Social media and inclusive humanitarian intervention: the case of Cyclone Idai in Chimanimani district, Zimbabwe

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Abstract

Purpose – The world-over, it is evident that, numbers and frequency of natural disasters have increased tremendously. The effects have given birth to a worldwide, all-inclusive humanitarian response and preparedness. In Zimbabwe, Cyclone Idai has ushered in the exploitation of various social media platforms by humanitarian organisations as a way of reaching out to the wider population on critical issues pertaining to the devastating effects of the cyclone. This study herein, aims to interrogate the efficacy of various social media platforms that were exploited by various humanitarian organisation involved in the Cyclone Idai humanitarian response. The various social media platforms are interrogated to establish their contribution to inclusivity or lack of it in relaying humanitarian interventions.

Design/methodology/approach – A mixed-method approach was used to conduct the research. Quantitative and qualitative methods were applied to gather the data. Quantitative data was collected using questionnaires with Likert scales and other closed questions provided. These were administered to representatives from the government, United Nations, donors, non-governmental organisations (NGOs), and members of the community. On the contrary, qualitative data was gathered from members of the community and humanitarian organisations through open-ended responses provided from interviews. Quantitative data was collected from a total of 384 stakeholder representatives who were randomly selected from Chimanimani district of Manicaland province. In addition, 12 interview participants were purposively selected to complement the research tools listed above.

Findings – The study findings show that social media platforms to a greater extent are effective tools for creating inclusive humanitarian response. The study findings reveal that social media has a significant positive influence on inclusive humanitarian response, with a 5% level of significance. These quantitative results agree with results obtained from interviewed participants. Managers of NGOs, community-based groups, government agencies and churches engaged in managing rescue, relief and humanitarian aid are supposed to access the study's findings in the future, and may find the results resourceful.

Research limitations/implications – This study's generalisability to other districts and countries is constrained because it was conducted in the setting of the Chimanimani district. Future research can therefore be expanded to other Zimbabwean areas as well as to other countries in the Southern African region and beyond.

Practical implications – Humanitarian supply chain managers engaged in managing rescue, relief and humanitarian aid are proposed as having access to the study's findings in the future as they may find them useful.

Originality/value – This study contributes to the literature by providing insights that can improve information flow. This can be achieved by including different stakeholders in decision-making through the use of social media during disaster preparedness and response processes and helping them to better prepare for and respond to future disasters.

Keywords Zimbabwe, Social inclusion, Disasters, Social media, Cyclone Idai

Paper type Research paper

1. Introduction

The frequency and intensity of disasters have grown exponentially, necessitating a comprehensive and inclusive humanitarian response and preparation for and by everyone (Azerbaijan, 2019; Intergovernmental Panel on Climate Change, 2021). Disasters affect everyone, and they frequently bring to light long-standing injustices and imbalances that harm the poor, and other vulnerable groups with less access to resources. The most vulnerable

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populations, include but not limited to those with disabilities, the elderly, those who have been hurt or suffer from chronic illnesses, women, children, and people from minority groups. These groups are more often excluded from disaster risk management policies and plans. Such exclusions make it very difficult for the vulnerable groups to deal with the situations and most likely causing them to suffer more severely as compared to other groups (Lunga *et al.*, 2019). The primary principle for disaster risk management is to change power dynamics and remove barriers that restrict excluded groups from participating in planning and decision-making to increase resilience for everyone. All facets of Disaster Risk Reduction activities require multiple levels of actors. The inclusion of civil society organisations, communities, schools, students, parents, vulnerable groups and experts like psychologists has emerged as the key idea (Jiang *et al.*, 2023; Azerbaijan, 2019). To improve collaboration for disaster preparedness, disaster risk reduction strategies must be multi-hazard, multi-sectoral and inclusive (World Health Organisation, 2020; UNISDR, 2015). Participation by locals in disaster management can boost social inclusion, strengthen recovery services and increase transparency and accountability in the industry (Lin and Lee, 2023). The majority of actors (Home affairs and Ministry of Defence, United Nations, donors, religious institutions, affected individuals, local businesses, non-governmental organisation (NGO) representatives, members of the community and the private sector) involved in humanitarian action are beginning to focus on inclusive humanitarian action for vulnerable people (Modgil *et al.*, 2022; World Health Organisation, 2020). Zimbabwe has experienced cyclonic disasters over the past three decades, with Cyclone Eline in 2000, Cyclone Dineo in 2017 and Cyclone Idai in 2019 being the most devastating of those recorded. Cyclone Idai, which hit Zimbabwe in March 2019, destroyed infrastructure, schools and farmland, leaving 340 people dead and many more missing (Chatiza, 2019). Risk variables in the social, economic and political spheres had an impact on Cyclone Idai disaster response operations (Chari *et al.*, 2020). Local communities should be given the tools they need to manage and lower the risk of disaster. A good example of this occurred in Vietnam, where large-scale evacuation by local authorities minimised casualties (Takagi *et al.*, 2023). Taking it from the foregoing argument, communities are most likely to be better able in the use of coping mechanisms and skills, while drawing on the knowledge of other stakeholders in solving their problems (Nkombi and Wentink, 2022). However, achieving inclusive humanitarian action remains a challenge, and more remains to be done to successfully implement the most possible intervention. Effective use of information and communication technology has been touted as crucial to an inclusive humanitarian response. Adoption of information and communication technology (ICT) has a significant impact on the effectiveness, efficiency and adaptability of humanitarian response; coordination; and decision-making (Altay and Labonte, 2014; Iqbal and Ahmad, 2022; Chari and Novukela, 2023; Gupta *et al.*, 2022). Social media has become a more popular ICT tool for information sharing to support humanitarian efforts and respond in real time to the individual needs of individuals (Maghsoudi and Moshtari, 2021). This is crucial at every level of the humanitarian process, from learning how to get alerted to impending crises to knowing how to prepare effectively and how to look for further information, to learning how to get information on how aid is distributed and how the process works (Kumar *et al.*, 2022). From the perspective of community resilience and sustainable inclusion, it is critical to address individual communication needs, such as providing information about community events, providing psychosocial support, and including people with disabilities in decision-making and representation at various administrative levels (Nkombi and Wentink, 2022). Social media use, according to several researchers, promotes social inclusion in disaster response. For example, Castillo (2021) stated that "[. . .] a community's ability to recover lies in the strength of its social cohesion, or solidarity among neighbors. Social media, which connects neighbors and strangers alike, can help foster that resilience during a disaster." Domalewska (2019) asserted that a variety of actors use social media during emergencies for various purposes to facilitate disaster management. The use of social media in developing countries, especially in Africa, is emerging. In light of the current literature, little research has been done on using social media to facilitate inclusive humanitarian interventions in developing countries. It is crucial to conduct an empirical study to gather information and present replicable examples of good practices from the field to support the new perspective of the inclusion of the community and other humanitarian stakeholders in disaster response. There is no specific research that has been done in Zimbabwe on the use of social media to promote inclusive disaster relief operations. This study explores the connection between social media use during the Cyclone Idai crisis and an inclusive humanitarian response. This study therefore answers the following research question (RQ1):

