

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. -1058
TO BE ANSWERED ON WEDNESDAY, 8TH FEBRUARY, 2023**

MONITORING OF HIMALAYAN GLACIERS

†1058. DR. RAMESH POKHRIYAL "NISHANK":

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the monitoring of Himalayan Glaciers is carried out regularly by the Government;
- (b) if so, the present status thereof;
- (c) the steps taken by the Government to promote conservation and to carry out research thereon during the last five years; and
- (d) the number of institutes/universities pursuing research on glaciers?

**ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)**

- (a) Yes Sir.
- (b) Several Indian institutes/universities/organizations funded by the Government of India through Ministry of Earth Sciences (MoES), Department of Science & Technology (DST), Ministry of Environment Forest and Climate Change (MoEFCC), Ministry of Mines (MoM) and Ministry of Jal Shakti (MoJS) monitor Himalayan glaciers for various scientific studies including glacier melting and have reported accelerated heterogeneous mass loss in Himalayan glaciers. The mean retreat rate of Hindu Kush Himalayan glaciers is 14.9 ± 15.1 meter/annum (m/a); which varies from 12.7 ± 13.2 m/a in Indus, 15.5 ± 14.4 m/a in Ganga and 20.2 ± 19.7 m/a in Brahmaputra river basins. However, glaciers in the Karakoram region have shown comparatively minor length change (-1.37 ± 22.8 m/a), indicating the stable conditions.

Ministry of Earth Sciences (MoES) through its autonomous institute, the National Centre for Polar and Ocean Research (NCPOR) has been monitoring six glaciers in the Chandra basin (2437 km² area) in western Himalaya since 2013. A state-of-the-art field research station 'Himansh' established in Chandra basin and operational since 2016 for conducting field experiment and expeditions to glaciers. The glacier inventory prepared by NCPOR for the Chandra basin shows that it has lost about 6% of its glacial area during last 20 years and 2.4 meter water equivalent (m w.e.) to 9 m w.e. ice mass during 2013-2021. The glaciers in Bhaga basin lost huge ice mass in the range 6 m w.e. to 9 m.w.e. during 2008-2021. Annual rate of retreat of Chandra basin glaciers vary from 13 to 33 meter/year during last decade.

Geological Survey of India (GSI) has conducted mass balance studies on nine glaciers and carried out secular movement studies on 81 glaciers to assess the recessional and advancement pattern of the glacier. Majority of Himalayan glaciers are observed melting/retreating at varying rates in different regions.

The mass balance studies conducted for some Himalayan glaciers by University of Kashmir, Sikkim University and Indian Institute of Science, under the projects funded by Department of Science and Technology (DST) revealed that majority of Himalayan glaciers are melting or retreating at varying rates.

Wadia Institute of Himalayan Geology (WIHG) has been monitoring three glaciers in Central Himalaya and three glaciers in Western Himalaya. The results reveal that the Dokriani Glacier in the Bhagirathi basin is retreating at 15-20 m/a since 1995, whereas Chorabari Glacier in the Mandakini basin is retreating at 9-11 m/a during 2003-2017. Durung-Drung and Pensilungpa glaciers in Suru basin, Ladakh, are retreating at 12 m/a and ~ 5.6 m/a, respectively.

National Institute of Hydrology (NIH) has been monitoring the hydrological and hydro – meteorological data at Bhojwasa downstream of Gaumukh. The volume of flow recorded during these years does not show much variation. NIH is also monitoring two glaciers namely Phuche and Khadung in Ladakh Himalayas since 2010.

- (c) Ministry of Earth Science (MoES) through NCPOR has been monitoring glaciers during last five years to address various scientific questions. Department of Science and Technology (DST) has supported various research & development projects for studying Himalayan Glaciers under the National Mission for Sustaining Himalayan Ecosystem (NMSHE) and National Mission on Strategic Knowledge for Climate Change (NMSKCC). Under NMSKCC, 3 Centres of Excellence (CoEs) are established one each in J&K, Sikkim and Assam. Kashmir University and Sikkim University are engaged in research pertaining to glaciology whereas Tezpur University in Assam is working on the Himalayan ecosystem.
- (d) Over 20 national institutions/ state and central universities are currently conducting research on Himalayan Glaciers.
