



Tectonically Active Zone of Himalayas

Why in News

Recently, a group of scientists from the **Wadia Institute of Himalayan Geology (WIHG)**, Dehradun have found that the **Indus-Tsangpo Suture Zone (ITSZ)** of [Himalaya](#) is **tectonically active**.

- The suture zone of Himalaya was conventionally thought to be locked.
- WIHG is an **autonomous institute** under the [Department of Science and Technology](#) (DST), Government of India.
- **Tectonics** is the **scientific study of the deformation of the rocks** that make up the Earth's crust and the forces that produce such deformation.
 - It deals with the **folding and faulting** associated with mountain building, the large-scale, **gradual upward and downward movements** of the crust and **sudden horizontal displacements** along faults.

Key Points

- **Geological Features that Support the Finding:**
 - Sedimentary beds are tilted and thrust broken.
 - Rivers are associated with uplifted terraces.
 - Bedrock shows brittle deformation at much shallower depths.
- These deformed geological features were **dated using the technique of Optically Stimulated Luminescence (OSL)** and data of **seismicity** and **denudation rate** was also reviewed.
 - **Optically-Stimulated Luminescence:** It is a late **quaternary** (geological time period that encompasses the most recent 2.6 million years) dating technique used to date the last time quartz sediment was exposed to light. As sediment is transported by wind, water or ice, it is exposed to sunlight and zeroed of any previous luminescence signal.
 - **Seismicity:** It is the worldwide or local distribution of [earthquakes](#) in space, time, and magnitude. More specifically, it refers to the measure of the frequency of earthquakes in a region.
 - [Denudation](#): It is a long term process in which the wearing and tearing of the surface of the Earth take place. It includes all those processes that lower relief and acts both chemically (**chemical weathering**) and physically (**mechanical weathering**).
- **The region of the ITSZ has been neo-tectonically active since the last 78000-58000 years.**
 - The ITSZ is a suture zone in the **Ladakh region** and marks the limit of the [Indian plate](#) **where it collides with the Eurasian plate** and is subducted below the latter.
 - The ITSZ can be traced for **more than 200 km** and a wide variety of rock association along the ITSZ indicates that the collision at the plate boundary was of very **complex nature**.
- The ITSZ was conventionally believed to be a locked zone till now.
- This will have **major implications** in terms of earthquake study, prediction, understanding the seismic structure of the mountain chains well as its evolution.

Suture Zones

- A suture zone is a **linear belt of intense deformation**, where distinct terranes, or tectonic units with different plate tectonic, metamorphic, and paleogeographic histories join together.
- These zones also **provide the only record of deep oceanic crust and of ancient seafloor processes** for roughly the first 90% of Earth's history.
- Their study provides a means to understand the end-product of **plate tectonic processes** in time and space. In plate tectonics, sutures are seen as the remains of subduction zones together with the terranes possibly representing fragments of different tectonic plates.
- The suture zone is often **represented on the surface by a mountain range comprising intensely deformed rocks.**
- The **Iapetus Suture from Great Britain**, which is now concealed beneath younger rocks, and **Indo-Tsangpo Suture** well exposed in the Himalayas are some of the best examples of suture zones.

[Source: PIB](#)

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