Sleepy Classes IAS
Awakening Toppers

Monthly
CURRENT AFFAIRS

February 2025

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Economy

Banking

RBI Cut Repo Rate

Monetary Policy Committee (MPC) of RBI has cut repo rate by 25 bps to 6.25%.

- MPC has cut policy repo rate under the liquidity adjustment facility (LAF) nearly after a five-year gap.

Other Important Decisions

- To continue a 'neutral' monetary policy stance.
    - A neutral stance indicates that the RBI maintains flexibility in adjusting policy rates based on prevailing economic conditions.
- GDP growth for FY '26 projected at 6.7%.
- Food inflation pressures are likely to see significant "softening", Core inflation expected to rise but remain moderate.

Rationale For MPC Decisions

- Inflation has declined and growth is expected to recover from the low of Q2:2024-25.
- Excessive volatility in global financial markets and
- Continued uncertainties about global trade policies coupled with adverse weather events.

About Liquidity Adjustment Facility (LAF)

LAF is a monetary policy tool used by the RBI to manage liquidity (short-term cash flow) in the banking system and control interest rates.

It includes repo and reverse repo rates.

- The repo rate is the interest rate at which the central bank lends money to banks, while the reverse repo rate is the rate at which banks can park their surplus funds with the central bank.

Deposit Insurance

The government is considering increasing the bank deposit insurance cover above the current limit of ₹ 5 lakh.

About Deposit Insurance

It is a measure of protection to depositors, particularly small depositors, from the risk of loss of their savings arising from bank failures.

Background: Deposit insurance was introduced in India in 1962 under the Deposit Insurance and Credit Guarantee Corporation (DICGC) Act, 1961.

- India was the second country (after the US in 1933) in the world to provide for such provision.

Coverage: The insurance protection extends to ₹ 5 lakh per depositor, which covers the aggregate of all accounts maintained by that depositor across all branches of the insured bank.

- However, if the deposits are held with more than one bank, deposit insurance coverage limit is applied separately to the deposits in each bank.

Covered Bank: Insures all commercial banks, including branches of foreign banks functioning in India, local area banks, regional rural banks, and cooperative banks.

- Deposit insurance scheme is compulsory and no bank can withdraw from it.

- **Exceptions**: Land development banks, Non-Banking Financial Company's (NBFCs) etc

- **Insures**: Savings, fixed, current, and recurring deposits are insured.

  - Exceptions: Does not provide **insurance for deposits by foreign, central, and state governments, and for inter bank deposits.**

- It insures both the principal and interest amount held by a depositor in a bank.

- Through amendment in 2021, Section 18A amendment to the DICGC Act

allowed depositors to receive time-bound (within 90 days) interim payments up to the insured amount when the RBI imposes restrictions on banks.

- Deposit insurance premium is borne entirely by the insured bank. o DICGC collects premiums from member banks at flat or risk-based differentiated rates.

About Deposit Insurance and Credit Guarantee Corporation (DICGC)

- Established on January 01, 1962 under the DICGC Act, 1961.

- It is a wholly owned subsidiary of the Reserve Bank of India.

- Head Office: Mumbai.

Industry

Intellectual Property Rights (IPR)

Why in the News?

India's Intellectual Property Rights (IPR) ecosystem has grown significantly over the past decade.

However, patent applications stagnated in 2024, with very few approvals, raising concerns that low private-sector Research and Development (R&D) investment is limiting innovation.

Key Trends in India's IPR Ecosystem

Increase in Patents: India now ranks 6th globally in terms of patent applications, with 64,480 patent filings in 2023.

- Patent applications grew from 42,951 (2013-14) to 92,168 (2023-24), with grants rising due to backlog clearance.

- In 2013-14, 25.5% of patent applications were from Indian residents, which increased to 56% in 2023-24.

  - Earlier, patent filings were dominated by foreign multinational corporations, but

Indian applicants are now filing more patents.

However, in 2024-25, 78,264 patent applications and 26,083 grants indicate a lower approval rate.

Trademarks: According to the World Intellectual Property Organization (WIPO) 2024 report, India ranked 4th globally in trademark filings after the US, China, and Russia.

- Trademark applications in India have indeed grown significantly from around 2 lakh in 2016-17 to approximately 4.8 lakh in 2023-24. However, the rate of increase has slowed.

Industrial Design: 36.4% increase in industrial design applications, driven by textiles, tools & machines, and health sectors.

Manpower: The patent office workforce increased from 272 in 2014-15 to 956 currently, but still lags behind China (13,704) and the US (8,132).

What are the Challenges in India's Patent Ecosystem?

Low R&D Investment: India's R&D spending is just 0.65% of GDP (compared to the US (3.6%), China (2.4%), Singapore (2.2%)).

- The private sector contributes only 36% to R&D, whereas it accounts for 79% in the US and 77% in China.

- Many Indian companies operate at a global scale but invest little in R&D, limiting patent filings.

High Dependence on Foreign Patents: Despite rising domestic filings, foreign entities dominate Patent approvals (74.46% in 2022), far exceeding China's 12.87%.

- India remains reliant on imported technology, leading to a trade deficit and reduced self-reliance in innovation.

Manpower Shortage: Patent examination capacity is limited due to a lack of skilled examiners. Fewer examiners lead to long processing delays and lower patent approval rates.

- On average, it takes about 58 months to grant a patent in India, compared to 21 months in the US.

Quality of Patent Applications: Domestic patent filings lag in approvals due to poor-quality applications, weak research, plagiarized content, and lack of resources in startups

Weak IP Enforcement: Patent infringement cases are rising in India, but weak enforcement and judicial backlogs hinder effective protection.

- Indian firms often lack the expertise to navigate the global IP system effectively. In the digital age, easy copying, anonymous infringers, and cross-border piracy further complicate IP enforcement.

Way Forward

- **Ease of Patent Filing:** Streamlining digital patent processing with AI-driven IP infringement detection systems can increase patent filling.

  - Tax incentives for corporate R&D spending and increased venture capital funding can

drive deep-tech advancements and boost patent filings.

- **Enforcement and Legal Framework:** Set up specialized IP courts to resolve patent disputes faster. Increase penalties for copyright infringement to deter violations under Copyright Act 1957.

- **Global Partnerships for Innovation:** Participate in global patent treaties like the Riyadh Design Law Treaty to simplify cross-border filings and

attract foreign investment in strengthening India's IP ecosystem

- **IP Awareness:** Integrate IP education into curricula and conduct awareness programs in universities and businesses.

    - Encourage joint R&D projects with international institutions like WIPO to enhance the quality and quantity of domestic patent filings

Economic Growth and Development

SWAYATT Initiative

Why in News?

Government E-Marketplace (GeM) celebrated the 6th anniversary of the SWAYATT (Startups, Women & Youth Advantage through e-Transactions) initiative.

What is the SWAYATT Initiative?

About: It was launched in 2019 to enhance the market access for women entrepreneurs, youth, startups, Micro & Small Enterprises (MSEs), and Self-Help Groups (SHGs).

- It enhances seller inclusion through training, registration, and capacity-building to leverage GeM for market access and growth.

Achievements

- Women-led enterprises and startups have grown significantly, increasing from 6,300 women-led MSEs and 3,400 startups at launch to 1,77,786 Udyam-verified women MSEs.

- Women-led businesses now constitute 8% of GeM's seller base.

- GeM facilitated Rs 35,950 Crore worth of orders from startups, addressing challenges in market access, finance, and value addition.

    - It aims to double women entrepreneurs, increase their procurement share (currently 3.78%), and onboard 1 lakh DPIIT- registered startups.

- MoU was signed between GeM & FICCI Ladies Organisation (FICCI-FLO) to train and onboard 9,500+ women entrepreneurs, ensuring direct market linkages and boosting inclusive growth.

- "Startup Runway" and "Womaniya" storefronts were included to enhance visibility for startups, women entrepreneurs, and youth among government buyers.

What is Government e-Marketplace (GeM)?

- GeM is the public procurement portal for Central & State Governments, PSUs, and affiliated entities to procure goods and services.

  - It serves as India's National Procurement Portal.

- It was established in 2016 under the Directorate General of Supplies and Disposals (DGS&D), Ministry of Commerce and Industry with technical support from the National e-Governance Division (MeitY).

- It is a paperless, cashless, and system-driven platform that minimizes human Intervention in Public Procurement.

Time Use Survey (TUS)

Recently, National Statistics Office (NSO) released the 2nd Time Use Survey (TUS) for the year 2024.

About Time Use Survey (TUS)

- **Purpose**: It provides a framework for measuring time dispositions by the population on different activities.

- **Objective**: To measure the participation of men and women in paid and unpaid activities.

Key Findings

- Increase in women participation in employment related activities (paid activities).

- There is increased acknowledgement of caregiving activities regardless of gender within Indian families.

- Time spent in Culture, leisure, mass-media and sports practices has increased in both men and women.

FDI Limit Hiked in Insurance Sector

Finance Minister announced proposal to raise FDI limit in the Insurance sector from 74% to 100%.

- This enhanced limit will be available for those companies which invest the entire premium in India.

