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## Smog in North India

### Why in news?

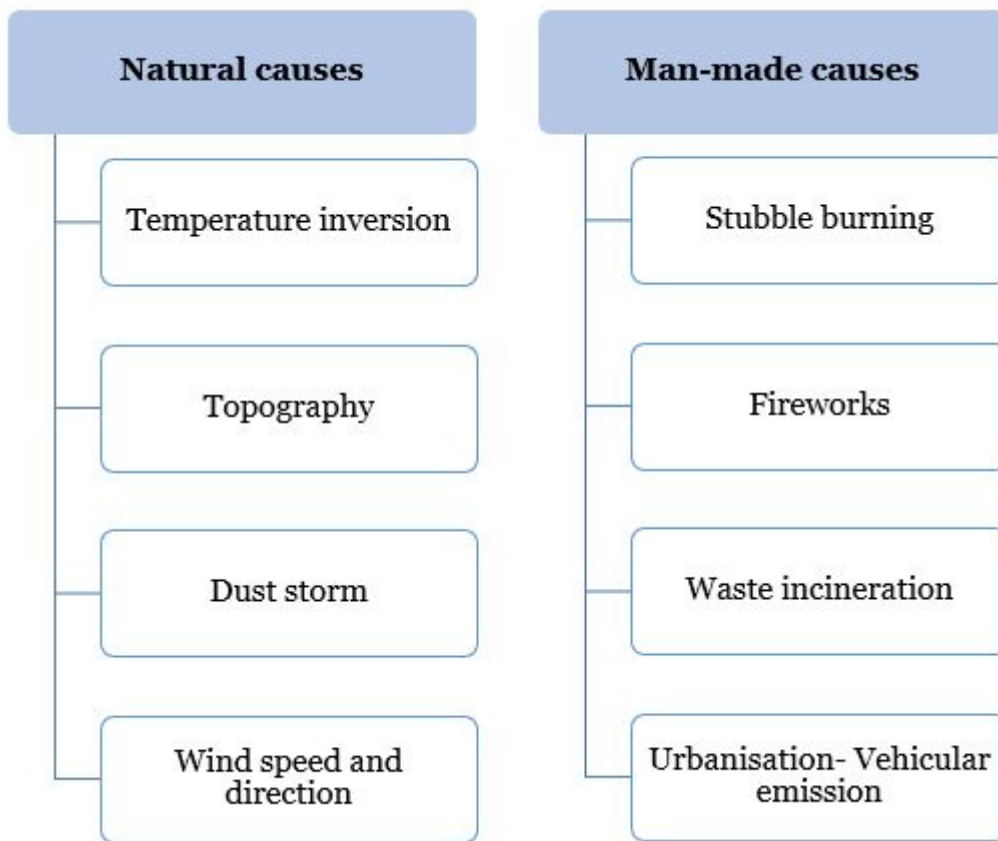
According to scientists, North India can tackle smog using eco-friendly farm practices from the South.

### What is a smog?

- **Smog**= Smoke + Fog
- **Photochemical smog**- It is called as a *Los Angeles smog* which is produced when sunlight reacts with nitrogen oxides and at least one volatile organic compound (VOC) in the atmosphere.
- Sunlight hits these chemicals, thus forming airborne particles and ground-level ozone or smog.
- **Sulphurous smog** -It is called as *London smog* which is caused by the high concentration of sulphur oxides in the atmosphere

