Landslides in Kerala

Why in news?

The death toll from the Wayanad landslides crossed 400 and around 152 people are still missing.

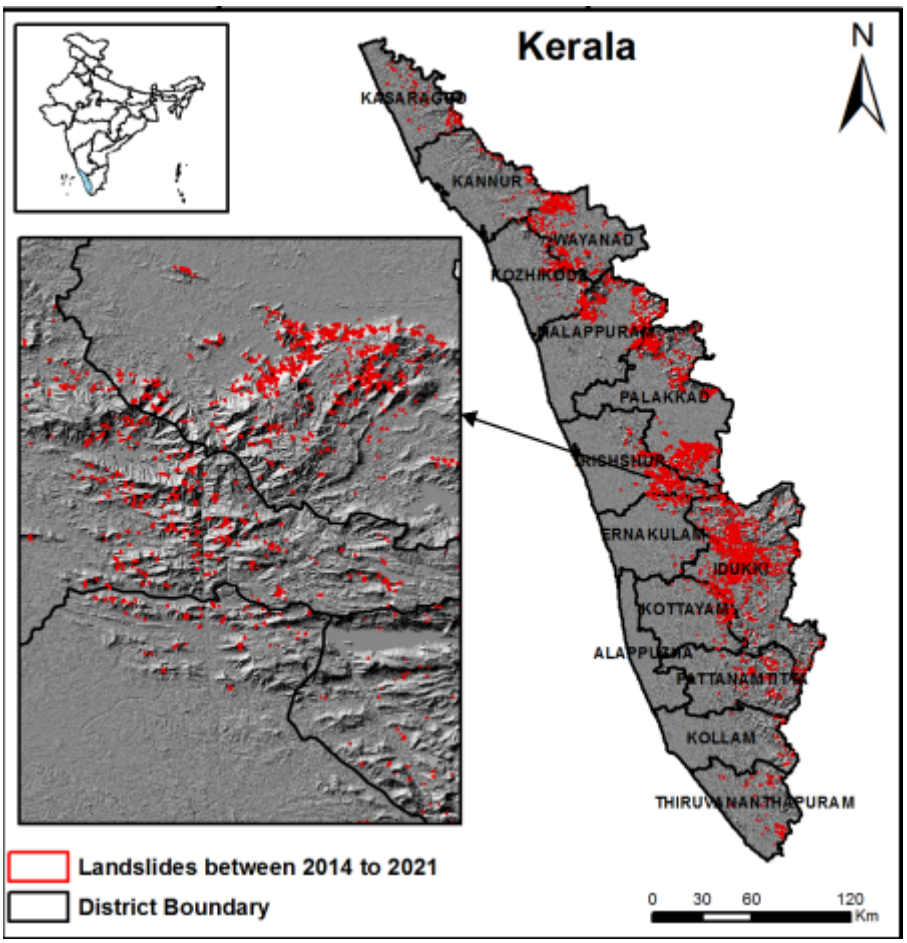
What is landslide?

- **Landslides** – They are hydro-geological hazards of mass wasting of rock falls, mudflows, shallow or deep-seated slope failures and debris flows happening over surface and sub-surface.
- **Impacts** – It leads loss of live and large scale destruction of infrastructures, properties and industries.
- It profoundly alters the landscape of the region causing loss of flora and fauna.
- It changes the course of river and divert in path.
- It forces people in the region to migrate.
- **India** - 15 % of the India's landmass is prone to landslides.
- It includes majorly of
    - Himalayas
    - The Northeastern hill ranges
    - The Western Ghats and the Nilgiris
    - The Eastern Ghats
    - The Vindhyas
- **Measure taken** – Government had formed Gadgil expert committee in 2011 and Kasturirangan committee in 2012.
- Landslide atlas has been prepared by ISROs National Remote Sensing Center and *National Landslide Risk Management Strategy* has been formed by National Disaster Management Authority.
- Monitoring by satellites like *IRS-1D , Resourcesat, Cartosat, Sentinel* , InSAR are used.
- River Basin specific *Flood Early Warning System* was developed to handle the landslide associated with floods.
- *Landslide Risk Mitigation Scheme* (LRMS) was started to provide financial support for landslide prone states.