- To enhance the FDI limit, the government will have to bring amendments to Insurance Act 1938, Life Insurance Corporation Act 1956, and Insurance Regulatory and Development Authority Act, 1999.

Significance Of 100% FDI In Insurance Sector

- Higher Investment: More foreign capital for growth and expansion.

- Enhanced Competition: Better products, improved services, and competitive pricing.

- Technological Advancements: Adoption of advanced tech and innovative products.

- Improved Penetration: More people brought under insurance coverage and help achieve the target of 'Insurance for All' by 2047.

Status Of India's Insurance Sector

(Economic Survey 2024-25)

- Total insurance premium grew 7.7% in FY24, reaching Rs.11.2 lakh crore.

- Insurance penetration declined from 4% in FY23 to 3.7% in FY24.

- Insurance Density rose from USD 92 in FY23 to USD 95 in FY24.

- Insurance penetration is measured as percentage of insurance premium to GDP whereas insurance density is calculated as ratio of premium to population (per capita premium).

Challenges Faced by Insurance Sector in India

- Absence of top companies: Out of 25 world's top insurance firms, 20 are not present in India now.

- Economic Constraints: Affordability issues restrict insurance adoption.

- Cultural Preferences: Preference for traditional financial practices over insurance.

Infrastructure

Bharat Tex 2025

Why in NEWS?

The Prime Minister addressed the Bharat Tex 2025 event, which is a global platform for engagement, collaboration, and policy discussions in the textile sector in which over 120 countries participated.

India's Textile Sector

- India's textile industry contributes 2.3% to GDP, 12% to exports, 13% to industrial production and employs 45 million, second only to agriculture.

- India is the 6th largest textile exporter globally (after China, EU, Vietnam, Bangladesh, and Turkey) and world's 2nd largest producer of textiles and garments.

  - India's textile exports increased 7% from 2023 to 2024, reaching Rs 3 lakh crore, with a target of Rs 9 lakh crore by 2030

Challenges in Textile Sector

- India's textile sector faces high cotton dependence (60%), competition from Bangladesh & Vietnam, logistics inefficiencies (costs at 13-14% of GDP compared to China's 8%) and environmental concerns from fast fashion.

- Government Initiatives for Textile Sector:

- Mega Integrated Textile Region and Apparel (MITRA) Parks

- Mission for Cotton Productivity: To facilitate improvements in productivity and sustainability of cotton farming.

- GI tagging for Handloom Products: E.g. Uppada Jamdani Sarees, Muga Silk of Assam, Kashmir Pashmina etc.

- Samarth Scheme.

Agriculture

Prime Minister Dhan-Dhaanya Krishi Yojana (PMDKY)

Why in NEWS?

The Finance Minister announced the launch of the Prime Minister Dhan-Dhaanya Krishi Yojana (PMDKY) in the Union Budget 2025.

About Prime Minister Dhan-Dhaanya Krishi Yojana (PMDKY)

Coverage: It will cover 100 districts based on 3 broad parameters: low productivity, moderate crop intensity, and below-average credit parameters.

- Cropping intensity is a measure of how efficiently land is used, and it is defined as the number of crops grown on the same field during a given agricultural year.

- At the all India level, the cropping intensity was recorded at 155% in 2021-22 (Ministry of Agriculture).

- **Inspired by ADP**: It will be on the line of Aspirational Districts Programme (ADP), which was launched in 2018.

- **Outlay**: Budget documents do not provide a separate allocation for the scheme.

- **Implementation Strategy:** The program will be executed in partnership with state governments, focusing on the convergence of existing schemes.

- It is initiated by the NITI Aayog in collaboration with the state governments.

Aspirational Districts Programme (ADP)

Aim: To quickly and effectively transform 112 of the most under developed districts across India, based on 3 Cs

- Convergence (of Central and State schemes),

- Collaboration (of Central and State level nodal officers, and District Collectors), and

- Competition (among districts through monthly delta ranking).

- It focuses on the strength of each district, identifying low-hanging fruits for immediate improvement and measuring progress by ranking districts on a monthly basis.

- The ranking is based on the incremental progress made across 49 Key Performance Indicators under 5 broad socio-economic themes.

  - Health & Nutrition, Education, Agriculture & Water Resources, Financial Inclusion & Skill Development, and Infrastructure.

Environment

Biodiversity

Eurasian otters

Context - Once believed to have almost vanished, the Eurasian otters have **resurfaced in the Valley of Kashmir** over the last 3 years. The species was recently sighted in Gurez Valley, some 123 kms north of Srinagar.

First live documentation

- The video of the species showed otters feasting on fish in gurgling Kishanganga river/Neelam river, which flows through the placid Valley. (Jhelum River)

- It represents first live documentation of the species for the last 25 years

- The sightings have become rare in recent years with none reported outside the Gurez Valley.

- In late nineties, the otters were commonly seen in rivers and streams across Kashmir.

- In 1997, it was spotted in the back waters of famous Dal Lake.

Eurasian otters

- The Eurasian otters locally known as *Vodur* belongs to Mustelidae family and inhabits semi-aquatic environments.

- The species feeds on fish and is responsible for maintaining healthy ecosystem.

- The Eurasian otter has sleek brown fur, which is often paler on the underside and a long lithe body with a thick tail and short legs.

- Adaptations for an aquatic lifestyle include webbed feet, the ability to close the small ears and the nose when under water, and very dense, short fur that traps a layer of air to insulate the animal.

- **Threats** - Over the last three decades, the population of otters dwindled significantly. Habitat loss, use of pesticides and poaching contributed to the declining population of otters across Jammu and Kashmir.

Conservation Status

- The International Union for conservation of Nature (IUCN) listed the Eurasian otters as **near threatened** on its red list in 2004 and 2008.The official, however, said that it would not be appropriate, as recently reported by

a section of press, to say that the species was extinct.

- **IWPA :** Schedule I
- **CITES :** Appendix I

Gurez Valley

- It is located approximately **123 kilometres away from Srinagar**, Jammu & Kashmir. Enveloped by snow-capped peaks, this high-altitude valley sits about 8,000 feet above sea level.

- **The valley is divided into three regions – Dawar, Tulail, and Bagtore**. Dawar is the central region, acting as the commercial hub with bustling markets and local shops. Tulail and Bagtore are primarily rural zones dotted with quaint villages.

Asian elephants

Context - In a study published in the journal *Mammalian Biology* on December 23, 2024, researchers compared the calls of Asian elephants based on their age, sex, and behaviour.

Key Findings

- They found the duration of trumpets remained fairly consistent across all age classes for both male and female Asian elephants but roars and roar-rumbles got longer with age.

- Every behaviour of Asian elephants is fascinating to witness, and their acoustic communication makes it even more remarkable because of elephants' capabilities to switch between very high-frequency to very low-frequency sounds.

- The researchers divided the vocalisations into high and low frequencies based on whether human ears could hear them.

- The most common high-frequency vocalisations, which both the **Asian and the African savannah elephants** can produce, are trumpets — the iconic sound uniquely associated with elephants.

- According to some mathematical models, these elephants may be producing the trumpets by blowing air in sudden bursts through the trunk, a form of "second voice" that doesn't require the vocal cords to be involved.

- Researchers had previously believed Asian elephants trumpeted chiefly to communicate disturbances caused by humans and other troublesome species.

- The new study isn't so sure.

- The study reveals that trumpets are generated in a variety of contexts, including social interactions, play, and in agonistic interactions both within and between groups

Whether Asian elephants' high-frequency vocalisations differed by age and sex ?

- The team set up recording equipment in the protected areas of Bandipur National Park and Mudumalai National Park, which are 75 km apart.

- Both parks are home to large populations of Asian elephants, with an estimated 1,025 in the former and 300 in the latter.

- Younger elephants, both male and female, produced calls of a higher pitch to attract the attention of their herd mates and establish their presence. On the other hand, the older ones used lower-pitched calls for the same purpose.

- According to the paper, these differences could be shaped by changes in body size and vocalisation mechanisms as the elephants aged.

- The researchers also found that the role of roars issued by Asian elephant calves closely mirrored those of their African cousins. The infants used these powerful calls to get the attention of the adults in a herd and signal their emotional states.

Asian Elephants

- The Asian elephant is the largest land mammal on the Asian continent.

- They inhabit dry to wet forest and grassland habitats in 13 range countries spanning South and Southeast Asia.

- While they have preferred forage plants, Asian elephants have adapted to surviving on resources that vary based on the area.

- Asian elephants are extremely sociable, forming groups of six to seven related females that are led by the oldest female, the matriarch.

- Like African elephants, these groups occasionally join others to form larger herds, although these associations are relatively short-lived.

- In Asia, elephant herd sizes are significantly smaller than those of savannah elephants in Africa.

- More than two-thirds of an elephant's day may be spent feeding on grasses, but it also eats large amounts of tree bark, roots, leaves, and small stems. Cultivated crops such as bananas, rice, and sugarcane are favorite foods. Elephants are always close to a source of fresh water because they need to drink at least once a day.

- According to Hindu mythology, the gods (*deva*) and the demons (*asura*) churned the oceans in a search for the elixir of life so that they would become immortal.

