

Social Media Usage for Natural Disaster Management

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Abstract:- In the present study, an attempt has been made to study the importance of social media and the manner in which various stakeholders all over the world, especially in India constructively use social media for creating an awareness on climate change and management of natural disasters.

Keywords:- Social Media Usage; Social Media Impact; Social Media For Natural Disaster Management.

I. INTRODUCTION

We cannot discuss climate change without knowing the meaning of climate change. In order to know the meaning of *climate change*, it is important to understand the meaning of *climate*. Many people naively consider *climate* as synonymous with weather but both *climate* and *weather* hold different meanings. Our planet Earth has one atmosphere but irrespective of this we can observe significant weather variations in different parts of the world. It is amazing to observe how nature works and that weather keeps on changing over minutes, hours, days and weeks. Thus, weather varies from day to day. Troposphere is part of the Earth's atmosphere where most of the weather events take place. Changes in a weather at a given time or place are fueled by changes in the atmosphere caused by various factors like speed and direction of wind, air pressure, humidity and temperature. Unlike weather which changes from day to day, climate implies the weather of a place over a significant longer time period. Climate too varies in different regions but it is different from weather. When it comes to knowing a climate of a place, we have to take into consideration the temperature, wind, precipitation, i.e., different measures of weather which take place over a number of years. To effectively study climate, many climate scientists often take into consideration an average of weather observations observed in a specific place over 30 years and this rigorous process is referred to as Climate Normals. Climate change is an umbrella term for the tremendous fault in the weather observations throughout the world. Increase in the global average temperatures is a significant factor which induces climate change (Encyclopedia of Climate and Weather, 2011).

According to National Aeronautics and Space Administration (NASA) climate change is:

“...a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass changes such as sea level rise;

ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events.”

In 2018-2019, India and its people underwent major loss in terms of life and property. Indian floods wreaked havoc in the lives of the people. According to World Bank, “India is among the countries most vulnerable to climate change. It has one of the highest densities of economic activity in the world...By 2020, pressure on India's water, soil and forests are expected to become the highest in the world.” Hazardous industrial emissions and destructive human activities are making world warmer, extreme weather events and disruptive patterns of rainfall are accelerating climate change (Padmanabhan et al., 2019).

In contemporary times, social media is being used by many environmental and social activists for spreading information to combat problems created by natural disasters or life-threatening situations. Social media is also being used by environmental activists for raising concerns about climate change and for campaigns.

Before proceeding to the review of literature it is important to have a look at the research method and objectives.

II. RESEARCH METHODOLOGY

For formulation of the research objectives relevant sources of literature were reviewed which included newspaper articles, magazines, and research papers from journals.

Firstly, empirical studies and conceptual papers were identified for initiating investigation of the research issues pertaining to the concepts like social media, and climate change. Secondly, the inclusion of relevant sources of literature was done with an aim to examine the usage of social media for life threatening situations or emergency.

Screening of the identified empirical studies was done with a specific inclusion criterion which focused on three specific themes:

- Social media usage for combating problems created by life-threatening situations;
- Social media usage for global mobilization of climate change activists and stakeholders;
- Social media usage for management of natural disasters with an emphasis on India. This inclusion criterion became a prerequisite for ensuring that studies included

for the present review primarily focused on the 'usage of social media for combating natural disasters.'

III. OBJECTIVES OF THE STUDY

The study focused upon the following objectives:

- Examining the usage of social media for combating problems created by life-threatening situations.
- Studying the social media usage for the purpose of global mobilization of climate change activists and stakeholders.
- Examining the usage of social media for management of natural disasters with an emphasis on Indian floods.

IV. REVIEW OF LITERATURE

Review of literature takes into consideration only one form of social media, i.e., social networking sites like Twitter, Facebook and WhatsApp because they are the popular forms of social media. Literature review of social media usage for combating natural disasters is categorized under the following three themes:

A. Social media usage for combating problems created by life-threatening situations:

Social media has emerged as an extremely powerful tool for the communication and dissemination of the information. It is important to understand that the meaning of 'information' in the context of social media refers to *message received and understood*. Social media is not only used for strengthening human relationships but also bridging and bonding social capital (Vallor, 2012; Kanter, Afifi & Robbins, 2012)

Gao et al. (2011) in their study found that when it comes to emergency or life-threatening situations then social media users respond to emergencies by using social networking sites for sharing information. This way the information shared can be used by emergency agencies for apropos insights regarding a critical life-threatening situation. This timely alert in the form of information is requisite for prevention of grave consequences emanating from life-threatening situations.

