

CENTRE FOR DISASTER MITIGATION AND MANAGEMENT (CDMM)

VELLORE INSTITUTE OF TECHNOLOGY (VIT), VELLORE



Director's Message

Centre for Disaster Mitigation and Management (CDMM) is functioning with a vision to create a disaster risk-free India, through the confluence of the cultures of preparedness, quick response, strategic thinking, and prevention. CDMM is carrying out its activities in line with the Prime Minister's ten-point agenda for disaster risk reduction. The thrust areas of the centre are landslides, earthquakes, floods, cyclones and climate change. Research, consultancy, capacity building and support for the government in dealing with natural disasters are the primary activities of the Centre. I am happy to share the latest newsletter of CDMM, highlighting our dedicated efforts towards a resilient and safer nation.

Vision:

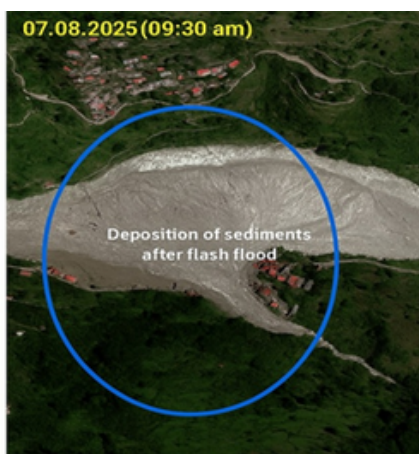
To create disaster risk-free India, through the confluence of the cultures of preparedness, quick response, strategic thinking, and prevention.

Mission:

Destination- Disaster Risk- Free India



Dr. Rama Mohan Rao P
Director, CDMM



Source: National Remote Sensing Centre (NRSC) and European Space Agency (ESA)

Sponsored Research Projects (Sanctioned /Approved)

- **Dr. Surendar M (PI)**, with **Dr. Kuvar Satya Singh** and **Dr. Priyadharshini B (Co-PIs)** from VIT Vellore received **₹48 lakhs** from the **Ministry of Earth Sciences, Government of India** for the project “Integrated Monitoring and Modeling of Snowpack Characteristics for Enhanced Avalanche Forecasting in Himachal Pradesh using Remote Sensing and WRF Model”.
- **Dr. Surendar M (Co-PI)** received **₹12 crore** in funding from the **Indian Council of Medical Research (ICMR)**, in collaboration with **SBST/SCORE, CMC, and other institutions** for the project “Climate change and Brain infections in India : A multi-centre, multidisciplinary collaborative study on the impact of Climate change on brain infections (CLIMB-INDIA)”.
- **Dr. Surendar M (PI)**, with **Dr S. S. Chandrasekaran** and **Dr Sudarshan Nandy (Co-PIs)**, received an approval of **₹23 lakhs** by the **DST under the Indo–Sri Lanka Bilateral Programme** for the project “Landslide Monitoring and Mapping Using a Multi-modal Approach with Geospatial, Geophysical, and Machine Learning Techniques”.
- **Dr. Kuvar Satya Singh (PI; VIT, India)** and **Dr. Swadhin Kumar Behera (PI; JAMSTEC, Japan)** received approximately **₹21 lakhs** in funding from the **Japan Science and Technology (JST) Agency** for the project “High-resolution WRF-AI integrated model for tropical cyclone intensity and precipitation forecasting in the Bay of Bengal”.
- **Dr. Surendar M (PI)** and **D. Divyesh Varade (Co-PI)**, IIT Jammu received an approval of **₹ 27.7 lakhs** from **ISRO - Space Application Centre (SAC)** for the project titled “Estimating snow properties and glacier ice thickness using NISAR data”.

