Forest Fires

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Why is in news? Wildfires ravage Hawaii's Maui island: How climate change has a link to the fires

Charred frames of cars and homes, scorched electricity poles, ashy roads, and a towering banyan tree blackened by the fire but still standing – these images of the aftermath of the devastating fire in Hawaii's Maui island have grabbed the world's attention.

The wildfires, which have already killed nearly 100 people and left thousands homeless, have become part of a wider global list of unusually intense blazes that have raged across Europe, Canada and the United States.

What happened in Hawaii?

Hawaii is no stranger to fires, which burn on a smaller scale with some regularity, especially in the drier parts of the island.

The current fires – active in Lahaina, Upcountry and P?lehu/K?hei – are believed to have started on August 8, with the one in Lahaina spreading quickly across the town.

Low humidity and dry vegetation too precipitated the issue.

Initial reports suggest that the changing land-use patterns in Hawaii, which has seen farm and forest lands being replaced by flammable non-native species of grasses like Guinea grass, are a likely cause for the easy spread of the fire.

Over the past few decades, wildfire has been increasing in Hawaii as a result of changing climate, as a result of increases in invasive species, and a lot of our active agriculture going out and becoming fallow. And so we have invasive species, we have fuels on the ground, we have all the conditions that make for a ripe wildfire environment.

Link between forest fires and climate change:

Forest fires is a natural or human-made, the phenomenon is a critical part of the ecosystem. A healthy fire is key to ensuring that forests remain robust and resilient.

It also aids the natural replenishment of nutrients in the soil, helps sunlight reach the forest floors, and encourages the germination of seeds.

It is the increasingly intense nature of the wildfires – aided by the **warming weather, dry conditions and change in rain cycles** – that is now becoming a source of worry.

Experts have compared it akin to the difference between throwing a lighted matchstick on a pile of wet, green wood and on dry kindling.

And **increasingly, climate change is determining the degree of dryness** of the latter. July 2023, for instance, saw the highest temperatures on record across the planet and evidence suggests that the record will be broken sooner than later.

The **Northern Hemisphere has seen significant wildfire activity** since the beginning of May this year, with widespread record-breaking fires in Canada and large fires across eastern Russia," European Union's Copernicus programme, which monitors atmospheric conditions on Earth said.

Besides the destruction of lives and livelihoods, these catastrophic wildfires also **release an immense amount of carbon dioxide and other greenhouse gases into the atmosphere**.

Example: The Canadian wildfires alone have emitted 290 megatonnes of carbon between Jan 1 and July 31, representing over 25% of the global total for 2023 to date, as per data from the Copernicus programme.

Climate change aids wildfires, which, in turn, release the carbon stored in trees as CO2 and methane, evolving into a vicious cycle.

There is also one immediate issue – these **immense fires contribute adversely to air pollution**, leading to long-term and short-term respiratory issues, heart disease and lung cancer

