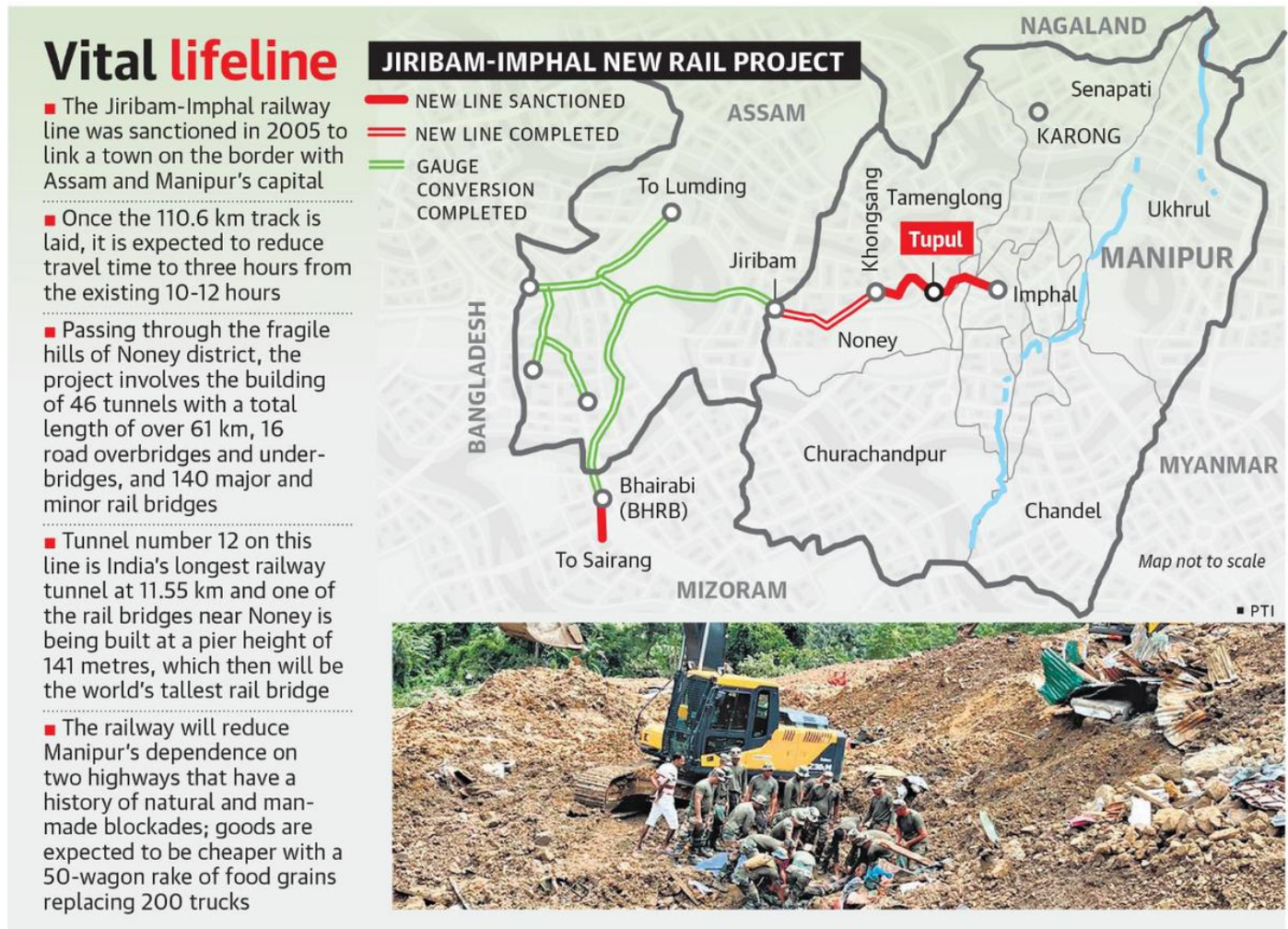


Landslide in Manipur (GS Paper 1, Geography)

Why in news?

- Landslides have killed at least 125 people across four north-eastern States in 2022 after the onset of rainfall in April. Almost half of them died working on a **railway project at the Tupul substation** in Makhum village of Manipur's Noney district.
- The Railways have reportedly **blamed jhum or shifting or slash-and-burn cultivation** on hill slopes for the tragedy, sparking debates on the tendency to **overlook geological challenges** and not factor in climate change while executing major developmental projects.