- In general, the Asian elephant is smaller than the African bush elephant and has the highest body point on the head.

Conservation Status

- Asian Elephant - Endangered

- Wildlife (Protection) Act, 1972 - Schedule I

- Convention of the Migratory species (CMS) - Appendix I

Mugger Crocodile

Context - A two-day-long counting exercise to estimate the number of crocodiles in the **Vishwamitri river of Gujarat's Vadodara city** concluded.(Dhadhar river)

The crocodile count in Vadodara is usually done by the forest department. But this time, it was done by the **GEER Foundation, a government-funded NGO** based in Gandhinagar

- The last count had found that there were slightly under 300 mugger crocodiles in the Vishwamitri.

Vishwamitri river

- The Vishwamitri originates on the hill of Pavagadh in Panchmahals district and flows some **200 kilometres into the Gulf of Khambhat.**

- Primarily rain-fed, it flows through a 25-km stretch of Vadodara, Gujarat's third-largest city, along the way before meeting the sea in Bharuch district.

- The **Vadodara stretch of the Vishwamitri** is unique in that it is home to a large population of mugger or marsh crocodiles (*Crocodylus palustris*).

- Despite the Vishwamitri being the receptacle of sewage and industrial pollution and Vadodara being home to three million people, the crocodiles have managed to thrive in the river as it flows through the city

Mugger Crocodile

- **Common Names :** Mugger, Muggar, Broad-snouted Crocodile, **Marsh Crocodile**

- This species is found in India, Sri Lanka, Pakistan, Nepal and possibly, in Bangladesh, its range extends westwards into eastern Iran.

- The species has become locally extinct over large parts of its range, with viable populations only occurring in Protected Areas .

- **India and Sri Lanka** retain the major populations. In India, it is reported to be present in 15 of India's states

including much of the Ganga River drainage.

- Significant populations occur in middle Ganga (Bihar and Jharkand), Chambal River (Rajastan and Madhya Pradesh) and in Gujarat.

- The Mugger crocodile is a medium to large crocodilian species; an adult male may reach up to 4.5 meters (18 ft) in length and weigh 450 kg (1000 lbs).

- The Mugger is a **hole-nesting species,** with egg-laying taking place during the annual dry season.

Conservation status:

- **IUCN :** Vulnerable

- **IWPAA :** Schedule I

- **CITES :** Appendix I

Aravali safari park project

Context - Haryana government's ambitious 3,858 hectare Aravali safari park project spread across Gurugram and Nuh is envisaged to be the **world's largest safari park.**

However, the project has faced stiff opposition ever since it was first mooted.

About Project

- The proposed Aravali safari park will have animal cages, guest houses,

hotels, restaurants, auditoriums, an animal hospital, childrens' parks, botanical gardens, aquariums, cable cars, a tunnel walk with exhibits, an open-air theatre and eateries.

- The project has now been transferred to the forest department and an expert committee has been set up to oversee it.

- Of the total 3,858 hectares proposed in the tender, 2,574 will be spread across 11 villages in Gurugram and the remaining 1,284 in Nuh, across its seven villages.

WHAT THE PARK MAY HAVE

Entertainment zone | It would be designed along specific themes inspired from fiction or Indian mythological characters

The Safari Club | The recreation club would have leisure activities. It would also have venues to host conferences, large gatherings and even accommodation. An aquarium, zip flyer, cable car, canopy safari and tunnel walk will also be there

Eco village | It will take visitors through a cultural and culinary journey. It will have space for handicraft and handloom products and even fine dining. There may be open-air theatre, stalls, display galleries, kiosks and food outlets

Infrastructure | Road networks along with space for pedestrians. There would be elephant or horse rides as well as eco-trekking trails

Criticism

- A group of 37 retired Indian Forest Service officers have written a letter to Prime Minister seeking to scrap the project arguing that the project's aim is to **simply increase tourist footfall and not conserve the mountain range.**

- The primary purpose of any intervention in an eco-sensitive area should be '**conservation and restoration' and not destruction**.

- The increased footfall, vehicular traffic and construction will **disturb aquifers under the Aravali hills** which are critical reserves for the water-starved

districts of Gurugram and Nuh (the groundwater level in the two districts has been categorised as 'over-exploited' by the Central Ground Water Board).

- Additionally, the location of the project **falls under the category of "forest",** which is protected under the **Forest Conservation Act, 1980.**

- Besides, Haryana has **very low forest cover of 3.6%,** and therefore, the State needs rewilding of natural forests and not destructive safari projects, the letter said.

About Aravali

- The **Aravalli Range** (also spelled Aravali) is a mountain range in **Northern-Western India,** running approximately 670 km (420 mi) in a south-west direction, starting near Delhi, passing through southern Haryana, Rajasthan, and ending in Ahmedabad Gujarat.

- The highest peak is **Guru Shikhar on Mount Abu** at 1,722 m (5,650 ft).

Laws protecting Aravali?

- Of the approximately 80,000 hectare Aravali hill area in Haryana, a majority is protected under various laws and by orders of the **Supreme Court and NGT.**

- **Punjab Land Preservation Act (PLPA), 1900** -The most widespread protection to the Aravalis comes from the **Punjab Land Preservation Act (PLPA),** 1900. The Special Sections 4 and 5 of the Act restrict the breaking of

land and hence deforestation in hills for non-agricultural use.

• Recently around 24,000 hectares has been notified as **Protected Forest under the Indian Forest Act**, as a proposed offset to forest land diversion in the Nicobar islands

• **T.N. Godavarman Thirumulpad judgment (1996)** - extends legal protection to forests as per dictionary meaning — which should cover the remaining Aravali areas that are not notified as forest.

• **Regional Plan 2021 for the National Capital Region** - also offers crucial protection, designating the Aravalis and forest areas as '**Natural Conservation Zone**' and restricting the maximum construction limit to 0.5%.

Cheetahs gave birth to two cubs

Context - Recently Veera, one of the cheetahs housed in Madhya Pradesh's Kuno National Park, has given birth to two cubs.

About

• There are currently 26 cheetahs, including 14 cubs, at Kuno National Park.

• After spending over a year inside protective enclosures, two cheetahs — Agni and Vayu — were released into the open forest area recently.

About Cheetah

• Once spanning from the Mediterranean shores to the heart of India, the **Asiatic Cheetah** (A. j. venaticus) now teeters on the brink of extinction, confined solely to Iran,

where it is categorized as **Critically Endangered**

Extinction

• Historically, Asiatic Cheetahs had a very wide distribution in India, occurring from as far north as Punjab to Tirunelveli district in southern Tamil Nadu, from Gujarat and Rajasthan in the west to Bengal in the east

• **In 1952, the cheetah bid farewell to India,** succumbing to a culmination of threats.

• Large-scale captures for coursing, bounties, and sports hunting, coupled with habitat fragmentation and destruction, dwindled their range and prey base.

• The 20th century witnessed a severe decline, exacerbated by inadequate conservation measures in Indian reserves, amplifying the plight of these majestic felines.

Project Cheetah

- Project Cheetah, which saw the introduction of the African sub-species of the wild cat in India

- The ambitious project has two overarching objectives.

- **First, to** establish a **stable, breeding population of cheetahs** in central India.

- **Two,** to use cheetahs as an **umbrella species** to restore open natural ecosystems such as scrubs, savannahs, grasslands, and degraded forests.

- Project Cheetah aims to bring back **independent India's only extinct large mammal** – the cheetah.

- As part of the project, 50 cheetahs will be introduced in various National Parks over five years.

- Cheetah happens to be the only large carnivore that got completely wiped out from India, mainly due to **over-hunting and habitat loss.**

- The first batch of eight cheetahs from Namibia arrived on September 17, 2022

Kuno National Park

- Kuno National Park of **Madhya Pradesh** is one the most unique destination for all wildlife lovers and enthusiasts.

- It was established as a wildlife sanctuary in 1981 and later became a national park in 2018.

- As soon as one ventures inside this park they experience the exclusive forest of **Kardhai, Khair and Salai** and

one can see wildlife by the dozens foraging across vast meadows.

- Some grasslands here are bigger than most at Kanha or Bandhavgarh Tiger Reserve.

- This area was known to be a dense forest in ancient times as well.

- One of the gazette of Gwalior princely state of year 1902, records that the **Mughal Emperor Akbar** while returning from Malwa region captured a big herd of elephants in the forests near Shivpuri in the year 1564.

- Abul fazal also mentioned this fact that Lions were found in this region and the **last Lion in this region is known to be shot near to city of Guna in the year 1872.**

- It is widely believed that **Kardhai tree,** which is found in abundance here, turns green even with just **presence of humidity** in atmosphere, even before the arrival of first monsoon showers.

- In many ways it represents the true spirit of Kuno's – its never say die attitude and the ability to survive and ultimately grow despite many challenges this forest has overcome.

- This area which has become a National Park today started out as a sanctuary of about 350 sq. kms.

- And was in shape of a leaf with **Kuno river** forming the main centre spine. This river not only helps in keeping a constant water supply in the area and irrigating the forest from inside out but also gave this protected area its name.