Alexander (2014) states that emergency agencies can make use of information shared by social media users for management of emergency events and further reduction of risks caused by the crisis. It is important that emergency events are timely dealt by taking into consideration their characteristics and public opinions for arriving at a constructive conclusion which could help to overcome the losses incurred by the crises.

Social media or social networking sites being a new outlook has emerged as a new way to provide instant information during natural disasters (Topno, 2016: 29).

According to Topno (2016: 29), social media is generally used in four ways:

- Sharing updates and spreading awareness of the condition
- Creating communities and volunteers for relief operation
- Fund raising

- Monitoring and providing insights of the whole situation.

B. Social media usage for global mobilization of climate change activists and stakeholders:

Social media is a significant platform with massive outreach which can be effectively utilized for influencing the perception and behavior of public. Though, public engagement is limited, all over the world the focus is primarily laid on changing the behavior of an individual. With the constructive approach to spread awareness, many international government and non-governmental organizations are making use of social media and several pro-climate campaigns are being successfully promoted through social media.

According to Norris (2003: 2), "*the younger generation, in particular, may be at the forefront of those who have adapted to the newer forms of political expression, mobilization and engagement.*" The entire world looked up to a 16-year young adolescent Greta Thunberg when she tweeted a video of her United Nations General Assembly speech on Twitter, with the caption, "*Right here, right now is where we draw the line. The world is waking up. And change is coming, whether you like it or not.*" Thunberg's speech with her caption and hash tag #howdareyou went viral; her tweet and speech became successful in influencing international celebrities like Leonardo DiCaprio and Priyanka Chopra. Many other people including renowned businessmen, professors, doctors and engineers on Twitter pledged to take stringent action to reverse the effects caused by the climate change. Public perception is very important for promoting a constructive action against the problems of climate change (India Today, 2019). Whenever there are natural disasters, people often use social media platforms to exchange opinions, information and safety measures to prevent loss of lives. We are living in the inescapable age of social media. With the advent of smartphones, social media is even more accessible than before. Thus, it is very crucial for the key stakeholders to use social media as a medium for mobilizing people and promoting climate change. Green Peace is one such renowned international non-governmental organization that actively uses social media like Facebook and Twitter.

PhD research scholars Amir Erfanian and Lori Fomenko from University of Connecticut brainstormed to promote scientific research on climate change through social media like YouTube. Thus, Erfanian and Fomenko came up with ClimaMedia – a website that promotes active social engagement through informative videos on climate change by bridging the knowledge gap between the public and scientific communities. Social media can be used as an effective platform of communication and public engagement when it comes to mass mobilization and global outreach. Many studies have substantiated that the power of social media platforms can be leveraged to cast a significant positive impact on the behavior and attitude of the individuals (Salganik et al., 2006; Wu et al., 2011; Kramer et al., 2014).

Social media can be utilized by younger generation for climate change activism and for spreading climate change information within their social circle. Youth can make effective use of social media for creation of public forum specifically for voicing out innovative measures to combat climate change. Social media can felicitate e-movements which for raising awareness regarding climate (Neumayer & Svensson, 2016; Collin, 2015; Olsson & Dahlgren, 2010).

Goldfine (2011: 30) explained the ways in which social media was utilized during Tsunami and earthquake in Japan in March 2011. It was found that Facebook and Twitter were used to provide information about the disaster. Twitter and Facebook were effectively used to collect donations and for discussing organizational participation in the disaster relief.

Leiserowitz et al. (2013: 6) found in their study that 23 percent of the Americans who experienced extreme weather events communicate their experiences on Facebook and 19 percent of the Americans shared the photo of the weather event or its aftermath using Facebook, Tumblr, or Instagram. It was found that around 89 percent of the Americans are more likely to share or communicate their experiences about weather events through face-to-face communication. This shows that even though a small percentage of Americans use social media to communicate their experiences of extreme weather and climate change but with coming times this usage of social media might increase given the fact that many organizations and climate change activists are making use of social media.