What is the Jiribam-Imphal railway?

- Sanctioned in February 2005 as a national project, the **110.625 km Jiribam-Imphal line** is considered a vital segment of the **Trans-Asian Railway** envisaged as an integrated freight railway network across Europe and Asia.
- The **broad-gauge project** entails connecting Manipur's Jiribam, a town on the border with Assam, and State capital Imphal mostly **across the fragile hills of Noney district**, is expected to reduce the travel time from the existing 10-12 hours to three hours.
- More than 65% of this project with an anticipated cost of ₹14,322.79 crore has been completed and goods trains reached the Khongsang railway station, 68.605 km from Jiribam, in March.
- The railways have tagged this project, expected to be functional by December 2023, as its most ambitious and challenging endeavour.

46 tunnels:

- The project involves 46 tunnels with a total length of 61.398 km, 16 road overbridges and under-bridges, and 140 major and minor rail bridges.
- **Tunnel number 12 on this line is India's longest railway tunnel** at 11.55 km and one of the rail bridges near Noney is being built at a pier height of 141 metres, the world's tallest.

Why are most landslide victims combatants?

- India's northeast comprising Manipur and seven other States is the **sixth most earthquake-prone belt** in the world.
- The geologically young hills of the region are **landslide-prone and heavy rains invariably allow only a working season of six months**, somewhat explaining the delay in the Jiribam-Imphal project.
- The writ of extremist groups also affected the project until the 107 Infantry Battalion (Territorial Army) of the 11 Gorkha Rifles was entrusted in 2019 with protecting the stretch.
- A massive landslide triggered by heavy rainfall hit the location of the unit at the Tupul railway yard construction camp and the sliding debris blocked the Ijei River temporarily, creating a dam-like situation.
- Movement on the Jiribam-Imphal national highway has also been affected by a series of landslips, an annual affair.

What caused the Tupul landslide?

- The Railways have apparently blamed two successive disasters along project sites in the northeast on the traditional practice of jhum or shifting cultivation.
- The first was the **Lumding-Silchar railway**, which was breached at 58 locations in May and the second was the Jiribam-Imphal section. Jhum is practised on hill slopes by clearing vegetation.
- Noney landslide to jhum was unfortunate as shifting cultivation and landslides have always been a feature in the northeast, a Himalayan region.
- There are also established State rules that forbid jhum in given areas and it is the responsibility of the administration to ensure that such rules are enforced.
- Projects do not factor in climate change, which has been causing short bursts of heavy rainfall over a small area instead of moderate showers spread over a larger area.

How can disasters be averted?

- Researchers have advised the Railways and the government to **consult local people for sustainable projects** instead of bulldozing or drilling through the hills.
- The Railways should have learnt lessons from the Lumding-Silchar project experience to minimise disasters in the equally vulnerable Jiribam-Imphal sector.
- An audit report in 2009 and a Commissioner of Railway Safety report in 2015 had faulted the Lumding-Silchar broad-gauge project for having been executed without adequate geotechnical investigation of the soil.
- In their Disaster Management Plan of 2017, the Manipur Public Works Department said landslides and mudslides are quite common in the hilly State.

Roadmap by GSI:

