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Environmental Fake News And Public Behavior In Kerala. Mapping The Importance Of Social Media Literacy With Special Reference To "Kerala Flood 2024

Mr. Sankaranarayanan K. B[1], Dr. S. Kadeswaran[2], Dr. Jayaseelan. R[3]
[1]Research Scholar, Dept. of Communication, PSG CAS, Coimbatore.
[2]Assistant Prof., Dept. of Visual Comm. & Electronic Media, PSG CAS, Coimbatore.
[3]Assistant Prof., Dept. of Visual Comm. & Electronic Media, PSG CAS, Coimbatore.

Abstract
This study investigates the impact of environmental fake news on public behavior and during disaster events in Kerala, that focuses on the moderating role of social media literacy. The 2024 Wayanad landslides and related conditions provided a setting to examine how misinformation circulated via social media influences community trust, responsiveness with safety protocols, and support for governmental policies. Quantitative findings from 450 respondents reveal a significant positive correlation between education and social media literacy, while age and place of living also shape fake news susceptibility. Urban and younger individuals showed stronger social media literacy, enabling better identification of fake news, though emotional distress during emergencies may compromise critical evaluation of messages spread during crisis situation. Qualitative interviews highlighted collective verification strategies and conditional trust among institutions, underscoring Kerala's community-centric dynamics. The study demonstrates that high social media literacy serves as a shielding factor, but is insufficient in isolation; effective disaster communication requires integrated approaches leveraging education, transparent government messaging, and strengthening community networks. Insights gathered from Kerala's experience suggests future efforts in combating environmental misinformation incorporating various interventions strategies and strengthening public resilience in crisis situations.

Keywords – #*social media literacy, #environmental fake news, #public behavior, #Kerala flood.*

INTRODUCTION

In today's world fake news has emerged as a biggest threat, particularly during natural disasters when accurate information is vital for public safety and effective policy implementations. The proliferation of various social media platforms has fundamentally transformed how information spreads, creating both opportunities for quick dissemination of critical information and pathways for fake news to reach large number of audiences within seconds (Spampatti et al., 2023). This change is consequential when examining the relationship between environmental fake news and public behavior during disaster events.

Kerala is a state renowned for its large mountain scales, environmental sensitivity and vulnerability to extreme weather conditions. The state has a unique geographical position along India's southwestern coast, that includes the Western Ghats Mountain range and coastal line on the other side, makes it particularly susceptible to various environmental hazards including floods, landslides, Tsunami etc. (Government of Kerala, 2023). The 2024 environmental disasters in Kerala, particularly the Wayanad landslides that occurred on July 30, 2024 (Mathrubhumi.com), had claimed over 420 lives and 397 injured people (partial/full), serve as a reminder of the state's environmental vulnerabilities (Ministry of Home Affairs, 2024.)

The connection of environmental fake news, social media literacy level and public behavior becomes particularly significant in this context. Previous research has consistently proved that fake news can substantially weaken the public trust in official communications, leading to reduced compliance with safety protocols and reduced support for environmental policies (Chen, L. 2024). During the 2018 Kerala floods, fake information about dam safety, government capabilities, and army's relief distribution significantly hampered rescue operations and created unnecessary panic and havoc among affected the populations (BBC, 2018). Similar patterns were also noticed during the 2024 disaster as well, where fake news about the Chief Minister's Disaster Relief Fund and fake news about various environmental impacts, government response efforts etc., were widely circulated ion social media platforms (India Today, 2024).

The concept of social media literacy gained its prominence as a mediating factor in the relationship between fake news and behavioral responses among the public. Individuals who have higher levels of media literacy are theoretically said to be better equipped to identify fake news, evaluating and analyzing source credibility, and take decisions wisely about sharing content (Austin et al., 2024). Potters cognitive model also has foregrounded, how individuals' competencies can shape the ability to analyze, interpret and evaluate media messages (Potter, 2016). However, the effectiveness of media literacy as a shielding factor during these kinds of disaster situations, when cognitive processing of an individual may be compromised by urgency, fear and uncertainty, remains underexplored. The importance of social media literacy in the context of disasters remains underexplored. Emotional distress and urgency to share an information due to some fear or distress may diminish individuals' capacity for critically analyze the messages (Walter & Murphy, 2018).

