tool. Warnings, real-time updates, coordination's happens faster in digital media as compared to the traditional way of communication (Verma et al., 2025). Bhoi et al. (2025) also explain that social media data can help the stakeholders and authorities by sharing real-time insights for quick decision-making. In cyclone-prone states like Odisha, communication plays a vital role, but integrating the youth-driven social media into the risk communication framework will enhance the communication because social media will replace the traditional system, but it will make the communication faster, interactive, real-time and more accessible.

However, despite the highest number of Facebook users with nearly 367 million and approximately 487 million WhatsApp users (Verma et al., 2025), there are still a limited number of empirical studies on how youth utilise social networking sites for disaster communication at the local level. Therefore, the research objective of this study is to understand the role of media in disaster risk reduction from the youth's perspective, which

aligns with the significant objectives of the Sustainable Development Goals 3, 9, 10, 11, and 13. The Risk Communication Theory was used as the theoretical framework for the study, which highlights the developing landscape of disaster communication in the form of digital and traditional media.

Literature review:

The impact of climate change is causing natural disasters, and the communities are increasingly exposed to these disasters. Therefore, disaster management is being defined and redefined constantly. Nowadays, social media is one significant tool for communicating before, during and after a disaster (or a catastrophe). Researchers have been studying the role of digital platforms in preparedness, response and recovery with increasing frequency.

Numerous studies highlight how social media channels can facilitate increased disaster preparedness and reduced disaster risk through the dissemination of timely information. Sultan and Maharjan (2022) conducted a study on the effect of social media use on cyclone-induced losses of coastal households in Bangladesh after Cyclone Amphan. Their research discovered that those households that use both social media and traditional media suffered much lesser losses as compared to those only on traditional. Through social media, timely and actionable information enabled households to take preventive measures, such as putting in place safeguards for crops and livestock. The study noted some disadvantages as well, such as poor internet connection and fake news, which suggests that social media is fruitful if available and looked at the reliability of information too.

These studies do not only focus on the case studies of individuals; Nile et al. (2019) analysed five major disasters that took place in the United States, such as hurricanes, tornado outbreaks, flooding, etc., through Twitter activity. The type of disaster determines the nature of social media use as per their findings. To illustrate, the users were found to be more actively involved in sharing prior information before a hurricane. On the other hand, real-time updates and communications regarding recovery were found to be more popular in the case of tornadoes and floods. Notably, the study reveals that people with moderately-sized social networks, rather than highly influential users, are key players in information spread. This means that disaster communication through social media takes place via diffusion rather than influence.

Finau et al. (2020) looked at the use of social media during Tropical Cyclone Winston in Fiji, showing social media functioning in different phases of a disaster. Before the cyclone, platforms were used for warning and sharing information, during the cyclone, people live-blogged their ordeal, and after the cyclone, it contributed to collective recovery through hashtags #StrongerThanWinston. According to the study, social media is not limited to just one phase of disaster management but is useful throughout the disaster cycle.

Recent research has highlighted the effective contributions of social media to humanitarian response efforts. Social media platforms are essential to achieving an inclusive humanitarian response in Chari & Ngcamu (2025) as it enables communication between government agencies, NGOs, and community groups. The evidence corroborating these findings is both quantifiable and based on the

experience of disaster practitioners who are now increasingly using social media as a tool for coordination and inclusion.

Multiple investigations, meanwhile, indicate systemic disparities that shape the use and effectiveness of social media during disasters. Dargin et al. (2021) reported that class and spatial factors significantly influence social media use, while the use of social media to get information for vulnerable populations is more pronounced compared to others. For macro-level information, the problems faced by rural communities and low-income people are more complex. Digital technology has become ubiquitous over time, yet our results show the digital divide remains strong.

