

Increasing Cases of Cloud Bursts in India: Need for Strategic Climate Change Communication

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Climate change induced cloud bursts and flashfloods are on a rise in India. Recent incidents have pointed out the problems and impact of such events on the infrastructure and people living in the region. Not just the Himalayan belt, incidents of sudden flooding due to excessive rainfall is being felt in different metro cities across the country. While administrative steps are being taken to find solutions to counter the current problem, there is an immediate need to promote climate change communication or climate related risk communication to better equip the common people about the problems of climate change and be ready for it. The commentary paper focuses on case study of recent incidents of climate change induced cloudbursts and flooding in India – Kishtwar Cloudburst, Uttarkashi Cloudburst, Kolkata Cloud burst, Mandi and Chamba Cloudburst. By looking at the individual incidents of cloudburst and its associated impact on human lives in the given areas, it also explores the need for a strong strategic climate change communication for better future planning.

Keywords: climate change in india, climate change communication, cloudburst in india, flash flood in india

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1. Introduction

India has been seeing an increase in the frequency of cloudbursts and flashfloods across the country. Whether it be incidents in Jammu and Kashmir, Dharali, Uttarakhand, Kullu, Kolkata, Shimla, Spiti or Lauhal, the increase in number of flashfloods from 2017 to present date is well documented in the Western Himalayan region and others. According to Anil Kulkarni, a distinguished name in science, Divecha Centre for Climate Change at Indian Institute of Science, higher temperatures enable higher water holding capacity of air. This significant increase in air column moisture leads to cloudburst **(Nandi 2025)**. A recent study by Kuldeep Pareta and Upasana Pareta reviews cloudburst events in the Himalayan region from 1970 to 2024. There is an observable increasing frequency of the same in all these years **(Pareta and Pareta 2025)**. Keeping incidents like the one in Dharali in mind, it can be argued that not just a decent climate change risk communication strategy is necessary but there is a need to demarcate safe zones for hotels, buildings and other human habitats in the Himalayan region. This must be done with the expertise of the Indian Meteorological Department. The Himalayan region is particularly vulnerable to the issue of cloud bursts flashfloods and landslides. However in a press briefing on August 31st 2025, Director-General of IMD Indian Meteorological Department, Mrityunjay Mahapatra said that it is impossible to forecast cloudbursts but mini cloud bursts have increased **(Koshy 2025)**. Although there is an active Prime Minister's Council on Climate Change, National Action Plan on Climate Change, State Action Plan on Climate Change, Climate Change Bill, yet there is a need to reassess the climate change legislation in India **(Rajora 2023, Pg 10)**.

The changes that have been occurring in the Earth's climate have a deep and profound effect on the lives of people in South Asia. Changing temperature and the pattern of rainfall have affected agriculture in the region. The annual temperature has changed and seen a significant increase in the last few years. Rising temperature can impact health, productivity and cause climate induced migration in people **(Mani et al. 2018, pg 3)**. Along with economic disruptions and impact on infrastructure and lives of people, the profound effect of Climate Change in India is becoming increasingly visible throughout the country.

But the awareness in people needs to be built through strategic climate change communication. The vulnerability of the people in India ranges from factors like rise in sea level to extreme weather events. More people are being exposed to climate change hotspots, places that are experiencing a strong negative effect of climate change. It is projected by 2050, 148 million people in India will be living in zones that vulnerable climate hotspots **(Leiserowitz et al. 2022, Pg 5)**. The Centre for Climate Change Research led the preparation of report by the Ministry of Earth Sciences that outlined the impact of 'human induced climate change'. It has pointed to the regional anthropogenic influences and other effects of warming on increase of heavy rainfall events and extremes of weather conditions across India **(Ministry of Earth Sciences 2021, Pg 1)**.

The problems of climate change that India is facing is primarily centred around erratic rainfall, heatwaves, decreasing water tables, pollution and floods **(Saha 2025)**. When unexpectedly the precipitation exceeds 100 mm and is accompanied by lightning and strong winds over a limited geographical area, it is called a cloudburst. The combination of monsoon and the Himalayan conditions and topography creates favourable conditions for cloud bursts. While a cloud burst is extremely intense it is short lived and since it occurs over a small geographic area the impact is massive **(Mishra et al. 2021)**. Climate change is strongly aiding to this by inducing warm moist air to condense and burst in a short timeframe. The sheer volume of the amount of precipitation in a densely populated region has little help in draining that water so soon. This then leads to flash floods. Since it is so localised and sudden the power of prediction is significantly reduced. On an average for every 1 degree rise in temperature, the moisture retention capacity of the air increases by 7 per cent **(Janardhan 2025)**. But cases of erratic rainfall and cloud bursts are not just limited to the Himalayan region. On September 23, 2025 Kolkata received approximately 247.5 mm of rain within 24 hours. There was a major disruption of life due to waterlogging in the city with 9 dead due to electrocution **(The Hindu Bureau 2025)**.

