



## Joshimath Land Subsidence

**Prelims:** Natural Disaster, Floods, Draughts, Landslide, Joshimath.

**Mains:** Reason for Joshimath Land Subsidence and Related Concerns.

### Why in News?

Due to land subsidence, Joshimath - a key transit point for tourists travelling to Badrinath and Hemkund Sahib - developed cracks, **causing panic and protests among the local population.**

- Joshimath has been declared a [landslide-subsidence zone](#) and over 60 families living in uninhabitable houses in the sinking town have been evacuated to temporary relief centres.

### Where is Joshimath Located?

- Joshimath is a hilly town located on the **Rishikesh-Badrinath National Highway (NH-7) in Chamoli district of Uttarakhand.**
- The city serves as a **tourist town as it acts as an overnight rest stop for people visiting Badrinath, Auli, Valley of Flowers, and Hemkund Sahib, among other important religious and tourist locations** in the state.
- Joshimath is also of great strategic importance to **the Indian armed forces and is home to one of the Army's** most important cantonments.
- The town (fall in [high-risk seismic Zone-V](#)) is traversed by running streams with a high **gradient from Vishnuprayag, a confluence of the Dhauliganga and the Alaknanda rivers.**
- It is home to one of the **four cardinal maths or monasteries established by Adi Shankara - Sringeri in Karnataka, Dwarka in Gujarat, Puri in Odisha and Joshimath near Badrinath in Uttarakhand.**



## Why is Joshimath Sinking?

### ▪ Background:

- Cracks on walls and buildings were **first reported in 2021**, as Chamoli district of Uttarakhand experienced frequent landslides and flooding.
- As per reports, the Uttarakhand government's expert panel in 2022 found that several pockets of **Joshimath are "sinking" owing to man-made and natural factors.**
- It was found that a gradual settling or sudden sinking of the earth's surface due **to the removal or displacement of subsurface materials** — has induced structural defects and damage in almost all wards of the city.

### ▪ Reasons:

- **Site of an Ancient landslide:** According to the **1976 Mishra Committee report, Joshimath lies on a deposit of sand and stone**, it's not on the main rock. It lies on an ancient landslide. The report added that undercutting by river currents of Alaknanda and Dhauliganga are also playing their part in bringing landslides.
  - The committee had recommended that **restrictions be placed on heavy construction work, blasting or digging to remove boulders** for road repairs and other construction, felling of trees.
- **Geography:** Scattered rocks in the area are **covered with old landslide debris comprising boulders**, gneissic rocks, and loose soil, with a low bearing capacity.
  - These gneissic rocks are highly weathered and have a low cohesive value with a tendency of high pore pressure when saturated with water, especially during monsoons.
- **Construction Activities:** Increased construction, hydroelectric projects, and the widening of the NH have made the slopes highly unstable in the last couple of decades.
- **Land Erosion:** Due to the running streams from Vishnuprayag and sliding along the natural streams are the other reasons behind the city's fate.

### ▪ Impact:

- At least **66 families have fled the town while 561 houses have reported cracks.** A government official said that over 3000 people have been affected so far.

## What can be done to save Joshimath?

- Experts recommend a **complete shutdown of development and hydroelectric projects in the region**. But the urgent need is to relocate the **residents to a safer place and then reimagine the town's planning** to accommodate the new variables and the changing geographical factors.
- Drainage planning is one of the biggest factors **that needs to be studied and redeveloped**. The city is suffering from poor drainage and sewer management as more and more waste is seeping into the soil, loosening it from within. The irrigation department has been asked by the state government to look into the issue and create a new plan for the drainage system.
- Experts have also suggested **replantation in the region, especially at the vulnerable sites to retain soil capacity**. There is a need for a coordinated effort between the government and civil bodies with the aid of military organizations like the [Border Roads Organisation \(BRO\)](#) to save Joshimath.
- While the state already has weather forecasting technology that can warn people of local events, **its coverage needs to be improved**.
  - Weather forecasting in Uttarakhand is done through satellites and Doppler weather radars (instruments that use electromagnetic energy to find precipitation and determine its location and intensity).
- The state government also **needs to take scientific studies more seriously, which clearly spell out the reasons for the current crisis**. Only then will the state put an end to its development frenzy.

### What is Land Subsidence?

- Land subsidence is a gradual settling or sudden sinking of the Earth's surface.
- Subsidence - sinking of the ground because of underground material movement—is most often **caused by the removal of water, oil, natural gas, or mineral resources out of the ground** by pumping, fracking, or mining activities.
- Subsidence can also be caused by **natural events such as earthquakes, soil compaction, glacial isostatic adjustment, erosion**, sinkhole formation, and adding water to fine soils deposited by wind (a natural process known as loess deposits).
- Subsidence can happen over very large areas like whole states or provinces, or very small areas like the corner of your yard.

### What is Landslide?

- A landslide is defined as the **movement of a mass of rock, debris, or earth down a slope**.
- They are a type of **mass wasting**, which denotes any downward movement of soil and rock under the direct influence of gravity.
- The term **landslide encompasses five modes of slope movement**: falls, topples, slides, spreads, and flows.

## UPSC Civil Services Examination Previous Year Questions (PYQs)

- Q.** Bring out the causes for more frequent landslides in the Himalayas than in Western Ghats. **(2013)**
- Q.** Describe the various causes and the effects of landslides. Mention the important components of the National Landslide Risk Management Strategy. **(2021)**