Consultancy Projects (Sanctioned)

- **Dr. Prasanth S** executed the project titled “Optimizing the Mix Design and Laying of Bituminous Road Using Industrial Plastic Waste” for Daimler India Commercial Vehicles Pvt. Ltd., India. The study aimed to improve pavement performance while promoting sustainable waste utilization, and the project was completed with a budget of **₹1.68 Lakhs**.
- **Dr. G. P. Ganapathy** was involved in the preparation of a Detailed Project Report (DPR) for damage assessment due to fly ash deposition in the Kosasthalaiyar River Basin at the Ennore Backwater Complex, for the Department of Environment and Climate Change, Government of Tamil Nadu, India. The study focused on environmental impact assessment and remediation planning, with a sanctioned project budget of **₹1.51 crores**.

- **Dr. Prasanth S** conducted a condition assessment of reinforced concrete (RC) columns at the KPF Factory of Needle Industries India Pvt. Ltd., India. The assessment employed non-destructive testing techniques to evaluate structural integrity and safety, and the project was executed with a budget of **₹1.62 Lakhs**.

Patents Published

- **Dr. Prasanth S** and **Mr. Akarsh Aravind Kunwar**. “An Intelligent Air Quality Index (AQI) Monitoring System”.
- **Dr. Prasanth S** and **Mr. Vineet Tiwari**. “A solar-powered free-floating buoy system and a method for AI-based tsunami early warning”.

Research Papers Published

- **A. Ray, G. C. Atul, S. C. Sapkota, P. Saha, S. Das, R. Rai, and M. Khandelwal**, “Stability analysis and prediction of bimslope failures using numerical modelling and hybrid meta-heuristic models,” *Natural Hazards*, vol. 121, pp. 8995–9020, 2025, doi: 10.1007/s11069-025-07164-9.
- **S. Sowmya and R. M. R. Pannem**, “Integrating bacteria and fibres for self-healing concrete: A comprehensive review of synergistic effects,” *Results in Engineering*, vol. 28, 2025, doi: 10.1016/j.rineng.2025.107071.
- **M. S. Reshma and K. S. Singh**, “An evaluation of cloud microphysical parameterization schemes at 1.667 km resolution in the simulation of super cyclone Amphan and extremely severe cyclonic storm Phailin,” *Geomatics, Natural Hazards and Risk*, vol. 16, no. 1, 2025, doi: 10.1080/19475705.2025.2475905.
- **Bashaveni and R. M. R. Pannem**, “Prediction of self-healing ability and compressive strength of bacterial-based self-healing concrete using direct method of ultrasonic pulse velocity test,” *Nondestructive Testing and Evaluation*, 2025, doi: 10.1080/10589759.2025.2482862.
- **N. Nath, V. B. Zaalishvili, and G. P. Ganapathy**, “Social vulnerability and spatial adaptation: A case study of community responses to natural disasters in Silchar, Assam State, India,” *Geologiya i Geofizika Yuga Rossii*, vol. 15, no. 2, pp. 128–141, 2025, doi: 10.46698/vnc.2025.67.58.001.
- **K. Gayathridevi and A. Ray**, “Influence of block shape and size distribution on bimslope stability: A numerical investigation of static and seismic behavior,” *International Journal of Geo-Engineering*, vol. 16, no. 1, 2025, doi: 10.1186/s40703-025-00248-2.
- **S. K. Sekar, R. Ranjith, and S. Prasanth**, “Sustainable concrete matrix using ceramic electrical insulator waste as binder and filler under elevated temperature,” *World Journal of Engineering*, 2025, doi: 10.1108/WJE-06-2025-0428.
- **S. Subramanian and G. P. Ganapathy**, “An analysis of the hidden vulnerabilities: The role of construction quality in seismic risk mitigation in low-to-moderate seismicity regions,” *Results in Engineering*, vol. 28, 2025, doi: 10.1016/j.rineng.2025.108116
- **V. C. Doddamani, P. Rakaraddi, A. Ray, R. Rai, and M. Khandelwal**, “Geotechnical challenges in slope stability: Experimental investigation of coconut fiber reinforcement under seismic loading,” *Iranian Journal of Science and Technology, Transactions of Civil Engineering*, 2025, doi: 10.1007/s40996-025-01759-9.
- **N. Amritha and S. Prasanth**, “Seismic performances of reinforced concrete buildings with openings in unreinforced masonry infill walls: A soil–foundation–structure modelling approach,” *Frontiers in Built Environment*, vol. 11, 2025, doi: 10.3389/fbuil.2025.1667289.