- Since the project of reintroduction of Asiatic Lions has been on going for a while and one of the preconditions as raised by concerned authorities about the status of this protected area as Sanctuary not being worthy of hosting the lions, was upgraded to National Park while adding another about 400 sq kms to it and it is now 748 sq km of pristine forest area. The park lies within the larger Kuno Wildlife Division which has a total area of 1235 sq. km.

Arabian leopard

Context - Recent study revealed that Arabian leopard (*Panthera pardus nimr*) has returned to the **plateau of Nejd in Dhofar**, the largest of Oman's 11 governorates on the border with Yemen.

About

- The Arabian leopard was once widespread in Dhofar, including the Nejd, which is a landscape of **rolling plateaus,** low cliffs and *wadis* (river valleys) that extend northward to the Empty Quarter sand desert.

- It was believed that the **Arabian leopard had been locally hunted to extinction** in the Nejd.

- This assumption was made after surveys by camera traps in the central part of the Nejd between September 20, 2004 and June 17, 2007, and in the western Nejd between September 5 and December 30, 2013 did not detect leopards.

- The arid Nejd receives **less than 100 mm of rainfall per year,** with sparse vegetation dominated by thorn trees, as per the study.

The Arabian leopard (*Panthera pardus nimr*)

- It is a **leopard subspecies** native to the **Arabian Peninsula.**

- It has been listed as **Critically Endangered** on the IUCN Red List since 1996 as fewer than 200 wild individuals were estimated to be alive in 2006.

- The Arabian leopard is the **smallest leopard subspecies.**

- It was tentatively affirmed as a distinct subspecies by genetic analysis of a single wild leopard from South Arabia, which appeared most **closely related to the African leopard.**

- The Arabian leopard's **fur varies from pale yellow to deep golden**, tawny, or grey and is patterned with rosettes.

- It is **smaller than both African and Persian leopards.**

- However, it is the **largest cat in the Arabian Peninsula.**

- It is considered that the current range of **Arabian leopards is limited to the Arabian Peninsula,** including Egypt's Sinai Peninsula.

- There they live in mountainous uplands and hilly steppes but seldom move to open plains, deserts, or coastal lowlands.

- They prefer well-vegetated terrain that is difficult for humans to reach. Since the late 1990s, leopards were not recorded in Egypt.

Parambikulam Tiger Reserve

Context - A **faunal survey** by the Forest Department at the Parambikulam Tiger Reserve in Palakkad has added **15 new species t**o the protected area's checklist.

About

- The exercise, conducted from February 6 to 9 by the Parambikulam Tiger Conservation Foundation in association with Travancore Nature History Society and other non-governmental organisations, spanned 11 base camps spread across the reserve's diverse habitats.

- The new additions to the checklist were **Painted spurfowl, Rufus-bellied hawk-eagle, Indian grey hornbill, Anamalai Sholakili, Taiga flycatcher, Plain prinia and Green leaf warbler.**

- Notable species observed during the survey also included the **Great Indian hornbill, Ceylon frogmouth, Lesser fish eagle and Shaheen falcon**

- **Five new butterfly species** were also added to the reserve's checklist, including the **Long-brand bushbrown, Shot silverline, Scarce shot silverline, White-disc hedge blue and Palni dart.**

- Moreover, the survey identified 39 species of odonates, including three new species — Brown darner (*Gynacantha dravida* Lieftinck, 1960), Parakeet darner (*Gynacantha millardi* Fraser,1920), and *Vestalis submontana* Fraser, 1934 Montane Forest-Glory – increasing the reserve's odonate checklist to 69 species.

Parambikulam Tiger Reserve

- Nestled in the **serene hills of the Western Ghats,** Parambikulam Tiger Reserve straddles the border between **Kerala and Tamil Nadu.**

- This pristine wildlife sanctuary is renowned for its rich biodiversity, dense forests, and the majestic presence of Bengal tigers.

- When Parambikulam Wildlife Sanctuary was declared as Parambikulam Tiger Reserve in 2013, as per Section 38 X of the Wild Life (Protection) Act, 1972, the **Parambikulam Tiger Conservation Foundation (PaTCoF) was established** as a **non-profit organization** working under Parambikulam Tiger Reserve in 2014.

- As per the Act, many of the activities which were already being carried out by Parambikulam FDA were amalgamated with PaTCoF and thus receiving statutory support.

- In the present arrangement **Parambikulam Forest Development Agency (FDA) manages the Ecotourism and Eco-Developmental initiatives** of Parambikulam Tiger Reserve while **PaTCoF is engaged in Wildlife Monitoring, Research,** Capacity Development, Species Survey and

other scientific/technical aspects related to managing the Tiger Reserve

• The scenic beauty of Parambikulam Tiger Reserve is accentuated by its numerous water bodies, including rivers, reservoirs, and dams.

• The **Parambikulam Dam, Thunakadavu Dam, and Peruvaripallam Dam** are significant landmarks within the reserve.

• These water bodies not only support the rich biodiversity but also offer picturesque settings for relaxation and recreation.

Tiger Reserves
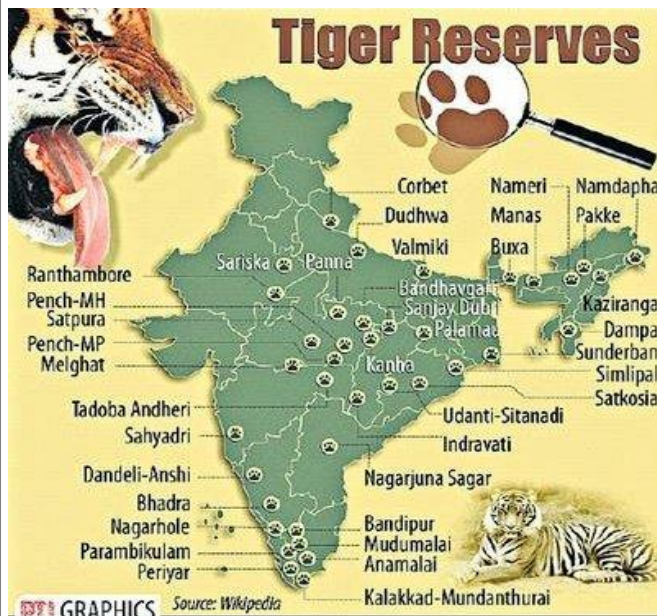
International Big Cat Alliance (IBCA)

Context- The Framework Agreement on establishment of the International Big Cat Alliance (IBCA) has officially come into force.

• The IBCA and its Secretariat have become a full-fledged treaty based inter-governmental international organization and international legal entity.

• To this effect, the Ministry of External Affairs (MEA), Government of India (the Depository of the Framework Agreement) has confirmed that five countries - Republic of Nicaragua, Kingdom of Eswatini, Republic of India, Federal Republic of Somalia and Republic of Liberia - have deposited the instruments of ratification/acceptance/approval, under the Article VIII (1) of the Framework Agreement.

• As of now, 27 countries including India have consented to join IBCA and several international/national organizations working in the field of wildlife conservation have also partnered with IBCA.

• The IBCA was launched by the Prime Minister Shri Narendra Modi on 9th April,2023, during the event 'Commemorating 50 years of Project Tiger'.

• The Union Cabinet approved the establishment of IBCA with **headquarters in India**.

• It was launched with the aim of conservation of **seven big cats - Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma –** with membership of all UN countries/the range countries harbouring the said species and non-range countries where historically these species are not found but interested to support big cat conservation.

• The IBCA was established by Government of India, through the nodal organisation viz., **National Tiger Conservation Authority**

(NTCA), Ministry of Environment, Forest & Climate Change (MoEFCC).

- **Objective -**The primary objective of IBCA is to facilitate collaboration and synergy among stakeholders, consolidating successful conservation practices and expertise to achieve a common goal of **conservation of big cats at global level**.

- This unified approach, bolstered by financial support, aims to bolster the conservation agenda, halt the decline in big cat populations, and reverse current trends.

The National Tiger Conservation Authority (NTCA)

- It is a statutory body under the **Ministry of Environment, Forests and Climate Change** constituted under enabling provisions of the **Wildlife (Protection) Act, 1972,** as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it under the said Act.

- NTCA has been **fulfilling its mandate within the ambit of the Wildlife (Protection) Act, 1972** for strengthening tiger conservation in the country by retaining an oversight through advisories/normative guidelines, based on appraisal of tiger status, ongoing conservation initiatives and recommendations of specially constituted Committees.

- The **authority consists** of the Minister in charge of the Ministry of Environment and Forests (as Chairperson), the Minister of State in the Ministry of Environment and Forests (as Vice-Chairperson), three members of Parliament, Secretary, Ministry of Environment and Forests and other members.

- The '**Project Tiger**' is a Centrally Sponsored Scheme (CSS) of the Ministry of Environment, Forests and Climate Change, providing funding support to tiger range States for in-situ conservation of tigers in designated tiger reserves, and has put the endangered tiger on an assured path of recovery by saving it from extinction, as revealed by the recent findings of the All India tiger estimation using the refined methodology.

Pliosaur skull

Context -A **massive pliosaur skull** has been discovered embedded in the cliffs near **Kimmeridge Bay, Dorset,** astonishing paleontologists and sparking new debates about the deadliest hunters of the Jurassic era.