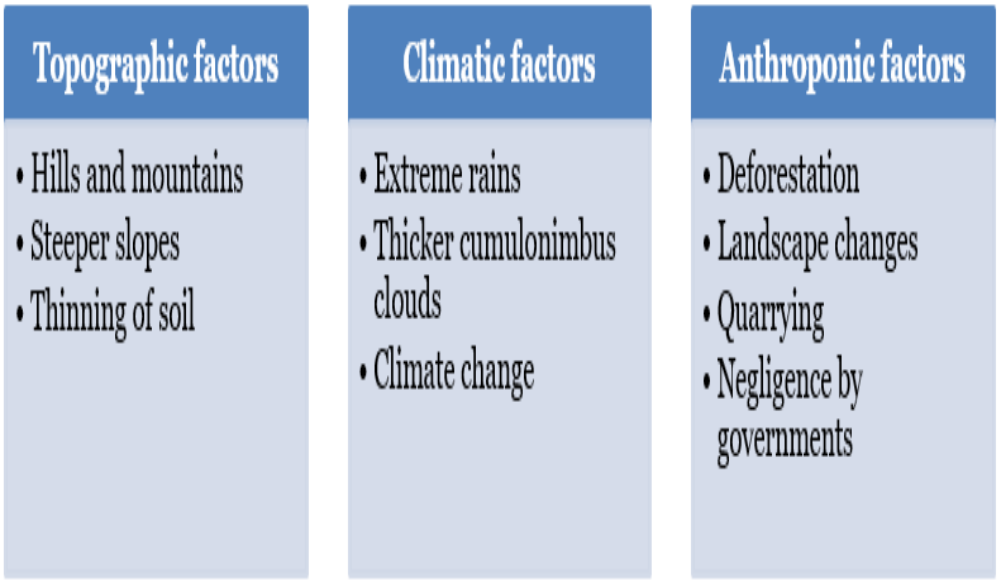
Why Kerala is prone to landslide disaster?

- **Landslide in Western Ghats** – It is characterized by a lateritic cap and steep slopes in Western Ghats in the South Konkan coast besides Nilgiris.
    - Laterite cap – Thick laterite soil cover.
- **Vulnerability of Kerala** - About 8% of the area in the Western Ghats in the Kerala is labelled as a critical zone for mass movements.
- According to the landslide atlas in 2023, 10 out of the 30 most landslide-prone districts

in India were located in Kerala, with Wayanad ranked 13th.



- **Status of Kerala's vulnerability** - Of the 3,782 landslides between 2015 and 2022, 2,239 (nearly 59.2%) were reported from Kerala.
- In 2022, the Ministry of Earth Sciences informed that Kerala witnessed the highest number of major landslides in the country over the past seven years.
- **Causes** – There are natural and man-made causes.



- **Geographic vulnerability** – Roughly *50% of Kerala consists of hills and mountainous*

regions with *slopes greater than 20 degrees*, making these areas prone to landslides during heavy rains.

- **Disruption in soil cover** - Western Ghats in Kerala are marked by thick soil cover but human interventions have affected them.
- During monsoon, the soil gets saturated due to percolating rainwater, making it unstable and when the water content reaches a threshold level, the soil mass becomes weak triggering debris flows.
- **Changing nature of clouds** – The *thicker cumulonimbus clouds*, which extend up to 14 km in height and could *create sudden, short spells of heavy rain* over smaller areas, are forming over Kerala during the Southwest monsoon.
- Earlier, low-hanging, thinner clouds were usually the norm.
- **Extreme rains** – It is intensifying across India and over the Western Ghats from Kerala to Maharashtra.
- **Cyclones in Arabian Sea** - The Arabian Sea is warming at a high rate and with it, the possibility of severe cyclonic storms is rising.
- All over Kerala, the monsoon pattern has been changing.
- **Climate change** – Spells of heavy rain, which lead to calamities like floods and landslides, are a result of climate change induced by global warming.
- **Anthropogenic causes** – There is *widespread deforestation* and *denuding of hills* due to landform changes.
- **Unsustainable developments** – Unscientific construction activities in vulnerable areas also lead to disasters.
- **Deforestation** – Reduction in forest cover makes the soil in the slopes loose and increase the fragility of the terrain.
- 59% of the total landslides in Kerala occurred in plantation areas.
- **Lack of updated data** - Engineering structures are being built based on the amount of rainfall and intensity of rainfall in older days.
- **Blockage of water channels** – Small drainage channels present on the surface of the hilly areas are blocked by erecting buildings and contour bunds block their natural flow.
- During the rains, the water that percolates get concentrated leading to increased pore pressure along the channel.
- **Indiscriminate quarrying** – Such activities in Ecologically Sensitive Areas (ESAs) make the landscape unstable.
- **Misgovernance** – Measures recommended by the expert committed were neglected.
    - In 2011, Western Ghats Ecology Expert Panel led by Madhav Gadgil had had recommended that the *entire Western Ghats* be notified as ESAs.
    - The Kasturirangan committee reduced the extent of ESAs to ***37%*** of the Western Ghats.

What lies ahead?

- There is a need to rethink new or added risk factors while constructing roads or culverts.
- All mountain drainage channels should be free helping easy runoff.
- Maintaining adequate buffer zones in constructing buildings on or near water channels.

- Ban on mining, quarrying and other red category industries new thermal power plants, hydropower projects and large-scale wind energy projects in ecologically sensitive zones.
- Increase the forest cover in the region with endemic species of trees.
- Reducing the population pressure on eco sensitive sensitive regions.
- Implementing the Gadkil and Kasturirangan expert committee recommendations.
- Sensitizing people, tourism and industries sector about the ecological vulnerability of the region.
- Development of landslide early warning systems.
- Capacity development of National and State Disaster Management Authorities to handle landslides.

References

1. New Indian Express | Increased death toll in Wayanad Landslide
2. First Post | Vulnerability of Kerala
3. Front Line| Changing Nature of Relief and Climate in Kerala