- **S. Subramanian and G. P. Ganapathy**, “Approach for estimation of seismic damage potential to vital community facilities for emergency planning,” *Spatial Information Research*, vol. 33, no. 5, 2025, doi: 10.1007/s41324-025-00641-0.
- **S. K. Sekar, R. Ranjith, and S. Prasanth**, “Torsion behaviour of reinforced standard strength concrete beams using ceramic waste powder,” *Structural Concrete*, 2025, doi: 10.1002/suco.70426.
- **S. Mahalingam, B. Priyadharshini, A. Asutosh, and M. Mishra**, “Assessment of PM2.5 deposition in the human respiratory tract from a hyperlocal dataset in Bhubaneswar, India,” *Air Quality, Atmosphere and Health*, 2025, doi: 10.1007/s11869-025-01743-2.
- **K. Gayathridevi and A. Ray**, “A detailed review of the geomechanical and geohydrological behaviours of block in-matrix geological formations at laboratory and virtual scales,” *Progress in Engineering Science*, vol. 2, no. 3, 2025, doi: 10.1016/j.pes.2025.100127.
- **S. N. Chellamuthu and G. P. Ganapathy**, “Evaluation of ground conditions and vehicle-induced vibration using spatio-geophysical approach for the Nilgiris landslide transportation interaction corridor, Western Ghats, India,” *Geomatics, Natural Hazards and Risk*, vol. 16, no. 1, 2025, doi: 10.1080/19475705.2025.2532046.
- **S. S. Chandrasekaran, R. Kesavaram, S. Manickam, G. P. Ganapathy, A. Ray, P. Nivethitha, and A. Thamizhmaran**, “Failure mechanism of the rainfall-induced landslide in December 2024 in Tiruvannamalai, India: Insights from the field, geotechnical, and remote sensing observations,” *Landslides*, 2025, doi: 10.1007/s10346-025-02585-w.
- **S. Gupta, B. Priyadharshini, D. Haldar, S. Bag, I. Zaidi, and S. Goel**, “The intersection of climate change and cancer across global populations: A bibliometric analysis (2000–2024),” *Cancer Epidemiology*, vol. 99, Art. no. 102926, 2025, doi: 10.1016/j.canep.2025.102926.
- **R. Ashok and K. S. Singh**, “Impact of improved initial condition in a medium range forecast of super cyclonic storm Kyarr over Arabian Sea using high resolution WRF and its data assimilation technique,” *Theoretical and Applied Climatology*, vol. 156, p. 653, 2025, doi: 10.1007/s00704-025-05871-8.
- **K. Chanchal and K. S. Singh**, “Evaluating the role of microphysical schemes at a cloud-resolving scale on simulation of heavy rainfall events near the coastal region of southern India,” *Modeling Earth Systems and Environment*, vol. 11, no. 6, p. 444, 2025, doi: 10.1007/s40808-025-02595-6.
- **K. Thatiparthi, S. Bonthu, P. K. Bhaskaran, and K. S. Singh**, “Assessment of vulnerable villages in the landfall regions of intense cyclonic storms along the east coast of India using an integrated storm surge modelling system: A case study for Cyclone Phailin,” *Ocean Dynamics*, vol. 75, no. 12, p. 105, 2025, doi: 10.1007/s10236-025-01753-9.
- **A. Thankachan and K. S. Singh**, “Role of background error statistics in the prediction of severe cyclonic storm over the Bay of Bengal using the WRF-3DVAR data assimilation system,” *Advances in Space Research*, 2025, doi:https://doi.org/10.1016/j.asr.2025.07.095
- **K. Thatiparthi and K. S. Singh**, “Evaluating the impact of satellite radiance observations on the simulation of intense tropical cyclones over the Bay of Bengal on a convective-permitting scale using a data assimilation technique,” *Modeling Earth Systems and Environment*, vol. 11, no. 5, pp. 1–25, 2025, doi: 10.1007/s40808-025-02506-9.

