

General Studies-3; Topic: Disaster and disaster management.

Tackling Glacial Burst

Introduction

- Recently glacier burst took place in Uttarakhand after a chunk of Nanda Devi glacier broke off.
- It triggered an avalanche and a deluge crushing two hydroelectric power stations and washing away scores of homes.

What are Glacial Lake Outburst Floods (GLOFs).

- When glaciers melt, the water in glacial lakes accumulates behind loose, natural “glacial/moraine dams” made of ice, sand, pebbles and ice residue.
- A GLOF refers to the flooding that occurs when the water dammed by a glacier or a moraine is released suddenly.
- Unlike earthen dams, the weak structure of the moraine dam leads to the abrupt failure of the dam on top of the glacial lake.
- A failure of the dam has the potential of releasing millions of cubic metres of water in a short period, causing catastrophic flooding downstream.

Formation of new Glacial lakes

- Glacial retreat due to climate change occurring in most parts of the Hindu Kush Himalaya has given rise to the formation of numerous new glacial lakes, which are the major cause of GLOFs.
- Since glaciers in the Himalayas are in a retreating phase, glacial lakes are growing.
- Potentially dangerous lakes can be identified based on
 - field observations,
 - records of past events,
 - geomorphologic and geotechnical characteristics of the lake/dam and
 - surroundings, and other physical conditions.

How well is India prepared?

- While some work on identification of such lakes has been done by Central Water Commission (CWC).
- Some aspects are still a work in progress like: a robust early warning system, and a broad framework for infrastructure development, construction and excavation in vulnerable zones.
- In contrast to other countries, there are no uniform codes for excavation, construction and grading codes in India.
- There are no widely accepted procedures or regulation in India for land use planning in the GLOF/Landslide Lake Outburst Floods (LLOFs) prone areas.

Early warning systems (EWS) in India

- The number of implemented and operational GLOF EWS is still very small, even at the global scale.
- India has a remarkable history of successful warnings in relation to Landslide Lake Outburst Floods (LLOFs), dating back to the 19th century.

NDMA Guidelines / Recommendations

- The NDMA guidelines say that risk reduction has to begin with
 - identifying and mapping such lakes,
 - taking structural measures to prevent their sudden breach, and
 - establishing mechanism to save lives and property in times of a breach.
- NDMA has recommended use of Synthetic-Aperture Radar imagery to automatically detect changes in water bodies, including new lake formations, during the monsoon months.

- To manage lakes structurally, reducing the volume of water with methods such as controlled breaching, pumping or siphoning out water, and making a tunnel through the moraine barrier or under an ice dam.
- Restricting constructions and development in GLOF/Landslide Lake Outburst Floods (LLOFs) prone areas is a very efficient means to reduce risks at no cost.
- Construction of any habitation should be prohibited in the high hazard zone.
- Existing buildings are to be relocated to a safer nearby region and all the resources for the relocation have to be managed by Central/State governments.
- New infrastructures in the medium hazard zone have to be accompanied by specific protection measures.
- There should be monitoring systems prior to, during, and after construction of infrastructure and settlements in the downstream area.
- Apart from specialised forces such as NDRF, ITBP and the Army, there is a need for trained local manpower.
- Experience has shown that over 80 percent of search and rescue is carried out by the local community.
- These local teams can assist in planning and setting up emergency shelters, distributing relief packages, identifying missing people, and addressing the needs for food, healthcare, water supply etc.
- Need for a comprehensive alarm system using modern communication technology.
- Psychological counselling of victims, apart from dissemination of accurate information through press conferences and mass media.