The spread of environmental fake news through social media platforms causes significant challenges to effective disaster management and there by implementation of environmental policy by government officials in Kerala. This phenomenon is not only limited to Kerala but it also reflects broader global patterns, where environmental fake news has been shown to significantly impact public perception and behavior during natural disasters (Chan et al., 2017). The spread of fake news especially during environmental emergencies continues to undermine public trust, hamper relief operations, in ways that can compromise near and long-term environmental resilience.

Individual-level factors such as social media literacy, demographic factors, psychological and cognitive factors, collectively influences on how people perceive, process, believe, and act upon environmental information during emergency situations. People often say that social media changes the way people talk about things and makes them act in ways that aren't fair, which hurts democracy instead of helping it (Marda & Milan, 2018). While extensive research suggests that, there remains a significant gap in understanding how environmental fake news specifically affects public behavior in disaster-prone regions like Kerala where the literacy rate is high than the national average. Without understanding on how false environmental information influences public opinion and behavior, it is very difficult to propose and design targeted interventions strategies that can maintain public trust and support for environmental policies during critical periods.

Significance of the Study

The study advances through in-depth understanding of social media literacy as a defending factor against fake news effects. Previous researchers have primarily examined media literacy in controlled settings or general contexts, but its effectiveness during real disaster situations remains underexplored and is unclear. This research provides empirical evidence about how social media literacy skills can equip individuals into better decision-making during environmental crises, contributing to both media literacy theory and disaster communication frameworks. Understanding how fake news affects public behavior enables the development of more effective communication strategies during environmental emergencies especially in vulnerable places that are affected. These findings will be crucial for increasing public trust and cooperation among the public during crisis situations. The research also reports about certain vital questions about information democracy and public participation in environmental governance. In an era where environmental challenges require joint action and sustained public support for understanding how fake news can cause distrust this process is essential for maintaining democratic participation in environmental decision-making

LITERATURE REVIEW

Contemporary research on fake news recognition has evolved beyond only fact-checking practices and just checking the cognitive and behavioural responses to false information. Many recent researchers have identified certain ways through which environmental fake news is propagated. Chen, L. (2024) opined that false environmental information often employs complex argumentation techniques that deed cognitive biases and emotional responses, making detection making it difficult for the individuals without specialized knowledge or critical thinking training. Spampatti et al. (2024) in his study highlighted the architecture of social media where the spread of fake news gets accelerated with misleading contents and increase the risk during crisis situations. People who are in search of any information during this time may heavily rely on the social media due to poor access to mainstream media, delay in proper updates and may be due to unavailability of electricity and access as well. Chan et al., (2017) found that environmental misinformation

can be spread in many forms, including incorrect warnings, misreports, misrepresented data, pictures or videos/audio about disaster, and misleading claims about the disaster responses and sometimes climate change impacts as well. The BBC's (2018) documentation of the Kerala floods 2018 gave a clear picture on how gossips about dam safety and rumors about relief fund management generated panic and made rescue operations a havoc.

Social media literacy on the other hand acts as a potential defending factor against fake news effects among these individuals, with particular focus on to its role in environmental communication contexts. A study by (Pennycook and Rand's., 2020) demonstrates that digital media literacy interventions can improve the individuals' ability to differentiate between fake and fact content, even for several weeks after initial exposure to training materials. Many other research reveals that media literacy interventions reduce individuals falling into false news. Trust in mainstream news sources can also minimize this effect, suggesting that such methods can enhance discrimination of false content without creating generalized scepticism. When considering the environmental contexts, their findings indicate that the effectiveness of media literacy training does not rest on whether information aligns with individuals' previous knowledge or experiences, but also the need, urgency and proximity as well. However, media literacy skills in emergency situations have a unique problem that is not fully addressed in controlled experimental settings. Research by (Austin et al., 2024) suggests that media literacy skills work under normal circumstances, but its effectiveness may be compromised when individuals face urgency, emotional and cognitive stress, and information overload during emergencies.
The environmental communication and behaviour change theory provides essential context for understanding how fake news affects public behaviour during emergency situations. Research applying Social Cognitive Theory proposed by Albert Bandura when applied to environmental communication reveals that self-efficacy (individuals' confidence in their ability to take meaningful judgement) and outcome expectations (beliefs about the likely consequences of their behaviours) will set more themselves more challenging goals, and also will try to be a part in pro-environmental behavior compared with other individuals with a lower awareness of their value to perform such acts.

