



Uttarakhand Wildfires: Threat To Glaciers

Why in News?

In Uttarakhand, the **wildfires** have taken a toll on the region's forests. From November 2023, 1,107 hectares of forest cover have succumbed to 886 separate incidents of wildfires, sparking concerns about the **profound impact on the local ecosystems**.

Key Points

- The **Forest Survey of India (FSI)** has issued multiple fire alerts to Uttarakhand, emphasising the severity of the ongoing crisis.
- A former scientist from the **Wadia Institute of Himalayan Geology**, sheds light on the increased concentration of **Black Carbon** in the atmosphere, particularly during summer due to forest fires, exacerbates **glacier melting** and disrupts the delicate balance of the entire ecosystem.
- A recent study conducted by the **World Bank** underscores the role of black carbon in accelerating glacier melt.
 - According to the report, the accumulation of black carbon not only diminishes the reflectance of glacier surfaces, leading to increased absorption of solar radiation, but also elevates air temperatures, further accelerating glacier retreat.
- The **World Meteorological Organisation (WMO)** warns of accelerated glacier retreat in **the Himalayas** and heightened risks of natural disasters like **Glacial Lake Outburst Floods**.
 - Their recent study states the need for concerted efforts to mitigate the impacts of black carbon emissions and safeguard the fragile ecosystems of the Himalayan region.

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)**, **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.

Black Carbon's Arctic Impact

Black carbon, commonly known as soot, is a particulate pollutant that negatively affects both the climate and human health. Soot particles suspended in the atmosphere absorb sunlight, adding to global warming. And when it collects on ice and snow, it hastens melting.

NEGATIVE IMPACTS OF BLACK CARBON

Particulates trapped in lungs leads to illness



Clean clouds reflect sunlight

Sooty clouds absorb sunlight, creating changes in cloud and rain patterns

Clean snow and ice reflect sunlight

Black carbon particles absorb sunlight, warming the snow and ice, increasing melting

Black carbon

Sunlight

Melt

CAUSES

- ▼ Smoke from open burning
- ▼ Industry and coal-fired power plants
- ▼ Engine emissions (diesel, ships, trains)

Note: Illustration is diagrammatic and not to scale.