RQ1. What was the impact of social media adoption on inclusive humanitarian response in Cyclone Idai?

To answer this question, the study uses regression modelling, which has become common in supply chain management and humanitarian logistics (Moyo *et al.*, 2023; Sykes, 1993, Zhu *et al.*, 2011). The regression modelling allows an analysis of the direct effect of social media adoption on humanitarian response. To predict the effect, the social media response had on humanitarian response. The study applied the regression model analysis given the quantifiable variables, as well as its ability to give reliable results if all tests are done.

The rest of the article is organised as follows: The study is structured thus: the next section to this is review of the related literature to the study; followed the methodology section, which describes how the study was carried out. The proceeding section to this that is numbered (4) evaluates and discusses the numerical and qualitative results. The conclusion and recommendations are proffered in the final section of the study. Therefore, the immediate section relates to reviewing of the related literature.

2. Literature review

2.1 Inclusion in humanitarian action

The increased risks associated with disasters and climate change around the world do not affect everyone evenly. Research from numerous contexts and nations demonstrates that marginalised and poor populations frequently experience disproportionate harm from these dangers (Escobar and Trohanis, 2022). Certain demographic groups are frequently excluded because of their distinct factors; including age, disability, gender, religion and social standing. These groups are more susceptible to disasters.

This is so, due to the fact that, these are the most vulnerable to disasters, that is: women, children, aged people, people with disabilities and other under-represented groups. These groups, if inclusivity is to be achieved, must participate in disaster preparedness. The most vulnerable sectors of a community are incorporated into technical and logical frameworks that strengthen their ability to withstand future disasters through inclusive disaster preparedness. Given this reality, practitioners are adopting inclusive approaches to disaster risk management (DRM) that consider and try to address the increased susceptibility of specific populations.

Inclusion requires recognising diversity, risk and circumstances. If help is provided and decisions are made, inclusion determines who is "in" and who is "out" (Ferretti *et al.*, 2016). Inclusion refers to the steps taken to guarantee that everyone affected by a crisis has the right to information, protection and assistance – regardless of their age, sexual orientation, gender identity, level of disability, nationality or ethnic, religious or social origin or identity (Barbelet and Wake, 2020). According to Searle *et al.* (2016), inclusion in humanitarian action refers to steps taken to guarantee that each person impacted by a crisis has the right to information, protection and assistance, regardless of their age, nationality, gender identity, level of disability, ethnicity, sexual orientation, religious affiliation or social origin or identity. The goal of inclusive action is to identify and remove barriers that keep those who are more disadvantaged, excluded or in danger from participating in political processes and gaining from humanitarian endeavours. A framework is created by Ferretti *et al.* (2016) to evaluate inclusion in humanitarian assistance, and Section 2.1.1 presents these.

2.1.1 *Participation in decision-making*

The low presence of vulnerable groups in humanitarian clusters, both at the national and district levels, supports a repeated finding in humanitarian evaluations about their poor participation in national NGOs and civil society organisations in the humanitarian cluster system. In the course of humanitarian efforts, vulnerable people may go mostly unnoticed (Barber, 2016a). Humanitarian norms are clear on the importance of including vulnerable people in participatory procedures. According to the Core Humanitarian Standard for accountability and excellence, all communities and individuals affected by crises must be represented and actively engaged (Barber, 2016b). Special efforts should be taken to include those who are under-represented, marginalised or otherwise "invisible", according to the Sphere Guidelines (The Sphere Project, 2011). Humanitarian groups face practical difficulties that affect village-level consultations, including community dispersion, access barriers and pre-existing modes of decision-making. It is evident that most villages do not have a hub where locals may go for reliable information. Information must be transmitted, not only within individual villages but also between them. Communities keep an eye on what happens in the nearby villages, but it might be difficult for them to get information to confirm eligibility for help. The use of social media platforms can improve a community's ability to foresee and prepare for crises. Collaborative initiatives may be created on social media platforms to furnish interested communities with a complete collection of content to evaluate and validate data that may provide intervention possibilities during a crisis, for example (Chan, 2011). Although the humanitarian sector may struggle to secure the effective engagement of catastrophe victims, participation is a crucial component of inclusion (Barbelet and Wake, 2020). By participating, people can assert their rights, keep service providers accountable and take part as equal participants in the planning and delivery of help (Barbelet and Wake, 2020).