Research by (Fishbein and Ajzen., 2010) demonstrates that behavioural aspects develop from attitudes toward the behaviour, with respect to what others expect, and perceived behavioural control. Environmental fake news or any fake news can disrupt each of these components, creating attitude-behaviour gaps that reduce corrective actions and meaningful judgements. Research by (Rotenberg 2018) examined the psychology of trust, reveals that credibility assessments involve both cognitive evaluation of evidence and emotional responses to source of news. Environmental fake news often exploits emotional responses by framing environmental issues in terms of fear, uncertainty, or anger, making credibility assessment more difficult.
Socio economic status and place of living (urban/rural) divide how information is shaped critically processed and perceived with rural populations being more susceptible due to limitations in digital infrastructure (Heiss et al., 2023). A study conducted on Facebook in Kerala by Rahman et al. (2023) found out in their study that adaptive and collective approaches is needed for uplifting information accuracy and fostering resilience against spread of misinformation in social media.
From the above literature review and going through the newspaper reports of the disaster time, the below objectives and research questions were derived from the observed research gap.

Objectives of the Study

The primary objective of the study is to examine social media literacy and map the relationship between environmental fake news and changes in public behavior during emergency situations in Kerala.

Specific Objectives:

The current study was guided by several research questions that address the intricate relationships between environmental fake news, social media literacy, and public behavior. These research questions were designed to provide both descriptive understanding of current phenomena and explanatory insights into underlying mechanisms.

1. To analyze the how social media literacy among the individuals help to take correct judgement of fake news shared during crisis situations in social media.
2. To understand the social media literacy level and how it affects the relationship between environmental fake news and trust/belief in false information.
3. To observe the demographic factors, social media usage patterns, on environmental fake news among Kerala residents.

Research Questions

While keeping the objectives in mind, the study focuses on addressing specific research question, that are presented below.

1. How environmental fake news are circulated among the public during the 2024 Kerala environmental disaster, and what were their primary sources and distribution pathways?
2. What role does trust in government institutions, media sources, and scientific authorities play in mediating the relationship between fake news spread during disaster times?
3. How do the environmental fake news affect the people especially during the crisis times and how does the social media literacy helps them?

RESEARCH METHODOLOGY

The misinformation recognition and response model MRRM developed by (Amazeen., 2023) is a relevant framework that is adopted for this study for the quantitative study. The framework understands how individuals process environmental fake news during crisis situations. This model suggests recognition of fake news consists of various stages: informational problem identification, issue motivation, and recognition of false contents. This fake news when triggers differential factors within the individual, it will affect the cognitive, affective, and behavioural outcomes.

The MRRM's points out on the dispositional and situational characteristics as mediating factors which in turn proves particularly relevant for environmental disaster contexts, where high-stress and urgency situations may decrease the normal information processing capabilities of an individual. Various research also supports this part of frameworks, that the recognition of false information requires not only cognitive factors, but also sufficient motivation and opportunity to engage in careful evaluation of message content.

This current study employs a mixed-methods, convergent parallel design to comprehensively examine the impact of environmental fake news and public behavior in Kerala. This methodological approach is derived from going through various studies researchers have gone through. The multi-dimensional and complex nature of fake news, requires both quantitative measurements alongside with qualitative exploration of underlying mechanisms and contextual factors (Creswell & Plano Clark, 2018). Simultaneous collection and analysis of quantitative and qualitative data streams is possible through convergent parallel design. This enables triangulation of findings and development of more complete understanding than either of the approach could provide independently. This approach also proves to be particularly valued when investigating fake news effects.

