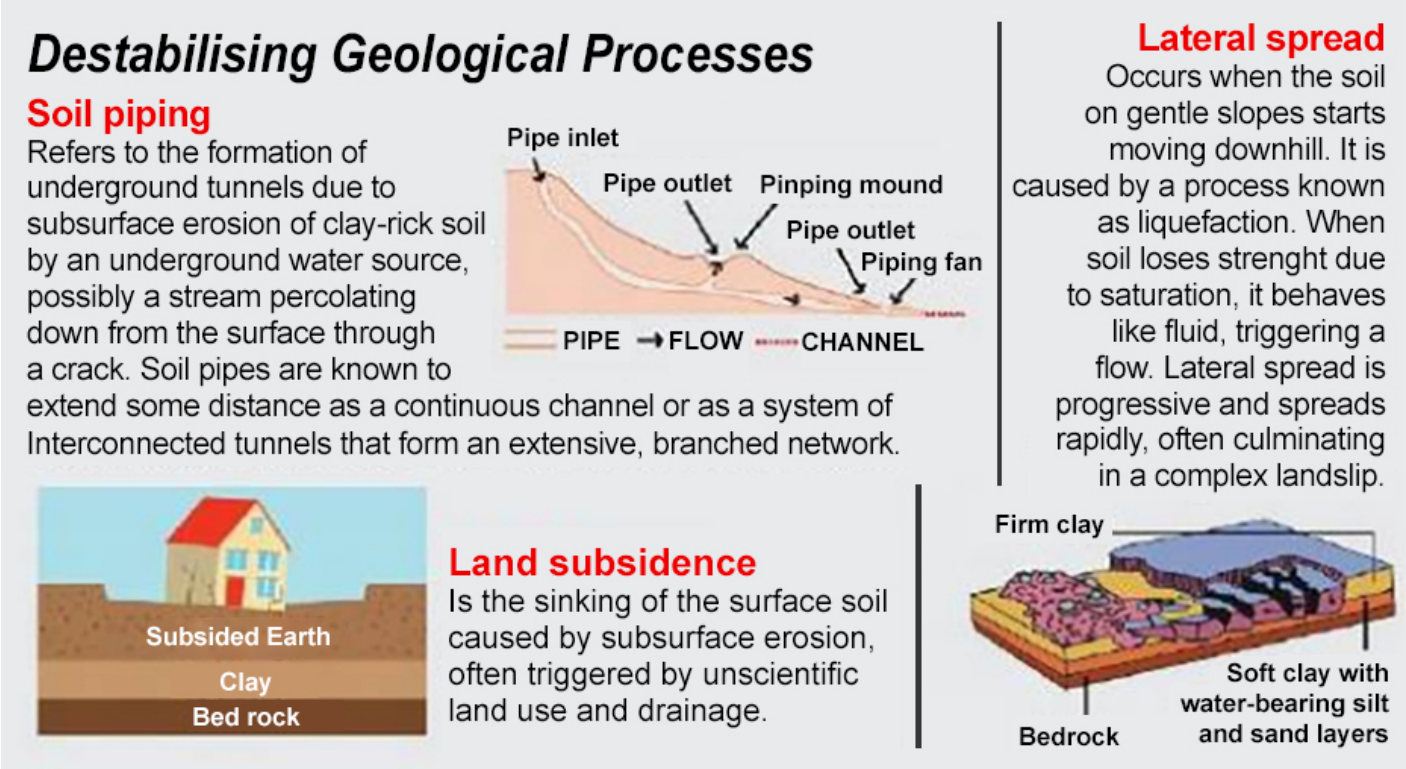
Threat to Human Habitation in the Highlands of Kerala

Investigation of **National Centre for Earth Science Studies (NCESS)** scientists in Kerala, in the wake of the **heavy rain and devastating floods in August 2018,** had found that **destabilising geological processes,** coupled with **extreme rainfall events** and **unscientific farming and construction activities,** pose a serious threat to human habitation in the highlands of the state.

- During the investigation in landslide prone areas in Thrissur and Kannur districts of Kerala, the researchers found **huge cracks across farmlands and dwellings**.
    - In the areas surveyed, most of the slopes were used for raising crops and farmers had **blocked the natural drainage systems**.
- **Land subsidence, lateral spread** and **soil piping** were an immediate threat to life and property in the uplands of the state.
    - Heavy intense rainfall triggers slope failure in locations where lateral spread and soil piping have occurred.

//



- Any developmental activities like construction of roads and buildings in such vulnerable areas require **remedial measures for slope stabilisation**.
- The team apart from outlining the remedial steps also **recommended the formation of a trained task force** for the highlands to monitor ground signatures like hollows, cracks, and water

spouts that often precede land subsidence, lateral spread and landslides.
- Based on the recommendations of the NCESS, the Union Ministry of Earth Sciences (MoES) has initiated steps to establish **a network of landslip monitoring stations** in the highlands.
    - The units based on acoustic emission technology will also have an **early warning mechanism to alert the local community**.

Landslide

- A landslide is defined as the **movement of a mass of rock, debris, or earth down a slope**.
- Landslides are a type of **"mass wasting",** which denotes any down-slope movement of soil and rock under the direct influence of gravity.
- There are 5 main types of landslides:
    - **Falls** are sudden movements of loads of soil, debris, and rock that break away from slopes and cliffs. They occur as a result of mechanical weathering, earthquakes, and force of gravity.
    - **Slides** are a kind of mass movement whereby the sliding material breaks away from underlying stable material.
    - **Topple** encompasses the forward spinning and movement of huge masses of rock, debris, and earth from a slope. It takes place around an axis near or at the bottom of the block of rock.
    - **Spread** takes place on gentle terrains via lateral extension followed by tensile fractures.
    - **Flow** landslide is categorized into earth flows, debris avalanche, debris flow, mudflows, and creep. The most prevalent occurring landslides are rock falls and debris flow.
- While landslides are considered naturally occurring disasters, human-induced changes in the environment have recently caused their upsurge.
- **Natural Causes of Landslides are:**
    - Climatic changes
    - Seismic activities
    - Weathering (natural procedure of rock deterioration that leads to weak, landslide-susceptive materials)
    - Erosion
    - Volcanic eruptions
    - Steeper slopes
- **Human causes of landslides are:**
    - Mining activities
    - Deforestation

National Centre for Earth Science Studies (NCESS)

- It was established in **1978 by Prof. C. Karunakaran**.
- It operates by the **Earth System Science Organization** under the Ministry of Earth Sciences.
- It **aims to understand the earth in its totality** and gain knowledge on the interactive and competing processes that shape the earth, from its evolution to the present status of ever increasing demand for natural resources.
- NCESS **fosters multidisciplinary research in emerging areas of solid earth science** by utilizing the knowledge for earth science applications .
- It is situated at **Thiruvananthapuram in Kerala**.

Source: TH