The use of social media enables collaborative problem-solving and decision-making by combining various information streams from mobile and Web-based technologies to fill in perceived information gaps and to gather, analyse and map data regarding urgent humanitarian needs (Chan, 2011). Authorities are more equipped to manage and react to a variety of potential crisis-related circumstances as their knowledge base expands. People who are in the midst of a crisis, especially those who might already be marginalised within their own communities, should have the power to decide how humanitarian organisations should assist them (CARE, 2017). Although not being designed for use in disaster management, the people affected by a disaster nonetheless use social media platforms to communicate, changing the public's role from being that of receiving information about a tragedy, to that of producing and sending critical information.

2.1.2 *Diversity*

Humanitarian aid should acknowledge that people have unique traits, abilities and needs that interact differently under various conditions. While more people accept that "not all women are the same", and "not all Dalits are the same", there is a growing understanding that these groups each have unique requirements. Improving inclusiveness requires a deeper appreciation of diversity. One must consider how, for instance, an earthquake can affect marginalised people. For instance, families whose land and possessions were lost face difficulties if they are displaced by minor landslides. Major landslide victims receive government assistance, whereas people impacted by minor incidents run the danger of falling through the gaps (Ferretti *et al.*, 2016). Existing procedures run the risk of escalating societal tensions and prejudice. Even social organisations have issued warnings about the danger of leaving men behind, and that giving aid based on age may harm young people.

Using a variety of communications is necessary to connect and forge relationships with multicultural communities so that survivors are exposed to many touchpoints for the relief effort. To do this, it may be necessary to distribute promotional materials like fliers and pamphlets on social media accounts (Disaster Technical Assistance Center, 2022). Organisations with leadership teams that are more diverse and inclusive may be able to provide more inclusive humanitarian aid, interact with affected populations more meaningfully, and hold them more accountable. The inability to forge strong alliances with local groups that advocate for the elderly, persons with disabilities or members of linguistic minorities represents a big missed opportunity to advance inclusive humanitarian activity (Hill *et al.*, 2020).

2.1.3 *Tailoring approaches*

Making sure that support is based on the unique capacities and needs of excluded persons is what it means to tailor methods. For instance, homes with the elderly or breastfeeding mothers would get extra deliveries. In some instances, formulaic procedures that excluded people from aid were the consequence of a limited assessment of the local realities. In one example, the government

distributed rice to promote livelihoods and agricultural production. Specific household characteristics are essential and should always be considered for the inclusive benefit of the rightful groups of people (Dewanti *et al.*, 2019).

Household traits can include things like occupation, dependence ratio, labour force and the number of healthy family members. They can also include things like migration, the quantity of electrical appliances and cars, and the size of the farmland. There are several instances, though, in which no special consideration is given to very big households. In such instance, households get the same number of things regardless of the size of the family. Despite numerous clusters talk regarding the special needs of people who live at high altitudes, assistance is not always customised to meet their demands.

Several standardised procedures that excluded people from help are the consequence of incomplete assessments of the local circumstances. To encourage livelihoods and agricultural output, the government, for instance, provided rice. However, not everyone may have access to land suitable for cultivating rice, making them ineligible for assistance. Several people have the capacity to grow other crops (such as millet or maize), but those capacities may not be made available to them. They may have to scavenge their own seeds out of the disaster wreckages. The voices of the most vulnerable were frequently ignored if they are left out.

2.1.4 Removing barriers

If everyone is to be effectively involved in DRM policies and programs, there must be concerted efforts to understand and overcome the difficulties people encounter while interacting with their social and physical contexts (Escobar and Trohanis, 2022). Barriers ranging from physical to financial, informational to attitudinal and institutional might deny individuals access to vital markets, services and public areas with dignity. There are barriers preventing people from being included as active actors if assistance in disaster situations comes. Due to lack of information provided to people before, to distributions, and the usually prohibitive distances they have to travel to reach distribution places, these groups are frequently unable to take advantage of distributions (Barber, 2016a). It is important to understand that removing obstacles to inclusion is necessary if people are to be able to engage fully in their communities. While assistance may momentarily meet needs, if obstacles are not removed, long-term advantages might not be realised. The primary concern during disaster response is the quick and efficient initial response. For authorities to react effectively to the crisis, immediate situational awareness is necessary (Chan, 2011). During this phase, community networks are supposed to be engaged to gather, analyse and distribute information quickly. Therefore, the use social media tools become handy.

2.2 Social media in humanitarian crises

There is no widely agreed definition of social media. These activities have been seen and defined in a range of situations, including technical, social and communicative ones (Al Rahbi, 2017). Social media are "technologies that stimulate and facilitate engagement, collaboration, and communication through debate, voting, comments, and the sharing of information", according to the Collins dictionary (Malita, 2011). By building on the conceptual and technical foundations of Web 2.0, a group of Web-based applications collectively referred to as social media facilitate the production and distribution of user-generated content (Kaplan and Haenlein, 2010). Obar and Wildman (2015) defined social media as any internet-based application that:

- is based on user-generated or user-shared content;
- lets users create and share profiles;
- connects their profiles with those of other users to create social connections; and
- lets users share content with other users.