About

- The fossil, boasting a **bite force stronger than that of a T. rex,** belonged to a **marine reptile** that ruled the seas 145 million years ago.

- With its **razor-sharp teeth and immense jaw power,** this ancient predator is now being compared to the most fearsome creatures to have ever lived.

- Pliosaurs were the **apex predators of the Jurassic oceans**, dominating their waters with huge, muscular jaws

capable of crushing prey with devastating force.

- Scientists analyzing the newly discovered fossil estimate that **its bite was even stronger than that of a Tyrannosaurus rex.**

- Renowned naturalist David Attenborough, who followed the discovery closely, even posed the ultimate prehistoric battle question: Pliosaur vs. T. rex—who would win? According to experts, the

answer is clear: the **pliosaur was the true king of Jurassic-era carnivores.**

Climate Change

Adaptation Vs Mitigation

Context - India has indicated a change in its climate approach by **placing greater emphasis on adaptation** measures rather than focusing primarily on **emission reductions (mitigation)**.

- The recalibration of India's position comes at a time when the international attention on climate action has tapered off a bit, despite 2023 and 2024 setting back-to-back temperature records.

Reason behind shift

- The shift in India's emphasis seems to be prompted by a reassessment of ground realities. The world is nowhere close to meeting its emissions reduction targets for 2030 or 2035 due to inaction largely on the part of the developed countries. In fact, global emissions are still on the rise.

- There is, thus, very little incentive for a developing country such as India to allocate resources for mitigation

efforts. Appreciable benefits of mitigation accrue only when the world as a whole reduces emissions by a significant amount. Also, these benefits are not witnessed immediately as global warming is caused not by the amount of greenhouse gases being emitted, but by their concentration in the atmosphere over time.

- The Economic Survey for 2024-25 asserted that India must first strive to attain developed country parameters by 2047 using available resources, and only then focus on achieving the net zero goal by 2070.

- This is significant as it can liberate India from the dilemma of carrying out aggressive decarbonisation while pursuing rapid economic growth.

- In a sense, the Economic Survey is recommending that India follow the Chinese example. China has unreservedly prioritised economic growth and industrialisation without

bothering about its emissions, which have grown four times from the mid-1990s. This was also when the international climate regime was established. The rapid economic growth has not just brought prosperity but also allowed China to build capabilities that will enable it to decarbonise faster than probably anyone else.

- The meagre financial package agreed to at the COP29 conference in Baku, Azerbaijan, last year has eroded the trust of developing countries in this international process. They do not see their concerns being addressed adequately. Developed countries have not fulfilled their responsibilities on emission reductions and have been extremely stingy in meeting their financial obligations as well.

- US President Donald Trump's immediate withdrawal from the Paris Agreement after assuming office in January 2025, and his decisions to produce more fossil fuels, have brought a certain inevitability to the climate crisis going out of control.

- For India, this means less pressure on issues such as coal phase-down .

- When countries with greater responsibilities, resources and capabilities have made energy choices irrespective of their impact on the climate crisis, India cannot be blamed for exercising similar options in its national interest.

Significance of Adaptation

- Adaptation, on the other hand, offers immediate and local benefits.

- Building up resilience against the impacts of climate change can be a better utilisation of limited resources.

- To a large extent, resilience is often a factor of prosperity.

- This is why India has argued that development is the best shield against the climate crisis.

Mitigation: Focus on greenhouse gases

- Mitigation centers on the root cause of climate change: the heat-trapping greenhouse gases humans are adding to the atmosphere faster than our planet can absorb them. These can be addressed by reducing the sources of greenhouse gas emissions, or enhancing "sinks" of greenhouse gases that remove them from the atmosphere.

- **Reducing sources:** Almost three-quarters of humans' greenhouse gas emissions come from burning fossil fuels like coal, oil and natural gas, so mitigation often focuses on replacing those fuels with other sources of energy, like renewables and nuclear power. Mitigation can also tackle other sources of greenhouse gases: protecting forests from being cut down, for instance, or collecting methane from landfills.

- **Enhancing sinks:** Other forms of mitigation, like growing new forests and designing and building "direct air capture" systems, work by taking

greenhouse gases out of the atmosphere—sometimes called "carbon removal." These approaches are challenging to do at a very large scale, and they do not eliminate the need to drastically lower our emissions. Still, authorities like the Intergovernmental Panel on Climate Change agree that some carbon removal will be needed to head off the worst climate change scenarios.[3]

• The final aim of mitigation is to stop the buildup of greenhouse gases in the atmosphere altogether, and begin drawing them down.

• The Paris Agreement of 2015 set worldwide targets for mitigation, with almost every country on Earth agreeing to zero out their greenhouse gas emissions in time to halt global warming at no more than 2° C, and ideally at no more than 1.5° C.

Adaptation: Focus on climate impacts

• If mitigation is successful worldwide, then one day greenhouse gases will stop building up in the atmosphere, and the planet will slowly stop warming. Even so, we will already have created a hotter world, changed the Earth's weather patterns, and "locked in" some future changes—like sea level rise, which may continue for hundreds of years after the Earth's temperature stabilizes.

• Adaptation to these changes will vary from place to place. Often, it involves building or retrofitting infrastructure, like a better storm drain system to manage increased flooding. But adaptation can also include natural solutions, like restoring wetlands to buffer hurricanes, or behavior and policy changes, like growing new food crops that can better handle warmer seasons and droughts.
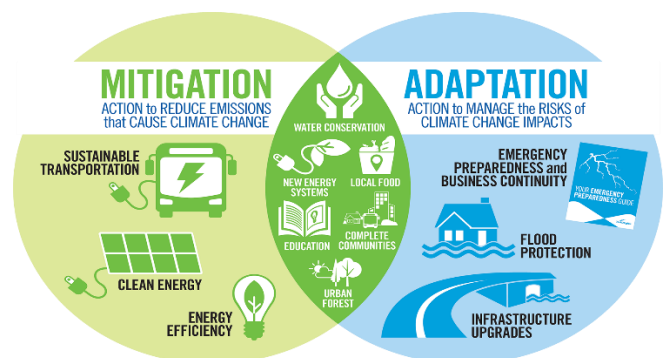
Renewable Energy

Solar Power Capacity

Context - India has achieved a historic milestone by surpassing **100 GW of installed solar power capacity,** reinforcing its position as a global leader in renewable energy.

• This remarkable achievement is a testament to the nation's commitment to a cleaner, greener future and marks a significant step toward realizing its ambitious target of 500 GW of non-fossil fuel-based energy capacity by 2030.

About

• India's solar power sector has witnessed an extraordinary **3450 % increase** in capacity over the past decade, rising from **2.82 GW in 2014 to 100 GW in 2025**. As of January 31, 2025,

India's total solar capacity installed stands at **100.33 GW**, with 84.10 GW under implementation and an additional 47.49 GW under tendering.

• Solar energy remains the dominant contributor to India's renewable energy growth, accounting for 47% of the total installed renewable energy capacity.

• The rooftop solar sector in India witnessed remarkable growth in 2024, with 4.59 GW of new capacity installed, reflecting a 53% increase compared to 2023.

• A key driver of this growth has been the **PM Surya Ghar: Muft Bijli Yojana**, launched in 2024, which is now nearing 9 lakh rooftop solar installations, enabling households across the country to embrace clean energy solutions.

PM Surya Ghar Muft Bijlee Yojana

• The Government of India has approved the PM Surya Ghar: Muft Bijli Yojana on 29th February, 2024 to increase the share of solar rooftop capacity and empower residential households to generate their own electricity.

• The scheme is implemented by a **National programme Implementation Agency** (NPIA) at the National level and by the State Implementation Agencies (SIAs) at the state level.

• The Distribution Utility (DISCOMs or Power/Energy Departments, as the case may be) shall be the State Implementation Agencies (SIA) at the State/UT level.)

• Under the scheme, the DISCOMs shall be required to put in place several facilitative measures for promotion of rooftop solar in their respective areas such as availability of net meters, timely inspection and commissioning of installations, vendor registration and management, interdepartmental convergence for solarizing government building, etc.

How does PM Surya Ghar Muft Bijlee Yojana work?

• The scheme provides for a subsidy of 60% of the solar unit cost for systems up to 2kW capacity and 40 percent of additional system cost for systems between 2 to 3kW capacity.

• The subsidy has been capped at 3kW capacity.

• At current benchmark prices, this will mean Rs 30,000 subsidy for 1kW system, Rs 60,000 for 2kW systems and Rs 78,000 for 3kW systems or higher.

Who are eligible to apply for the Scheme?

• The applicant must be an Indian citizen.

• Must own a house with a roof that is suitable for installing solar panels.

• The household must have a valid electricity connection.