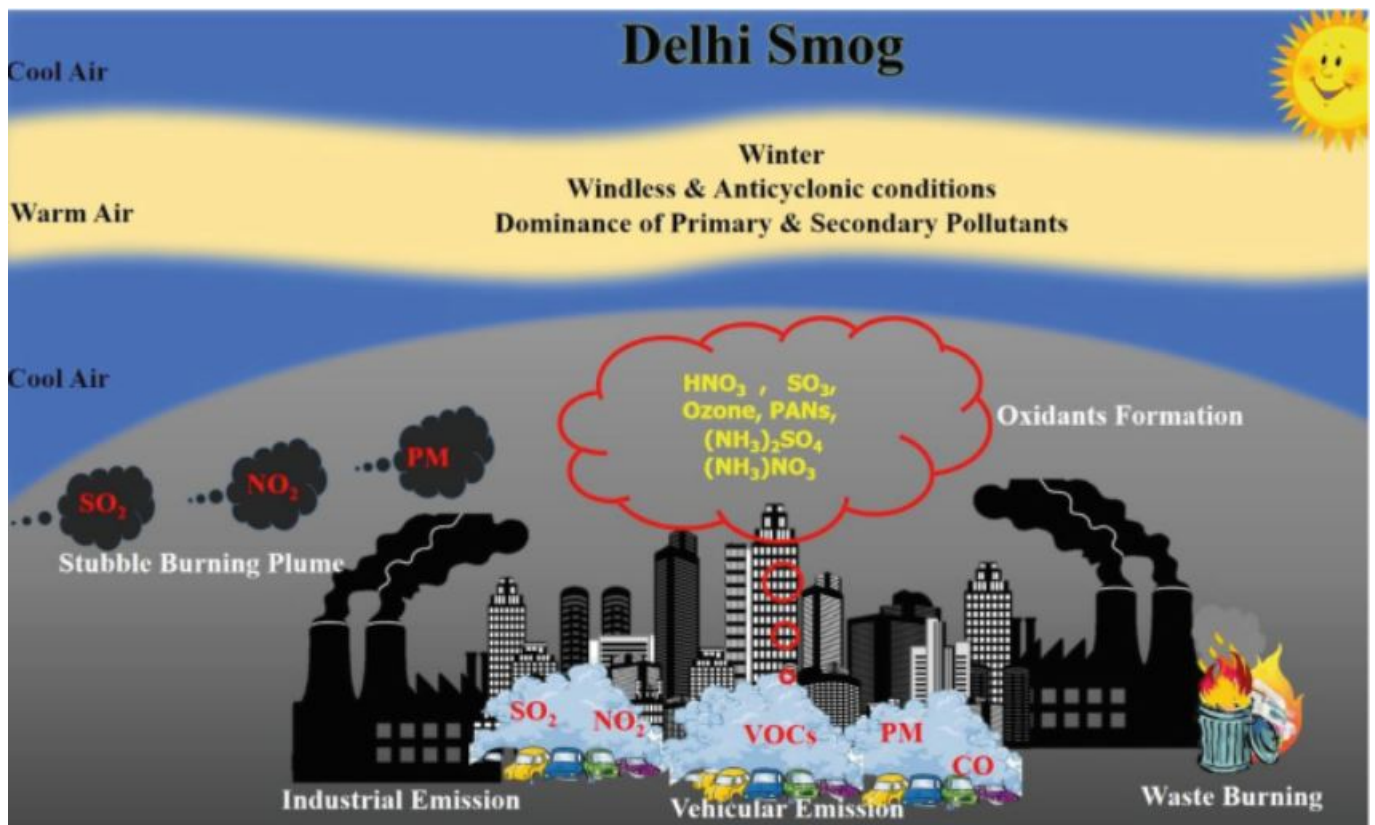
| Type of ozone       | About  |
|---------------------|--|
| Stratospheric ozone | It is high above the Earth, acts as a barrier that protects humans and the environment from excessive amounts of solar ultraviolet radiation.          |
| Ground level ozone  | It is trapped near the ground by heat inversions or other weather conditions, it causes the respiratory distress and burning eyes associated with smog |

### What are the causes of smog in North India?



- **Stubble burning**- The tight window between rice harvesting and wheat planting compels farmers in Punjab and Haryana to resort to burning stubble urgently.
- It produces large amounts of smoke and particulate matter that travel to nearby regions.
- **Urbanisation**- Industries in Delhi and other cities emit pollutants such as sulphur dioxide, nitrogen oxides, and volatile organic compounds that react with sunlight and form smog.
- **Dust**- Construction activities, road dust, and desert storms generate fine dust particles that reduce visibility and worsen air quality.
- **Waste incineration**- Burning of garbage and biomass in open dumps and landfills releases toxic gases and smoke into the air.
- **Fireworks**- During festivals such as Diwali, people burst crackers and fireworks that produce smoke and metal particles that add to the pollution.
- **Vehicle emissions**- The increasing number of vehicles on the roads, especially diesel ones, emit carbon monoxide, nitrogen oxides, and particulate matter that contribute to smog.
- **Temperature inversions**- These are layers of air in which temperature increases with height, instead of decreasing as usual.
- This prevents the vertical mixing of air and traps pollutants near the surface.
- **Topography**- The shape and features of the land, such as mountains and valleys, affect the flow and distribution of cold and warm air.
- This can influence the formation and strength of temperature inversions and the direction of wind currents.
- **Wind speed and direction**- The speed and direction of the wind can affect the transport and dispersion of pollutants.

- Low wind speeds and unfavourable wind directions can result in the accumulation of pollutants over the region.



### What are the consequences of smog?

- **Poor air quality**- Central Pollution Control Board (CPCB) data show the average [Air Quality Index \(AQI\)](#) over the past few days has been consistently above 450 (hazardous category).
- **Health problems**- It can cause or aggravate various health problems such as respiratory diseases, eye irritation, heart disease, birth defects, and reduced growth.
- **Loss of biodiversity**- Smog can inhibit photosynthesis, thereby damaging crops and forests.
- **Climate change**- Smog can also affect the climate by altering the radiative balance of the Earth.
- **Economic losses**- It can reduce the productivity, increase the health care costs, and lower the quality of life.
- **Cultural damage**- A thick layer of smog has engulfed the Mughal era monument *Taj Mahal* leading to discolouration, causing damage to its marble surface and the growth of algae in its walls.

### What can be done to tackle smog?

- **Eco-friendly farming practices**- Indo-Gangetic Plain (IGP) of North India can reduce its smog problem by adopting practices like mulching and nitrogen-fixing that are used in the [Cauvery basin](#) of south India.
  - **Mulching**- It involves covering the soil surface with organic or inorganic materials that can help turn the stubble into natural manure and enrich the soil.

- **Nitrogen fixing**- It involves growing plants that can convert atmospheric nitrogen into plant-available forms thus reducing the need for chemical fertilizers.
- **Alternate crop patterns**- Encourage farmers to shift away from rice and wheat cultivation and grow alternative crops with less stubble output.

## References

1. [Down To Earth- India can tackle smog in North India](#)
2. [NASA- Hazy November in Northern India](#)



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