



General Studies-3; Topic: Disaster and disaster management.

Landslides in India in 2024

Introduction

- The year 2024 witnessed devastating landslides across various regions of India.
- These landslides were often exacerbated by human-induced factors such as unregulated construction, deforestation, and poor land management, combined with natural triggers like heavy rainfall.

Causes of Landslides

- **Natural Causes:**
 - **Heavy Rainfall:** A primary trigger in regions like Kerala and Uttarakhand.
 - **Geological Instability:** Hillsides in regions like the Western Ghats and Himalayas are inherently fragile.
- **Anthropogenic Causes:**
 - **Deforestation:** Loss of tree cover leads to soil destabilization and increased erosion.
 - **Excessive Construction:** Unplanned development of roads and buildings weakens slopes.
 - **Mining Activities:** Widespread mining loosens soil and rocks, increasing landslide susceptibility.
 - **Industrial Waste Dumping:** Weakens soil structure and reduces its water retention capacity.
 - **Improper Agricultural Practices:** Overgrazing and chemical fertilizers degrade soil quality, leading to erosion.

Implications of Landslides

- Hundreds of fatalities and injuries in Wayanad and Shirur highlight the catastrophic impact on human life.
- Destruction of homes and infrastructure in Vilangad and Uttarakhand led to massive economic losses.
- Soil erosion and loss of topsoil undermine land productivity.
- Deforestation and mining activities exacerbate ecosystem damage.
- Repair and rehabilitation efforts impose a significant financial burden on local and state governments.

- Landslides force vulnerable populations to relocate, creating socio-economic challenges.

Broader Land Degradation Issues

- **State of India's Land Resources:**
 - Of India's 329 million hectares of land, only 250 mha are usable.
 - 175 mha of agricultural land suffers from erosion, salinity, alkalinity, or water-logging.
 - Urban sprawl and barren lands further reduce arable land availability.
- **Impact of Human Activities:**
 - Overpopulation, excessive groundwater extraction, and unregulated development degrade land quality.
 - Chennai, for instance, has lost 60% of its water bodies, exacerbating urban flooding risks.
- **Role of Vegetation and Forests:**
 - Forest cover is critical for reducing soil erosion, improving water retention, and supporting biodiversity.
 - India's forest cover is about 22%, but tree cover is only 3%.

The Role of Soil Health in Preventing Landslides

- Soil acts as a filter, water reservoir, and habitat for millions of organisms.
- Healthy soil mitigates the impact of extreme weather events and regulates climate.
- **Restoration Strategies:**
 - **Traditional Practices:** Utilizing organic fertilizers and crop rotation to replenish soil nutrients.
 - **Reforestation:** Trees add organic matter, prevent erosion, and enhance microbial life.
 - **Urban Planning:** Protecting natural water bodies and green cover during development projects.

Way Forward

- **Enforce stringent land-use regulations** to prevent deforestation and unregulated construction.
- **Implement stricter mining controls** to limit environmental degradation.
- **Develop landslide prediction models** using meteorological and geological data.
- Equip vulnerable regions with rapid response mechanisms.
- **Raise awareness about soil conservation practices.**
- **Promote local participation in afforestation drives** and soil health monitoring.
- **Adopt sustainable construction techniques**, especially in ecologically sensitive zones.
- Ensure roads and buildings are designed to withstand heavy rains and seismic activities.
- **Leverage international frameworks** like the **UN's Decade of Soils** to integrate global best practices.
- Partner with institutions to fund soil and land restoration programs.

Conclusion

- The landslides of 2024 underscore the urgent need for sustainable land management and disaster preparedness. Moving forward, India must prioritize land and soil health as a national resource.
- By treating soil as a living, finite resource, we can ensure ecological balance, safeguard livelihoods, and prevent the recurrence of such catastrophic events.