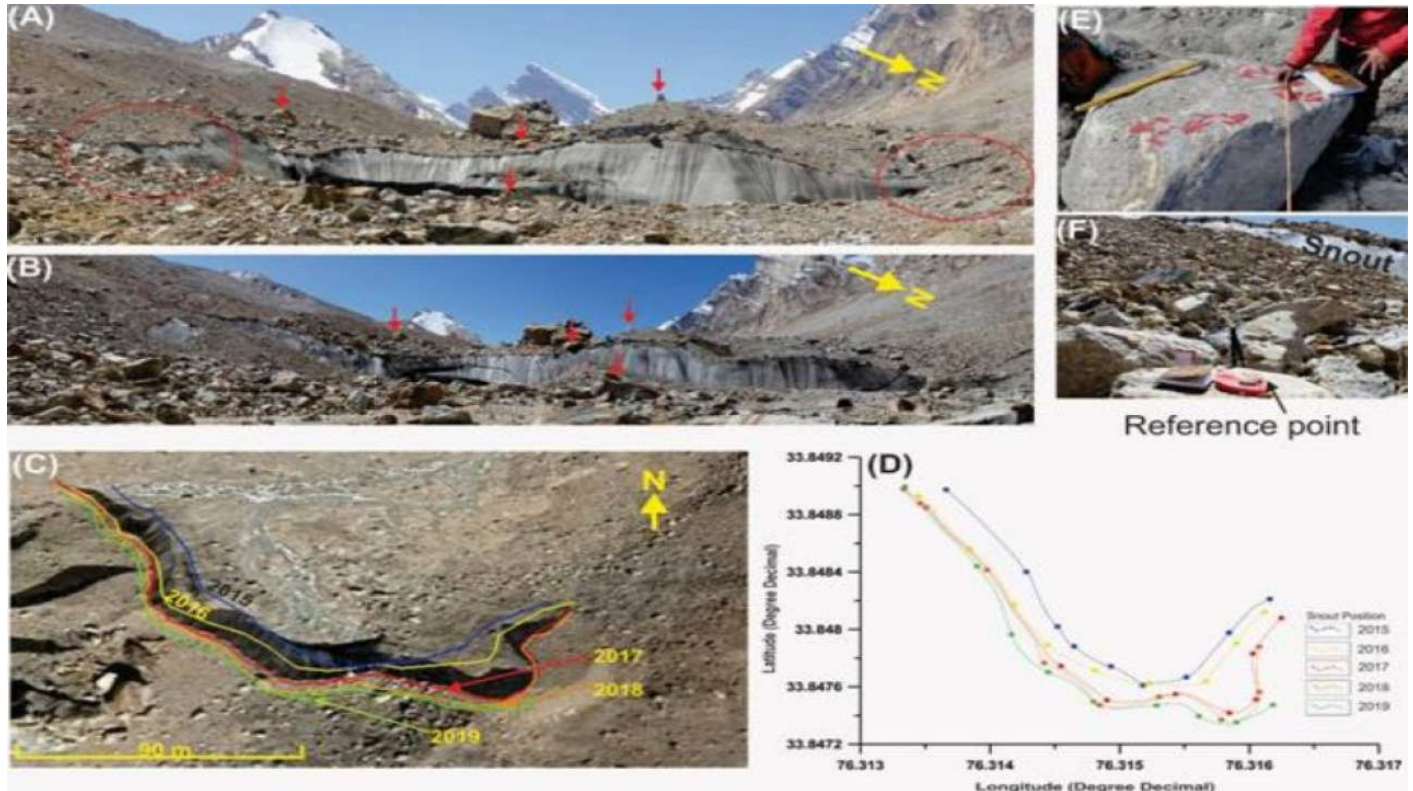
- According to the Geological Survey of India (GSI), disasters and human fatalities can be minimised if its national landslide susceptibility mapping is integrated with infrastructure development and planning in hilly or mountainous terrain.
- In India, the **mountainous and hilly areas in 16 States and in two Union Territories** in the Himalayan region, sub-Himalayan parts of the northeast and in the Western Ghats are landslide-prone. These areas comprise about 12.6% or 4.2 lakh sq. km of India's landmass spreading over 159 districts.
- It also said geology, road and railway projects, and unplanned quarrying and construction can turn these landslide-prone areas fatal. The GSI advised structural and non-structural measures for mitigating or preventing landslides.
- The structural measures involve engineering works for stabilisation and control of landslides while non-structural measures emphasise the identification and avoidance of landslide-prone areas through monitoring and warning systems.
- Successes of structural measures include Varunabhat in Uttarkashi, Tindharia in West Bengal's Darjeeling district and some hydroelectric projects under construction. Nainital in Uttarakhand and Nilgiris in Tamil Nadu

are the only two places in India where non-structural measures have been successfully implemented through landslide hazard zoning information.

Ladakh's glaciers threatened by growing vehicular emissions, says study **(GS Paper 3, Environment)**

Why in news?

- The decadal pace at which **glaciers are receding in Ladakh's Drass region**, indicates a grave threat to Himalayan glaciers.
- A recent study attributes this to the **growing vehicular traffic in the region**, which is also witnessing a **massive build-up of military on both the sides of Line of Actual Control (LAC)** since 2020.



Basis of study:

- The study is based on satellite images of 77 glaciers observed over two decades, from 2000 to 2020, in the Drass basin of western Himalaya. The glaciers studied ranged in size from 0.27 sq. km. to 14.01 sq. km, with an average size of 2.30 sq. km.
- The study reports that the glacier area decreased from 176.77 sq. km. in 2000 to 171.46 sq. km. in 2020, which is about 3% of the total glacier area.