2. Case Study of Recent Major Incidents of Cloud Bursts and Incessant Rainfall in 2025

1. Kishtwar Cloudburst: Approximately 13kms from the Chasoti village in Kishtwar district of Jammu and Kashmir experienced two cloudbursts on August 14th 2025 that unleashed boulders, mud and torrents of water. About 60 people were killed, 100 injured and missing (**Ganai and Khajuria 2025**). The Chief Minister announced all kinds of assistance to the people suffering (**Verma 2025**). People had gathered for Machail mata Yatra. The controversy surrounding the tragedy deals with the question whether this could have been avoided. A day before the onset of the pilgrimage a cloudburst had occurred in the area stalling the yatra by a few days. Chief Minister of state claimed accountability of the event as it was predictable and yet no action was taken on it (**Ghosh 2025**). What is interesting is the fact that a govt report issued in 2024-25 on Kishtwar district regarding Glacial Lake Outburst Flood had mentioned the same region to be vulnerable to risks. It mentioned places like Warwan, Marwah, Padder machail, Dachchan to be prone to GLOF risks (**Ganai 2025**). On August 26, 2025, Warwan valley was affected by a cloudburst that 190 houses killing cattle.



Before and After Images on NDTV article showing the Affected Area due to cloudburst and flash flood. (Ghosh 2025)

Source: <https://www.ndtv.com/india-news/missed-warnings-systemic-lapses-kishtwar-cloudburst-was-a-tragedy-foretold-9151702>

2. Uttarkashi Cloudbursts: Cloudbursts, torrential rain triggered flash floods in Uttarkashi district of Uttarakhand on August 5 2025. The flash flood hit residential buildings and hotels in Dharali town (**The Hindu Bureau 2025a**). Even after 51 days of the tragedy 67 people had remained unaccounted.

Two separate cloud bursts in Dharali and Sukhi unleashed mayhem in the region. According to initial reports about 20-25 hotels were washed away including large portions of Dharali market. National Disaster Response Force, Indo Tibetan Border Police, Indian Army were deployed immediately to continue rescue operations. Mudslides blocked railway tracks. Questions were raised on cause of the disaster (**Priya and Yadav 2025**). It has even been questioned if it was a cloud burst at all as the IMD rainfall data revealed inconsistencies on the same according to IMD scientist Rohit Thapliyal. According to a research that was led by Prof Sundriyal, due to warming of the region, the trend of rainfall changed in Uttarakhand over time. Post 2010 there has been an increase in precipitation in the region. Steep slopes and fragile formations of the topography make it more vulnerable such incidents. According to a study published in November 2023, there were 183 incidents of natural disaster in the region between 2020 to 2023. Experts are of the opinion, natural disasters are being worsened by the human activity in the region. Deforestation, creation of tourism infrastructure, unregulated concrete building are all adding to the vulnerability of the region (**PTI 2025**). Global warming has increased incidents of cloudbursts in the region, scientists also warn that not just precipitation, shrinking of glaciers and the extra volume of water will trigger ecological crisis in the region on a long term scale. About 56 lakh tourists visited the Char Dham pilgrimage in the year 2023 alone. The building of unregulated infrastructure, amenities on unstable slopes, hill cutting, are all adding to the destruction of natural buffers. Major incidents of the past like Malpa Landslide, Kedarnath floods of 2013, 2021 Chalmoli floods, 2022 Draupadi ka Danda Avalanche all are witness to the problems in the region (**ET Online 2025**).



Photo showing devastation in Dharali (Livemint 2025)



Photograph showing the devastation happening in Dharali. (Livemint 2025)

Source:

<https://www.livemint.com/photos/uttarkashi-cloudburst-15-images-that-capture-the-shocking-devastation-misery-in-dharali-uttarakhand-harsil-kheer-ganga-11754397743329-15.html>

