FOREST FIRES - GS III MAINS

Q. What are the reasons for the increase in frequency of forest fires in India? Discuss how it will impact our ecosystem as a whole. (15 marks, 250 words)

News: *Why Uttarakhand is prone to forest fires | Explained*

What's in the news?

- Recently, a massive fire spread through the forests near Nainital in Uttarakhand which lead to the deployment of Indian Air Force personnel.

Backdrop of Uttarakhand Forest Fire:

- **Assessment of Forest fires:** The Nainital, Haldwani and Ramnagar forest divisions were worst affected.

- **Role of Bambi Buckets:** In some regions, the fires were doused with the help of a Bambi bucket, used to pour large amounts of water on the flames in relatively quick intervals.

Causes of Uttarakhand Forest Fire:

- **Man-Made Factors:** Most fires are believed to be man-made, due to changes in agriculture and unchecked land-use patterns.

- **Causes of Uttarakhand Wildfires:** The forest department has previously cited four causes of wildfires in Uttarakhand – deliberate fires by locals, carelessness, farming-related activities and natural reasons.

Frequency of Forest Fires in India:

1. Forest Fires in India:

- The Forest Survey of India (FSI) website states that nearly 36 percent of India's forests are prone to frequent fires.

2. Forest Fires Season:

- The forest fire season in India lasts between November to June.
- Higher fire incidents are reported in March, April and May due to ample availability of dry biomass following the end of winter and amid the prevailing summer season.

3. Factors Influencing Forest Fires:

- Factors like temperatures, precipitation, vegetation, and moisture contribute to the scale and frequency of these fires.
- According to experts, three factors cause the spread of forest fires — fuel load, oxygen and temperature. Dry leaves are fuel for forest fires.

4. Forest Fire Severity:

- Severe fires occur in many forest types particularly dry deciduous forest, while evergreen, semi-evergreen and montane temperate forests are comparatively less prone.
- Nearly 4% of the country's forest cover is extremely prone to fire, whereas 6% of forest cover is found to be very highly fire prone (ISFR 2019).

5. Forest Fire Hotspots:

- An FSI analysis in ISFR 2021 also found that states in northeastern India showed the highest tendency for forest fires.
- Parts of western Maharashtra, southern Chhattisgarh, central Odisha and regions in Andhra Pradesh, Telangana and Karnataka also showed patches of extremely and very highly fire-prone zones.

Impact of Forest Fires:

1. Loss of Biodiversity:

- Forest fires can lead to the destruction of habitats, resulting in the loss of plant and animal species.
- Some species may struggle to recover or may face local extinction following a severe fire.

2. Degradation of Ecosystems:

- Fires can disrupt the natural balance of ecosystems by altering soil composition, nutrient levels, and water cycles.
- This can lead to long-term changes in vegetation patterns and ecological processes.

3. Air Pollution:

- The smoke and ash generated by forest fires contribute to air pollution, releasing harmful pollutants such as particulate matter, carbon monoxide, and volatile organic compounds.
- Prolonged exposure to these pollutants can have adverse effects on human health, particularly for those with respiratory conditions.

4. Water Contamination:

- Runoff from burnt areas can contaminate water sources with sediment, ash, and chemicals, affecting aquatic ecosystems and water quality.
- This can have implications for both wildlife and human communities that rely on these water sources for drinking, irrigation, and other purposes.

5. Economic Losses:

- Forest fires can cause significant economic damage by destroying timber resources, agricultural land, and infrastructure.
- In addition to direct losses, there may be indirect impacts on industries such as tourism, forestry, and agriculture.

6. Increased Risk of Natural Hazards:

- Following a fire, the loss of vegetation can increase the risk of soil erosion, landslides, and flooding, especially in steep terrain or areas with heavy rainfall.
- This can pose hazards to communities downstream and exacerbate the impacts of extreme weather events.

Measures to Prevent Forest Fires:

1. MoEFCC Recommendations:

The Ministry of Environment, Forest and Climate Change (MoEFCC) lists the following methods to prevent and control a forest fire such as

- Construction of watch towers for early detection.
- Deployment of fire watchers.
- Involvement of local communities.
- Creation and maintenance of fire lines.

2. NDMA Guidelines:

- According to the National Disaster Management Authority (NDMA) website, two types of fire lines are in practice.
  - Kachha or covered fire
  - Pucca or open fire lines.
- In Kaccha fire lines, the undergrowth and shrubs are removed while trees are retained to decrease the fuel load.
- The Pucca fire lines are clear felled areas separating a forest/compartment/block from another to control the spread of potential fires.

3. Satellite Technology in Enhancing Fire Prevention:

- Satellite based remote sensing technology and GIS tools have been effective in better prevention and management of fires through creation of early warning for fire prone areas, monitoring fires on a real time basis and estimation of burn scars.

4. Fire-Fighting Robots:

- Utilizing robots such as Thermite, designed by Howe and Howe Technologies, to suppress fires in locations too hazardous for human firefighters to enter.

5. Public Awareness Campaigns:

- Government agencies conduct public awareness campaigns emphasizing the significance of forest preservation, safe behaviour during wildfires, and reporting instances of illegal activities contributing to forest fires.

Adopting a comprehensive approach to forest fire management, encompassing prevention, mitigation, and control, can yield improved outcomes, conserving natural resources and reducing human and property losses.