Many organizations like Green Peace and Amnesty International make use of social media to achieve massive public engagement. Social media was extensively used for two major climate change movements like Earth Hour (2015) and the United Nations Climate Change Conference (COP21 held in 2015). When it comes to effective social collaboration on action against climate change, environmental pollution and global warming then social media has an immense potential to unite various stakeholders like school district, teachers and students from a school (Aydin & Hossain, 2012).

O'Neill et al. (2015) found in their study that social media can have a substantial direct effect on the attitude of social media users who are more engaged on the social media. Ogunjinmi et al. (2016) conducted a study in the Federal University of Technology, Akure. Their study found that 98.3 percent of respondents came to know about climate via social media and a good percentage of 48.6 percent respondents discussed climate change with their friends on social media. Facebook was found as the most popular platform for spreading the information related to the climate change.

According to Nisbet and Kotcher (2009), many climate change campaigns make use of social media.

Williams et al. (2015: 136) found in their study that public discussion of climate change on social media has a potential to have an impact on the climate debate in an offline

sphere. Their study states that countries which have more Internet usage would be the ones to be greatly impacted by social media. Even countries having lower Internet usage would be impacted as there would be a higher probability for Internet users to be opinion leaders.

Ogunjinmi et al. (2016) found that the level of social media engagement of the respondents determined their concerns about climate change. The frequency with which the respondents receive information through social media on issues like climate change has a significant impact on the awareness and knowledge of the respondents. Kahan et al. (2012) in their study found that an individual's peer-group perception on climate change on the social media will affect the behavior of that individual and shape his or her perception on climate change in accordance with that of his or her peer-group. Social media can play a significant role in dissemination of climate change information and even mainstream media could be affected by the scientific topics shared on social media (Schafer, 2012). O'Brien et al. (2018) in their study analyzed the manner in which youth challenge political interests and power relationships for furtherance of goals directed at climate-resilient future.

Ogunjinmi et al. (2016) call for the innovation of a new social media platform which focuses on the climate change so that people all around the world get an access to information related to climate change.

Holmberg and Hellsten (2015: 811) examined 250,000 tweets and retweets to study how men and women make use of Twitter for communication on the climate change. It was found that men more often tweeted on climate change by tagging individuals with their usernames whereas women tweeted more often on climate change by making a specific mention to campaigns and organizations. Men maintained a skeptical stance in their tweets whereas women reflected a more convinced attitude towards climate change. The study found that organizations aiming at climate change can reach out to audience on the Twitter for better engagement. News Media and local campaigns can be used to engage women on Twitter for climate change.

C. *Social media usage for management of natural disasters with an emphasis on Indian floods*

According to Craig Fugate (US Federal Emergency Management Agency administrator), "*Social media* has revolutionized communication during disasters. Today we have a two-way street – residents are informed about hazards in real time and emergency managers receive immediate feedback on the consequences of a disaster. Twitter Alerts provide an opportunity to get information directly from trusted sources" (cited in Coyne, 2013). In 2011 there was a Tohoku earthquake and tsunami in the Japan which required Facebook engineers to develop a *disaster message board*; the intention behind the creation of the disaster message board was to enable affected people, relatives, friends of affected people to connect with each other. This further led Facebook to develop a feature called *safety check* which could assist users living close to the disaster site. *Safety check* could be used by Facebook users living in affected areas of disaster for

notifying their friends about their safety; this could be done by the users by marking themselves safe. In times of severe loss caused by the disaster, *safety check* can also enable friends and their families to locate their near and dear ones. International Medical Corps (IMC) which works for rescue and relief operations for hardest hit earthquake regions makes use of Facebook by using *Facebook Donate* feature. This feature is shown as a message at the top of the news feed asking people to directly donate to the IMC for bringing relief to the people affected by the Earthquake (Saleem, 2015). When hurricane *Sandy* affected people of a region (check) then more than 20 million Twitter posts were circulating on the Twitter. A largest utility company PSE&G in New Jersey used Twitter to update their Twitter feeds and used Twitter to share information of daily locations of their tents and generators.

