Rising black carbon heating the Himalayan snow

Prelims : Current events of national and international importance

Why in News?

A recent study by the think-tank Climate Trends stated that Levels of black carbon-ultra-fine particles of carbon in the Himalayas have been rising.

- The study analysed satellite-based measurements of black carbon and changes in snow temperature between 2000 and 2023.
- **Findings** - Eastern Himalaya records warmest snow surfaces, followed by the central and western Himalayas.
- This is contributing to warmer snow, increasing the risk of unseasonal flooding by glacier-fed rivers.
- **Sources** – Biomass combustion, fossil fuel use, Fertiliser, Vehicle exhaust, and open burning, particularly in the Indo-Gangetic plain, which acts as a hotspot for emissions.
- **Effects** - Light-absorbing particles like black carbon reduces the snow's ability to reflect sunlight, accelerating surface heating.
- Aerosols particulate matter emissions from a variety of sources, from fertiliser to vehicle exhaust, clog the atmosphere, deflecting sunlight away from the carbon and mask the heating effect of greenhouse gases.
- Continued temperature rise in snow-covered areas can shorten snow season duration and advance melting onset, impacting hydrological systems and water security for millions downstream.
- Thus, temperature increases, in conjunction with black carbon presence, are significantly altering the snow thermal regime in the Himalayas.
- Black carbon is different in that it absorbs sunlight and, if it settles on the surface, can thus heat the ground.

> *Black carbon is considered as a catalyst to global warming, even though it is relatively short-lived in the atmosphere, unlike carbon dioxide, the most pervasive greenhouse gas.*

Reference

The Hindu | Black carbon' heating Himalayan snow



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