The study also takes out certain factors from Bandura's Social Cognitive Theory. Researchers applied the concepts broadly to environmental contexts, pointing out the reciprocal interaction across personal factors, environmental influences, and behavioral outcomes among the individuals. This framework is especially useful for figuring out how fake news about the environment gets in the way of the normal ways that environmental communication affects behavior in Kerala.

Since, previous research results demonstrates that quantitative measurements alone can miss many important dimensions in how individuals interpret, perceive, process, and respond to false information during crisis situations (Amazeen & Krishna, 2023). The main foundation for this research rests within the logical examples, which emphasizes the practical consequences of research and the value of multiple methods to fathom out the complex problems of social media, fake news and communication during crisis periods.

Quantitative Components

The quantitative data collection is completed using a cross-sectional survey design to measure the relationships between environmental fake news exposure, social media literacy levels, and behavioral responses among the residents in Kerala. Even though the cross-sectional design has its own limitations in

establishing causal relationships due to practical constraints of conducting research with disaster-affected populations, the survey instruments are included with questions from multiple perspective about literacy level, behavior change and paradigm shifts to partially address temporal relationships.

Qualitative Components

The Semi-structured interviews provided flexibility to know about the unexpected themes derived from the responses of the study and we felt it as a valuable process when investigating sensitive topics like fake news belief and trust in governmental communication, as it allows researchers to build rapport and encourage honest disclosure from the respondents (Rubin & Rubin, 2012). The qualitative component contains semi-structured interviews from various respondents to capture the behavioral responses through which we can measure the literacy levels, and how environmental fake news influences their decision-making processes, trust the relationships, and corrective actions. This will allow for the in-depth checkup of individual experiences, cognitive factors, and meaning-matching processes that quantitative measures cannot capture through a survey.

Sampling and Population.

The target population includes adult residents who are 18 years and older mainly from the districts of Wayanad, Kozhikode, Malappuram and Kannur. Wayand district along with other nearby districts also experienced the 2024 environmental disasters. Due to the proximity with the Wayanad district the other three districts were also chosen for the study. This population was selected based on their direct exposure to both environmental disasters and related fake news circulation during the crisis period.

The sampling tried to include maximum variation in demographic characteristics, geographic location, disaster impact severity, and self-reported fake news exposure levels. For the quantitative study, stratified random sampling was used to ensure representation across key demographic variables including age, gender, education level. For the qualitative study, purposive sampling was used to select the respondents representing diverse perspectives and experiences with environmental fake news during the disaster period.

The qualitative sample targeted approximately 600 participants across four categories: 1) disaster-affected residents, 2) local governance officials, 3) police and emergency responders, and 4) media professionals and fact-checkers. This multi-stakeholder approach helped to examine the effects of environmental fake news from multiple perspectives and identify the systemic patterns and individual variations among the selected regions.

Data Collection

Quantitative data collection was completed using a structured questionnaire. The primary mode is done by online surveys for participants with mobile and internet access and have decent digital literacy levels. For qualitative data all interviews were conducted in participants' chosen language (Malayalam, Tamil, or English. This documentation enabled researchers for quantitative analysis of fake news alongside with qualitative analysis of content themes, public behavior and persuasive techniques.

DATA ANALYSIS & INTERPRETATION

The below portion represents the empirical findings from the mixed method study examining the environmental misinformation and its relationship with social media literacy and public behaviour among the residents in Kerala. From the 600 online and offline survey responses only 450 responses were correctly filled and had full data. 20 participants among them were also selected for qualitative interview.

Table 1: Distribution of gender among respondents

Gender	**n**	**%**
Male	213	47.3
Female	237	52.7
Total	450	100

n = Number of respondents; % = Percentage of respondents.