• The household must not have availed of any other subsidy for solar panels

India's power sources as of January 31, 2025	Installed capacity (in GW)	Share (%) in power generation
Coal	220.49	47.29
Hydro power	46.97	10.07
Nuclear	8.18	1.75
Oil and Gas	25.41	5.45
Small hydro	5.1	1.09
Solar energy	100.33	21.52
Wind	48.37	10.37
Bio power	11.41	2.45
Total	466.26	100

Source: India Energy, NITI Aayog

Environmental Pollution

Segregation of waste at source

Context - Recently Supreme Court says **segregation of waste at source** is vital for environment's health

Apex Court asked the National Capital Region (NCR) States of Delhi, Haryana, Uttar Pradesh and Rajasthan how smart city projects envisaged by their governments could actually become a reality unless there was proper segregation of waste at the source in compliance with the Solid Waste Management Rules, 2016.

Solid waste management Rules 2016

Key highlights

- The source segregation of waste has been mandated to channelize the waste to wealth by **recovery, reuse and recycle.**

- Responsibilities of Generators have been introduced to segregate waste in to three streams, **Wet** (Biodegradable), **Dry** (Plastic, Paper, metal, wood, etc.) and **domestic hazardous wastes** (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.

- Integration of waste pickers/ rag pickers and waste dealers/ Kabadiwalas in the formal system should be done by State Governments, and Self Help Group, or any other group to be formed.

- No person should **throw, burn, or bury the solid waste** generated by him, on streets, open public spaces outside his premises, or in the drain, or water bodies.

- Generator will have to pay '**User Fee**' to waste collector and for '**Spot Fine**' for **Littering and Non-segregation.**

- All hotels and restaurants should **segregate biodegradable waste** and set up a system of collection or follow the system of collection set up by local body to ensure that such food waste is utilized for **composting /bio-methanation.**

- All **Resident Welfare and market Associations, Gated communities and institution** with an area >5,000 sq. m should segregate waste at source- in to valuable dry waste like plastic, tin,

glass, paper, etc. and handover recyclable material to either the authorized waste pickers or the authorized recyclers, or to the urban local body

- The **developers of Special Economic Zone, industrial estate, industrial park** to earmark at least 5% of the total area of the plot or minimum 5 plots/ sheds for recovery and recycling facility.

- All **industrial units** using fuel and located within 100 km from a solid waste based RDF plant shall make arrangements within six months from the date of notification of these rules to replace at least 5 % of their fuel requirement by RDF so produced.

- **Non-recyclable waste** having calorific value of 1500 K/cal/kg or more shall not be disposed of on landfills and shall only be utilized for generating energy either or through refuse derived fuel or by giving away as feed stock for preparing refuse derived fuel.

- An **event, or gathering organiser of more than 100 persons at any licensed/ unlicensed place,** should ensure segregation of waste at source and handing over of segregated waste to waste collector or agency, as specified by local authority.

- Special provision for management of **solid waste in hilly areas**:- Construction of landfill on the hill shall be avoided. A transfer station at a suitable enclosed location shall be setup to collect residual waste from the processing facility and inert waste.

Suitable land shall be identified in the plain areas, down the hill, within 25 kilometers for setting up sanitary landfill. The residual waste from the transfer station shall be disposed off at this sanitary landfill.

Impact of ethanol on the environment

Context - Recently some scientists showed concerns **regarding impact of ethanol on environment.**

Concerns

Relaxation in environment clearance -

- To meet the required target of 20% ethanol in petrol by 2025-26, 1,016 crore litres of ethanol would be required.

- The Centre announced relaxations in the application processes for environmental clearance and also offered subsidies on purchase of grains to ensure a smoother process for ethanol factories.

Pollution -

- Scientists and farmers saying water resources are depleting and emissions from factories are polluting the air, water, and soil. Andhra Pradesh, Maharashtra, Haryana and Punjab have the highest number of ethanol factories in the country, contributing a substantial portion to the overall production capacity of 947 crore litres in 2022 .

- Since 2024, there have been continuous protests at the Gummaladoddi, Gandepalli, Arugolanu villages in

Andhra Pradesh against the EBP programme. All the three villages are located near a river or a canal, which is the source of drinking water and agricultural needs.

- All ethanol production plants and distilleries fall under the 'red category', which means that they have a pollution score of 60 or more, as per Central government norms. But to facilitate a smoother and quicker clearance process, the Centre has allowed them to be set up without public hearings. Many of them are near human settlements.

Impact on agriculture-

- Lokayukta officials had also said officials of the Pollution Control Board had failed to take action in 2022 against a factory producing ethanol since 2008 in Gandepalli despite knowing that effluents were being discharged into a nearby canal, which is used by farmers for agricultural purposes.

Health impact-

- Much of the confusion regarding how polluting an ethanol plant can be arises from the fact that environmental clearances do not mention emissions to begin with. Experts say that hazardous, cancer-causing chemicals such as acetaldehyde, formaldehyde, and acrolein are some of the emissions from ethanol factories, but these don't find a mention in the clearances given to the ethanol factories

Water depletion

- Farmers also fear that the water-guzzling factories will leave them with no water for their crops. Their fears are not unfounded. Scientists for People, a collective of scientists based in Hyderabad, argue that a grain-based ethanol factory requires 8-12 litres of water per litre of ethanol. With the flow in perennial rivers such as the Krishna being lean for most of the year, factories located near these rivers depend on groundwater, which is a contravention of the rules.

Relevance of EBP Programme

- A Niti Aayog report states that when petrol was blended with 20% of the biofuel, carbon monoxide reduced by 30% in four wheelers and 50% in two wheelers. While this may be true, scientists and environmentalists ask of what use the EBP programme is if the gains achieved are negated by the harmful chemicals released into the atmosphere during the process.

- On the one hand, environmentalists say the processes involved in the making of biofuel make it more harmful for the environment. On the other, industrialists say many factories cannot afford pollution control measures because of rising production and labour costs.

Ethanol blending Programme

- It was introduced in India as a pilot project in 2001, the Central government in 2020 decided to advance the target of **20% ethanol blending in petrol from 2030 to 2025** as the way towards a greener future.

- The EBP programme was said to be the way of addressing multiple concerns — of growing energy consumption, oil imports, and increasing carbon emissions from vehicles.

- Under the EBP, ethanol is made using grains, such as broken rice and corn, and is therefore said to double farmers' income as well. As of 2024, the blend percentage was 15% in the country.

- To meet the required target of 20% ethanol in petrol by 2025-26, 1,016 crore litres of ethanol would be required.

- The Centre announced relaxations in the application processes for environmental clearance and also offered subsidies on purchase of grains to ensure a smoother process for ethanol factories.

Ecosystems

Peatlands

Context - A recent study has cautioned that **peatlands, crucial carbon reservoirs, are severely underprotected,** and their ongoing destruction could jeopardise climate change goals.

Key Highlights

- Peatlands, which occupy **only 3 per cent of the Earth's surface**, hold 600 billion tonnes of carbon — surpassing the carbon stored in all the world's forest biomass combined. However, **merely 17 per cent of peatlands are safeguarded** worldwide.

- Specifically, **only 11 per cent of boreal peatlands** are protected, compared to 27 per cent of temperate and tropical peatlands.

- The figure is in stark contrast to the levels of protection afforded to other at-risk ecosystems like mangroves (42 per cent), saltmarshes (50 per cent) and tropical forests (38 per cent).

- At least 27 per cent of the world's peatlands are located on indigenous peoples' lands, where these communities have protected them. Over 85 per cent of peatlands on indigenous peoples' lands are not part of other protected areas.

- Countries with the most peatlands include **Canada, Russia, Indonesia, the United States, Brazil**, the Democratic Republic of the Congo, China, Peru, Finland and the Republic of the Congo. These 10 countries contain 80 per cent of global peatlands. And **the first five contain 70 per cent of global peatlands.**

- Almost a **quarter of the world's peatlands are facing significant stress** due to extensive drainage and degradation from commercial agriculture, forestry, mining, infrastructure development and peat extraction for fuel and horticulture.

- Additionally, peatlands worldwide are adversely **affected by climate change.**

- The estimates of protected peatlands include **Ramsar sites, which comprise roughly a fifth of protected peatlands globally** and nearly two-fifths of protected peatlands in the tropics.

- Yet, Ramsar sites generally lack strong government commitment, evidenced by the absence of domestic legislation, legal frameworks or management plans in these sites.

Peatlands

- Peatlands are **terrestrial wetland ecosystems** in which waterlogged conditions prevent plant material from fully decomposing.

- Consequently, the production of organic matter exceeds its decomposition, which results in a net accumulation of *peat*.

- In cool climates, peatland vegetation is mostly made up of *Sphagnum* **mosses, sedges and shrubs** and are the primary builder of peat, whereas in warmer climates graminoids and woody vegetation provide most of the organic matter

- Peatlands occur in every climatic zone and continent and cover **4.23 million km^2,** which corresponds to **2.84% of the Earth's terrestrial surface** .

- Peatlands include landscapes that are still actively accumulating peat (mires), others that are no longer accumulating and do not support the principal peat forming plants (e.g. *Sphagnum sp*.), and peatlands used for economic uses such as agriculture, forestry and excavation for

energy & heat generation, horticulture and a other uses.

- About 84% of the world's peatlands are considered to be in natural, or near-natural state.

- **Drained peatlands make up about 16% of the world's peatlands, or 0.5% of the Earth's terrestrial surface**.

