



Fast-Growing Glacial Lake in Uttarakhand Himalayas Raises Worries

Why in News?

According to the scientists at Dehradun-based **Wadia Institute of Himalayan Geology (WIHG)**, the **Bhilangana glacial lake** situated in the [Bhagirathi catchment](#) has grown to about 0.38 sq km area in the last 47 years and can pose a potential threat to people downstream.

Key Points

- **Glacial lakes** form when the vast sheet of glaciers **starts melting** and the melt water gets accumulated.
 - As the global temperatures rise and climate change intensifies, many of the glaciers have also begun to withdraw at a rapid rate, triggering the formation of numerous such glacial lakes, which, if unstable, can send torrents of water downstream and wreak **disastrous floods**.
- Studies show that over a thousand such glacial lakes have formed in the Uttarakhand Himalayas, but their understanding is limited due to lack of adequate ground-based studies.
 - **13 such glacial lakes are identified in Uttarakhand** that are **moraine-dammed lakes** and around ten glaciers which are being continuously monitored, as they may pose threat to people downstream.
 - Similar to this was experienced in **2013 in Kedarnath, 2021 in the Rishiganga-Dhauliganga glacial avalanche**, and more recently in [Sikkim's South Lhonak Lake](#).
- According to the [Geological Survey of India \(GSI\)](#), there are about 9,575 glaciers in the [Indian Himalayan Region \(IHR\)](#), only 980 of them lie in the north-western state of Uttarakhand and the most sensitive ones are being continuously monitored by the team.
- The largest glacier in Uttarakhand Himalayas, [Gangotri Glacier](#) with a length of nearly 30 kms is retreating at a rate of about 15-20 metres per year.

Wadia Institute of Himalayan Geology (WIHG)

- The Wadia Institute of Himalayan Geology is an **autonomous research Institute of the Department of Science & Technology**.
- Established in June, 1968 as a small nucleus in two rooms of the Botany Department, Delhi University, the Institute was shifted to DehraDun during April, 1976.

Glacial Lake Outburst Flood (GLOF)

- It is a type of catastrophic flood that occurs when the **dam containing a glacial lake fails**, releasing a large volume of water.
- This type of flood is **typically caused by rapid melting of glaciers or the buildup of water** in the lake due to heavy precipitation or the inflow of meltwater.
- In February 2021, **Chamoli district in Uttarakhand witnessed flash floods** which are **suspected to have been caused by GLOFs**.
- **Causes:**
 - These floods can be triggered by a number of factors, including **changes in the volume**

of the glacier, changes in the water level of the lake, and earthquakes.

- According to [NDMA \(National Disaster Management Authority\)](https://www.ndma.gov.in/), **glacial retreat due to climate change** occurring in most parts of the **Hindu Kush Himalayas** has given rise to the formation of numerous new glacial lakes, which are the major cause of GLOFs.

Moraine-Dammed Lake

- A moraine-dammed lake occurs when the **terminal moraine** has prevented some **meltwater** from leaving the valley.
- When a glacier retreats, there is a space left over between the retreating glacier and the piece that stayed intact which holds leftover debris (**moraine**).
- Meltwater from both glaciers seep into this space creating a ribbon-shaped lake due to the pattern of ice melt.
- This ice melt may cause a glacier lake outburst flood, leading to severe damage to the environment and communities nearby.

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