

Forest Fires: Causes and Impact on Environment

Sanjeev Kumar^{1*} and Shaminder Kumar²

¹Assistant Professor, School of Agriculture, Shoolini University, Solan, HP,

²PhD Research Scholar, Department of Social Sciences,
Dr. YSP UHF, Nauni, Solan, HP,

*Corresponding Email: sharmask93@rediffmail.com

ARTICLE ID: 012

Forest fire is as old as the forest itself. It is a common phenomenon in environment and a part of nature. Although, forest fires act as an agent of regeneration, change and plays an important role in shaping ecosystems, but it can be deadly by destroying wildlife habitats, timber, houses and polluting the air with harmful emissions. According to a report of Forest Survey of India (2019), India has forest cover of about 7, 12,249 sq. km, comprising 21.67 per cent of the total geographic area of the country. Although, the rural population of the country has an intimate relationship with forests, the tropical moist and dry deciduous forests are extensively affected by the forest fire. The main problem with forest fires is that the forests are usually remote, abandoned/unmanaged areas filled with trees, dry and parching wood leaves which act as a fuel source. These elements form a highly combustible material and represent the perfect context for initial-fire ignition and act as fuel for later stages of the fire. On a hot summer day, drought conditions are at peak and something as small as a spark has the potential to create a large wildfire with devastating results. A typical forest fire cycle depends on spatiotemporal variations in topography, climate and fuel composition. The initial stage of forest fires is normally referred to as the “surface fire” stage which then leads to feeding on adjoining trees and results higher and higher flames, thus becoming “crown fire”. A crown fire is particularly very dangerous in a coniferous forest because resinous material given off burning logs burn furiously.

Causes of Forest Fires

The list of reasons for the fires in our forests lies within human activity carried out whether intentionally or unintentionally. Some of the causes of forest fires are listed below:

- a) In India, most of the forest fires are deliberately set by small/marginal farmers or landless rural people. For example, in the North eastern parts of India, the practice of slash and burn shifting cultivation is the leading cause of forest fires.

- b) Local people do forest floor burning for various traditional reasons like grasses rejuvenation, *mahua* flower and *sal* seed collection on the clean forest floor, to promote a better flush of tendu leaves and shifting cultivation, etc.
- c) Another one of the most important cause of forest fires is related to the need of fodder for grazing animals. Although, the availability of permanent pasture or grazing land is about 12.5 million ha, but most of this area is virtually devoid of grass. Therefore, most of the grazing requirement is met from forest area by setting fires to produce new flushes of grass in the dry season.
- d) Campfires and open burning of the waste garbage nearby forest areas also leads to forest fires in some cases.
- e) Some fires occur naturally by lightning, rubbing of *bamboo*, rolling stones, etc.
- f) Fire climate (high temperature, low humidity & high wind velocity) and fire material (leaves litter & grasses) are accelerating factors for the fast spread of fires.

Impact of Forest Fires on Environment

Fire is a major factor of destruction of human settlement and often causes deterioration of site by subsequently increased erosion. If the weather conditions are very dry or windy, the fire burns much faster. A fire may be either beneficial or detrimental to individuals of a particular species but the effect of a single fire is not as environmentally significant as a change to the fire regime. Damage also can be caused by smoke. Smoke in the building smells unpleasant, leaves ashes, and impacts human health. Some of the impacts of forest fires on the environment are listed as below:

- a) One of the most important environmental effects of burning is the increased probability of further burning in subsequent years, as dead trees topple to the ground, opening up the forest to drying by sunlight, and building up the fuel load with an increase in fire-prone species, such as pyrophytic grasses. The most destructive fires occur in forests that have burned previously
- b) Forest fires results in loss of valuable timber resources, degradation of a catchment area, loss of biodiversity and extinction of plants and animals and loss to agriculture and horticulture crops.

- c) Forest fires have a great impact on the physical environment including land cover, biodiversity, climate change, forest ecosystem, and socio-economic system of affected countries. The loss caused by a forest fire is difficult to quantify but an estimate by the economy and environ group has estimated the cost of damage from the Southeast Asian fires .It cause air pollution and depletion of ozone stratum
- d) Forest fires results in loss of carbon sink resource and increase in the percentage of CO₂ in the atmosphere. As per the estimate, 20 million people are in danger of respiratory problems from the fire in Southeast Asia.
- e) The burning of dead leaves and debris contributed immensely to wildfire in the Amazon, total timber losses resulting from surface fires exceed several million dollars per year and may reach tens of millions when large areas of un-logged forest catch fire because of drought-induced fire susceptibility

Conclusions

Forest fires have been a local issue with global impact, which may happen more frequently than the recent past due to impact of rising temperature and global warming. As populations grow with expansion of industrial development into forested areas and climate change alters fire regimes, the risk to communities and infrastructure will likely increase. Mischievous fires and fires which originated from villages near the forest areas are the major causal factors for fire incidences, therefore, sensitization of people and their social awakening through various meeting with villagers/ settlers and awareness campaigns about the negative consequences of forest fires on their health, environment and degradation of natural resources, by State Forest Department can be very effective to prevent forest fires.