Forest fires and their effect on carbon emissions

- During 2003–2017, a total of 5,20,861 active forest fire events were detected in India, and according to the report of the Forest Survey of India, over 54% of the forest cover in India is exposed to occasional fire.
- The study published in *Science of the Total Environment* used remote sensing–based models to measure primary productivity over an area and also looked at burn indices, which help to demarcate the forest fire burn scars using satellite imagery.

Common index

- “The normalized burn ratio is an effective burn index commonly used to identify burnt regions in large fire zones. In normal conditions, healthy vegetation exhibits a very high reflectance in the near-infrared spectral region and considerably low reflectance in the shortwave infrared spectral region. These conditions get dismantled and reversed if a fire occurs,” explains Srikanta Sannigrahi, the first author of the paper in an email to The Hindu. He is a postdoctoral researcher at University College Dublin, Ireland.

Promising tool

- He adds that the spectral differences between healthy vegetation and burnt forest areas can easily be identified and highlighted by remote sensing burn indices. It can be a promising tool for land resource managers and fire officials.
- The team notes that the States of northeast India, Madhya Pradesh, Odisha, Chhattisgarh, Himachal Pradesh and Uttarakhand are the most fire-prone in India.
- Previous studies using forecasting models and in-situ observations in western Himalaya have shown a sharp increase of carbon monoxide, nitrogen oxides and ozone during high fire activity periods.
- The current paper noted very high to high carbon emissions in the eastern Himalayan states, western desert region and lower Himalayan region.
- They note that the occurrence of high fire intensity at the low altitude Himalayan hilly regions may be due to the plant species (pine trees) in the area and proximity to villages.
- Villages make them more susceptible to anthropogenic activities like forest cover clearance, grazing and so on.
Studies have shown that the sharp increase in average and **maximum air temperature**, **decline in precipitation**, change in **land-use patterns** have caused the increased episodes of forest fires in most of the Asian countries.