This applies to messaging applications like WhatsApp or Signal, as well as social media platforms like Facebook, X (formerly known as Twitter), Instagram and TikTok which allow communication between individuals and groups of users. A vast range of users and functions are available on social media. Some include integrated blogging and instant messaging tools, whereas others let you exchange images or videos. Social inclusion requires reaching everyone through times of conflict, tragedy, vulnerability and risk (UN General Assembly, 2016). According to 2022 data, internet usage was 63.1% of the global population and has become a core pillar of the modern information society (Statista, 2022). Use of social media surged by more than 10% in just one year, reaching 4.55 billion users in October 2021 (Kemp, 2021). The significance of social media as a tool for information dissemination and disaster aid has been highlighted by recent natural catastrophes. According to some (Obrecht and Warner, 2016; Kaspersen and Lindsey-Curtet, 2016; Willitts-King *et al.*, 2019), the current rapid spread of new, non-humanitarian technologies presents a remarkable opportunity to improve the effectiveness and efficiency of humanitarian aid delivery. This is frequently the case in environments with limited resources and growing need.

2.3 Social media and inclusion hypothesis formulation

Social media now plays a significant role in the humanitarian sector. The use of social media as a data source and a two-way communication channel might potentially have a big impact on how aid is distributed, both in terms of the type of aid that is dispersed to particular populations and the responsiveness and accountability of aid actors to those who use their services. After disasters, people try to get in touch with their loved ones and friends to check on their well-being (Saroj and Pal, 2020). They look for, or exchange information on necessities including food, shelter, transportation and health care. Even then, users can access social media for real-time information exchange by using smartphones, tablets and other devices. Due to the advent of social media, it has become possible to provide two-way communication and engagement between organisations and the public. Social media has become a common tool in crisis situations. Compared to conventional platforms like newspapers or TV, it makes communication more engaging and readily available (Huang *et al.*, 2010). Online communication became even more important in the COVID-19 pandemic setting due to physical barriers that were put in place.

In times of crisis, social media expedites the dissemination of information, and strengthens teamwork for immediate relief. Social media links people together, strengthens social ties and promotes institutional linkages in the absence or aftermath of hazards. These technologies differ from other common types of ICT in that users can use the system to make their opinions, understandings and knowledge public, expanding the body of

information that is available to the community. In the field of disaster response, social media is increasingly being used as a vital information-based communication tool (Dennis *et al.*, 2016; Hiltz *et al.*, 2014; Yates and Paquette, 2011). Social media allows free online information exchange through dialogue and exchanges (Yates and Paquette, 2011). Emergencies necessitate accelerated information gathering, processing, decision-making, and dissemination efforts because of the high levels of uncertainty and disruption of current communication mechanisms (Kapucu *et al.*, 2010). Moreover, social media has the ability to streamline comprehensive communication, improve information flow and be adaptable to responders' changing demands (Sutton *et al.*, 2008; Yates and Paquette, 2011). Social media has become a useful tool that can aid in times of crisis because of these features. Online social media platforms facilitate quick and easy information exchange through sharing and communication, which creates a huge amount of digital content (Huang *et al.*, 2010). Decisions may be shaped by information regarding situational awareness obtained from social media (Martín *et al.*, 2017).

Social media sites assist in distributing information, encouragement and precautions. It significantly affects the response to natural disasters, more quickly than sending field employees to the scene of a disaster. Social media users spark discussion, deliver real-time information and make it possible to reach out to those who would otherwise be difficult to reach with information and assistance (Kankanamge *et al.*, 2020; Intergovernmental Panel on Climate Change, 2021). For instance, X (formerly known as Twitter) information sharing has a history of inspiring social cascades of selflessness and co-operation. Public health workers can use it as a great resource to be informed on people's health before, during and after disasters. Public health experts and decision-makers can use X as a platform to respond quickly to post-disaster concerns and offer support. This makes it possible for people to feel understood and helped by authorities and may provide mental relief to those who are nervous by making them feel connected and helpful, supported by others and encouraged (Taylor *et al.*, 2012). Rescue personnel can locate victims in need by using certain X hashtags that are available. X brings people together by allowing them to share information with people all over the world, which might encourage support for those who are affected (Taylor *et al.*, 2012). During a disaster, hash-tagging, the primary way of recording relevant information on X, can be used to swiftly raise awareness of a natural disaster and collect response data from active users. To better assist and support disaster victims, experts and officials should review the posts by people who were impacted and alter the programmes and laws they uphold to better suit their requirements. During, and after disasters, communities can help one another emotionally and medically by exchanging Facebook posts, providing safe havens for those in need (Mutebi *et al.*, 2020). Public health can also benefit from the information obtained through social media from the disaster-affected community. A blogger sharing their intimate, emotional account of what happened to their family after a disaster and the precautions they took can save lives and improve public health. Social media can fulfil fundamental needs by providing accurate, timely and relevant information and a way to connect with others, empowering people and communities to take care of themselves (Taylor *et al.*, 2012). Following this, the following research hypothesis is presented:

H1. There is a significant positive effect of social media adoption on inclusive humanitarian response.

