



Critical Threats Facing the Aravallis

For Prelims: [Aravali Green Wall Project](#), [Land Degradation and Desertification in India](#), [Conserving Forests for a Sustainable Future](#), [Mountain Ranges in India](#), [Mountain Ranges in World](#)

For Mains: Loss of flora and fauna, impact of deforestation on biodiversity, Role of the Aravalis in regional ecology, climate, and water systems.

Source: TH

Why in News?

A recent scientific study **on land use dynamics in the Aravallis** has highlighted that the ongoing destruction of the hills has resulted in significant biodiversity loss, soil degradation, and reduced vegetation cover.

What are the Key Challenges Highlighted in the Study Regarding the Aravallis?

- **Loss of Hills:** Between 1975 and 2019, **nearly 8% (5,772.7 sq km) of the Aravali hills have disappeared**, with 5% (3,676 sq km) **converted into barren land** and 1% (776.8 sq km) into settlements.
 - The destruction of the hills has enabled the **Thar desert's** expansion toward the **National Capital Region**, causing increased desertification, higher pollution, and erratic weather.
- **Increase in Mining Area:** From 1.8% in 1975 to 2.2% in 2019.
 - **"Explosive" urbanization and unchecked mining** are key contributors to the ongoing deterioration of the Aravali hills.
 - Over 25% of the Aravallis and 31 hill ranges in Rajasthan have vanished due to illegal quarrying.
 - Mining contributes to the major air pollution in the NCR region, especially through **Respirable Particulate Matter (RPM)**.
- **Increase in Human Settlements:** From **4.5% in 1975 to 13.3% in 2019**.
- **Forest Cover:** In the **central range dropped by 32%** between 1975-2019, with a significant **rise in cultivated land**.
 - During 1999 to 2019, the forest area decreased **up to 0.9% of total area**.
 - The average annual **deforestation rate was 0.57%** during the study period.
- **Impact on Water Bodies:** **Water bodies** expanded from **1.7% in 1975 to 1.9% in 1989**, but have since **steadily declined**.
 - Mining to great depths has punctured **aquifers**, **disturbing water flow, drying lakes, and creating new water bodies** due to depressions left by illegal miners.
- **Impact of Protected Areas in Aravalis:** **Todgarh-Raoli and Kumbhalgarh wildlife sanctuaries** in the central Aravali Range **positively impacted the eco-sensitive zone**, leading to minimal forest depletion.
- **Enhanced Vegetation Index (EVI):** **EVI** least value of 0 to -0.2 in upper central Aravali region (Nagaur district) - indicating unhealthy vegetation.

- **Future Projections:** By 2059, the total **loss of Aravali area is projected to reach 22%** (16,360 sq km), with 3.5% (2,628.6 sq km) of the total area likely to be used for mining.
- **Other Major Challenges faced by Aravalis:**
 - Significant decline in flora and fauna, including leopards, striped hyenas, golden jackals, and other species.
 - Many rivers originating in the Aravallis, like **Banas, Luni, Sahibi, and Sakhi, are now dead.**
 - Loss of natural forests along the Aravallis has escalated human-wildlife conflicts.