Conference Paper

- **V. S. Gargi and S. Manickam**, “Assessment of Sentinel-1 satellite imagery for soybean and potato crop classification for Dharwad during Kharif crop cycles,” in *Proc. 2025 IEEE Int. Conf. on Next-Gen Technologies of Artificial Intelligence and Geoscience Remote Sensing (EarthSense)*, Hyderabad, India, 2025, pp. 1–4, doi: 10.1109/EarthSense66084.2025.11297348.

Events Organized

Workshops

Dr. Arunava Ray and **Dr. Prasanth S** organized a one-day workshop on “Challenges in Strengthening of Reinforced Concrete Structures” on 12 September 2025 at the Centre for Disaster Mitigation and Management (CDMM), Vellore Institute of Technology (VIT), Vellore, in association with the **Indian Society of Earthquake Technology (ISET)**, VIT Vellore Chapter, and the **Indian Geotechnical Society (IGS)**, Vellore Chapter.



Dr. Kuvar Satya Singh and **Dr. Surendar M** organized a two-day workshop on “Technologies for Disaster Risk Reduction in India” sponsored by **ANRF**, at the Centre for Disaster Mitigation and Management (CDMM), Vellore Institute of Technology (VIT), Vellore, on 13 - 14 October 2025. The event ensured participation of 25 faculties and research scholars in and around VIT.





Adjunct Professor Visit

Dr. Iftekhar Ahmed, Adjunct Professor, visited the campus from 30 November 2025 to 22 December 2025 as part of ongoing academic collaboration. He currently serves as Associate Professor and Program Convenor – Disaster Risk and Resilience at the School of Architecture and Built Environment, **College of Engineering, Science and Environment, The University of Newcastle, Australia**. During his visit, Dr. Ahmed handled classes for the NDMM programme, delivered special lectures on disaster risk and resilience, and actively engaged in academic discussions with faculty members and research scholars.

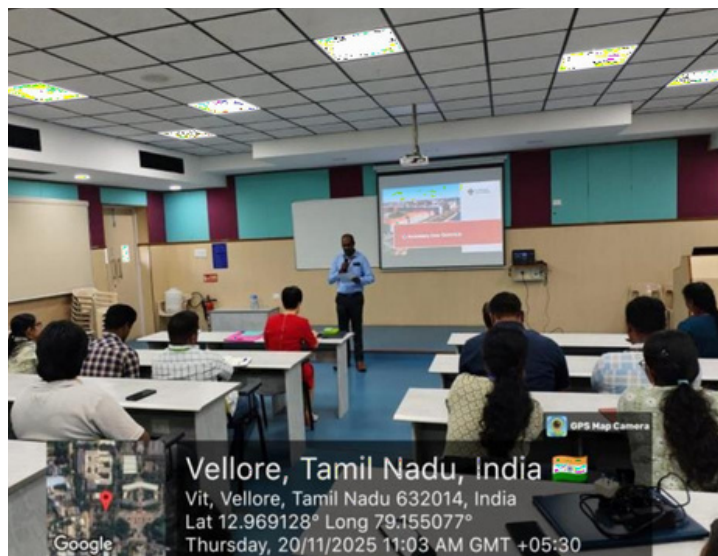


A Guest Lecture on “Urbanization and Urban Disaster Resilience” was delivered by Dr. Iftekhar Ahmed, Associate Professor, University of Newcastle, Australia, on 10 December 2025.



International Guest Lecture

A Guest Lecture on “**Climate Risk Management in the Central Asian Region**” was delivered by **Dr. Nataliia A. Simchenko**, Professor and Head, Department of Economic Theory and Economic Policy, Saint Petersburg State University, Russian Federation, on 20 November 2025.