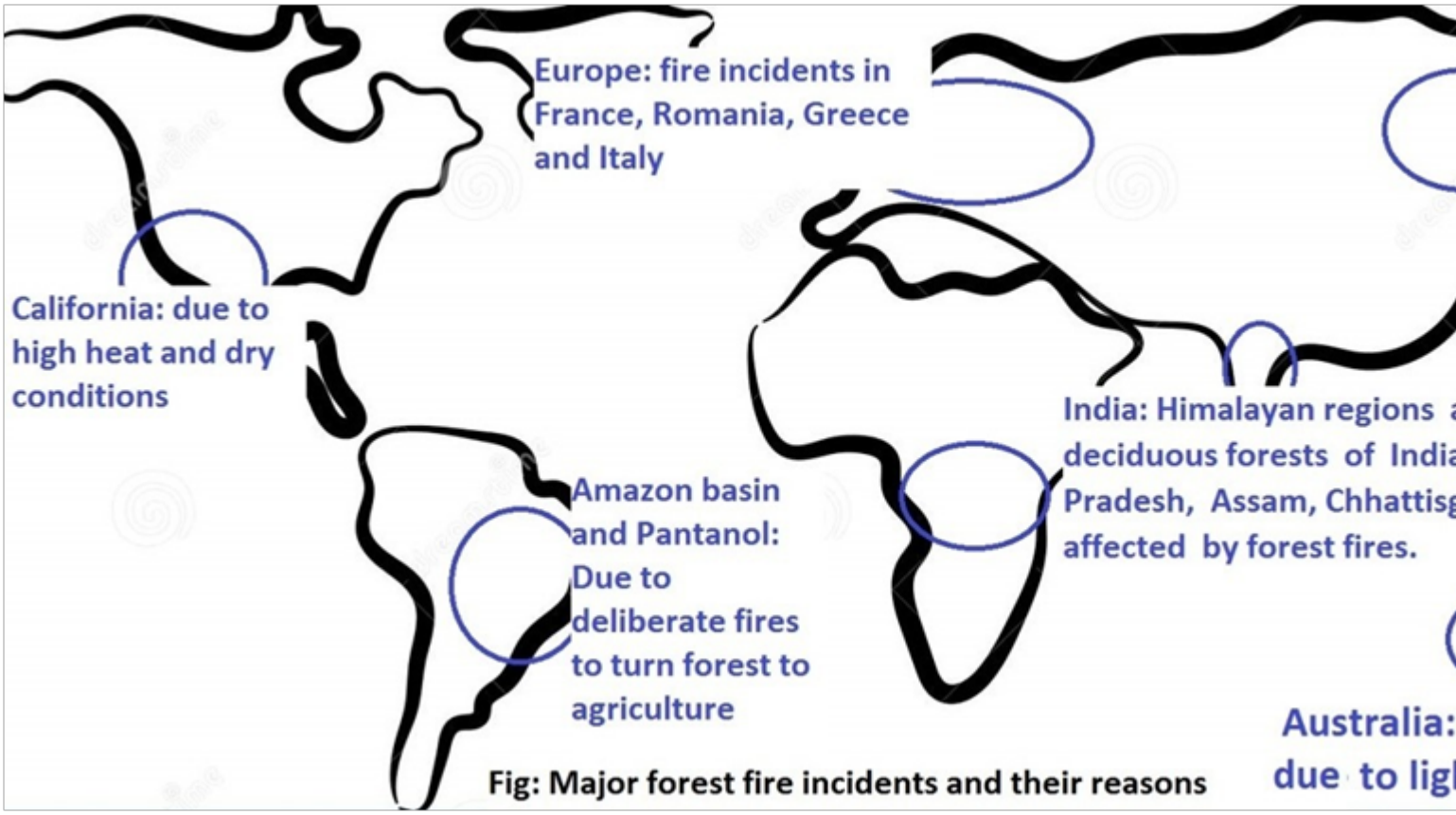


Fig: Major forest fire incidents and their reasons

Forest Fire:

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.

Causes:

Any forest fires start from natural causes such as lightning which set trees on fire.

However, rain extinguishes such fires without causing much damage. High atmospheric temperatures and dryness (low humidity) offer favourable circumstance for a fire to start.

Fire is caused when a source of fire like naked flame, cigarette or bidi, electric spark or any source of ignition comes into contact with inflammable material.

Reasons for wildfires worsening:

Wildfires require right climatic conditions, burnable fuel and a spark.

Rising temperatures suck moisture out of plants, creating an abundance of dry fuel.

Drought and high heat can kill plants and dry out dead grass, and other material on the forest floor that fuel the fire once it starts sweeping through a patch.

While dry vegetation is the burnable fuel that serves as kindling for fires, the spark is sometimes caused by lightning, at other times by accident or recklessness of the local population.

Health Concerns regarding wildfires:

Smoke of wildfires contains various **harmful pollutants, fine particulate matter, carbon monoxide, volatile organic compounds and nitrogen oxide**s.

It may accentuate health risks of millions of residents living in vicinity to the affected areas.

Due to this pollution exposure the health effects are many which can **range from relatively minor to more serious** . For instance -

Minor - eye and respiratory tract irritation.

Major health effects - exacerbation of asthma and heart failure and premature death.

Most affected segment of the society will be children, pregnant people, older adults and people with heart or lung disease. Hence it impacts on the quality of life and right to health as people are forced to breathe in this foul air.

As per an estimate by Amnesty International 115 million people's health are impacted by this.

Recent Data on forest Fires:

