

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 527**  
TO BE ANSWERED ON 24.07.2025

**Glacier and glacial lake preservation measures**

527. SMT. SANGEETA YADAV:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether Government has taken strategic actions to monitor glaciers and glacial lakes across the country and the Indian Himalayan Region in particular;
- (b) if so, the details thereof;
- (c) whether any SOP has been prepared to address the Glacial Lake Outburst Flood (GLOF) like event in co-ordination with other Ministries like Ministry of Home Affairs, Department of Science and Technology and Ministry of Jal Shakti;
- (d) if so, the details thereof, if not, the reasons therefor; and
- (e) the details of steps taken in case of such GLOF events in the last five years?

**ANSWER**

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

(SHRI KIRTI VARDHAN SINGH)

(a) & (b) The Government, through various Ministries, Departments and Institutes, has taken strategic and systematic actions to monitor glaciers and glacial lakes in the Indian Himalayan Region (IHR).

The Ministry of Jal Shakti (MoJS) has constituted a Steering Committee on 'Monitoring of Glacier' under the Chairmanship of Secretary, Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR), to monitor and coordinate the work carried out by various ministries and organizations on the Himalayan glaciers.

The Central Water Commission (CWC) under Ministry of Jal Shakti (MoJS) is the nodal agency for monitoring glacial lakes and water bodies in India. The CWC presently monitors 902 Glacial Lakes and Water Bodies (GL&WBs) of size greater than 10 Ha included from Glacial Lake Inventory 2011 prepared by National Remote Sensing Centre (NRSC), in the Himalayan Region of Indian River Basins, for the period June to October every year, using remote sensing techniques.

The National Disaster Management Authority (NDMA), under the Ministry of Home Affairs (MHA) has also taken strategic and systematic actions to monitor glaciers and glacial lakes, under the National Glacial Lake Outburst Flood (GLOF) Risk Mitigation Programme (NGRMP), implemented in four Himalayan States, namely, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh. Key initiatives under the NGRMP include identification of

195 high-risk glacial lakes and conducting field expeditions to the high-risk lakes using bathymetric surveys and other mapping techniques. Early Warning Systems (EWS) and Automatic Weather Stations (AWS) have also been installed under NGRMP at key locations including South Lhonak and Shako Chu lakes in Sikkim, to ensure real-time monitoring. Further, NDMA has constituted the Committee on Disaster Risk Reduction (CoDRR) and Technical Advisory Committee (TAC) to guide and monitor its implementation in coordination with various expert institutions.

The Wadia Institute of Himalayan Geology (WIHG), under the Department of Science and Technology (DST), actively monitors glaciers through field-based observations across the Central Himalaya, Western Himalaya, and Karakoram regions. Currently, WIHG monitors thirteen glaciers, seven in the Central Himalaya and six in the Western Himalaya and Karakoram. Furthermore, WIHG has also conducted comprehensive surveys of several glaciers across Ladakh, the Karakoram, Uttarakhand, Himachal Pradesh, and the Eastern Himalaya using satellite imagery. These surveys aim to assess glacier recession patterns and estimate mass balance changes over time.

The Geological Survey of India (GSI), under the Ministry of Mines, is also involved in monitoring and measuring glacier recession or advance and conducting mass balance observations of selected glaciers, particularly in the Indian Himalayan Region. GSI has conducted mass balance studies on nine glaciers and secular movement studies on 104 glaciers to analyze their patterns of recession and advance. GSI is also engaged in monitoring and evaluation of glacial lakes for Glacial Lake Outburst Floods (GLOFs) susceptibility in different parts of the Himalayan Region.

The G.B. Pant National Institute of Himalayan Environment (GBPNIHE), an autonomous institute of the Ministry of Environment, Forest & Climate Change (MoEFCC), is also involved in glacier studies in the Himalayan region through field measurements and remote sensing approach.

The Ministry of Earth Sciences (MoES) through its autonomous institute, the National Centre for Polar and Ocean Research (NCPOR) monitors six glaciers in the Chandra basin (2437 km<sup>2</sup> area) in Western Himalaya. A state-of-the-art field research station 'Himansh' established in Chandra basin is operational since 2016 for conducting field experiment and expeditions to glaciers. NCPOR also monitors and carries out scientific research on two pro-glacial lakes in the Chandra Basin (Gepang Gath and Samundra Tapu). Additionally, NCPOR, in collaboration with the Centre for Earth Sciences & Himalayan Studies (CESHS) in Itanagar, has initiated a glaciological monitoring programme in the Kameng Basin, Arunachal Pradesh.

(c) to (e) A Standard Operating Procedure (SOP) has been prepared as part of the National Disaster Management Authority (NDMA) Guidelines for the Management of Glacial Lake Outburst Floods (GLOFs). This SOP, which was developed in coordination with key central ministries, including Ministry of Home Affairs (MHA), Department of Science and Technology (DST) and Ministry of Jal Shakti (MoJS), outlines a comprehensive and phased response mechanism to GLOF events, covering pre-disaster preparedness, real-time emergency response, and post-disaster recovery. This coordinated approach ensures an integrated multi-sectoral response, leveraging scientific knowledge and operational capabilities for effective GLOF risk management.

As per information provided by NDMA, in the last five years, several steps have been taken in response to GLOF events, like immediate technical response, post-event assessments, urgent repair of EWS infrastructure, risk assessments and downstream hazard modelling, mitigation pilot projects, etc. State-led interventions, including installation of AWS/ EWS, bathymetric surveys, establishment of community evacuation protocols, formation of risk-specific lake categories and prioritized funding for mitigation and monitoring have also been undertaken.

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