Key Highlights:

- The **glaciers at lower elevations receded by 4.10%** whereas glaciers at mid- and higher elevations receded by 3.23% and 1.46% over the period observed.
- The heavy vehicular movement is the main cause for the rapid pace at which glaciers are receding in the region.
- The study points out that 17 glaciers situated close to the national highway showed higher glacier shrinkage (4.11%) and snout retreat (209 m) than the glaciers situated further away from the national highway, numbering 60, with glacier shrinkage (2.82%) and snout retreat (148 m).

Black carbon concentration:

- **Black carbon concentration** ranged from 287 to 3,726 nanograms per cubic metre, with an average of 1,518 nanograms per cubic metre, "which is markedly higher compared to the black carbon concentration reported from other high-altitude locations in the Hindu Kush Himalayas.
- From 1980 to 2020, black carbon concentration has increased significantly from 338 nanogram per cubic meter in 1984 to 634 nano gram per cubic meter in 2020.
- It is inferred that the increasing black carbon concentration, due to the proximity to the national highway (NH), has significantly affected the glacier health.

Conclusion:

- It is feared that if the observed trends of the climate change continue in the future due to increased greenhouse gas emissions and increase in black carbon concentration and other anthropogenic pollutants, glaciers in the Himalaya may disappear entirely, having a significant impact on regional water supplies, hydrological processes, ecosystem services and transboundary water sharing.

Ancient Buddhist site finally in focus after 20 years
(GS Paper 1, Culture)

Why in news?

- The Archaeological Survey of India (ASI) is planning for the conservation of the ancient Buddhist site, Kanaganahalli.

Location:

- The ancient Buddhist site is located **on the bank of Bhima river** near Kanaganahalli (forming part of Sannati site) in Kalaburagi district.



Details:

- Left almost unattended to for 20 years after it came to light through the excavation by the ASI between 1994 and 2001.
- The ASI has now come up with a plan for the conservation of the site at a cost of ₹3.5 crore.

- Till now, some items of antiquity found during excavation were kept in three tin sheds in the same site, while many remained scattered in the open.

Focus on Maha Stupa:

- The conservation project taken up now envisages the **resetting of the remains of Maha Stupa** retrieved in the excavation to their original positions without much ornamentation and reconstructing of fallen portions of the Ayaka platforms using newly-fabricated bricks of the same size, shape and texture.
- The stupa was built with locally available limestone. Most of the dome slabs, drum slabs, inscribed sculptures and other structural remains were in a broken state when they were retrieved.

Accidental discovery:

- **Sannati and Kanaganahalli were small and ordinary villages** on the bank of Bhima till 1986 when the Kali temple at the Chandralamba temple complex in Sannati collapsed.
- In the process of clearing the debris, they **discovered an Ashokan edict** which put the villages on the world map and opened new avenues of historical research on Mauryan Emperor Ashoka and Buddhism in its early years.
- It prompted the ASI excavations at Sannati and nearby Kanaganahalli and attracted historians across India and beyond.

Kanaganahalli excavation:

- The Kanaganahalli excavation opened up many marvels – an **‘abandoned well’** in the eyes of local villagers turned out to be the magnificent Maha Stupa, which was referred to as **Adholoka Maha Chaitya** (the Great Stupa of the netherworlds) in the inscriptions and, more significantly, the **stone-portrait of Emperor Ashoka**, surrounded by his queens and female attendants.
- While the Stupa is believed to be one of the largest of its time, the **stone-portrait is considered to be the only surviving image of the Mauryan Emperor** which had the **inscription ‘Raya Asoko’ in Brahmi on it.**
- This image of Ashoka is currently in one of the tin sheds. It was only six months ago that this historically significant find got a glass cover.