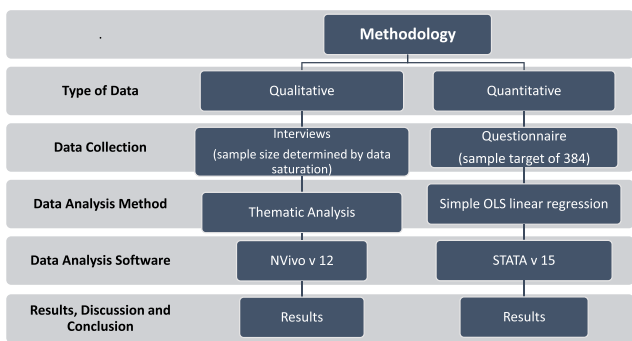
3. Methodology

The study used a mixed-method approach, combining questionnaires (see Appendix 1) administered to representatives from government, United Nations, donors, NGOs, the community and in-depth interviews with humanitarian stakeholders as shown in Figure 1.

In mixed-methods research, two different philosophies of inquiries are combined into the third research paradigm (pragmatism) (Teddlie and Tashakkori, 2003). Due to the fact that, social media has two-way communication capabilities, the authors view users as information producers and receivers at the same time. Social media users are primarily divided them into four categories: individuals, organisations, government departments and communities.

Mixed approach assisted researchers to understand, not just whether an intervention works, but also capture "soft-core views and experiences" (Creswell, 2014). A total of 384 community representatives who used social media and non-social media users in relation to Cyclone Idai relief operations were randomly selected from Chimanimani district of Manicaland province's population of 153,620, using Krejcie and Morgan (1970) sample size calculator, to respond to questionnaires. According to Matsvange *et al.* (2020), Chimanimani was the most severely affected district in Zimbabwe, with an estimated 300 fatalities, over 325 reported missing persons and about 4,000 displaced people. To create a more appealing sample from the larger pool of available common participants for this study, random sampling accurately provided selection accuracy (Magaisa and Matipira, 2019). The non-social media users received information about the cyclone indirectly through people in their personal networks. The Likert scale–based questions were used for the adoption of social media measurement scale, and dimensions of inclusion were adopted from Ferretti *et al.* (2016). Mean scores for the scale items were calculated to represent each variable. In the case of assessment of accuracy of the data, measurements of reliability were carried out, with Cronbach's

Figure 1 Schematic of the methodology



Source: Created by authors

alpha coming in at 0.878, implying acceptable internal consistency. After explaining the study's purpose and how participants were expected to participate, participants' consent was first obtained through a consent form. Throughout the study, anonymity and confidentiality were upheld. Qualitative data was gathered from 12 interview participants who were purposefully selected until saturation of data.

4. Results

The study explored the connection between social media usage during Cyclone Idai crisis and inclusive humanitarian response. The dependent variable and each independent variable used in this study are shown in Table 1 along with their descriptive statistics.

The study sought to understand the relationship between the use of social media during and after Cyclone Idai, and the inclusion of all categories of people in humanitarian response during and after the Cyclone. The correlation matrix between each independent variable used in the linear regression analysis is shown in Table 2. The matrix shows the correlation coefficients between social media usage during and after Cyclone Idai, and the inclusion of all categories of people in humanitarian response.

Results in Table 2 revealed the absence of multicollinearity, as absolute correlation coefficients among the predictors are less than 0.7 and therefore are not highly correlated with each other, making it easier to interpret the results of the regression. In addition, a variance inflation factor (VIF) test was done to check for multicollinearity and also confirmed the absence of it as presented in Appendix 2.

The heteroscedasticity test was done using the Breusch–Pagan test and the results, as presented in Appendix 3, show the presence of heterogeneity. The robust standard errors were used to overcome the bias caused by the heterogeneity of the data. Likewise, the normality test was done using the Shapiro–Wilk test as indicated in Appendix 4, and all the variables have a $p > 0.05$, meaning we cannot reject the null hypothesis indicating the data is normally distributed.

The Grubbs test for outliers was done, and no outliers were detected in the data. Common method bias was done using the Harman's single factor test, and showed the percentage variance of about 13% as presented in Appendix 5, which is below the rule of thumb of 50%. This indicates that there is no presence of the common method bias. As indicated in Appendix 6, the p-values are less than 0.5, which is less than the significance level of 0.05. Based on this, the null hypothesis was rejected, and the conclusion that there is no non-response bias in the sample was reached.

In analysing the relationship between inclusive humanitarian response (dependent variable) and use of social media and other control variables, the research applied a simple linear regression model using ordinary least squares guided by equation (1):

$$HumResp = \beta_0 + \beta_1 SocMed + \beta_2 Age + \beta_3 Edu + \beta_4 Gend + \varepsilon \quad (1)$$

where *HumResp* is Inclusive Humanitarian response and is the dependent variable, *SocMed* is Social media use which is the main independent variable, *Age* is the age of respondents, Edu is the highest-level education attained, whereas *Gend* is the gender of a given respondent.