- Due to the process of peat accumulation, peatlands are **carbon rich ecosystems that store and sequester more carbon than any other type of terrestrial ecosystem**, exceeding thereby even the global above-ground carbon stock of forest ecosystems.

- When peatlands are drained, the carbon from organic matter contained in peat dries and oxidizes gradually to CO_2, and is permanently lost from the system.

- Over time, this process also results in **soil compaction and subsidence,** making it difficult to restore proper hydrology without water table management.

Way Forward

- **Urgent action worldwide to protect, sustainably manage, and restore peatlands is essential**. This involves **stopping degrading activities** such as agricultural conversion and drainage, and **restoring the waterlogged conditions** required for peat formation.

- Data shows that this is the **only land-based option to indefinitely sequester carbon**, is **cost-effective**, and that any

emissions from restoration are more than offset in the long-term.

- **Clear and ambitious targets for the rewetting and restoration of peatlands must be set** (such as those in the UK and Association of Southeast Asian Nations country strategies), and peatland protection **included in national adaptation plans to meet commitments under the Paris Agreement**.

- The **definition of peatlands** varies between countries, and often excludes areas of value to industry.

- Given the urgent need to reduce greenhouse gas emissions and prevent biodiversity loss, **definitions of peatlands should prioritise conservation, restoration and sustainable management**.

- **Public and private finance must be mobilised** to secure peatlands and **provide green jobs**.

- Possible instruments include: emissions trading schemes and carbon markets; investment in restoration through payment for ecosystem services (such as clean water and flood protection); environmental bonds; government-backed carbon price guarantees.

- **The international community**, including the UN Environment Programme, Food and Agriculture Organization and Ramsar Convention, have already **committed to several goals, resolutions and strategic actions**

peatland cover in %
- 0
- 0.0 - 0.4
- 0.4 - 2.0
- 2.0 - 4.0
- 4.0 - 8.0
- > 8.0
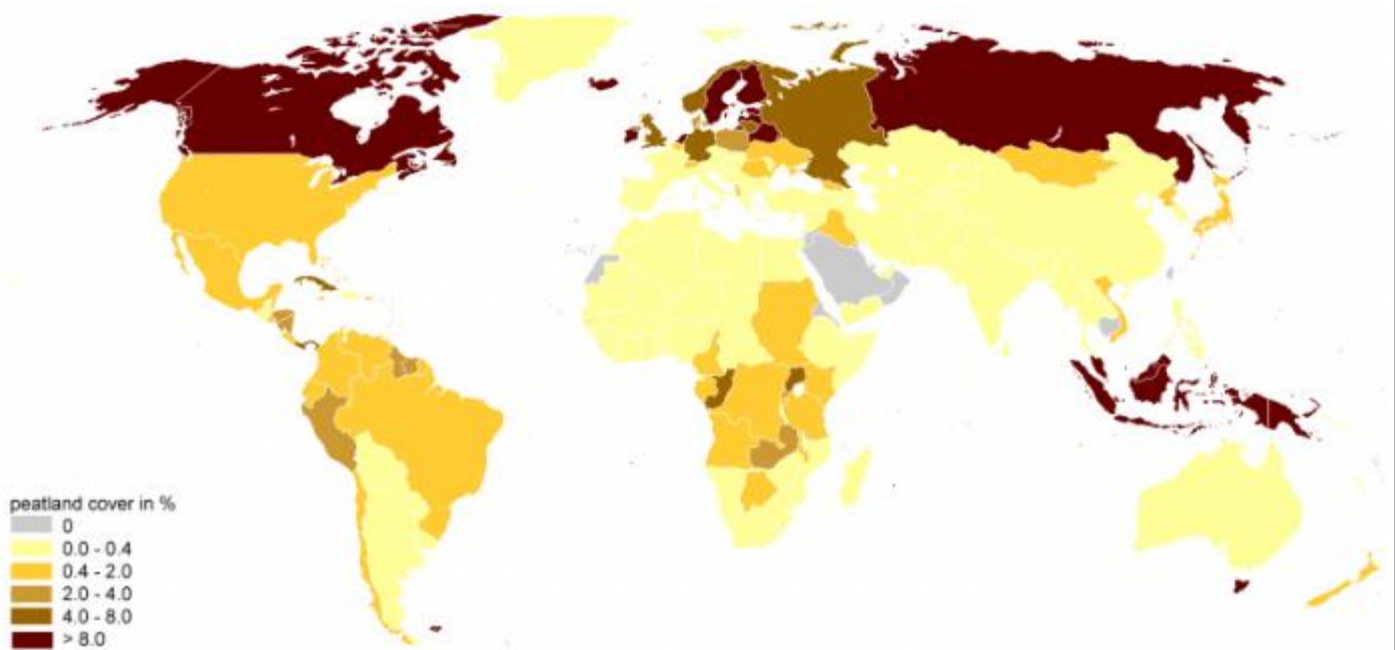
History

Art and Culture

Ratnagiri - Buddhist Site

A view of the Buddha head in Ratnagiri, Odisha | Express photo

A colossal Buddha head, a giant palm unearthed during an ASI excavation in Ratnagiri
What this means

A view of the excavation site in Ratnagiri, Odisha

The Archaeological Survey of India (ASI) has uncovered remarkable Buddhist remains during fresh excavations at the historic Ratnagiri site.

- Key discoveries include: **Colossal Buddha Head (8th-9th century AD), 5-foot Palm, likely part of a larger**

Buddha statue, Ancient Wall and Inscribed Relics.

- Ratnagiri – translated as the '*Hills of Jewels*", is located in **Jajpur district, Odisha**, approximately **100 km northeast of Bhubaneswar**.

- It is part of the **Diamond Triangle of Odisha**, along with **Udaygiri and Lalitgiri**.

The Indian EXPRESS
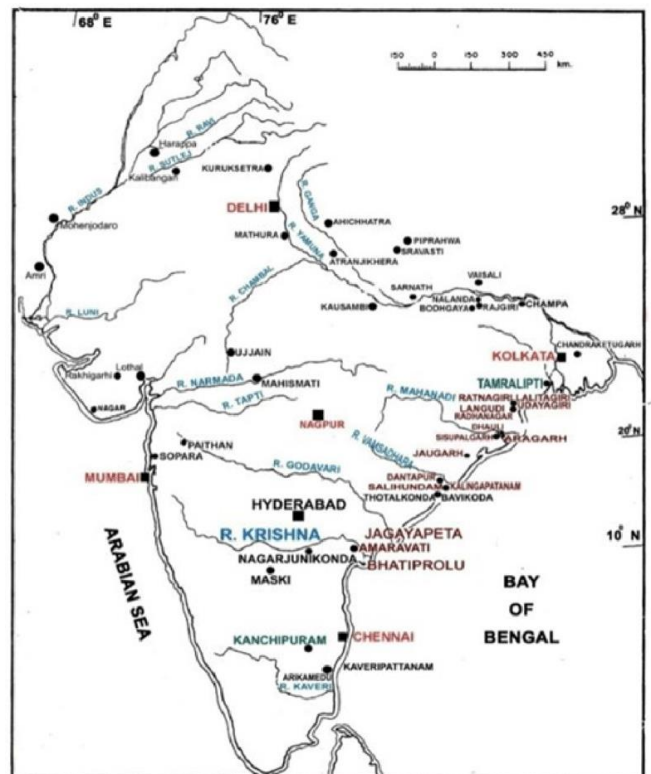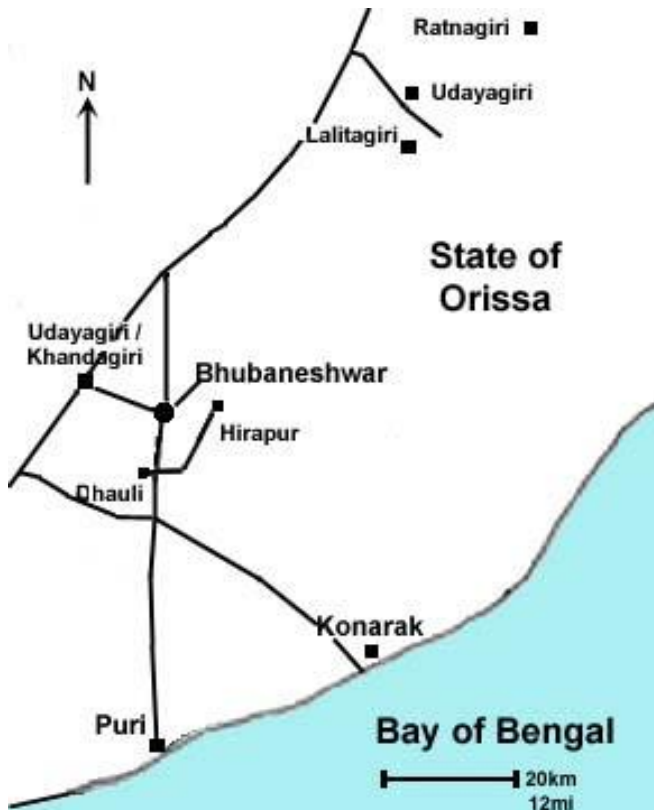
ODISHA & SOUTHEAST ASIA

■ Odisha has long enjoyed maritime and trade links with Southeast Asian countries. The state annually holds Baliyatra (voyage to Bali) – a festival to commemorate the maritime and cultural links between Kalinga and Bali and other South and Southeast Asian regions

■ Mauryan Emperor Ashoka, who invaded Kalinga in 261 BC but eventually embraced Buddhism after the war, helped spread the religion to Sri Lanka, and Central and Southeast Asia

- The site stands on a hill between *Birupa and Brahmani rivers* and is Odisha's most famous — and the most excavated – Buddhist site.

