December, 2025

To,
The Additional Chief Executive Officer (Admin.)
Uttarakhand State Disaster Management Authority,
IT Park Sahastradhra Road

Subject: Reference to letter No. 493/USDMA-2024 dated 7th June 2024 and email dated 04.11.2024.

Dear Sir,

With reference to the above-mentioned letter regarding the submission of the monthly progress report for the project **"Long-term Monitoring of the Gangotri Glacier, Garhwal Himalaya"**, sponsored by the **Uttarakhand State Disaster Management Authority (USDMA)** and undertaken by the **Wadia Institute of Himalayan Geology (WIHG)** since March 2022, the project emphasizes systematic study mapping and monitoring of the Gangotri Glacier and its associated glacial lakes, collection of meteorological and hydrological data, assessment of glacier-related hazards, and timely dissemination of risk-related information to USDMA. In this regard, it is informed that during October–November 2023, a monitoring network consisting of **two Automatic Weather Stations (AWS), one Automatic Water Level Recorder (AWLR), and two broadband seismic stations** was successfully installed within the basin.

In December 2025, two watch and ward officials undertook a visit to the Gangotri Glacier region to ensure the smooth functioning of scientific instruments installed at all the monitoring sites. Their inspection covered Bhojwasa, Chirwasa, and Maneri, where they carefully checked the operational status of equipment used for monitoring. The visit was part of routine monitoring efforts aimed at maintaining the data collection, ensuring that the instruments remained reliable despite the harsh winter conditions.

Figure 1. View of the observatories and the base camp during December. The region appears free of snow, and the water sources along the track from Gangotri to Bhojwasa were frozen.

Further, the field observations revealed that no major snowfall event was recorded at Bhojwasa during December, a finding further confirmed by satellite observations. For this, Sentinel-2 and Landsat scenes were utilized to detect and validate the snow cover conditions, ensuring consistency between ground-based measurements and remote sensing data. **The snow cover distribution across the Gangotri Glacier region showed a stable pattern, with 45 % recorded on 6 December, 43 % on 11 December, and 43 % again on 16 December.** Snow Cover Area (SCA) calculations (in percent) were carried out for the basin area up to Bhojwasa.

This stability reflects the absence of fresh snowfall after the last event in November, with only minor reductions in snow cover attributed to compaction, sublimation, or localized melting **(Figure 2)**. Field photographs **(29th December, 2025)** also highlighted snow-free region around Bhojwasa, and the accompanying figure indicates low temperatures during December, evidenced by frozen water sources, underscoring the role of cold conditions in preserving the November snowfall as the primary source of snow cover throughout the month.

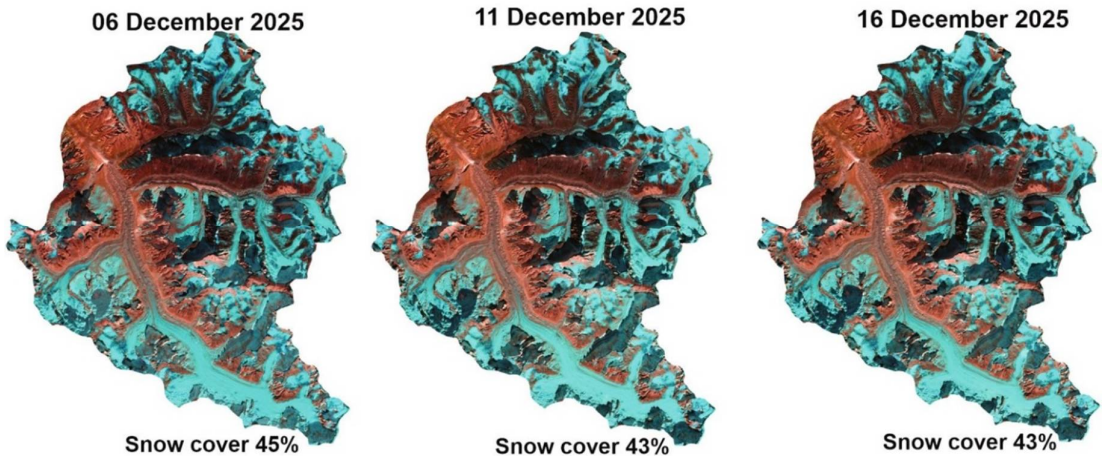

Figure 2. Distribution of snow cover conditions in Bhojwasa during December, derived from Sentinel-2 and Landsat imagery.

The instruments installed at Bhojwasa, Chirwasa, and Maneri were verified to be functioning properly during the site visit. Available satellite data and field observations were jointly examined to identify any major events such as debris flows or the formation of new glacial lakes. Both field-based assessments and remote sensing analyses confirmed the absence of debris flows, major glacial lake development, or significant geomorphic disturbances in the vicinity of the Gangotri Glacier. In addition, snow cover distribution remained stable throughout December; this stability reflects the absence of fresh snowfall during the month, as the last recorded event occurred in November. The persistence of the November snowpack, supported by low temperatures and frozen water sources.

Thank you for your attention to this matter.

Amit Kumar

Dr. Amit Kumar
Scientist C
Wadia Institute of Himalayan Geology, Dehradun