Several studies have also focused on Twitter as a main platform in disaster communication. Pourebrahim et al. (2019) illustrated that Twitter can be a useful source of information regarding disasters, particularly with regard to outages. Further, it can ease the identification of storm destruction and assist in relief planning. Likewise, Kryvasheye et al. (2016) observed that social media activity has a high correlation with disaster impact. For instance, the greater the level of Twitter activity in an area, the greater the impact was observed during Hurricane Sandy. Research also indicated that social media data can help with damage assessment and monitoring to provide real-time information during emergencies.

Furthermore, Lam et al. (2010) presented an extensive framework for comprehending the role of social media in disaster resilience. The paper highlights the central role played by social media, which extends from being a digital forum to communicate to something that can become a source of real-time

information for rescue operations. However, it also reveals a significant challenge of misinformation.

According to other research, social media data can be incorporated into conventional research and dialogue. According to Kitazawa & Hale (2020), the implementation of a survey-based approach can be enhanced by social media analysis. The analysis provides real-time insights into public awareness and response to early warning systems. Just as Saroj & Pal (2020) argue, "Twitter, Facebook, YouTube and other platforms can be used to extract and process data in times of emergency, thereby enhancing situational awareness and helping in crisis management. The communication processes within social media have also been examined". According to Mirbabaie et al. (2020), communicating effectively via social media can reduce distrust and provide a shared understanding during disasters. On the contrary, C. According to Knox (2022), local emergency management agencies have trouble using social media due to inconsistent messaging, capacity issues and technical limitations.

Along with the institutional and technological perspectives, several studies point to the value of public participation in disaster communication. The role of crowdsourcing through social media in aiding disaster management in contexts like Haiti, New York, for Hurricane Sandy, and the Philippines. These examples show how online crowdsourcing can easily mobilise resources and spread information during a crisis (Verma et al. 2025).c

Fan (2014) highlights how public responses to calamities have changed due to social media. People are using online platforms more to get information, connect with people and request or provide help. The shift in communication

patterns that implies the use of social media for disaster communications is a sign of the times.

Bhuvana (2020) provides further evidence of this transformation in various disaster contexts such as the Christchurch earthquake and the Kerala floods. The study exemplifies how platforms such as X (Twitter), Facebook and WhatsApp were put to great use for real-time updates, locating missing persons and coordinating relief efforts. Hashtags #Keralafloods and #eqnz illustrate how social media can boost collective action and information dissemination in case of any emergency.

The literature highlights the increasing use of social media in disaster management. Social media is being used for disseminating information and coordination, etc. This simultaneously indicates the challenges concerning access, reliability and effective use. Although prior studies have made substantial contributions to knowledge on the use of social media during various disastrous events, there is still a need to look further into how specific groups, especially youth, use these platforms in disaster regions.

Methodology:

The study applies quantitative research methodology to explore social media use by youth in managing disasters, particularly cyclones in Balasore Sadar Block, Balasore, Odisha. A quantitative method was deemed suitable as it allows for systematic data collection and statistical analysis of patterns relating to the use of social media, preparedness and response during disasters.

Study area and selection criteria

Research was carried out in the five coastal villages of Balasore Sadar block, namely, Kasafal, Dubalagadi, Jayadev Kasba Pahi, Hidigan, and Mirjapur. Specific vulnerability criteria were used to select these villages. All the chosen sites are located within a 5 km distance from the coast of the sea. The sites are, therefore, prone to hazards such as tidal inundation, high wind speed, etc., due to cyclones. In addition, the District Disaster Management Office classified these areas as disasters and falls under the high wind zone category.

The villages have previously been affected by cyclone incidents, making them relevant sites to study communication and preparedness strategies.

Sampling technique and sample size

The multistage sampling technique was adopted to select the respondents from the five villages. In the first phase, vulnerable villages were selected based on the specific vulnerability criteria, and in the subsequent phase, respondents were chosen randomly from these villages. The total sample size of 394 respondents was determined using the Taro Yamane formula. Youth between 15 to 29 years were shortlisted as the respondents. To maintain the gender balance, 50:50 representation of male and female respondents was taken to reduce the gender bias and to ensure the inclusivity in the findings.

