

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE**

LOK SABHA

UNSTARRED QUESTION NO. 1808

TO BE ANSWERED ON WEDNESDAY, JULY 29, 2026

SPACE TECHNOLOGY FOR DISASTER MANAGEMENT IN LADAKH

1808. SHRI MOHMAD HANEEFA:

Will the PRIME MINISTER be pleased to state:

- (a) whether Indian Space Research Organization (ISRO) is using satellite and geospatial technologies to monitor glaciers, glacial lakes, snowfall, water resources, landslides, avalanches and other natural hazards in Ladakh and if so, the details thereof;**
- (b) the details of satellite-based projects undertaken in Ladakh during the last five years for disaster management, glacier monitoring, agriculture, water resource planning and climate resilience;**
- (c) whether the Government proposes to strengthen satellite-based early warning systems for Glacial Lake Outburst Floods (GLOFs), avalanches, flash floods and landslides in Ladakh;**
- (d) whether satellite data and decision-support tools are being regularly shared with the UT Administration for disaster preparedness and developmental planning; and**
- (e) the steps taken to expand the use of space technology for sustainable development and disaster risk reduction in Ladakh?**

ANSWER

**MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC
GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE**

(DR. JITENDRA SINGH):

(a) Government of India is using satellite and geospatial technologies to monitor glaciers, glacial lakes, snowfall, water resources and landslides in Ladakh. Details of the activities are given below:

- Glacier inventory: A database of more than 2,000 glaciers in Ladakh has been generated using 2020-23 satellite data. Changes in the extent of more than 1,000 glaciers for over two decades were mapped.**
- Glacial lakes: An inventory of 3219 glacial lakes of area greater than 0.25 hectares has been generated for Ladakh as part of National Hydrology Project of Ministry of Jal Shakti. Glacial Lake Outburst Floods (GLOF) risk modelling have been done for high-risk lakes, including Katkar and Suru in Ladakh.**
- Snow-cover mapping: Daily satellite-derived snow-cover mapping over the Indian Himalaya, including Ladakh, has been carried out from 2019 till September 2025.**
- Wetlands: Mapped 4,912 wetlands in Ladakh in collaboration with the University of Jammu.**
- Waterbodies: About 41 waterbodies larger than 5.0 hectares surface area are being monitored and updated using satellite data and the information is provided**

under the Bhuvan Waterbody Information System since 2012.

- **Landslides: ISRO is using satellite data to periodically update the landslide inventory in Ladakh.**

(b) Satellite-based projects undertaken in Ladakh during the last five years include:

- **Cryosphere Science and Applications Programme (CAP):** an ongoing ISRO project to monitor snow and glaciers of the Himalaya-Karakoram region, including Ladakh, in collaboration with State agencies, academia and institutes.
- **Ladakh Specific Modelling and Space Applications (LAMA):** ISRO/DoS is executing a project for Ladakh UT encompassing - development of space inputs-based weather forecasting model, heavy rainfall alerts and hydrological simulations for estimating snow melt, glacial melt runoff and river discharge.
- **Satellite Integrated Landslide Assessment and Alert System (SILAAS) project (under ISRO-DMSP):** undertaken since 2023 to map landslides using satellite data in Ladakh; and for generation of village-wise landslide alerts.
- **National Hydrology Project (2017-2025):** Sponsored by the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, covering glacial lakes mapping, GLOF risk assessment, snow-cover monitoring, evapotranspiration and hydrological drought assessment.

- **Geo-Ladakh: ‘Spatial Data Infrastructure (SDI) Geoportal with Allied Database Development for UT-Ladakh’ project has been carried out by ISRO towards development of ‘Geo-Ladakh’ geoportal and generation of geospatial database of natural resources, energy, infrastructure and administrative boundaries along with capacity building.**
- (c) ISRO/DOS is engaged in advanced R&D activities to strengthen space input-based early warning system for GLOF, extreme weather events, as well as landslides; the outcome from which would be beneficial for Ladakh also.**
- (d) ISRO/DoS provides space-based information on floods, GLOF events and forest fires to the Ladakh UT during the response phase of major disasters. Under the Space-based Information Support for Decentralised Planning (SISDP), ISRO/DoS has mapped Land Use/Land Cover, Drainage, Settlements, Slope, and Rail & Road infrastructure at a 1:10,000 scale and hosted on the Bhuvan-Panchayat portal for developmental planning.**
- (e) As part of capacity building towards expanding the use of space technology for sustainable development and disaster risk reduction, ISRO/DoS has been periodically conducting training programs, wherein participants from Ladakh have also benefitted.**
