RISING MT. EVEREST - GEOGRAPHY

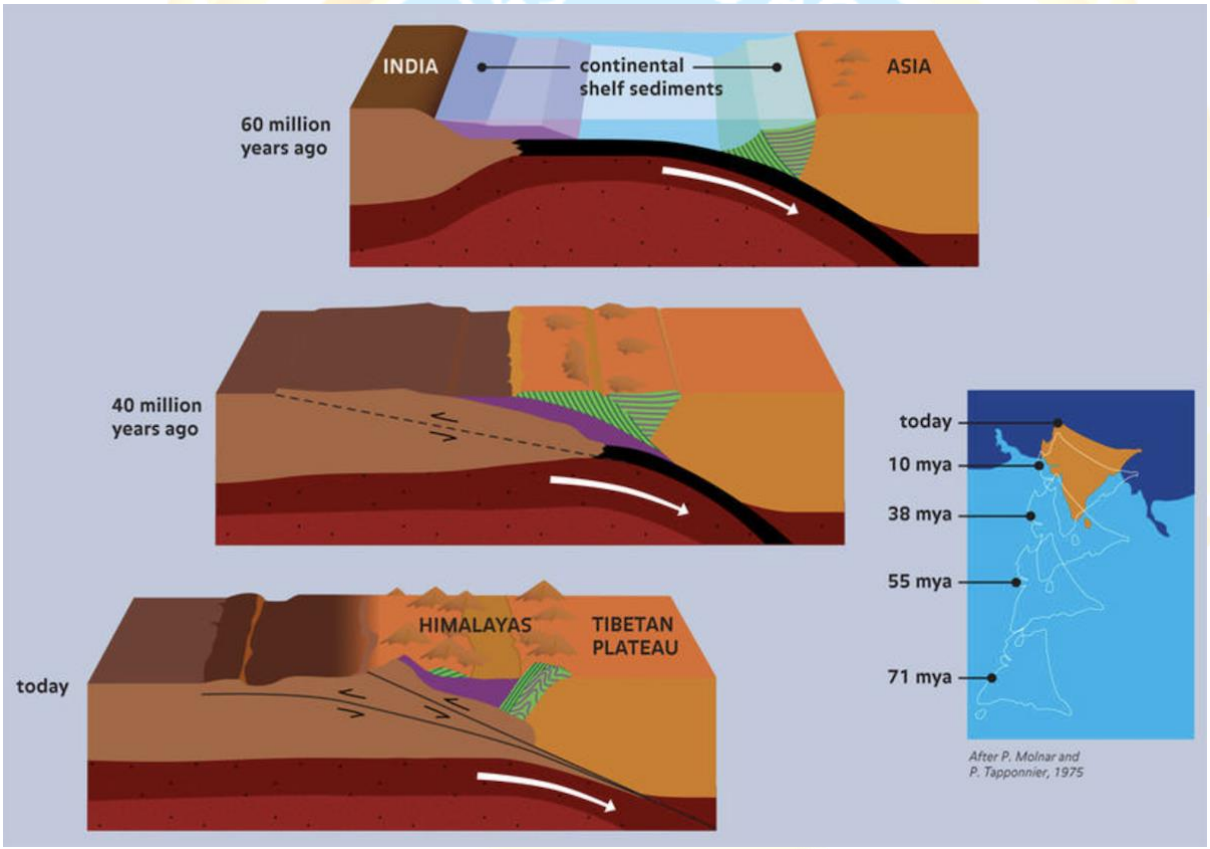
News: Mount Everest, standing at 8.85 kilometres above sea level, continues to rise, according to a recent study published in Nature Geoscience.

WHAT'S IN THE NEWS?

Details:

- Around 89,000 years ago, the Kosi River merged with the Arun River, resulting in an estimated height increase of between **15 to 50 metres (49 to 164 feet) for Everest.**
- This growth is due to a geological phenomenon known as **isostatic rebound,** where the Earth's crust rises in response to the removal of weight.
- As the merged rivers increased erosion and transported vast amounts of rock and soil away from the area, the land began to rise—much like a boat lifts as cargo is unloaded.

Isostatic rebound (also called continental rebound, post-glacial rebound or isostatic adjustment) is the rise of land masses that were depressed by the huge weight of ice sheets during the last ice age.



Geological Processes Behind Isostatic Rebound

1. **Loading and Unloading of the Crust**

Glacial Isostatic Adjustment (GIA): When large ice sheets form during glaciations, their immense weight pushes the Earth's crust downward. As the glaciers melt, the removal of this weight leads to the crust rising back up, a process called **post-glacial rebound.**

River Erosion: Similar to glacial melt, rivers that continuously erode rock and soil also reduce the weight pressing on the crust. This can lead to local or regional uplift, such as the Arun River's effect on the Himalayas.

2. **Mantle Response and Buoyancy**

The Earth's mantle behaves like a very viscous fluid over geological time scales. When the crust is unloaded, the mantle beneath slowly flows back into the space, allowing the crust to rise. This process is relatively slow, occurring over thousands of years.

The crust acts like a buoyant object on the mantle. When mass is removed (either through erosion or ice melt), the crust becomes lighter and is pushed up by the mantle, similar to how a boat rises higher in water when cargo is removed.

3. **Thermal Contraction and Expansion**

Changes in temperature can also influence isostatic adjustments. In colder periods, the crust can contract and subside, while in warmer periods it can expand and rise. This thermal effect can interact with other factors like erosion and tectonics to modify the rate of uplift.

Example of Isostatic Rebound in Action:

Scandinavia: Following the melting of large ice sheets from the last Ice Age, parts of Scandinavia are still rising at rates of up to 1 cm per year as the crust adjusts to the loss of glacial weight.

Himalayas: In regions like the Himalayas, rivers such as the Arun can erode material from the mountain bases, **triggering isostatic rebound**, which contributes to the ongoing rise of peaks like Mount Everest.

4. **Tectonic Interactions**

Isostatic rebound often works in tandem with tectonic processes, which are the movements of the Earth's plates.

While tectonic forces are primarily responsible for large-scale changes like **mountain formation, isostatic rebound provides localized adjustments.**

For example, after erosion or glacial melt, tectonic activity can interact with isostatic processes to further influence elevation changes.

Source: https://indianexpress.com/article/explained/nearby-river-contributes-to-the-rise-of-mount-everest-says-new-study-9598772/