Interpretation: A total sample of 450 respondents comprising of 213 males (47.3%) and 237 females (52.7%).

Table 2: Distribution of Age among respondents

Age Group	Frequency (n)	Percentage (%)
18-29	78	17.3
30-44	226	50.2
45-79	146	32.4
Total	450	100

n = Number of respondents; % = Percentage of respondents.

Interpretation: The middle-aged adults (30-44 years) comprise 50.2% of the sample (n = 226). Older adults (45-79 years) comprise of 32.4% (n = 146), meanwhile the young adults (18-29 years) made up 17.3% (n = 78).

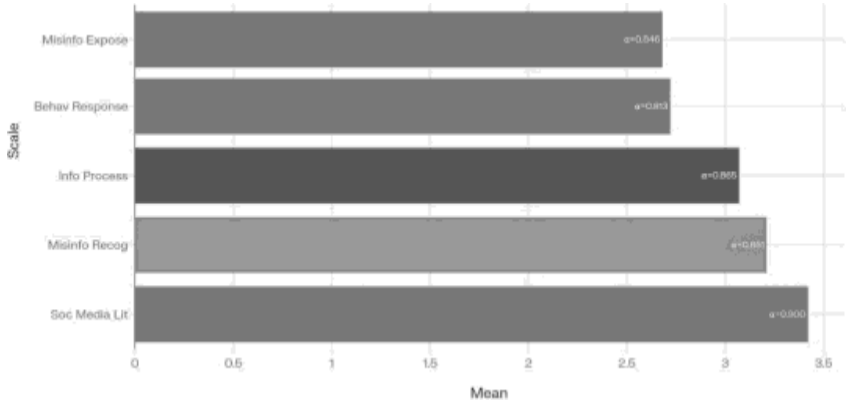
The study was carried out by validating the scale for measurement of various factors incorporated for the study. The below table represents the reliability analysis for the five factors used in the study.

Table 3: Crosstab for place of living and social media literacy

Statistical Test	Value	Significance	Interpretation
Pearson Chi-Square	83.127	p = 0.001	Significant association
Pearson's R	0.318	p < 0.001	Moderate, significant positive correlation
Spearman Correlation	0.325	p < 0.001	Moderate, significant positive correlation

Interpretation: From the above table its interpreted that the Pearson Chi-Square value is 83.127, indicates that a statistically significant relationship between place of living and social media literacy. The Pearson's R is 0.318 (SE = 0.04), p < 0.001 and Spearman Correlation is 0.325 (SE = 0.042), p < 0.001, indicates moderate, significant positive correlation between place of living and social media literacy levels. So, the urban residents generally report higher social media literacy compared to rural and semi-urban peers, which calls out for the importance of enhancing the interventions of media literacy programs in the rural semi-urban areas.

Graph 1: Reliability scores for the scale.



Social Media Literacy (α = 0.900), followed by Misinformation Recognition (α = 0.851), Information Processing and Response (α = 0.865) scales showed strong internal consistency. Behavioral Response (α = 0.813), Misinformation Exposure (α = 0.846) achieved good reliability.

Interpretation: The descriptive statistics for means of key scales revealed interesting patterns in participant responses. Social media literacy (SML) showed highest mean score (M = 3.42, SD = 0.55), indicating moderate to high perceived competency in social media navigation and usage. Misinformation Recognition (MR) showed (M = 3.21, SD = 0.56), suggesting sensible confidence in identifying fake environmental information. Information Processing and Response (IPR) indicated moderate levels (M = 3.07, SD = 0.51), while Behavioral Response (BR) exhibited lower engagement (M = 2.72, SD = 0.58) following the 2024 disasters.

Misinformation Exposure (ME) showed reasonable levels (M = 2.68, SD = 0.57), which suggested that participants encounter false information, but exposure is not so much high.