Fire Mock Drills

Dr. G. P. Ganapathy conducted a Fire Safety Sensitization and Hands-on Exercise session for M.Sc. Chemistry students on 13 September 2025, emphasizing practical emergency response and fire safety preparedness. He led a Fire Mock Drill Hands-on Exercise during the two-day workshop on “Technologies for Disaster Risk Reduction in India,” held on 13 - 14 October 2025. Additionally, he delivered a Live Demonstration of Fire Extinguishers as a Guest Lecturer during the three-day workshop on “Simulation and Control of Power System Networks and EVs,” organized by the Department of Electrical Engineering, SELECT, Vellore Institute of Technology, on 17 July 2025.



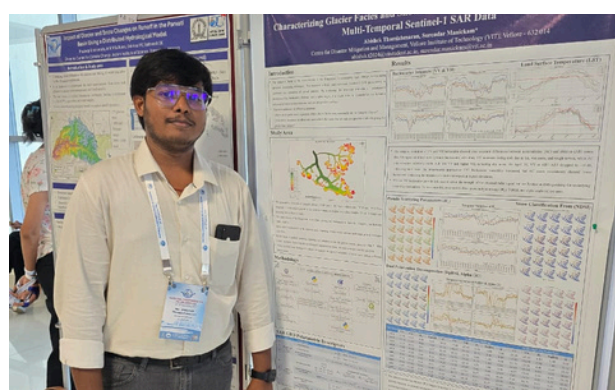
Guest Lectures Delivered

- **Dr. Rama Mohan Rao P** (2025), Non Destructive Testing Techniques , Department of Civil Engineering Velalar college of Engineering &Technology, Thindal, Erode, 8 August 2025.
- **Dr. Surendar M** (2025), Remote Sensing of Cryosphere, Special Lecture Series (Online), Department of Geography, School of Earth Sciences, Central University of Tamil Nadu, Thiruvavur, Tamil Nadu, 15 October 2025.

- **Dr. G. P. Ganapathy** (2025), Handling Emergencies, Fire Mock Drill - Hands-on Exercise during the two-day workshop on “Technologies for Disaster Risk Reduction in India,” on 13 - 14 October 2025.
- **Dr. G. P. Ganapathy** (2025), Use of Technologies for Quick Response to Disasters, Short-Term Training Programme / FDP on “Capacity Building for Disaster Risk Reduction, Jointly Organised by NIDM Government of India and MMTC, Assam University, Silchar, Assam, 12 November 2025 - Online.
- **Dr. Kuvar Satya Singh** (2025), Mathematical Modelling on extreme events using numerical weather prediction model at Department of Mathematics, School of Mathematics Statistics and Computer Science, on 24 November 2025.

Conferences, Workshops, Training Programmes Attended

- **Dr. Kuvar Satya Singh** attended IMS-2025 organized by Department of Mathematics and Astronomy on 26 - 29 December 2025 at University of Lucknow, presented the paper titled “Role of data assimilation on numerical simulation of tropical cyclone induced rainfall.”
- **Dr. Arunava Ray** attended IGC-2025 and presented the paper “Long-term deformation behaviour of sheet pile under sustained loading in hilly terrain” at NIT Jalandhar held on 18 - 20 December 2025.
- **Dr. Priyadharshini. B** attended Clean Air Summit (ICAS) 2025, With the theme ‘Towards Clean Air for All: Modelling the Solutions to Pollution’, held on 20 - 22 August 2025 at Bengaluru organized by CSTEP.
- **Dr. Surendar M** participated in NCPS-2025, presenting the paper titled “Advanced Snow Condition Assessment in the Indian Western Himalayas Using OSCAT Time-Series Data,” held in Goa from 16 - 18 September 2025.
- **Dr. Rama Mohan Rao Pannem** attended 8th International conference on Recent advances in composite materials organised by Indian Institute of Technology and presented the paper titled “ Experimental investigation on the Effect of metakaolin and GGBS on bacteria based self healing concrete containing fly ash aggregates” held in Varanasi (BHU) from 2 - 4 December 2025.
- **Vinayaka S Gargi** participated in the 2025 IEEE International Conference on Next-Gen Technologies of Artificial Intelligence and Geoscience Remote Sensing (EarthSense), presenting the paper titled “Assessment of Sentinel-1 Satellite Imagery for Soybean and Potato Crop Classification for Dharwad, During Kharif Crop Cycles,” held in Hyderabad from 17 - 18 September 2025.
- **Abishek T** participated in NCPS-2025, presenting the paper titled “Characterizing Glacier Facies and Snow Conditions of Gangotri Glacier using Multi-Temporal Sentinel-1 SAR Data,” held in Goa from 16 - 18 September 2025.