Data collection and analysis

A structured survey method was used to collect data. The questionnaires were administered via a field survey using printed (physical) copies and face-to-face interaction

with respondents. The responses were taken on the 5-point Likert scale based on the social media access, disaster awareness, preparedness and response. Thematic analysis was used to analyse the data.

Results:

• Media Exposure and Access

Social media is the most used means of communication among youth, followed by government SMS alerts and television. A significant percentage of respondents (about 90%) possess smartphones with internet facilities, mainly through Airtel, Jio and VI networks, enabling quick access to information.

Regarding languages, the Odia language is predominant, followed by Hindi and English. Among digital communication modes, WhatsApp, Facebook, YouTube, and X (Twitter) have been reported as important sources of information on weather and disasters.

While digital communication means are increasingly becoming popular, traditional communication systems remain important. The community speaker system is frequently used for making announcements, and members of the cyclone shelter committees make door-to-door visits to vulnerable families to communicate evacuation plans.

However, differences in technologies used by various occupational groups have also been found. For example, fishermen from Dublagadi and Kasafal use the Windy application for weather predictions; the SATARK application is not being used by people owing to a lack of knowledge about the application and low digital literacy levels. Moreover, people

without television sets or radios depend upon information provided through YouTube or by their acquaintances' electronic devices.

• Pre-Cyclone Media Exposure

The results indicate that, due to the use of social media, the youth of Balasore receive information like the formation of cyclone in the Bay of Bengal, cyclone warnings, alerts, landfall prediction ahead of everyone else, even before official government intervention takes place. Because fake news and miscommunication are very common during any disaster, the youth rely on the regional news sources like Kalinga TV, OTV and Kanak TV to verify the news. Another strong source to rely on and cross-check is to confirm with the Block Division Office, Sarpanch, Ward Members and Shelter Secretaries.

• During-Cyclone Media Exposure

During the cyclone, the media usage pattern changes. People start relying on the radio as it emerges as the key source of information, but a small section of households has. Respondents living in the Kaccha Houses take the radio with them to the cyclone shelter, and radios are also available in the shelters provided by the Odisha State Disaster Management Authority (OSDMA). Disruption of the network and power cuts during the cyclone affect the use of digital media. Mobile Networks become unreachable as well as unreliable, and the use of Televisions gets restricted in the absence of electricity. Community-level communication, like announcements within the shelters and receiving SMS from the authorities, play the important role in the dissemination of the information.

• Post-Cyclone Media Exposure

In the post-disaster phase or recovery phase, the information regarding the government relief schemes is not effectively disseminated through the digital media platforms. However, the respondents use social media platforms like YouTube, Facebook and Instagram to get the updates, visual content, destructions, relief and stories. The results also highlight that the low coverages in the vulnerable villages, like Kasafal and Dublagadi, hide the visibility and the challenges these villages face on a larger scale.

Discussion:

The study aims to evaluate the role of social media in disaster management for the youth in the cyclone-prone coastal region of Odisha. The study area in disaster communication works through a hybrid system. Moreover, social media occupies more space in the communication process before a disaster. Furthermore, communication through traditional media becomes very important during a disaster. Peter Sandman developed Risk Communication Theory, which stresses that communication about risks should not only be timely but also in sequence in an interactive and continuous manner so that one can deal with these risks meaningfully.

According to the survey, a major finding is that the youth first look to social media to get informed about cyclones. The earlier they get access to the information, the faster the people will meet their appropriate needs and preparedness actions concerning the hazards, even before the government. The process has been further strengthened by the growth of smartphone and internet usage (mostly through Airtel and Jio), which helps information spread fast. In this context, the impact of social media on the awareness-building function of risk communication,

where users will be able to see real-time updates on cyclone formation, movement and expected landfall.

The findings also show that social media is not the only information source that users rely on. When misinformation arises, people cross-check updates with regional channels like OTV, Kanak TV and Kalinga TV, as well as with local authorities like the Sarpanch and Block Development Office. Homer, together with the other characters in the show, avoids becoming a mere audience. The theoretical approach stresses two-way communication wherein trust and credibility play an important role, affecting the public's response to risk.

