

WILDFIRES – ENVIRONMENT

Wildfires in Albania, Greece, Italy, Portugal, Spain, and Turkey have resulted in fatalities and forced thousands to evacuate the affected regions.

Wildfires

Wildfires are uncontrolled fires that spread rapidly across forests, grasslands, brushlands, or tundra. They are fueled by a continuous supply of dry vegetation, oxygen, and heat, and are often driven by wind and terrain conditions. Once ignited, wildfires can sustain themselves for long periods until weather changes, natural barriers, or human intervention bring them under control.

Classification of Wildfires

Surface Fire

These fires burn along the ground surface, consuming dry leaves, fallen twigs, grasses, and shrubs. They are relatively easier to control compared to other types.

Underground or Zombie Fire

These low-intensity fires burn beneath the ground in peat or organic soils. They spread slowly, often remain unnoticed, and can smolder for weeks or even months, resurfacing under favorable conditions.

Canopy or Crown Fire

These highly intense fires spread across the treetops in the forest canopy, making them extremely difficult to control. They often spread faster than ground fires due to strong winds.

Controlled/Deliberate Fire

These are scientifically planned prescribed burns carried out by forest authorities to reduce excess dry fuel, restore ecosystem balance, and prevent larger wildfires in the future.

Causes of Wildfires

Geography

Regions with Mediterranean-type climates, such as southern Europe, California, and parts of Australia, are highly vulnerable due to hot, dry summers, low humidity, and strong dry winds (e.g., the Sirocco wind from the Sahara).

Climate Change

Prolonged droughts, erratic rainfall, unseasonal heat waves, and El Niño events increase vegetation dryness, creating highly flammable conditions.

Human-Induced Factors

Activities like slash-and-burn cultivation, land clearing for agriculture, tourism-related negligence, infrastructure projects, and careless waste management often trigger accidental or deliberate fires.

Weak Fire Management & Technology

Many regions lack modern surveillance systems, early warning networks, AI-based prediction models, and rapid-response firefighting equipment, which delays containment.

Biodiversity & Flammable Vegetation

Forest types such as dry deciduous forests, pine forests (due to resinous needles), bamboo groves, and monoculture plantations act as natural fuel and worsen fire spread, while also reducing native biodiversity.

Deforestation & Habitat Fragmentation

Road construction, mining, overgrazing, and weak enforcement of forest laws increase vulnerability by degrading ecosystems, shrinking wildlife habitats, and intensifying human–wildlife conflicts.

Impacts of Wildfires

Air Pollution & Climate Change

Wildfires release greenhouse gases like CO₂, methane, and fine particulate matter (PM_{2.5}), severely degrading air quality and contributing to global warming.

Biodiversity & Habitat Loss

Fires kill or displace wildlife, damage rare ecosystems, and push endangered species closer to extinction. For example, in 2020, nearly 17 million animals, including reptiles, primates, and birds, were killed by wildfires in Brazil.

Human Health Risk

Communities exposed to wildfire smoke face respiratory illnesses, eye irritation, heat stress, and mental trauma due to displacement and loss of livelihood.

Economic Damage

Wildfires destroy crops, homes, and infrastructure, impose heavy costs on firefighting operations, and cause significant financial losses to both governments and communities.

Soil & Water Degradation

The removal of vegetation leads to soil erosion, while ash and debris runoff contaminate rivers and lakes, harming aquatic ecosystems and drinking water supplies.

Wildfires in India

Extent of Risk

According to the India State of Forest Report (ISFR) 2021, nearly 36% of India's forest cover is prone to recurring forest fires. Of this, 2.81% is classified as extremely fire-prone, while 7.85% falls under the very highly fire-prone category.

Regional Trends

Mountain states have seen alarming increases in wildfire incidents between ISFR 2019–2023: Himachal Pradesh by 1,339%, Jammu & Kashmir by 2,822%, and Uttarakhand by 293%.

Common Wildfire Control Materials & Methods

Pink Fire Retardant

A slurry mixture containing ammonium phosphate and salts like ammonium polyphosphate, sometimes with toxic elements such as chromium and cadmium, is dropped from aircraft to slow or suppress wildfire spread.

Bambi Bucket

A collapsible bucket attached beneath helicopters is filled with water from nearby lakes or rivers and released through a bottom valve directly over fire zones. It is particularly effective in mountainous or inaccessible regions.

Steps Needed to Tackle Wildfires

Integrated Fire Management

Combining preventive measures like prescribed burning, fuel load reduction, creating firebreaks, enforcing strict safety regulations, and spreading community awareness.

Community & Tribal Participation

Engaging local people, Van Panchayats, and indigenous groups in fire prevention and early detection, while offering training and livelihood support to encourage participation.

Advanced Technology & Early Warning

Using AI-driven fire prediction models, satellite imagery, real-time weather monitoring, drones, and mobile alert systems to ensure rapid containment.

Ecosystem Restoration & Resilience

Planting fire-resistant species, developing green firebreaks, promoting climate-resilient forestry, and restoring wetlands and agroforestry systems for natural protection.

Policy Enforcement & Eco-Sensitive Development

Strictly regulating infrastructure and mining in fire-prone zones, promoting sustainable tourism, and ensuring transparent conservation funding through innovations like blockchain-based tracking.

Source: <https://timesofindia.indiatimes.com/world/europe/southern-europe-wildfires-3-killed-thousands-evacuated-in-greece-spain-turkey-albania-eu-sends-aid/articleshow/123294728.cms#:~:text=Southern%20Europe%20wildfires%3A%203%20killed,sends%20aid%20%2D%20Times%20of%20India>