With an aim to combat natural disasters and help communities, organizations, agencies, respond, recover and rebuild, Facebook has collaborated with a non-profit organization SEEDS in India and National Disaster Management Authority (NDMA). Facebook was highly used by people during Chennai floods for connecting and extending support. Disaster Maps was introduced by Facebook with the intention to bring relief to the sufferers. Facebook is also supporting Aapda Samachar Karyakarta – Disaster Information Volunteers wherein a network of trained volunteers makes use of Facebook platform to inform the government relief measures (PTI, The Hindu Businessline, 2017).

When the state of Jammu and Kashmir was affected by the floods in the 2014, then Army and Twitter joined hands to collaborate for rescue operations by creating an automated SOS service (Hooda, 2014). Due to tumbled infrastructure and severe effect on telecommunication facilities, local officials didn't have an alternative to contact the Army or government and army too was helpless as it became difficult to trace the location of the affected people. Twitter channelized SOS information received through Twitter feed by running it through a code which separated the SOS tweets from the rest, under #kashmirfloods. This information was sent to Indian Army for rescue operations. Army saved over 12000 people based on the information they received with the help of Twitter (Major General Shokin Chauhan, in an interview to The New York Times). Twitter was effectively used for the channelizing of relief materials which people from different states of India offered to contribute for Kashmir. There were almost 40 collection centres throughout the country and numerous distribution channels in the flood-hit valley for dispatching relief materials. The creative use of social media, thus, saved several lives (Saleem, 2015). Uttarakhand was struck by Himalayan Tsunami in June 2013 which caused landslides and floods. Many relief operations were carried by the government, army for stability restoration of the state. Online campaigns through social networking sites like Facebook and Twitter helped in tracing missing victims. Creation and effective utilization of the pages on the Facebook like '*Uttarakhand Flood Disaster 2013: Information, help and relief*', '*Help Uttarakhand – 2013 floods*', '*Khoya Paya*' helped in tracing information of

missing people. With an aim to connect missing people with their relatives, friends or loved ones, Uttarakhand State Government started an initiative on Facebook by the name of 'Uttarakhand State Government Initiative – Operation Connect'. Twitter played a humongous role in finding information about missing people with several hashtags like #RebuildUttarakhand, #UttarakhandHelp, #SaluteIndianArmy.

Yadav and Rahman (2016) by highlighting the case of 2015-Chennai floods state that social media can play an important role in India when it comes to natural disaster resilience.

Iyer, Davenport, and Sankaralingam (2018) in their study explain the significance of social media and social media analytics for combating the problems caused by natural disaster, they take into consideration the case of Chennai floods (which occurred in the year 2015). It is to be noted that the major cause for floods in Chennai was heavy rainfall of 490 mm (over 19 inches) in a single day. Floods wreaked havoc resulting in loss of \$3 billion to \$10 billion with over 500 people killed. In grievous circumstances when there was power cut, scarcity of food and spread of diseases, social media platforms like Facebook, WhatsApp and Twitter were employed for bringing relief to the people affected by floods; social media turned out to be beneficial when it came to relaying the flood information to the rescue agencies; flood and relief centers. Chennai Corporation authorities too made use of social media to figure out the ground reality and concerns of people regarding the spread of epidemic diseases and illegal garbage dumps. The Civic administration used social media to identify the top three priorities for social media usage: 1. Rescue operation, 2. Measures for Relief Provision and 3. Management of epidemic/diseases. Latent View Analytics is an analytics consulting firm which worked for the cause of disaster management during the Chennai floods. Chennai Corporation coordinated with LatentView for effective results. Latent View Analytics collected Twitter feeds using Twitter API and began to analyze it; a visualization dashboard was created for monitoring the trends, number of mentions, key influencers, popular hashtags. LatentView qualified the leads received from Twitter and forwarded the legitimate ones for the Chennai Corporation and the city residents. On December 14, the requests which were received through Twitter were: 41 requests for blood patients in the hospital, 40 requests to rescue animals, 77 requests for clearing the garbage, 500 requests for food from families near the British Consulate, and several requests for blankets. Latent View identified the legitimate ones for the consideration of the concerned authorities.

Nair, Ramya, and Sivakumar (2017) in their study found how people of Chennai made use of Twitter when Chennai was badly hit by the floods in the year 2015. It was found that the sources of the Twitter messages which disseminated information of the Chennai floods were the most influential users like India Today and DT Next.

