Joshimath Crisis

Why in news?

Almost a week after cracks appeared in many roads and hundreds of houses of Joshimath, Uttarakhand, authorities declared it a landslide and subsidence-hit zone.

What is land subsidence?

- According to the US-based National Oceanic and Atmospheric Administration (NOAA), land subsidence is the **sinking of the ground** because of underground material movement.
- This phenomenon can happen over very large areas like whole states or provinces, or very small areas like the corner of house yard.
- **Reasons** - This phenomenon can happen for a host of reasons, man-made or natural, such as the removal of water, oil, or natural resources, along with mining activities.
- Earthquakes, soil erosion, and soil compaction are also some of the well-known causes of subsidence.

What can be the reasons behind Joshimath's subsidence?

- The exact reason behind Joshimath land subsidence is still unknown.
- But experts suggest that the incident might have occurred due to a massive infrastructural project called the **Char Dham road project** that is being implemented in the Uttarakhand Himalaya.
- The residents have also blamed NTPC's **Tapovan Vishnugad Hydro Power Project** for the incident.
- They allege that the tunnel had water seepage "from a punctured aquifer, leading to the drying of water sources in Joshimath."
- But NTPC denied the allegations saying that the tunnel built by NTPC does not pass under Joshimath town.
- Other reasons may be
    1. Unplanned construction,
    2. Over-population, and
    3. Obstruction of the natural flow of water and hydel power activities.
- Not only this, the area is a seismic zone, which makes it prone to frequent earthquakes.
- The possibility of a land subsidence incident happening in the region was first highlighted around 50 years by the MC Mishra committee report was published.
- This report also cautioned against "unplanned development in this area, and identified the natural vulnerabilities."
- **Lack of a proper drainage system** - result of unplanned construction - might have also contributed to the sinking of the area.

- Reports have pointed out that subsidence in Joshimath might have been triggered by the **reactivation of a geographic fault** where the Indian Plate has pushed under the Eurasian Plate along the Himalayas.

A geographic fault is defined as a fracture or zone of fractures between two blocks of rock.

Why Joshimath city is extremely vulnerable?

- Joshimath city has been **built on an ancient landslide material** - meaning it rests on a deposit of sand and stone, not rock, which doesn't have high load-bearing capacity.
- This makes the area extremely vulnerable to ever-burgeoning infrastructure and population.

What are the future plans of the government?

- In the next decade, the Government proposes to build 66 tunnels in the Uttarakhand Himalaya and 18 tunnels are already in operation.
- Building these subsurface structures could result in gross damage to the environment, including
    1. concentration of pollutants from traffic exhaust compounded by a microenvironment with no sunlight and
    2. limited dispersion in such long-distance tunnels.
- The constant vibrations during the train movements will keep the mountain slope eternally unstable and thus, make it vulnerable to slide at the slightest trigger.

The construction of highways and railway tracks has become a prime cause for landslides and its occurrences have doubled over the years.

What could be done?

- A development strategy for the Himalayas should be primarily based on the region's natural resources such as biodiversity, ecotourism, etc
- Rather than building massive dams, focus should be on small projects that would be helpful in providing local energy supply.
- Most of the farmers have now abandoned their traditional practices and only less than 20% of the agricultural land in the Himalayan districts of Uttarakhand is now being farmed and the rest has become fallow land.
- An appropriate strategy for human well-being should use traditional knowledge, agricultural practices, construction practices and local cultural aspects.
- Going by the past experiences of forming expert committees and having their recommendations ignored, it is not clear what benefit would accrue by creating another one by the government.
- The Joshimath episode is a warning that the Himalayan environment may not be able to withstand another push generated by intrusive anthropogenic activities.

Reference

1. The Hindu | A mountain reeling under human aggression
2. Indian Express | Joshimath crisis: What is land subsidence and why does it happen?
3. Down To Earth | After Joshimath, it could be Karnaprayag, Nainital and other Uttarakhand towns next, say experts