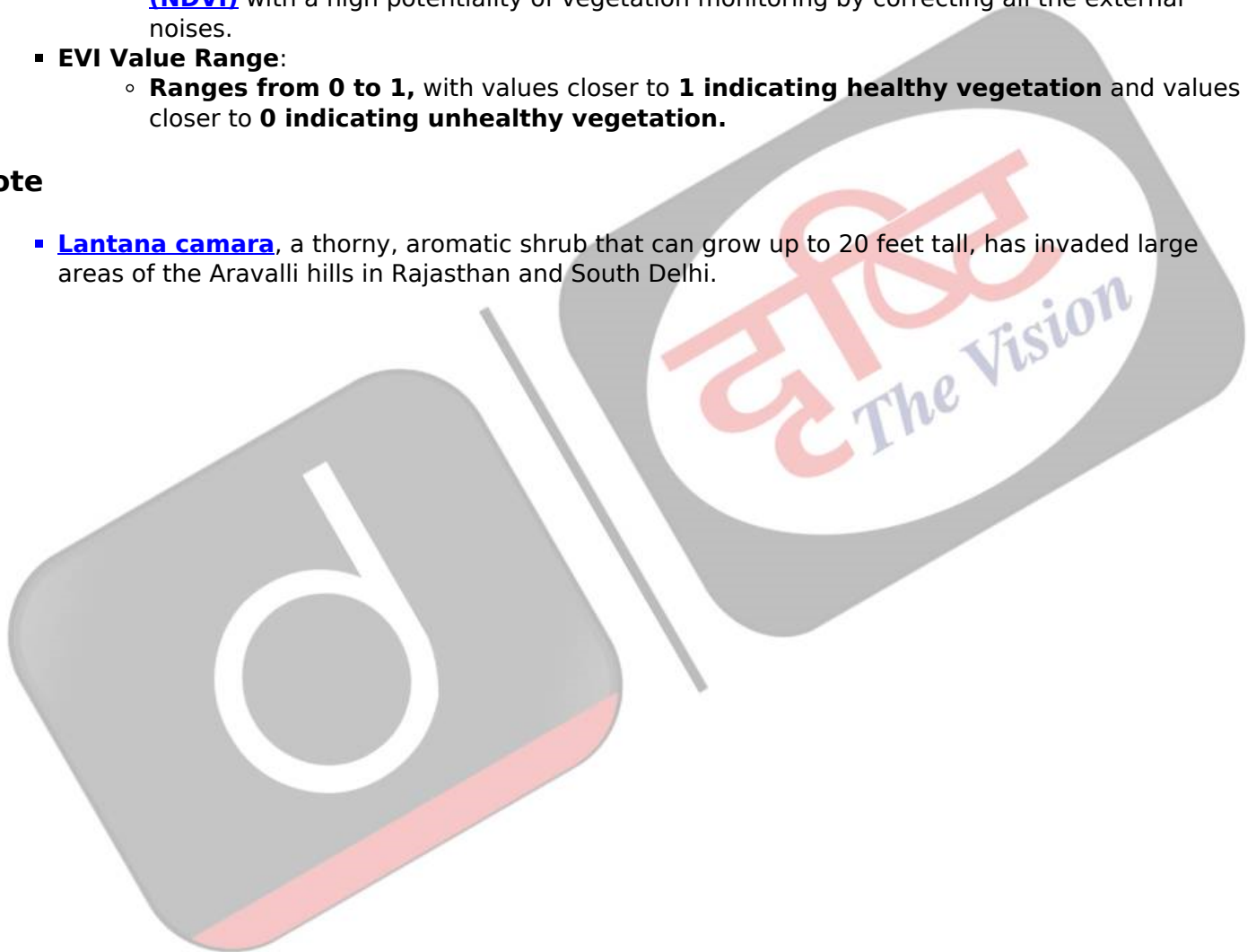
What is Enhanced Vegetation Index (EVI)?

- **About:**
 - EVI is an **advanced vegetation index created with higher sensitivity to biomass**, atmospheric background, and soil condition.
 - It is regarded as the modified version of **Normalized Difference Vegetation Index (NDVI)** with a high potentiality of vegetation monitoring by correcting all the external noises.
- **EVI Value Range:**
 - **Ranges from 0 to 1**, with values closer to **1 indicating healthy vegetation** and values closer to **0 indicating unhealthy vegetation.**

Note

- **Lantana camara**, a thorny, aromatic shrub that can grow up to 20 feet tall, has invaded large areas of the Aravalli hills in Rajasthan and South Delhi.

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'3.5% OF HILLS TO BE TAKEN UP FOR MINING BY 2059'

RECEDING HILLS

5772.7 sq km

7.6% of total forest land in the Aravalis was flattened between 1975 and 2019

16,360 sq km

21.6% of the Aravalis will be lost by 2059 if the degradation continues, according to projections

MINING RAMPANT

1,650.3 sq km

2.2% of Aravali area where illegal mining was active in 2019

2,628.6 sq km

3.5% of the hills will be taken up for mining by 2059, according to projections



ARAVALI REGION

CONSEQUENCES



Desert-like conditions will expand from Thar in Rajasthan towards north India, including Delhi-NCR. Sandstorms may become more frequent.



Loss of wildlife habitat and indigenous flora of the hills.

What are the Key Facts About Aravalis?

