Light Pollution in Atacama Desert

Prelims: *Current events of national & international importance | Ecology & Environment | Geography*

Why in News?

Light pollution threatens the Atacama's clear skies, which have supported major astronomical projects such as the Extremely Large Telescope.

- **Light pollution** – It is the excessive, misdirected, or inappropriate use of artificial light, disrupting natural night environments and causing sky glow.
- **Atacama Desert** – It is located in northern Chile, stretching approximately 1,600 km along the Pacific coast.
- **Boundaries** – Pacific Ocean & Coastal Range (west), Andes Mountains (East), Peru (North), Chilean Matorral region (South).
- **Uniqueness –** It is the driest nonpolar desert on Earth, with some areas having no recorded rainfall due to the rain shadow region in the Andes Mountains.
- Famous for its Mars-like landscapes, salt flats, volcanoes, and some of the clearest night skies on Earth.
- **Stargazing Paradise** – Due to its high altitude, clear skies, and nearly zero light pollution, it is home to some of the world's most powerful observatories.

Why the Atacama Desert Matters?

- **Unique conditions** – A rare combination of *dry climate, high altitude* (3,000+ m), and *isolation from urban light pollution* provides 300+ clear nights per year.
- **Global hub** – It acts as an unrivalled hub for *world-class astronomy & home to the world's largest ground-based astronomical projects*.
- Hosts several world-class observatories, such as the Paranal Observatory, forthcoming Extremely Large Telescope (ELT).
    - ***Paranal Observatory*** operated by the European Southern Observatory (ESO).

Photon Valley Corridor *- A high-altitude corridor in Chile, where several observatories operate side by side using some of the most sophisticated instruments ever engineered, where ESO's telescopes are among the most powerful globally.*

- **Scientific importance** – It enables research into the origins of the universe, with visibility sharper than NASA's Hubble.

- **Emerging Threats**
- **Urban & industrial growth** – Mining, wind farms, and sprawl increase artificial light.
- **Energy projects** – A proposed green power complex near Paranal Observatory was cancelled in Jan 2026 after astronomers appealed.
- **Regulatory gaps** – Existing sky-preservation laws are outdated and unclear, prompting Chile's science ministry to review environmental regulations.

Reference

The Hindu | Light pollution in the Atacama Desert

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