Relationship between key variables

Table 4: Correlations between demographic factors and fake news

Demographic Variable	Social Media Literacy (SML)	Misinformation Recognition (MR)
Education	r = .634***	r = .505***
Age	r = −.377***	r = −.245***

Interpretation: From the above table it's interpreted that education level of individuals has positively and strongly correlated with Social Media Literacy (r = .634, p < .001) and Misinformation Recognition (r = .505, p < .001). This indicates that higher educational level is directly proportional to enhanced media literacy. Age is correlated negatively with Social Media Literacy (r = −.377, p < .001) and Misinformation Recognition (r = −.245, p < .001), consistent with research suggesting younger individuals have higher social media literacy. Whereas Monthly income showed only moderate positive correlations with Social Media Literacy (r = 0.272, p < 0.001), representing the socioeconomic factors can influence media literacy development, along with digital divide.

Table 5: Key Correlation Patterns

Variable	1. SML	2. MR	3. IPR	4. BR	5. EM
1. Social Media Literacy (SML)	—	.55**	.50**	-.35*	-.28*
2. Misinformation Recognition (MR)		—	.60**	-.40*	-.30*
3. Info Processing & Response (IPR)			—	-.32*	-.29*
4. Behavioral Response (BR)				—	.62**
5. Misinformation Exposure (EM)					—

Interpretation: From the above Pearson correlation table relationships between social media literacy (SML), misinformation recognition (MR), information processing and response (IPR), behavioral response (BR), and misinformation exposure (EM) is established. As shown in Table 4 above, SML is positively correlated with MR (r = .55, p < .01), IPR (r = .50, p < .01), and negatively correlated with BR (r = -.35, p < .05) and EM (r = -.28, p < .05). MR was positively associated with IPR (r = .60, p < .01), so both MR and IPR are negatively associated with BR and EM. BR was strongly and positively related to EM (r = .62, p < .01), signifies that the importance of higher exposure to misinformation led to maladaptive or risk-prone behavioral responses among the individuals.

Regression Analysis

Table 6: Predictors of Social Media Literacy

Predictor	β	t	p
Education	.279	—	< .001
Age	−.017	—	< .001
Area Type	.187	—	< .001
Monthly Income	—	—	—

Interpretation: From the above table its interpreted that Social Media Literacy predictors yielded significant results (R2 = 0.619, F = 162.23, p < 0.001), explaining 61.9% of variance in media literacy scores. Among that Education emerged as the strongest predictor (β = 0.279, p < 0.001), supporting MRRM and Potters cognitive model theoretical frameworks emphasizing formal education's role in social media literacy development. And also, age demonstrated a significant negative effect (β = -0.017, p < 0.001), that is consistent with generational differences in digital technology adoption and usage. Area type (urban/rural) showed positive effects (β = 0.187, p < 0.001), indicating urban environments facilitate media literacy development. Monthly income showed minimal direct effects after controlling for other variables, suggesting education and age and place of living affects the social media literacy.

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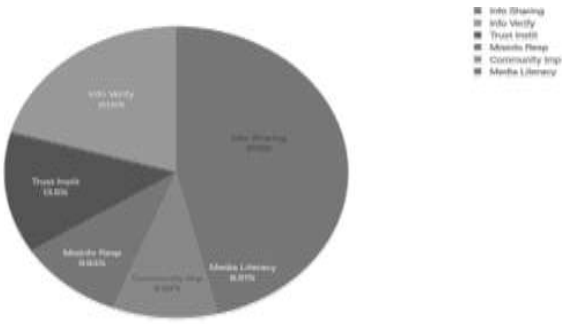
Thematic Analysis of Qualitative data

The qualitative interview among twenty respondents helped the researchers to derive three primary verification approaches.

Graph 2: Information verification among respondents



Distribution of qualitative themes extracted from the interview responses.

Information verification (self) – 20.6%, Information sharing for verification (with others) – 37.6%, Trust of institution/source – 13.5%. Misinformation response behavior – 9.93%, Community importance – 9.93%, media literacy – 8.51%.