The research also shows that conventional and community-based communication systems remain relevant. Effective messaging for cyclone preparedness is demonstrated through the use of loudspeakers and door-to-door communication by the cyclone shelter committee members, particularly of vulnerable households. Such approaches guarantee that information reaches populations who might not have access to digital networks, thereby addressing accessibility concerns and bolstering grassroots-level risk communication.

As per the findings, the reliance on digital communication was also questionable during the disaster phase. As big network disruptions and power outages affect social media and television viewing, radio and government messages through text messages are getting popular. The provision of communication systems like radios in cyclone shelters underscores their importance during an emergency. According to Risk Communication Theory, successful communication must be timely but also resilient and adaptable at

various disaster stages. Having many channels helps to ensure that there is continuous information flow, even under duress.

One more dimension of the findings is the role of specialised digital tools. In Dublagadi, fishermen have started using an application called Windy to monitor the weather. However, the use of the SATARK application is limited in the region, which hints at the availability vs adoption gap in the area. The effectiveness of technology-based risk communication systems can be enhanced with appropriate digital awareness, attitudes and usage by the communities. A lack of understanding and trust is limiting the potential of these tools.

After the disaster, communication efforts appear to have weakened relatively. Though people use social media and YouTube for post-disaster information and stories, formal communication regarding government programs and rehabilitation is confined to the formal use of media. This means that the continuity of communication after the crisis hits is not enough, which may impact long-term recovery and resilience. Moreover, the lack of coverage in small villages like Kasafal and Dublagadi points out different levels of visibility of information, which may affect the access to relief.

In general, the study shows that social media has strengthened the timeliness and reach of youth disaster communication, especially in pre-disaster communication. Nonetheless, its effectiveness is guided by misinformation, infrastructure issues and unequal access-related challenges. According to the report, the level of awareness is well established in risk communication. And sustained interest, credibility and post-disaster communication must be strengthened further.

In line with the research objective, it can be concluded that an effective disaster communication system in cyclone-prone regions must adopt a multi-channel and inclusive approach, integrating social media, traditional media, and community-based mechanisms. Strengthening digital literacy, improving the visibility of official communication, and ensuring continuity across all phases of disaster management are essential for enhancing resilience and reducing vulnerability among coastal communities.

Conclusion:

The current research discusses the changing trend in disaster communications in cyclone-prone areas of Odisha. The two media are working in a coordinated manner during disaster phases and so on. Social media has become the primary tool for transmitting early warning signals in real time, especially for youth who are first to become aware. At the same time, traditional media continues to have high credibility for verification purposes. Nonetheless, during their disaster phase, the radio becomes a vital communication link even if owned by a few. In cyclone shelters, radios are already made available and operated, and older community members use the radio more than the youth. People living in Hidigan, OSDMA radios help the people access information even during power cuts and network failures. The multi-layer communication system should be timely, continuous and adaptable, according to the findings of this study. The importance of effective risk communication must be linguistically and culturally appropriate. Using the local language ensures accuracy, enhances trust and increases accessibility for the vulnerable. Young people today are digital

natives with powerful abilities to access, understand and share information about disasters. This makes them key players in Disaster Risk Reduction (DRR). However, miscommunication, not using formal applications like SATARK and a lack of post-disaster communication show that their digital literacy and communication need further strengthening. Moreover, the lack of visibility of highly vulnerable and remote coastal hamlets shows that improving hyperlocal reporting is necessary for equitable access to information and resources. The disaster management apps along with targeted digital literacy initiatives and more geographically inclusive and hyperlocal media coverage, are essential because the communication process that extends beyond a disaster and the espousal of local coping or resilience mechanisms deserve more effort and energy at the level of communication. Overall, Sadar block needs an integrated approach which combines the speed, reach and authenticity of digital media with the credibility of traditional media.

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