- **Abishek T** attended the 3-week Capacity Building Program in Glaciology, held from 16 July - 5 August 2025, which was organised by the Centre of Excellence for Glacial Studies in the Western Himalaya, University of Kashmir, Srinagar, with support from the Department of Science and Technology (DST), Government of India.
- **Ambily Thankachan** presented the research titled “Impact of 3DVAR Data Assimilation for the Prediction of Severe Cyclonic Storms in the Bay of Bengal Region” in the HS32-A020 session at the 22nd Annual Meeting of the Asia Oceania Geosciences Society (AOGS 2025), held in Singapore from 27 July - 1 August 2025.
- **Ambily Thankachan** presented a research paper entitled “Role of 3D-VAR data assimilation technique in improving forecast of severe cyclonic storms over the Bay of Bengal region” at the International Conference on Sustainable Technologies for Energy, Environment, and Health (IC-STEELH), conducted from 17 - 19 September 2025 at VIT-Vellore, India.
- **Rohini Ashok** presented a paper titled “Numerical simulation of the simultaneous occurrence cyclones Luban and Titli over the North Indian Ocean using high-resolution modeling system” at the 22nd Annual Meeting of the Asia Oceania Geosciences Society (AOGS 2025) held from 27 July - 01 August 2025, at Sands Expo & Convention Centre, Marina Bay Sands Singapore.
- **Rohini Ashok** presented a paper titled “Sensitivity Analysis of PBL Schemes for ESCS Tauktae over the Arabian Sea using the Weather Research and Forecasting Model” at International Conference on Sustainable Technologies for Energy, Environment and Health (IC-STEELH), Vellore Institute of Technology (VIT), Vellore, Tamil Nadu held on 17 - 19 September 2025.
- **Reshma M S** presented research titled “Influence of Sea Surface Temperature in the Simulation of Super Cyclonic Storm Amphan on a Cloud-resolving Scale” at the 22nd Annual Meeting of the Asia Oceania Geosciences Society (AOGS2025) held in Singapore from 27 July - 1 August 2025.
- **Reshma M S** presented a research paper entitled “Impact of SST on simulation of Bay of Bengal tropical cyclones at high resolution WRF modeling system in a changing climate” at the International Conference on Sustainable Technologies for Energy, Environment, and Health (IC-STEELH), conducted from 17 - 19 September 2025 at VIT - Vellore, India.
- **Sowmya S** presented a research paper titled "Influence of Polypropylene fiber on the mechanical, durability and microstructural properties of concrete using XRD-Analysis” at the 3rd International Conference on Construction Materials and Structures Synergy of Materials and Structures (ICCMS - 2025) conducted from 3 - 5 July 2025 at IIT - Tirupathi.
- **Sabari Nathan C** presented a research paper titled “Spatio-Geophysical Evaluation of Ground Conditions and Vehicle Induced Vibrations in the Nilgiris Landslide Transportation Interaction Corridor” at the 9th National Geo-Research Scholars Meet conducted from 12 - 14 November 2025 at Wadia Institute of Himalayan Geology, Dehradun.
- **Asmitha N R** completed a one-week GIAN course on “Characterization and Modeling of Cementitious Materials” conducted from 10 - 14 November 2025 organized by the Department of Civil and Infrastructure Engineering, Indian Institute of Technology Dharwad.