Philip and Kannan (2019: 1412), in their study took up the case of Kerala floods which shook Kerala in the year of 2018. Floods in Kerala were caused due to heavy rainfall, which devastated the lives of the people. Many people lost their lives and affected grief-stricken residents of Kerala had to relocate to safer places in a bid to save their lives. Water from dams had to be released by the administration with a perspective to avoid impending destruction of the four districts. Their study elaborated how social media platforms like WhatsApp, Facebook, and Twitter were used to assist and bring relief to those affected in the time of disaster. People from all around the world joined hands and collaborated through social media platforms to bring relief and help to the people. It was found that social media can be used as an effective tool for mobilization of non-governmental organizations, fundraising volunteers and self-help groups (Ajay, A. 2019).

Rajendiran (2018: 8) in her study found that Twitter was used effectively during the Kerala floods to disseminate information in three categories of conversation among the Twitter users: Rescue, Relief and Health.

Rescue conversations on Twitter were based on requests calling out for rescuing flood sufferers who were trapped on the terrace, requests were made for boats and helicopters to rescue those stuck up in the floods. Relief conversations on Twitter were based on requests for basic necessities like bread, pulses, cereals, and milk powder, blankets, sanitary pads, diapers and drinking water. Health conversations on Twitter were based on requests for medicines, blood donation and concerns about snake bites, leptospirosis and dengue (Rajendiran, 2018: 8).

In India over 13 states (Kerala, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Tamil Nadu, Goa, Odisha, Andhra Pradesh, Punjab, Assam and Bihar) were affected due to heavy rains during July 2019 and September 2019.

Irrespective of the havoc wreaked by the rains in the year 2019, social media came as a respite for flood affected areas especially in Assam. Several NGOs in Bhutan constructively utilized social media like WhatsApp Messenger to send warnings of flashfloods, cloudbursts and landslides to the people of Assam – this saved many lives and prevented severe losses in the districts of Kokrajhar, Chirang and Baksa. Rivers like Saralbhangha, Ai and Manas which originate in Bhutan and flow downstream to join the Brahmaputra, overflow during the monsoon and cause immense losses in the bordering plains of the Assam. WhatsApp has made it easier for Bhutan NGOs to communicate with Assam residents and Assam NGOs whenever there is a case of heavy rains in Bhutan. This relay of timely information from NGOs like Bhutan India Friendship Association (BIFA) from Bhutan to Assam regarding the possibility of occurrence of floods helps Assam people save their lives and safeguard their assets (Parashar, 2019).

V. DISCUSSION – FUTURE AHEAD

The present paper described climate change, how climate change stakeholders have been making use of social media to disseminate information related to climate change. The paper also highlighted the use of social media in India for prevention of floods in Assam and for taking effective measures for the management of the floods. Pilka (2017: 36) in a study substantiated that journalism is not so accurate in terms of climate change and journalists are not doing justice when it comes to effective communication of climate on the Twitter. Even though Twitter is being used to share information about climate change, for many instances the prepermission of mobilization for constructive action towards climate change is a huge problem. It has to be noted that mere climate change information sharing isn't relevant unless netizens are made aware of the measures to be taken to solve the problems caused by climate change. Thus, sustainable climate communication must focus on the measures which citizens should adopt for palliating greenhouse gas emissions (Pilka, 2017: 37). Therefore, when it comes to active engagement of the netizens to resolve climate problems the onus not only lies on the journalists but also on the organizations working to resolve problems caused by climate change and the individuals who are climate change activists.

Gil De Zúñiga et al. (2018) in their study found that Twitter users have a great tendency to trust journalists. So, journalists have to analyze how Twitter can be used to mobilize the users for active engagement in solving the issue.

VI. CONCLUSION

Social media is an important tool to influence the attitude of the individuals who are actively engaged in the social media. It is imperative that the governments, non-governmental organizations, climate change stakeholders make an appropriate use of it for bringing a massive change.

According to Pilka, T. (2017: 16), the focus of environmental communication for climate change must not be confined to making people aware of the change coming in the climate but it is important that awareness is linked with active participation of the people in combating the problem of climate change because actions taken by government or non-governmental organizations are not sufficient to constructively deal with the changing climate.

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