Geography · GS - I

Examine the potential of wind energy in India and explain the reasons for their limited spatial spread.

EXAM YEAR	PAPER	SUBJECT
2022	GS - I	Geography

MARKS	WORD LIMIT
10	~150 words

Answer Hint

India possesses substantial wind-energy potential due to its long coastline, favourable coastal and inland wind corridors, and growing renewable-energy infrastructure. However, uneven wind distribution, grid limitations, land constraints, high initial investment and environmental considerations restrict its spatial spread.

Model Answer

Introduction

Wind energy is an important renewable energy source for India’s energy transition. Its potential is concentrated in states with favourable wind speeds and suitable geographical conditions.

Body

Potential of Wind Energy

India has significant wind resources, particularly in Gujarat, Tamil Nadu, Karnataka, Maharashtra, Rajasthan and Andhra Pradesh. Coastal regions, mountain passes and certain inland corridors offer favourable conditions. Offshore wind also presents opportunities along parts of the western and southern coast.

Wind energy can reduce dependence on fossil fuels, lower greenhouse-gas emissions, improve energy security and generate employment.

Reasons for Limited Spatial Spread

1. Uneven Wind Distribution: Suitable wind speeds are concentrated in specific regions and seasons.

2. High Initial Costs: Turbines, land acquisition, transmission infrastructure and installation require substantial investment.

3. Grid Constraints: Weak transmission networks and limited storage can cause curtailment of wind-generated electricity.

4. Land and Environmental Issues: Competing land uses, ecological sensitivity and concerns regarding birds and bats may constrain projects.

5. Project and Regulatory Challenges: Delays in clearances, financing difficulties and transmission connectivity affect expansion.

Conclusion

India’s wind-energy potential is substantial, but wider deployment requires stronger grids, storage, predictable policies, technological improvements and environmentally responsible project planning.

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