Ministry of Earth Sciences

PARLIAMENT QUESTION: STRATEGY ON GLACIER AND CLIMATE PROTECTION

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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). Based on field measurement of glaciers from 1975 to 2023, the cumulative mass loss of Indian Himalayan glaciers is estimated at -26 m w.e.

MoES through its autonomous institute, the National Centre for Polar and Ocean Research (NCPOR) has been monitoring six glaciers in the Chandra basin (2437 km^2 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. Annual rate of retreat of Chandra basin glaciers varies from 13 to 33 meter/year during last decade. Based on the energy balance model, the estimated mean annual mass balance of the upper Chandra Basin glaciers is 0.51 ± 0.28 m w.e. a^1, with a cumulative mass balance of 3.54 m w.e f. 2015 to 2022.

The enhanced melting of glaciers will lead to noticeable impacts which include (1) shifts in seasonality and higher inter-annual variability of runoff which may affect water supply at local to regional/continental scalesincluding the surrounding lowlands, (2) the formation and enlargement of new/existing lakes, enhances frequency of Glacial Lake Outburst Floods (GLOFs)/Flash floods, and (3) rising sea level at global scale. Changes in water availability can also disrupt ecosystems and biodiversity, impacting the livelihoods of communities that depend on these resources.

As comprehensive national strategy or action plan has been adopted by the Government for conservation of glaciers and maintaining climate equilibrium. Government of India is committed to protect the glaciers and has made efforts to reduce the impact of climate change through several measures undertaken through its various Ministries, Departments and Institutes.

A Steering Committee on ‘Monitoring of Glacier’ has been formed on 09.03.2023, by the Ministry of Jal Shakti (MoJS) under the Chairmanship of Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD & GR), MoJS includes members from different ministries and organizations to monitor and coordinate the work being carried out by various ministries and organizations on the Himalayan glaciers.

A Centre for Cryosphere and Climate Change Studies (C4S) has been established at National Institute of Hydrology (NIH), Roorkee in May 2023 by DoWR, RD & GR, MoJS to study the impact of climate change on water resources of the Indian Himalayan Region (IHR).

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.

This information was given by Dr. Jitendra Singh, Union Minister of State (Independent Charge) for Science and Technology, Earth Sciences, MoS PMO, MoS Personnel, Public Grievances & Pensions, Department of Atomic Energy and Department of Space, in a written reply in the Rajya Sabha today.

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