Aravalli Range & Dust Storm in Northwest of India

Prelims: *Current events of national and international importance | Geography*

Why in News?

A massive dust storm swept through Rajasthan's Churu district recently, shrouding the sky in dust and turning day into night.

- **Origin -** These ***pre-monsoon convective dust storms locally termed, Andhi*** are driven by intense solar heating during peak summer.
- This extreme heating creates low-pressure centers over the Thar Desert, inducing highly unstable convective updrafts that lift loose, dry desert topsoil into the upper atmosphere.
- **Impacted Areas -** Primarily Western and Northern Rajasthan (Churu, Bikaner, Jaisalmer, Sri Ganganagar).
- Due to high-velocity winds, the dust plume regularly spills over into neighboring Haryana, Punjab, and the National Capital Region (NCR).

Aravalli range

Geography of Aravalli
• The Aravallis are ***ancient fold mountains*** formed during the Proterozoic era The range trends in a Southwest to Northeast (SW-NE) direction. • **Sharing states -** It stretches across 4 states/UTs – Gujarat, Rajasthan Haryana, and Delhi. • **Highest Peak - Guru Shikhar**, located on Mount Abu in Rajasthan. • **Rivers –** Luni, Sabarmati, and Banas River. • **Composition -** The range is highly rich in metamorphic rocks such as quartzites, marbles, schists, and gneisses.

- The Aravalli Range acting as a structural barrier between the ***arid Thar Desert and the fertile Indo-Gangetic Plains.***
- **Physical Shield -** The SW-NE alignment of the Aravalli hills physically blocks lower-tropospheric desert dust from moving eastward into the fertile agricultural belt of the Gangetic Plains.

- **Monsoon Interception -** The range acts as a climatic divide.
- While it runs parallel to the Arabian Sea branch of the Southwest Monsoon (causing Western Rajasthan to remain a rain-shadow zone), its eastern slopes intercept moisture, keeping the Gangetic basin fertile.
- **Degradation of the Aravalli Range-** The protective capacity of the Aravallis is actively degrading due to human-induced factors.
    - **Rocky Gap Expansion -** The Aravalli Range is highly fragmented, featuring at least 28 documented natural gaps.
    - Massive illegal mining and hill flattening have widened these gaps, creating wind-conduits that allow Thar dust storms to easily breach into Delhi-NCR and Western UP.
    - **Loss of Green Cover** - Severe deforestation and unplanned urbanization along the foothills have destroyed the vegetative "green wall" that historically anchored shifting sand dunes.
    - **Desertification -** The weakening of this barrier accelerates the eastward creep of the Thar Desert, threatening the food security of the Indo-Gangetic plains by degrading soil quality and reducing visibility across Northern India.



Reference

[The Indian Express | Churu dust storm]



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