



## Forest Fires in the Himalayas

**For Prelims:** [Himalayan Region](#), [Forest Survey of India \(FSI\)](#), [Precipitation](#).

**For Mains:** Forest Fires in the Himalayas, Government Policies and Interventions, Environment Pollution and Degradation

**Source:** [DTE](#)

### Why in News?

There have been several instances of [Forest Fires](#) in the [Himalayan Region](#) especially in **Himachal and Uttarakhand** this winter because of a lack of precipitation.

- As per the [Forest Survey of India \(FSI\)](#), there have been **2,050 incidents of forest fires** between 16<sup>th</sup> October 2023 and 16th January 2024, but there were **just 296 incidents of forest fires during the same period last year**.

### What is Forest Fire?

- About:**
  - Also called **bush or vegetation fire or wildfire**, it can be described as any **uncontrolled and non-prescribed combustion** or burning of plants in a natural setting such as a forest, grassland, brush land or tundra, which consumes the natural fuels and spreads based on environmental conditions (e.g., wind, topography).
  - There are three conditions that need to be present in order for a **wildfire to burn: Fuel, Oxygen, and a Heat source**.
- Classification:**
  - Surface Fire:** A forest fire may burn **primarily as a surface fire, spreading along the ground** as the surface litter (senescent leaves and twigs and dry grasses etc) on the forest floor and is engulfed by the spreading flames.
  - Underground Fire:** The fires of low intensity, **consuming the organic matter** beneath and the surface litter of forest floor are sub-grouped as underground fire. In most of the **dense forests a thick mantle of organic matter** is found on top of the mineral soil.
    - These fires **usually spread entirely underground** and burn for some meters below the surface.
    - This fire spreads very slowly and in most of the cases it becomes very hard to detect and control such types of fires.
    - They may continue to burn for months and destroy vegetative cover of the soil.
  - Ground Fire:** These fires are fires in the subsurface organic fuels, such as duff layers under **forest stands, Arctic tundra or taiga**, and organic soils of swamps or bogs.
    - There is **no clear distinction between underground and ground fires**.
    - The smoldering underground fires sometimes change into Ground fire.
    - This fire burns root and other material on or beneath the surface i.e., burns the herbaceous growth on forest floor together with the layer of organic matter in

various stages of decay.

- They are **more damaging than surface fires**, as they can destroy vegetation completely. Ground fires burn underneath the surface by smoldering combustion and are more often ignited by surface fires.

## What Factors Contributed to Forest Fires in Himalayan Region?

- **Lack of Snowfall and Precipitation:**
  - The absence of snowfall and rainfall in the winter months **has left the region dry**. Snowfall and **Precipitation** are crucial for **maintaining soil moisture** and preventing the forest floor from becoming excessively dry.
- **Dry Conditions:**
  - The lack of moisture in the soil and vegetation **creates favorable conditions for forest fires**. Dry leaves, combined with dry soil, act as potential fuel for fires.
  - Rising temperatures, possibly linked to climate change, contribute to the drying of forests. Higher temperatures **increase evaporation rates, further depleting soil moisture**.
- **Human Activities:**
  - Human activities, **such as carelessly discarding cigarettes** or engaging in uncontrolled burning, can trigger forest fires.
  - Controlled burning by the forest department may also contribute to the issue if not properly managed.
- **Vulnerable Tree Species:**
  - Presence of fire-prone and flammable tree species like **Chir pine increases the risk of forest fires**.
    - About 15% of Himachal's forest area is covered with chir pine.
- **Long Dry Spell:**
  - Extended periods without rainfall or snowfall over several months create a long dry spell, making the region more susceptible to fires.

## What are the Government Initiatives to Cope With Forest Fires?

- **National Action Plan for Forest Fires (NAPFF)**, was started in 2018 with the goal of reducing forest fires by informing, enabling, and empowering forest fringe communities and incentivizing them to collaborate with state forest departments.
- **The Forest Fire Prevention and Management Scheme (FPM)** is the only government-sponsored programme dedicated to assisting states in dealing with forest fires.

## Way Forward

- There is a need to implement advanced **fire detection and monitoring systems**, including satellite-based technologies, to provide early warnings and enable rapid response to potential forest fires.
- Engage local communities in forest management and **fire prevention efforts**. Conduct awareness programs to **educate residents about responsible forest practices, fire safety, and the consequences of uncontrolled burning**.
- **Implement sustainable forest management practices that focus on maintaining biodiversity, promoting fire-resistant vegetation**, and reducing the presence of highly flammable tree species.

**UPSC Civil Services Examination Previous Year Question (PYQ)**

**Prelims**

**Q. Consider the following: (2019)**

1. Carbon monoxide
2. Methane
3. Ozone
4. Sulphur dioxide

**Which of the above are released into atmosphere due to the burning of crop/biomass residue?**

- (a) 1 and 2 only  
(b) 2, 3 and 4 only  
(c) 1 and 4 only  
(d) 1, 2, 3 and 4

**Ans: (d)**

- Biomass is organic material that comes from plants and animals, and it is a renewable source of energy. Biomass contains stored energy from the Sun. Plants absorb the Sun's energy in a process called photosynthesis. When biomass is burned, the chemical energy in biomass is released as heat.
- Crop residue and biomass burning (forest fires) is considered as a major source of Carbon Dioxide ( $\text{CO}_2$ ), Carbon Monoxide (CO), Methane ( $\text{CH}_4$ ), volatile organic compounds (VOC), and Nitrogen Oxides (NOX). Burning of rice crop residue releases Suspended Particulate Matter,  $\text{SO}_2$ ,  $\text{NO}_2$  and  $\text{O}_3$  in the atmosphere. **Therefore, option (d) is the correct answer**

**Mains:**

**Q.** Most of the unusual climatic happenings are explained as an outcome of the El-Nino effect. Do you agree? **(2014)**

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