3. Kolkata Cloudburst: Kolkata experienced its third highest precipitation since 1978 on September 22 2025. A record rainfall of 251.4 mm rainfall within a period of 24 hours caused havoc in the city with the entire city and its suburbs being waterlogged. Although IMD officials later challenged the probability of a cloudburst, yet the high moisture content of the air with clouds reaching five to seven kilometres caused the massive downpour (**Kumari and Marar 2025**). Due to flooding there were incidents of electrocution across the city and 9 people lost their lives due to this. Flights came to a halt, waterlogging caused massive distress to the people. This was followed up preventive power cuts. What further caused delay in rescue was the fact that the water level in the Hoogly river was high due to tide and the water in the city could not be pumped out with immediate effect (**TNN 2025**). IMD officials admitted that since the volume of rainfall was almost double, the affects were severely felt across the city. Decline of the city's waterbodies, unregulated urban expansion all contributed to the incident (**Basu 2025**). According to Mahesh Palawat, Vice-President, Skymet Weather, Bay of Bengal's warming waters are fuelling storms in the area leading to more evaporation, thereby creating intense low-pressure systems. Roxy Mathew Koll from the Indian Institute of Tropical Meteorology suggested that cyclogenesis and deep convection will occur due to rise of surface temperature of the Indian Ocean causing extreme rainfall events and massive cyclones (**Bandopadhyay 2025**).



(Image Source PTI Photo) (HT News Desk 2025)

Source: <https://www.hindustantimes.com/india-news/kolkata-sinks-amid-durga-puja-fervour-3-dead-as-overnight-rain-floods-waterlogging-kolkata-rains-news-101758605547309.html>

4. Mandi and Chamba Cloudbursts: The dual cloudbursts in Mandi and Chamba districts of Himachal Pradesh triggered the biggest flash floods of the state leaving 78 people dead and an estimated loss of about 572.69 crore. An estimated four panchayats of subdivision Churah were cut off from district headquarters. One motorable bridge and three footbridges were washed away. SDRF and NDRF carried out rescue operations as IAF provided aid to regions. Drones were also used to locate missing people. ITBP teams were also activated and 240 plus roads remained closed (**TNN 2025a**). According to a report published in The Hindu, 225 houses, 240 plus cattle sheds, about 14 bridges and more than 30 vehicles were damaged in the disaster in Karsong, Mandi (**PTI 2025a**). Hamirpur, Bilaspur, Mandi, Kangra, Sirmaur, Una, Shimla were all placed under orange alert. Governor of Himachal Pradesh, Shiv Pratap Shuka, blamed deforestation as the main culprit and called for measures to correct the situation. The governor also called for an inter departmental communication and consultation to better tackle the situation in future (**Dogra 2025**).



(PTI Photo)

Photograph shows aftermath of Mandi and the devastation in the region.

Source: https://www.business-standard.com/india-news/himachal-pradesh-7-districts-face-flash-flood-risk-225-roads-closed-125070800604_1.html

3. Conclusion

The incidents of incessant rains and climate change induced cloudbursts is not just a phenomenon of the Himalayan region. Gurugram has been facing continuous cases of flooding due to poorly managed drainage and climate change issues. North Chennai faced the same fate due to cloudburst on August 30th. The area saw a massive amount of precipitation on the given date and due to lack of interlinking of stormwater drains in the region the area suffered disruptions (**TNM Staff 2025**). Chief Minister of Madhya Pradesh, Mohan Yadav confirmed in his brief in July 30, 2025 that about 2900 people have been rescued from different districts of Madhya Pradesh as incessant rains caused flooding (**The Hindu Bureau 2025a**). 37 per cent of paddy in Punjab has been destroyed due to 2025 floods. According to Harchand Singh Barsat who is the chairman of Punjab State Agriculture Marketing Board, the state has suffered an estimated 20,000 crore loss (**V. Mishra 2025**). While choked waterways, poor maintenance of bandhs, deforestation, poor management of canals and drains are to be equally blamed but climate change is the biggest contributor to the erratic rainfall occurring in the state (**Goyal 2025**). Assam has been experiencing floods every year. Hyderabad also experienced incessant rains on Sept 28, 2025 that resulted in waterlogging and flooding of Musi river. The situation of erratic rain and induced floods are increasing along with cases of cloudbursts every year. There is strong need of not just measures to tackle climate change but to create a platform for Climate Change Communication. There is a need to communicate the problems of climate change in simple language that can be understood by the commoners. If the people in the Himalayan belt are made aware of the problems of topography, future hurdles can be removed which one experiences today. Tourism needs to be better managed without inducing factors that may make the area more vulnerable. Climate change communication would help people understand the risks of the climate, it will help them make informed choices. The local administration needs to work more closely with the

meteorological department thereby reducing risks of vulnerability. With the onset of strategic climate change communication the government can also help transmit Risk Communication strategies better. While it might be difficult to reverse the effects of climate change with immediate effect it might be helpful if we plan sustenance in a more strategic way. Climate Change Communication can be crucial in the light of increasing number of cloud burst cases and subsequent cases of flooding across the country.

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