Table 3 examines social media usage and comprehensive humanitarian assistance. Columns 2–4 of Table 3 display the robustness test models. The stated purpose of a robustness check is to determine how conclusions change if assumptions are altered. To do this, the researchers looked at how core regression coefficient estimates respond to changes in the regression specification, by adding or eliminating regressors. In column 2, the researchers eliminated Education and Gender variables. In column 3, the researchers eliminated Age and Gender variables, whereas in column 4, Age and Education were dropped. The results show that the model's coefficients are robust, and it is safe to assume that the estimated regression coefficients accurately reflect the underlying causal effects of social media adoption on inclusive humanitarian response. Thus, the model can be applied to policy analysis. The study findings reveal that social media has a significant positive

Table 1 Descriptive statistics

Variable	Observation	Mean	S.D.	Min	Max
Humanitarian response	367	2.863	0.475	1	4
Social media	367	5.234	3.369	1	9
Gender	367	1.417	0.494	1	2
Education	367	2.199	0.850	1	4
Age	367	2.324	0.973	1	5

Source: Table created by authors

Table 2 Correlations matrix

	Human. response	Social media	Age	Education	Gender
Human. response	1.0000				
Social media	0.1433	1.0000			
Age	0.0824	0.1468	1.0000		
Education	0.1147	0.1525	0.2489	1.0000	
Gender	0.0953	0.0709	−0.1172	−0.0028	1.0000

Source: Table created by authors

Table 3 Linear regression on use of social media and inclusive humanitarian response

Variables	(1) Inclusive humanitarian response	(2) Inclusive humanitarian response	(3) Inclusive humanitarian response	(4) Inclusive humanitarian response
Social media	0.1570**(0.0711)	0.1820**(0.0714)	0.1750**(0.0710)	0.1870***(0.0696)
Age	0.2620*(0.0240)	0.2950(0.0234)		
Education	0.450*(0.0278)		0.0512*(0.0278)	
Gender	0.0802(0.0481)			0.0795(0.0474)
Constant	2.393***(0.116)	2.595***(0.0677)	2.554***(0.0741)	2.549***(0.0834)
Observations	367	367	367	367
***R*-squared**	0.440	0.340	0.390	0.380

Notes: Robust standard errors in parentheses; $^{***}p < 0.01$; $^{**}p < 0.05$ and $^{*}p < 0.1$
Source: Table created by authors

influence on inclusive humanitarian response. The data in column 1 of Table 3 demonstrates that, at the 5% level of significance, social media use raises the likelihood of an inclusive humanitarian response by 1.57%. These quantitative results corroborate the results obtained from interviewed participants. The participants in the interviews also expressed satisfaction with the part that various social media platforms played in their involvement in relief operations before, during and following Cyclone Idai's landfall:

> Most of the news we heard about the cyclone had come from social media. Before the cyclone, we primarily received warnings via the Whatsapp platform, which described the intensity of the cyclone and encouraged some people to leave their homes for safe havens. Information came from many different sources, including friends, family members, neighbors, and other people we are in social groupings with. (Chimanimani Community member, 21 August 2022)

Participants underlined the importance of community members helping with rescue operations, disaster victim relief and infrastructure restoration:

> I have no doubt that social media news about the cyclone, which was covered in images and videos, reached billions of individuals using smart devices all over the world. The dissemination of information through the social media platforms Facebook, Whatsapp, and Twitter resulted in a surge in donations for the distribution to the need, and local community members had a significant impact on communicating the places that needed the most attention as evidenced by posted critical pictures on social media. (Chimanimani Community member, 22 August 2022)

Some humanitarian organisations were able to disseminate information using social media to quickly reach the general public and assist them in better preparation for and responding to the crisis:

> In order to improve our situational awareness and be better prepared to allocate resources based on emerging trends, we relied on crowd sourcing through social media, integrating different information sources from mobile and web-based technologies to aggregate, analyse, and plot data about urgent humanitarian needs. As a result, we were better able to manage and respond to a variety of crisis-related scenarios. Also, throughout the distribution of help, the needs of vulnerable populations like the elderly, children, the homeless, the disabled, and pregnant women were documented on social media and were considered. (Humanitarian logistics professional, 13 August 2022)

5. Discussion

This study examined the effectiveness of various social media platforms in achieving inclusive humanitarian response, when used by various humanitarian organisations in Cyclone Idai relief efforts. Social media has emerged as significant driver of choice in inclusive humanitarian response to disasters. These findings support the study's research hypothesis, and are consistent with earlier research by Hill *et al.* (2020), Barbelet and Wake (2020) and Escobar and Trohanis (2022), who found out that, the use of social media increases inclusivity in humanitarian efforts. The results presented in this study have several implications on theory and practice on social media and social inclusion in humanitarian relief efforts.

5.1 Theoretical implications

The study contributes to literature by providing insights into the role of social media in facilitating information flow to include different stakeholders in decision-making during the disaster preparedness and response processes. There are numerous theoretical implications of the impact of social media on social inclusion in disaster response. This study reveals that social media has been an invaluable resource for organising, supervising and enabling safety and anticipated reactions in disaster response and emergency management. The findings indicated that social media platforms encourage social inclusion by giving people involved in disaster response, such as volunteers, governmental organisations and impacted communities, a way to timeously communicate and work together in real time as research such as Barbelet and Wake (2020) and Hill *et al.* (2020) confirm.

The findings also suggest that social media plays a vital role in rapid information sharing during and after disasters. Through the usage of social media, impacted communities remained up to date on the state of response operations, resources that were available and safety protocols. Social network inclusivity helped by closing information gaps, facilitated decision-making thereby empowering people individually as well as in communities. Based on these findings, it appears that social media platforms gave voices to the underrepresented groups by giving them a direct avenue to communicate their needs, experiences and viewpoints with additional influential people. This aligns with earlier views by Taylor *et al.* (2012) and Kankanamge *et al.* (2020) who view social media as a tool for empowering people and communities to take care of themselves during disaster response.