A respondent told that *"I verify through news channels if possible and cross-check with my friends who are knowledgeable about these matters by sharing the news with them."* Majority of the respondents tends to share the information 37.6% for verification purposes. Evaluating credibility of source emerged among 20.6% of participants, with individuals with more education demonstrated better evaluation strategies. One of respondents opined that, *"I always check multiple sources and look for official government websites."* Cross-verification behaviours indicate systematic approach to information authentication among the respondents.

Active Correction behaviours among the respondents were noted during the interview, particularly among higher-educated respondents. About 30% of the respondents opined that trusting the source, correcting the information that are posted as fake within other groups/community, and having media literacy is essential for an individual during this crisis time. One respondent described that, *"During the landslides in Wayanad, I saw a message in WhatsApp with a video claiming that more landslides were about to come in following days in areas that were actually safe. I immediately contacted the local government officials to verify and then posted corrections in our community groups."* Most of the respondents engage actively rather than remaining passive consumers of environmental disaster information during emergency situations. Local community groups in social media helps the respondents for community validation (10%), that reflects Kerala's strong social networks and collective decision-making traditions during crisis situations. Eight respondents voiced conditional trust: *"I support government policies during emergency times, but I wish they are better communicated through correct channels to prevent spread of environmental misinformation."* This reflects the mindset of certain individuals in evaluating institutional trust while maintaining overall policy support.

Comparison of Qualitative and Quantitative findings.

This complete analysis of both qualitative and quantitative responses, reveals complex relationships between social media literacy, fake news recognition, and public behaviour in terms of demographic factors in Kerala's environmental disaster times. The findings highlight the importance of education and suggest that urban residence have better media literacy when compared to rural and semi-urban people, the relationship between media literacy and public behaviour proves more nuanced than MRRM theoretical frameworks suggest. More literate the public is the behaviour also follows more step-by-step verification and sharing procedures. But the public behaviour is more affected when the communication from the government officials becomes late and not reaching them through correct channel and time. Qualitative analysis enriches understanding by revealing how cultural factors, community networks, and trust in source and relationships mediate individual-level media literacy effects and fake news effects on them. The high reliability of most scales supports the validity of findings.

DISCUSSION

The findings of the study reveals that social media literacy serves as a significant shielding factor against environmental misinformation, where the MRRM framework's emphasis on individual competencies in information processing. The strong positive correlation between education and social media literacy ($r = .634$, $p < .001$) supports the framework which emphasizes that formal educational experiences enhance media processing capabilities. This relationship becomes particularly important in Kerala's point of view, where the state's high literacy rates (94% according to the 2011 Census) gives the foundation and basics for developing media literacy skills and there by navigate social media.

The effectiveness of social media literacy during these kinds of emergency situations presents a more complex picture than suggested by traditional models. While participants demonstrated strong theoretical knowledge of verification strategies (mean SML score = 3.42), qualitative findings revealed that emotional distress *("Fake news divides communities, creates confusion about what actions to take, and can lead to people not following important safety guidelines issued by authorities. F/44* - Teacher*")* and urgency during the 2024 disasters sometimes compromised systematic information processing.

The study also finds a significant demographic disparity in fake news susceptibility, with a clear pattern across age, education, and place of living. The negative correlation between age and social media literacy ($r = -.377$, $p < .001$) reflects broader digital divide. This also suggests that youth demonstrated superior technical skills in source verification and cross-referencing, while old age respondents often relied on community validation strategies. This is a finding that challenges assumptions on about uniform vulnerability to fake news. The place of living variations also proved particularly significant, with urban residents demonstrating higher environmental fake news identification capabilities compared to rural and semi-urban populations. This is also supported by responses from qualitative data focusing on unverified sharing and the behavior of public changes when the situations seem urgent. (*I don't think much before sharing. If it's about safety or disasters, I forward it immediately to help others. – M/55/farmer), (I share everything related to disasters because it might help someone. I think it's better to share than miss important information. – F/52/business).*

One of the most noteworthy findings of the study that concerns is prominence of collective verification strategies among participants. The thematic analysis revealed that sharing for verification indicates individual's media literacy skills are rooted within broader community verification processes. This finding goes beyond the MRRM conceptualizations where the collective dimensions of fake news recognition and response.

