GULLY EROSION: GEOGRAPHY

NEWS: Climate change and land-use changes exacerbate gully erosion, which is a major driver of land degradation across the world

WHAT'S IN THE NEWS?

Gully erosion, a severe form of land degradation, is threatening progress on key Sustainable Development Goals by damaging soil fertility, water resources, and ecosystems. Urgent preventive and restorative actions like reforestation and land-use planning are needed to tackle this silent crisis in India and globally.

Context and Global Relevance of Gully Erosion

- A recent *Scientific Reports* paper warns that gully erosion threatens progress on at least 9 out of 17 Sustainable Development Goals (SDGs).
- The most affected SDGs include Zero Hunger (SDG 2), Clean Water and Sanitation (SDG 6), and Climate Action (SDG 13).
- Gully erosion, though often overlooked, is emerging as a critical environmental crisis with widespread implications.

What is Gully Erosion?

- Gully erosion is a severe form of land degradation characterized by the formation of deep channels or gullies due to intense surface and subsurface water runoff.
- Unlike sheet or rill erosion, it causes irreversible loss of land by carving through the soil structure.
- It results in high specific soil losses, making the land unsuitable for cultivation and other purposes.

Status of Gully Erosion Worldwide and in India

- Globally, 51 locations have reported major gully-related disasters, with Nigeria alone accounting for 15 such cases.
- In India, gully formations are recorded in 19 states and Delhi.
- Worst-affected Indian states include Jharkhand, Chhattisgarh, Madhya Pradesh, and Rajasthan, which face recurring land degradation due to gullies.

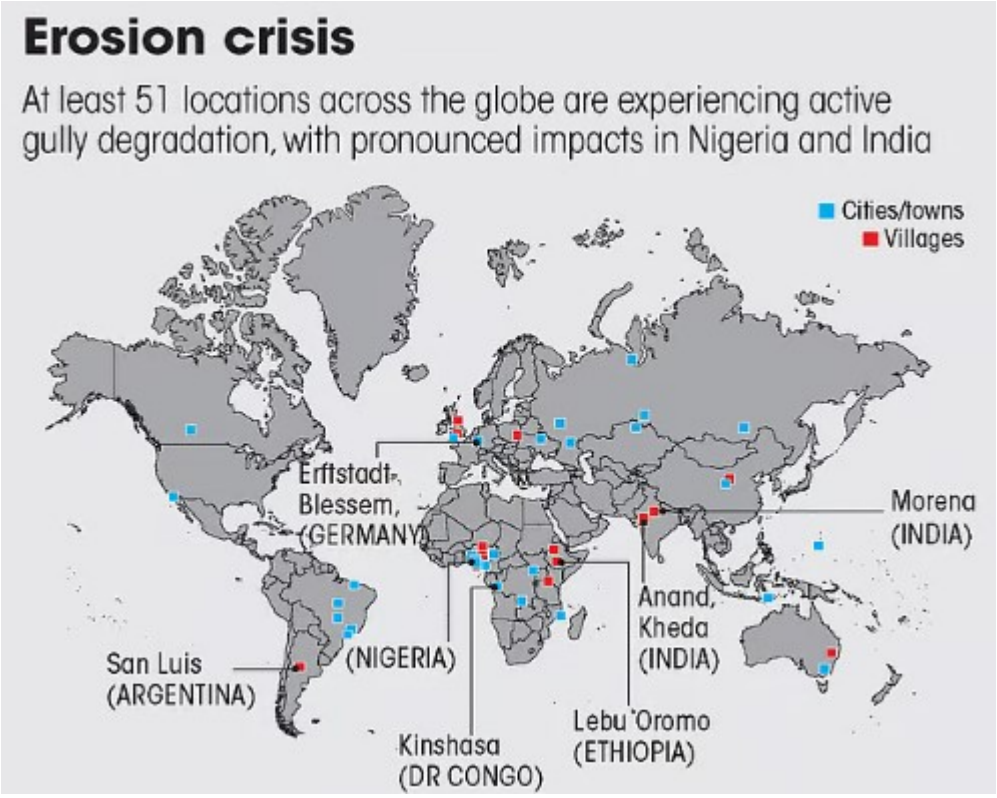
Causes of Gully Erosion

- Loss of Vegetation Cover: Trees and grasses protect soil; their absence makes soil loose and vulnerable to erosion, especially during heavy rains.
- Extreme Weather Patterns: Long dry spells followed by intense rainfall episodes increase runoff and reduce vegetative protection, accelerating erosion.
- Improper Waste Disposal: Dumping solid waste in drainage channels blocks the natural flow, creating water turbulence that enlarges gullies during storms.
- Weak Soil Composition: Areas with sandy or loosely packed soil (e.g., parts of Jharkhand and Chhattisgarh) are naturally more prone to gully formation under water pressure.

Impacts of Gully Erosion

- Loss of Fertile Topsoil: Gully erosion strips away the nutrient-rich top layer, crucial for agriculture. Its regeneration takes decades to centuries.
- Threat to Food Security: With reduced agricultural productivity, farmers' incomes decline, and SDG 2 (Zero Hunger) is severely impacted.
- Water Resource Depletion: Gullies reduce the land's ability to retain water, increasing surface runoff and decreasing groundwater recharge, leading to water scarcity and droughts—a setback to SDG 6.

- Ecosystem Degradation: It leads to habitat loss, biodiversity decline, and ecological imbalance, especially affecting local flora and fauna.
- Sediment Pollution: Displaced soil ends up in rivers and reservoirs, causing siltation, water pollution, and reduced storage capacities for irrigation and drinking water.



Solutions and Way Ahead

- Reforestation: Planting native trees and grasses in affected areas can stabilize soil and restore the ecological balance in catchments.
- Scientific Land Use Planning: Practices like contour farming, agroforestry, and terracing help reduce water flow speed and prevent soil displacement.
- Check Dams and Barriers: Building small dams using local materials like stones, logs, or concrete slows down water, encourages sediment deposition, and stabilizes gully beds.

- Community-Based Initiatives: Involving local communities in land restoration and awareness campaigns ensures sustainable outcomes.

Concluding Observations

- Gully erosion is a neglected environmental issue with serious long-term implications.
- India's commitment under the UN Convention to Combat Desertification to restore 26 million hectares of degraded land by 2030 must include focused strategies to prevent and mitigate gully erosion.
- Effective action requires a blend of ecological restoration, policy support, community engagement, and scientific planning to ensure land productivity and sustainability.

Source: https://www.downtoearth.org.in/environment/invisible-scars