Finally, the study contributes to the literature by accelerating the creation of online networks thereby bringing together a diverse range of people with a range of resources and the necessary skills (Barbelet and Wake, 2020). Social media

makes it easier to create online networks and communities that can organise resources and aid in disaster relief efforts. These virtual communities frequently facilitate more inclusive participation in relief and recovery efforts.

5.2 Practical implications

Stakeholders engaged in relief efforts benefitted greatly from the practical implications of social media's impact on social inclusion in disaster response. The function of agencies and organisations dedicated to disaster response is measured by outcomes. To meet their outcomes, stakeholders and agencies had to communicate precise information, through the creation of official social media accounts enabling them to simultaneously reach a variety of communities. This finding implies the value of social media platforms for disaster response teams working directly with impacted communities. Organisations may promote a sense of inclusion and boost community involvement in the response process by actively listening to their worries, answering their questions and attending to their needs.

These findings are valuable to managers of NGOs, community-based groups, government agencies and churches engaged in managing rescue, relief and humanitarian aid as they are deemed to have access to this study's findings in the future and may find them useful.

The way that social media affects social inclusion in disaster response has consequences for policy frameworks. The study recommends that, in order for the humanitarian aid response to be more inclusive, policymakers should encourage affected populations to use social media platforms to share information especially during the times the disaster would be unfolding more frequently.

Furthermore, the study recommends that to share information about evacuation routes and current whereabouts of victims should a crisis occur, members of the community are urged to start social media groups on sites such as Facebook and WhatsApp, and encourage family members and close friends to join. To see the most recent neighbourhood news and updates, residents are advised to follow their local fire departments, city councils and rural district councils on social media.

More so, by including social media technologies in humanitarian efforts, society in general and disaster victims in particular, are supposedly kept informed and active in disaster relief efforts. If victims receive prompts and appropriate resources, and early warnings that would positively impact on saving many lives.

This study further equips the interested stakeholders with better preparation and responsive strategies in case of future disasters. During times of crisis, disaster response organisations can use these useful implications as a guide to maximise social media's potential for promoting social inclusion and guaranteeing that everyone can benefit from digital communication.

5.3 Limitation and recommendations for future studies

Having proffered the recommendation, the study zeroes in on some limitations to the study. It is crucial to remember that the theoretical and practical implications discussed above are viewpoints that draw attention to possible results or factors. The real effect of social media on social inclusion in disaster relief can differ based on a number of variables, including the technological infrastructure, the local context, cultural norms and legal frameworks. Therefore, to fully comprehend the unique dynamics and implications of social media in disaster response, more empirical research and case studies are required. The current study's generalisability to other districts of Zimbabwe and other countries affected by Cyclone Idai is constrained because it was conducted in the setting of the Chimanimani town. It is recommended that future researches should therefore explore other Zimbabwean areas that were affected by Cyclone Idai, as well as other countries in the region such as Mozambique, Malawi and Madagascar.

6. Conclusions

The study examined the relationship between the adoption of social media use before during, and after Cyclone Idai and the inclusion of different categories of people in the humanitarian response. Focus was primarily of the said periods using extensive data that was acquired by the researchers in 2022. This article demonstrates a significant role of social media platforms in natural disaster communication. The study reveals that social media has become increasingly popular as a source of information for the general public during disasters. Using social media as a communication tool widens the audience for the message that is so important during a disaster. Posting, reading and sharing social media posts therefore becomes increasingly important in events such as sudden or slow onset disasters. The study noted that it is essential for humanitarian logistics professionals to consciously improve information flow to include different stakeholders in decision-making during the disaster preparedness and response processes, and help them to better prepare and respond to future disasters.

6.1 Executive summary

The study interrogated the efficacy of various social media platforms that were exploited by various humanitarian organisations involved in the Cyclone Idai humanitarian response in Chimanimani district of Zimbabwe. The various social media platforms were interrogated to establish their contribution to inclusivity or lack of it in relaying humanitarian interventions. The researchers used quantitative data collected using questionnaires administered to 384 representatives from the government, United Nations, donors, NGOs and members of the community from Chimanimani district of Manicaland province. On the contrary, qualitative data was gathered from members of the community and humanitarian organisations through 12 interviews to compliment the questionnaires. The paper shows that social media platforms are effective tools for creating inclusive humanitarian response. The paper reveals that social media has a significant influence on inclusive humanitarian response. Information flow can be achieved by including different stakeholders in decision-making through use of social media during the disaster preparedness and response processes, and helping them to better prepare and respond to future disasters. Managers of NGOs, community-based groups, government agencies and churches are able to disseminate information using social media to quickly reach the general public and assist them in better preparation for and responding to crises. Moreover, the underlined the importance of social media to community members helping with rescue operations, disaster victim relief and infrastructure restoration.

In summary, social media offers an opportunity for NGOs, government agencies, volunteers, churches, community-based groups and members of the local community engaged in managing rescue, relief and humanitarian aid hey may find them useful. The researchers recommend future research be expanded to other Zimbabwean areas other than Chimanimani district, as well as to other countries in the Southern African region and beyond.