Kerala's strong community-based decision-making tradition appear to function as both protective factors but the same time as potential vulnerability point also. The community validation can enhance accuracy through collective responses, but it can also amplify misinformation when false information gets shared within trusted social circles. Its is also supported while going through few interview responses (*I usually ask my family members or friends if they have seen similar information. If many people are sharing it, I tend to believe it's true.* – F/60/Teacher.).

The study also documented various instances where false information about relief distribution centres spread rapidly through WhatsApp groups before official communication is distributed by government officials. Other responses about the trust among the source revealed newer perspectives among media-literate participants, where many of them are expressing "conditional trust" in government institutions. As one participant articulated: *"I support government policies and communication during emergency times, but I wish they were faster and better."* This finding has important implications for crisis communication strategies, suggesting for the speeder, transparent and proactive communication than traditional one-way information dissemination.

The study also observed with diverse behavioural responses to environmental fake news, ranging from passive consumption of news/information to active correction and community education through proactive sharing. Participants with higher education levels and urban residence were more likely to have active correction behaviours, including contacting officials, posting corrective messages and informing concerned officials in social media groups, and educating community members about identification and verification strategies even within the crisis situations.

The application of the MRRM framework to environmental misinformation during disasters provided both theoretical support and validity for the current investigation. Environmental disasters create unique information processing challenges among the affected individuals, public, government and related

subsidiaries, that may not be fully explained by individualistic models of misinformation effects. The prominence of WhatsApp as a misinformation vector reflects broader patterns in regions with high mobile internet penetration and limited traditional media access (Pasquetto, I, et. al., 2022).

The study has got high reliability coefficient for all the scales ($\alpha = 0.813$ to 0.900) to support the validity of adapted MRRM measures in disaster situations. This finding aligns with literature suggesting that trust relationships become more complex during emergency situations when multiple information sources are spread across social media to compete for credibility. The study's findings line up with other research studies on social media literacy, misinformation effects and the public behaviour during disasters. The spread of fake news, confusions and havoc among public, and resource misallocation mirrors patterns observed during Hurricane Sandy, Chilean earthquakes, and other global disasters (Hilberts S, et. Al., 2025).

LIMITATIONS OF THE STUDY

1. The finding cannot be generalized to a population outside Kerala, since the study respondents are the real victims of the disaster.
2. Cross-sectional research design limits the findings about cause and effect; still retrospective questions partially address this but not to the core.
3. Cognitive and confirmation bias may not measure the responses correctly.
4. The study relies on self-reported media literacy. So, there is a chance to miss real-world behaviours of the individuals.
5. Kerala's high literacy rate and disaster management may not reflect in other regions.

CONCLUSION

Environmental fake news is a serious challenge to disaster management and safety in hazard-prone areas. The study found that social media literacy skills stand as a useful skill only when individual perceptions, cognitive factors, community ties, and institutional support all align together. Higher media literacy can sometimes increase distrust towards some information from specific institution, people or places because of increased cognitive and confirmation bias among those individuals, but the findings also underscore the need for transparent and proactive communication that is uncertain but still authentic. Social media literacy alone is not enough, for fighting against environmental misinformation, but the future researchers should also try to develop integrated frameworks involving people, communities, and trusted institutions. Kerala's 2024 disasters provide lessons to both people and government. Strong education and community networks help to develop better fake news strategies. Still, digital divide, access to correct information and trust issues persist, and requires attention. Addressing environmental fake news is a social challenge—information systems will function within trust, power, and community relationships. As climate change worsens disasters and related crisis situation emerge, managing fake news becomes a central point of importance for resilience and safety. It's all depending upon continued cooperation among researchers, policymakers, social media organizations, and communities to strengthen capacities at every level. Only through such collective actions, the communities sustain safety, trust, and effective governance among growing environmental uncertainties.

Disclosure and Conflicts of Interest

The author(s) declare no conflicts of interest regarding the publication of this study. The research has not received any financial or non-financial support from any organizations that could influence the findings.

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