

Waiting to Happen! What was the Trigger?



As South Lhonak glacier continued to retreat amid global warming by another 400 m between 2008 and 2019, lakes only grew

Glacial lake outburst flood (Glof) like disaster was waiting to happen

Trigger could be anything from cloudburst to landslide, avalanche or earthquake

Mitigation Steps

First field expedition of glacial lake conducted in August 2014, followed by another in 2016 which resulted in a project to start siphoning off lake water

Three pipelines were installed to siphon off 150 mlitres of water per second at that time

Central Water Commission initiated an advisory to evaluate the South Lhonak glacier

Early warning system was set in place in some locations by Centre for Development of Advanced Computing

Himalayan Problem

Problem of receding glaciers and the spectre of Glof devastation faces the entire Himalayan region as global warming provides new triggers in the young mountain ranges



Add to that the build-up of infrastructure, habitation, road network and hydropower plants

A 2021 study warned that 'both the existing and planned hydropower plants are exposed to potential outburst flood from glacial lakes'

- 1. Describe Glacial Lake Outburst Floods (GLOFs) and analyze their impacts on the Himalayan region. Suggest measures to mitigate the risks associated with GLOFs.**
- 2. What are Glacial Lake Outburst Floods (GLOFs)? Discuss their impact on the Himalayan region and outline strategies for mitigating these disasters in India. (250 words)**
- 3. Critically evaluate the role of the National Disaster Management Authority (NDMA) in managing GLOFs in India. Suggest improvements for a more effective disaster response mechanism. (250 words)**

→ What caused the flood in Sikkim?

■ About GLOF:

These are instances of large lake formed from melting of glaciers, sudden breaching of their moraine - natural dam that formed from rock, sediment & other debris.

→ 'South Lhonak glacier' located North Sikkim - fastest retreating glacier.

→ 7500 glaciers - in Himalay associated with GLOF.

→ Previous GLOF Examples:-

- 1926 J & K deluge.
- 1981 Kinnaur Valley in HP.
- 2013 Kedarnath UK.

■ Reasons:

- Uncertainty in Remote Sensing satellite (National Remote Sensing Centre).
- CWC (Central Water Commission) report may 60 feet - less time for people to react.

→ late process report by CWC.

• NDM Agency - excess rainfall reported

• IMD report both rainfall but not at north region.

■ Resulting damage:

→ Destruction of chungthang dam.

↓
directs water to power Teesta-3 hydro power project.

→ Teesta-4 - V, VI

→ water pipeline, sewage pipeline

■ Future:

• Himalayan ecosystem fragile.

(• Rise Temp.
through dams / hydro power (input))

• EWS (warning system)

• share satellite image to provide adequate warning.