Findings from Maha Stupa:

- The **Maha Stupa is believed to have been developed in three constructional phases – Maurya, Early Satavahana and Later Satavahana periods** stretching from 3rd Century B.C. to 3rd Century A.D.
- The Stupa is believed to have been destroyed in an earthquake.
- The recoveries included around 60 dome slabs with the sculptural rendering of **Jataka stories, Portrait of Ashoka, Shatavahana monarchs** and certain unique depictions of Buddhist missionaries sent by Ashoka to different parts; **72 drum-slabs decorated with a variety of Dharma-Chakras, Stupas, the first sermon, Bodhi-tree, Naga Muchulinda, Vihara complexes**; over 10 inscribed sculptures of the Buddha, over a dozen Buddha-Padas; fragments of Ayaka pillars, umbrella stones and shafts, parts of sculptures of Yakshas and lion and 250 Brahmi inscriptions with varied paleographical features.
- A lot of work is yet to be done to explore the hidden historical treasures in and around Sannati, which was **Ranamandal about 2000 years ago.**

Could be UNESCO site:

- The ASI site in Sannati is worth being a UNESCO World Heritage Site.
- However, as of now, there are not even well-developed roads to Sannati and Kanaganahalli which have the potential of attracting tourists from all over the world, especially from countries with sizable Buddhist populations like China, Thailand, Japan, Myanmar, Sri Lanka and Vietnam.

Altering green laws **(GS Paper 3, Environment)**

Why in news?

- On July 1, the Ministry of Environment, Forest and Climate Change, proposed amendments in the Environment (Protection) Act, 1986.

- The EPA establishes the “framework for studying, planning, and implementing long-term requirements of environmental safety and laying down a system of speedy and adequate response to situations threatening the environment.”
- Besides changes in the EPA, the Ministry, in a set of notifications, also proposed amendments to three other legislations.



What are the Environment Ministry’s proposed amendments?

The Environment Ministry has proposed amendments in **four key legislations**:

- a) The Environment (Protection) Act, 1986,
 - b) the Water (Prevention and Control of Pollution) Act, 1974,
 - c) the Air (Prevention and Control of Pollution) Act, 1981 and
 - d) the Public Liability Insurance (PLI) Act, 1991.
- These are the cornerstone environmental laws that **led to the setting up of the Central Pollution Control Board (CPCB)**, empowering it to take action against individuals and corporate bodies who pollute air, water and land.
 - They clutch of laws currently empowers the CPCB to either shut down a polluting industrial body or imprison executives of an organisation found to be environmental violators.
 - With a set of amendments, the Environment Ministry proposes to modify provisions of the Environment Protection Act (EPA), by replacing clauses that **provides for imprisonment with ones that only requires violators to pay a fine**. These, however, don’t apply to violations that cause grave injury or loss of life.

How will violators be punished?

- Currently the violators face imprisonment up to five years or a fine up to ₹1 lakh or both.
- If the violations continue, an additional fine of up to ₹5,000 for every day during which such failure or contravention continues after the conviction may be levied. There’s also a provision for the **jail term to extend to seven years**.
- The changes proposed include the **appointment of an ‘adjudication officer’** who will decide on the penalty in cases of environmental violations such as reports not being submitted or information not provided when demanded.
- Funds collected as penalties would be accrued in an “**Environmental Protection Fund**.”
- In case of contraventions of the Act, the penalties could extend to anywhere from five lakh to five crore, the proposal notes, but the clause on provision of a jail term for the first default has been sought to be removed.

Do these amendments defang environment laws?

- The Environment Ministry hasn't laid out a clear rationale on why these amendments were necessary. However, the history of environmental action and its success in India shows that the **current laws have had limited effectiveness**.
- An analysis by the Centre for Science and Environment found that Indian courts took between 9-33 years to clear a backlog of cases for environmental violations.
- Beginning 2018, close to 45,000 cases were pending for trial and another 35,000 cases were added in that year. **More than 90% of the cases were pending for trial in five of the seven environment laws.**

Positive aspect:

- Many challenges dogged the process of bringing violators to book. For instance, **to flag pollution from an industrial unit** would mean filing a complaint with the court of the concerned district magistrate, or furnishing evidence to the CPCB which would again have to approach the same institution.
- This would then box the crime in the category of 'criminal complaints' that would have to follow a set procedure and was extremely time-consuming.
- In most cases, it was practically impossible to hold a specific individual in an organisation responsible for a specific crime given the burden of proof required. No top executive in India had gone to jail for an environmental crime. This was different from cases of crimes such as poaching, or stealing forest produce, where there was always a definite offender who could be apprehended and dealt with by the police.
- The new amendments, thus, **potentially made a certain category of crimes 'civil crimes'** making it easier to hold organisations accountable.

Criticism:

- The existing clause of imprisonment was to deter violators and not to imprison them.
- The proposed penalties were too meagre and the amendments opened up avenues for "large scale corruption" as the 'Adjudication Officers' could be "arbitrary" in their decision-making.