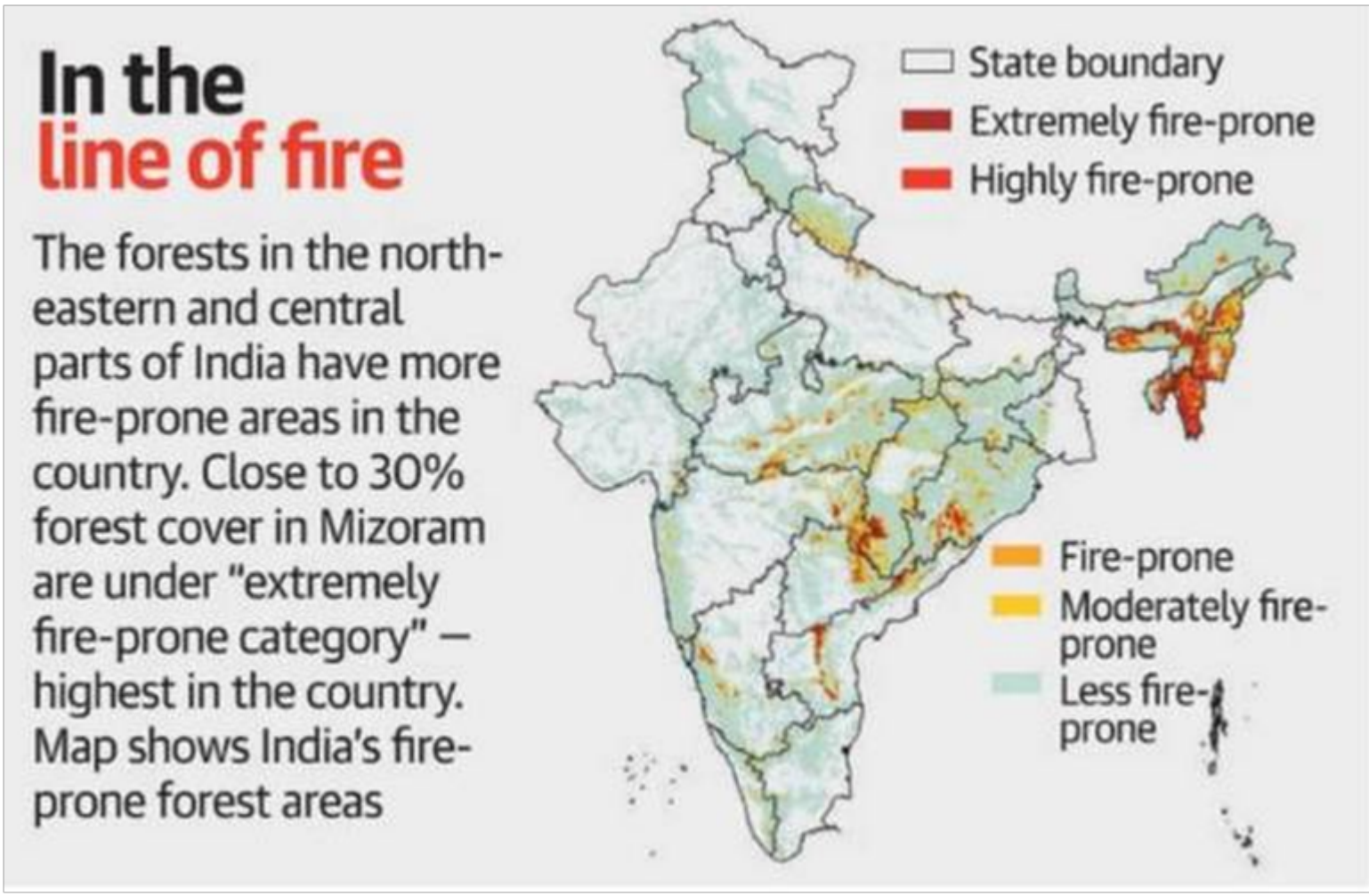
A total of 381 forest fires have been reported in India by 30th March, 2022, according to the **Forest Survey of India**. Madhya Pradesh has recorded the highest number of fires at 133.

In March 2022, significant forest fires were reported in states such as Uttarakhand, Madhya Pradesh and Rajasthan.

The recent fire at Rajasthan's Sariska Tiger Reserve was also considered to have been unseasonal, with high temperatures exacerbating the spread of the fire.

In January 2021 saw prolonged fires in Uttarakhand, Himachal Pradesh (Kullu Valley) and Nagaland-Manipur border (Dzukou Valley)

Recent fires also include those in Bandhavgarh Forest Reserve in Madhya Pradesh.



Measures to control:

National Policy on Forest Fire: finalized by the government

National Plan for forest fire management: National Forest Fire Danger Rating System, Fire fighting tools and machinery (e.g. Fire Beaters, Pulaskis Tools, Forest Fire Showel, etc.)

Forest Fire Prevention & Management Scheme (FFPMS, 2017): a revised version of the Forest Management Scheme

Community participation: by the involvement of NGOs, Voluntary Organisations, Village Forest Committees (VFCs), etc.

Institutionalize the partnership with forest fringe communities

Devise a forest fire forecasting system at the local level

Forest Fire Monitoring: FSI uses NASA'sMODIS(Moderate ResolutionImagingSpectro-radiometer)andVIIRS (VisibleInfraredImagingRadiometerSuite)satellites for its Forest fires alert system 2.0

Use of technology (such as Remote Sensing, GPS, and GIS) in planning, developing and operationalizing Fire management systems.