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Appendix 1. Questionnaire

Section A: Demographic Data

1. Gender

Male	01
Female	02
Other (Specify)	03

2. Level of education

Did Not Attend School	01
Primary School	02
Secondary School	03
Tertiary Education	05

3. Age

18≤ age ≤30 years	01
31≤ age ≤40 years	02
41≤ age ≤59 years	03
Age ≥60 years	04

4. Duration of social media use

<3 months	01
3-6 months	02
7-12 months	03
1-2 years	04
>2 years	05

5. Number of days per week?

≤1day	01
2-3 days	02
4-5 days	03
days ≥6	05

6. Amount of time/day

<10min	01
11-30min	02
31-60min	03
>60min	04

(*continued*)

7. Number of social media friends.

<50	01
51-100	02
101-200	03
201-400	04
>400	05

SECTION B: Adoption of social media in responding to Cyclone Idai in Zimbabwe

How often have you performed the following online social networking activities towards, during and after Cyclone Idai?

	1	**2**	**3**	**4**	**5**
1.Sent messages to friends on message board					
2 Chatted with friends via instant messaging function					
3 Replied to comments made by social networking friends					
4 Commented on friends' status, logs, and photos					
5 Shared/Forwarded content					
6 Browsed others' logs/photos/statuses/albums					
7 Updated self-status					
8 Posted photos/videos on personal web profile					
9 Decorated personal web profile (changed image/contact information/privacy setting)					

Section C: Dimensions of inclusion

In the table below please rate the extent to which social media was useful in the inclusion of all categories of people in humanitarian response during and after Cyclone Idai

Dimension	**Very low**	**----------**		**To very high**
1. Participation in decision making To what extent people have a say and/or are properly represented when decisions affecting them are taken?	People are informed of actions planned and Data is extracted from them	People are meaningfully consulted on pre-defined options / with conventional mechanism (e.g. assembly)	People define what options and strategies will best suit them, through well designed participatory initiatives	Local initiatives are fostered and supported through dialogue
2.Diversity Does assistance recognize that people have different	Assistance is based on pre-determined categories	Pre-determined categories are expanded / adapted to the context	Recognition that exclusion stems from interplay of different categories / role	Even hidden, taboo characteristics are considered

(*continued*)

characteristics, capacities, needs, which interplay differently in diverse circumstances?			of power is acknowledged	
3.Tailored approaches To what extent assistance responds to diversity context specific?	Assistance is predetermined	Assistance is standardized, based on local assessment	Assistance is adapted to the specific capacities / needs encountered locally	Assistance is fine-tuned, up to the individual level.
4.Removal of barriers To what extent does assistance ensure that the barriers preventing people from being included as active actors are recognized and removed?	Barriers are not identified / removed	Main barriers (physical) are identified and tackled	Social barriers are recognized and tackled	Assistance is interlinked to long term support to power / equality.
Dimension	**1**	**2**	**3**	**4**

End of questionnaire

Source: Table created by authors

Appendix 2

Table A1 Multicollinearity test using VIF

Variable	VIF	1/VIF
Age	1.10	0.910
Education	1.08	0.924
Social media	1.05	0.957
Gender	1.02	0.978
Mean VIF	1.06	

Source: Table created by authors

Appendix 3

Table A2 Breusch–Pagan/Cook–Weisberg test for heteroskedasticity

Chi^2(1)	7.88
Prob > chi^2	0.0050

Notes: Ho = constant variance; Variables = fitted values of humanitarian response
Source: Table created by authors

Appendix 4

Table A3 Test for normality using Shapiro–Wilk test

Variable	Observation	*W*	*V*	*z*	Prob>z
Humanitarian response	367	0.99540	1.172	0.375	0.574
Social media	367	0.92508	19.097	6.990	0.513
Age	367	0.98670	3.389	2.893	0.791
Education	367	0.98070	4.921	3.776	0.808
Gender	367	0.99844	0.398	−2.184	0.985

Note: Shapiro–Wilk W test for normal data
Source: Table created by authors

Appendix 5

Table A4 Common method using Harman single factor test

	Total variance explained					
	Initial eigenvalues			Extraction sums of squared loadings		
Factor	**Total**	**% of variance**	**Cumulative (%)**	**Total**	**% of variance**	**Cumulative (%)**
1	1.453	29.056	29.056	0.639	12.774	12.774
2	1.137	22.739	51.795			
3	0.857	17.137	68.931			
4	0.832	16.646	85.577			
5	0.721	14.423	100.000			

Note: Extraction method = Principal axis factoring
Source: Table created by authors

Appendix 6

Table A5 Paired samples test

Paired samples test									
		Paired differences							
					95% confidence interval of the difference				Sig. (two-tailed)
		Mean	S.D.	Std. error mean	Lower	Upper	*t*	df	*p*-value
Pair 1	Humanitarian response social media	−2.47548	3.33420	0.17404	−2.81773	−2.13323	−14.223	366	0.000
Pair 2	Humanitarian response – Gender	1.34196	0.64090	0.03345	1.27617	1.40775	40.113	366	0.000
Pair 3	Humanitarian response – Education	0.55995	0.91836	0.04794	0.46568	0.65421	11.681	366	0.000
Pair 4	Humanitarian response – Age	0.43460	1.04074	0.05433	0.32777	0.54144	8.000	366	0.000
Pair 5	Social media – Gender	3.817	3.370	0.176	3.472	4.163	21.700	366	0.000
Pair 6	Education – Age	−0.125	1.121	0.059	−0.240	−0.010	−2.141	366	0.033

Source: Table created by authors

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