▪ About:

- The Aravali Range extends from Gujarat to Delhi through Rajasthan, 692 km in length and varies between 10 to 120 km in width.
 - The range acts as a natural green wall, **with 80% located in Rajasthan and 20% in Haryana, Delhi, and Gujarat.**
- The Aravali mountains are divided into two, main ranges – **the Sambhar Sirohi Range and the Sambhar Khetri Range in Rajasthan**, where their extension is about 560 km.
- **It serves as an ecotone between the Thar Desert and the Gangetic Plain.**
 - Ecotones are areas where **two or more ecosystems, biological communities, or biotic regions meet.**
- **Gurusikhar (Rajasthan), the highest peak in the range, reaches an elevation of 1,722 meters.**

▪ Significance of Aravalis:

- The Aravalis **prevent the Thar Desert from encroaching** on the Indo-Gangetic plains, historically serving as a catchment for rivers and plains.

- The range **supports 300 native plant species, 120 bird species**, and exclusive animals like jackals and mongooses.
- During **monsoons**, the Aravallis **direct monsoon clouds eastward**, benefiting sub-Himalayan rivers and North Indian plains. In winter, they **shield fertile valleys from cold westerly winds**.
- The range **aids in groundwater replenishment** by absorbing rainwater, thus reviving groundwater levels.
- The Aravallis act as the **“lungs” for Delhi-NCR**, mitigating some effects of the **region's severe air pollution**.

What are the Supreme Court’s Rulings and Legal Notifications on the Aravallis?

- **2018 Ruling:** Banned illegal construction activities in the Aravalli range in Haryana, directing the demolition of the Kant Enclave and reimbursement to investors.
- **2009 Order:** Imposed a ban on mining throughout the Aravallis.
- **2002 Order:** Prohibited mining activities in Haryana due to large-scale degradation.
- **1996 Ruling:** Mandated that mining leases could not be renewed within 2-5 km radius of Badkhal Lake without permission from pollution control boards.
- **Precautionary Principle (1996):** **Supreme Court** established the principle that governments must foresee and prevent environmental degradation without waiting for scientific evidence (**Vellore Citizens Welfare Forum v Union of India**).
- **National Green Tribunal (2010):** Adopted the precautionary principle for environmental decisions under Section 20 of the **NGT Act**.
- **MoEFCC Notification (1992):** Prohibited new industries, mining, deforestation, and construction in the Aravalli range without prior permission from the MoEFC
- **Other Measures taken by Government: Creation of Commission for Air Quality Management in the NCR to deal with the Air Pollution menace in the region.**
 - To prevent illegal mining in the Aravalis, a seven-member **"Aravalli Rejuvenation Board" has been established in Gurugram.**

Way Forward

- **Implement the Aravali Green Wall Project:** Develop a **1,400 km long and 5 km wide** green belt around the Aravalli range.
 - **Rejuvenate 75 water bodies and cover** degraded lands in Haryana, Rajasthan, Gujarat, and Delhi.
 - This project, inspired by Africa's **'Great Green Wall,'** aims to restore ecological balance and combat desertification.
- **Adopt Successful Restoration Models:** Follow the successful example of the **biodiversity park in Gurgaon** by partnering with civil society, corporates, and residents for tree planting and habitat restoration.
 - Engage ecologists and local volunteers **to create self-sustaining ecosystems** within the Aravalli region.
- **Strengthen Legal and Regulatory Measures:** Enforce existing Supreme Court rulings and legal notifications to prevent illegal mining and construction.
 - Ensure compliance with **environmental regulations and integrate precautionary principles** to safeguard the Aravalli range from further degradation.
 - Implement strict **zoning laws to prevent further encroachment and illegal settlements** in the Aravalis.
- **Empower bodies** like **Aravali Rejuvenation Board** to deal with the menace of illegal mining.

Conclusion

The future of the Aravali Range hinges on **immediate and effective action** to curb ongoing environmental degradation. With projections **indicating a 22% loss by 2059** and the expansion of mining and urbanization, it is crucial to enforce legal measures strictly and invest in **large-scale restoration projects like the Aravali Green Wall**. By implementing innovative conservation models

and adhering to judicial rulings, we can safeguard this vital ecological barrier, protect biodiversity, and mitigate adverse climate **impacts for future generations.**

Drishti Mains Question

Q. Examine the impact of illegal mining and urbanization on the Aravali Range, and discuss the effectiveness of recent Supreme Court rulings in mitigating these issues.

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