

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

RAJYA SABHA
UNSTARRED QUESTION NO. 388
TO BE ANSWERED ON 25.07.2024

Risk of natural disasters due to melting of glaciers

388. SHRI HARSH MAHAJAN:

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

- (a) whether Government is taking serious note of the melting of glaciers due to climate change resulting in an increased risk of natural disasters;
- (b) whether Government has undertaken any study in this regard and if so, the details thereof; and
- (c) the number of such disasters occurred in the last one decade, State-wise, including Himachal Pradesh?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI KIRTI VARDHAN SINGH)

(a) & (b) The Government has taken serious note of the melting of glaciers due to climate change and has undertaken various scientific studies on glaciers, including on glacier melting, through several Indian Institutes, Universities and Organizations funded through various Ministries/ Departments like Ministry of Earth Sciences (MoES), Department of Science & Technology (DST), Ministry of Environment, Forest and Climate Change (MoEF&CC), etc.

For instance, monitoring of six glaciers in the Chandra Basin, Himachal Pradesh is undertaken by the National Centre of Polar and Ocean Research (NCPOR), an autonomous Institute under MoES, to understand differential response of glaciers to climate change and its impact on downstream hydrology. A study conducted by NCPOR indicates that two major glacial lakes (Samudra Tapu and Gepang Gath) of Chandra Basin have shown substantial expansion in their area and volume over the last five decades (1971-2022), which is significant in terms of their hazard potential for glacial lake outburst floods (GLOF).

Studies by the Wadia Institute of Himalayan Geology (WIHG), an autonomous institute of DST, report an increase in hazards related to shrinking glaciers and other processes in the glaciated and peri-glacial regions of Uttarakhand. These hazards include Glacial Lake Outburst Floods (GLOF), debris flows, and moraine failures.

The DST has also funded R&D projects to study different aspects of glaciers. As reported, the Divecha Centre for Climate Change at Indian Institute of Science (IISc), Bengaluru is mapping existing and potential glacier lakes, identifying numerous sites in Sikkim and Uttarakhand that

could potentially cause flash floods in the region. Additionally, the DST has established a Network Programme on the Himalayan Cryosphere, supporting six projects focused on different thematic areas of glacier research under the National Mission on Sustainable Himalayan Ecosystem (NMSHE).

The Department of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD & GR), Ministry of Jal Shakti (MoJS) has established a Centre for Cryosphere & Climate Change Studies at National Institute of Hydrology (NIH), Roorkee, in the year 2023, to facilitate effective management of snow and glacier resources in the country to address the concern of water availability in future.

The Geological Survey of India, Ministry of Mines has conducted mass balance studies on nine glaciers and carried out secular movement studies on 90 glaciers to assess the recessional and advancement pattern of the glacier.

The G.B. Pant National Institute of Himalayan Environment (GBPNIHE), an autonomous institute of the MoEF&CC, also has been involved in glacier studies in Himalayan region which includes snout monitoring, melt rate, mass balance and water quality and hydro-meteorological studies through field measurements and remote sensing approach. A discussion paper on "Himalayan Glaciers: A State-of-Art Review of Glacial Studies, Glacial Retreat and Climate Change" was prepared by the Institute to facilitate informed science-based discussion and policy planning on critical environmental issues of Himalayan glaciers. Further, MoEF&CC is also funding glacial studies under the National Mission on Himalayan Studies (NMHS).

(c) According to information provided by various States and expert Institutions, some of the major glacier related disasters that occurred in the last one decade, are as below:

State/ UT	Number of glacier related disasters	Years
Uttarakhand	2	2013, 2021
Ladakh	1	2021
Sikkim	1	2023

Further, as per information provided by State Government of Himachal Pradesh, during the last one decade, no such disaster resulting from glacier melt have been reported in the State.
