Environment & Ecology · GS - III

Winter air pollution across the Indo-Gangetic Plain reflects the interaction of regional emission sources and unfavourable meteorological conditions. Analyse the factors responsible for this phenomenon and suggest measures for coordinated regional air-quality management.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 11/11/2026	GS - III	Environment & Ecology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Indo-Gangetic Plain, temperature inversion, atmospheric boundary layer, stubble burning, vehicular emissions, industrial pollution, PM2.5, transboundary pollution, airshed-based management, crop-residue management, regional cooperation.

Model Answer

Introduction

Winter air pollution across the Indo-Gangetic Plain is a recurring environmental challenge. Its severity results from the combination of multiple emission sources and meteorological conditions that restrict pollutant dispersion.

Major Contributing Factors

- **Agricultural burning:** Crop-residue burning releases particulate matter and other pollutants.
- **Urban emissions:** Vehicular exhaust, construction dust, industries and household fuels contribute to pollution loads.
- **Meteorological conditions:** Temperature inversion, low wind speed and a shallow atmospheric boundary layer trap pollutants near the surface.

- **Regional transport:** Air pollutants move across administrative and national boundaries, making the problem regional rather than exclusively local.

Measures for Effective Management

Crop-residue management should promote in-situ decomposition and economically viable alternatives to burning. Cleaner public transport, industrial emission controls and dust management require stronger enforcement. Air-quality monitoring should be integrated through airshed-based planning across states. Regional cooperation, scientific forecasting and public-health advisories can improve preparedness.

Conclusion

Winter air pollution cannot be addressed through isolated city-level interventions. Coordinated emission reduction, agricultural reforms and regional environmental governance are essential for sustainable improvement.

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