Awards and Recognition

- **Dr. Rama Mohan Rao**, Professor, was invited as a **Jury Member for the IEEE - sponsored 24 - Hour Non - Stop National Level Students' Technical Hackathon "VCET HackElite 2K25"**, organized by Velalar College of Engineering and Technology (Autonomous), Erode held on 08 & 09 August 2025.

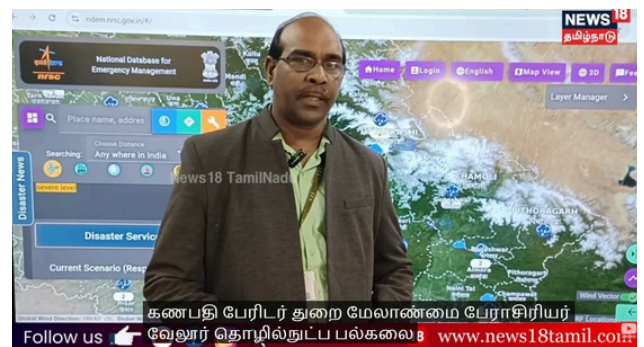


- **Dr. G. P. Ganapathy**, Professor (HAG) received the **Independence Day Award from the Department of Revenue and Disaster Management, Government of Tamil Nadu** for support to the District Disaster Management Authority, Vellore.
- **Dr. G. P. Ganapathy**, Professor (HAG) was nominated as a **Member of the Heat Wave Action Plan Core Committee, DDMA, Vellore District**; elected as **Vice-Chairman, Indian Society of Geomatics (ISG), Chennai Chapter (2025–2028)**; and served as **Chief Guest for Builders' Day** organized by the **Builders' Association of Vellore**.
- **Dr. Kuvar Satya Singh** received **Travel support from Anusandhan National Research Foundation to attend American Geophysical Union Annual Meeting 2025, USA (15 - 19 December 2025)**.

News Papers/Review

What Causes Sudden Flash Floods? – Disaster Management Expert Explains | Uttarakhand, - Dr. G. P. Ganapathy discusses on flashfloods of Himalayan village Dharali in Uttarkashi District, 6 August 2025.

Link: <https://www.youtube.com/watch?v=8xOWVQzMq8I>



Thunder and Lightning: Do's & Don'ts

Do's

- Find Low Ground: Seek shelter in a low-lying area.
- Keep monitoring local media for live updates and warning.
- Postpone outdoor activities and stay indoors.
- Protect Livestock: Move animals into a closed shelter
- Unplug: Disconnect appliances, ACs, and electronics before the storm arrives .
- Stay away from windows and doors.

Don'ts

- Seek Shelter Under Trees: Trees conduct electricity .
- Touch Metal: Stay away from fences, utility lines, flag masts, and TV masts.
- Ride Vehicles: Get off bicycles, motorcycles, or open vehicles .
- Stay in Water: If swimming or boating, get to safe land immediately.
- Lean on Walls: Do not lean against concrete walls or lie on concrete floors.

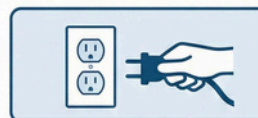
(@ NIDM)

LIGHTNING SAFETY GUIDELINES

RECOMMENDED ACTIONS



Seek Enclosed Shelter:
Seek sturdy, enclosed building or hard-topped vehicle.



Monitor & Unplug
Disconnect all electronics to prevent surge damage.



Secure Livestock:
Move animals to safe, enclosed shelters.



Stay Low:
Maintain a low profile, away from windows and doors.

AVOID DANGER



No Outdoors/Under Trees
Avoid open fields and standing under tall objects.



No Water Activities
Immediately exit pools, lakes, and avoid boating.



No Corded Electronics/Metal
Do not use corded devices or touch metal structures.



No Open Vehicles
Avoid open-top vehicles and motorcycles.

Professional Safety Information.

Editorial Board

Dr. Rama Mohan Rao (Professor)
Dr. Surendar M (Associate Professor)
Mr. Abishek T (Research Scholar)
Ms. Artha M A (Research Scholar)

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