- Earliest Excavation were conducted by **Debala Mitra** (1958-1961): Unearthed stupas, monastic complexes, and artifacts.

- Experts date the site to the **5th-13th centuries**, with its peak period of construction between the 7th and 10th centuries, under the patronage of the **Bhauma-kara dynasty.**

- During this time, Ratnagiri emerged as a hub for the **Mahayana** and **Tantrayana (Vajrayana)** sects of Buddhism.

- Some studies suggest that the famous **Chinese Buddhist monk and traveler,** *Hiuen Tsang*, who visited Odisha in 638-639 AD, may have visited Ratnagiri.

The Buddhist site at Kolaragiri :

- Rare stone sculptures of Lord Buddha, along with other sculptures, pottery and artefacts, were unearthed on Saturday by Archaeological Survey of India (ASI) officials at **Kolaragiri hillock**, around 2 km from the renowned Buddhist site of Ratnagiri, **in Jajpur district.**

The Buddhist site at Kolaragiri was perhaps built 2,000 years ago.

Bathouism

Assam: Move to recognise Bathouism highlights government commitment to preserve nature-based faiths, says expert

There was a need to recognise distinct indigenous identity of the Bodos, according to Sanghamitra Choudhury

Context: On February 22, 2025, the government of the Bodoland Territorial Region (BTR), an autonomous body under the 6th Schedule of the Constitution, in Assam made Bathouism an official option in the religion section of various application forms.

- Bathouism is **the traditional faith of the Bodos,** the **largest plains tribe of Assam.**

- Their homeland has been on the **north bank of the Brahmaputra, with the foothills of Bhutan** to the north and **make up about 5-6% of Assam's population.**

- Bathou is linked up with and centred **round the worship of Bathoubwrai or Sibwrai,** the **supreme god of the Bodos.**

- **'Ba' in Bodo means 'five'** and **'thou' means 'deep philosophical thought'.** The faith system is based **on five elements:** *Bar* (Air), *San* (Sun), *Ha* (Earth), *Or* (Fire) and *Okhrang* (Sky). It is like the *Panchatatva* **in Hinduism.**
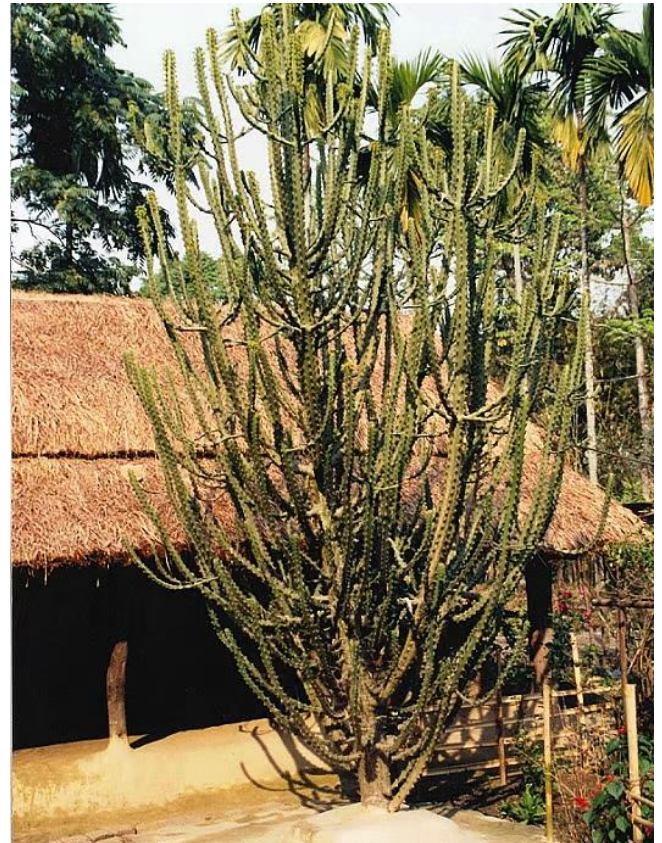
- In Bodo language, the word **Bwrai** signifies **the oldest or most elderly man in power and knowledge or the supreme** in all respects. Therefore, he exclusively represents **supreme soul, poromatma, who is omnipotent, omnicient, omnipresent.**

- The Bathou faith is centred on the *Sijou* **plant (***Euphorbia splendens***).** The Sijou is planted in the Bathou altar at the centre as the symbol of Bathou religion of the Bodos.

- In Bathou religion, the **Sijou plant has been widely accepted as the symbol of life or soul by the Bodo people**

since time immemorial. **The Sijou plant is the living symbol of Bathoubwrai, the supreme God of the Bodos.**

• There **are parallels between Bathousim and Sarnaism,** another indigenous faith largely practiced on the Chota Nagpur Plateau. Both share some similarities like **nature worship, belief in ancestral spirits and a priesthood.** The differences lie in the fact that they are practiced by different ethnic groups and are set in the context **of Central and Northeast India respectively.** Also, while Sarnaism is centred on **the sacred grove, Bathouism is centred on the Sijou tree.**

Dokra Artwork

Context: Prime Minister Narendra Modi, during his meeting with French President Emmanuel Macron on the sidelines of the AI Action Summit in Paris, presented him with a Dokra artwork—an exquisite metal-casting piece from Chhattisgarh.

• Dokra art, a **revered metal-casting tradition** from **Chhattisgarh**, is crafted using the **ancient lost-wax technique**.

• Made from **brass and copper**, the piece is adorned with **fine detailing** and enhanced with lapis lazuli and coral, adding a striking contrast.

• Dokra art **traces its origins back more than 4,000 years**. It is a form of folk art practiced by the **Dhokra Damar tribes,** who are traditionally metalsmiths.

• These artisans are primarily found in eastern India, including **West Bengal, Odisha, and Jharkhand, with a notable presence in Chhattisgarh** as well.

The iconic **Adilabad Dokra**, an ancient bell metal craft has been accorded with the **Geographical Indication (GI) tag by the Geographical Indications Registry of India in 2018.**

- Dokra pieces often **depict tribal life, nature, animals, deities, and musicians.** Each artwork tells a story:

    - **Musicians and Dancers:** Symbolize the **central role of music and celebration in tribal culture.**

    - **Animals like Elephants and Horses:** Represent **power, prosperity, and reverence for nature.**

    - **Deities:** Reflect indigenous **spiritual beliefs and cultural practices.**

Lezim Dance

Context: A scene from the trailer of **the Bollywood film Chhava**, based on the life of **Maratha ruler Chhatrapati Sambhaji Maharaj,** led to controversy in Maharashtra. In the scene actor who portrays the king, is seen performing the **Lezim** (Lazium) folk dance.

- It is traditional **folk dance of *Maharashtra*.**

- It is a major part of **cultural celebrations as well, such as Ganesh Chaturthi.**

- Performed using **Lezim,** a small mallet, is made of a thin wood with pieces of metal strung together which clash and produce a sonorous sound when swinging.

- Initially performed during **martial arts training** and later adapted into cultural and celebratory events, **Lezim is as much a rigorous physical exercise, a drill, as a dance.**

- The formations are in twos and fours and sometimes even a circle.

- The dance is accompanied by **a dhol or dholki** (small dhol).

- There **are no wind or string instruments** accompanying it, often there is no song accompaniment either, but of late, sometimes, a song is sung.

- **Vigorous movements**, such as stepping, squatting, and jumping, form an intrinsic part of the dance.

- The drum beat usually starts at a slower pace and gradually speeds up,

with the dancers performing faster movements in sync with the sound.

- It is a symbol of **Maratha pride and unity**, resonating with **the community's cultural identity.**

Dashavatar Drama

Dashavatar performances in Maharashtra | The men who play women under the stars 🅿️ Premium

For centuries, men in the State's Sindhudurg district and parts of north Goa have been playing women characters in Dashavatar performances that tell stories from Indian mythology. *The Hindu* talks to them to understand the complexities of their identities on and off stage, and the challenges in their roles and in society

Updated - February 08, 2025 03:46 pm IST

- Dashavatar is a traditional folk theatre **form prevalent in Maharashtra, particularly in the Konkan region.**

- Every year, the Dashavatar season begins **after the paddy harvest,** towards the **end of the Navratri fast in October, and continues until May the following year.**

- The plays are based on a clutch of **stories of the 10 incarnations of the Hindu god Vishnu:** Matsya (the fish), Kurma (the tortoise), Varaha (the boar), Narasimha (the lion-man), Vamana (the dwarf), and Rama from the Ramayana; Parashurama (Rama with an axe), and Krishna (or his brother Balarama) from the

Mahabharata; and Buddha and Kalki (an avatar yet to come).
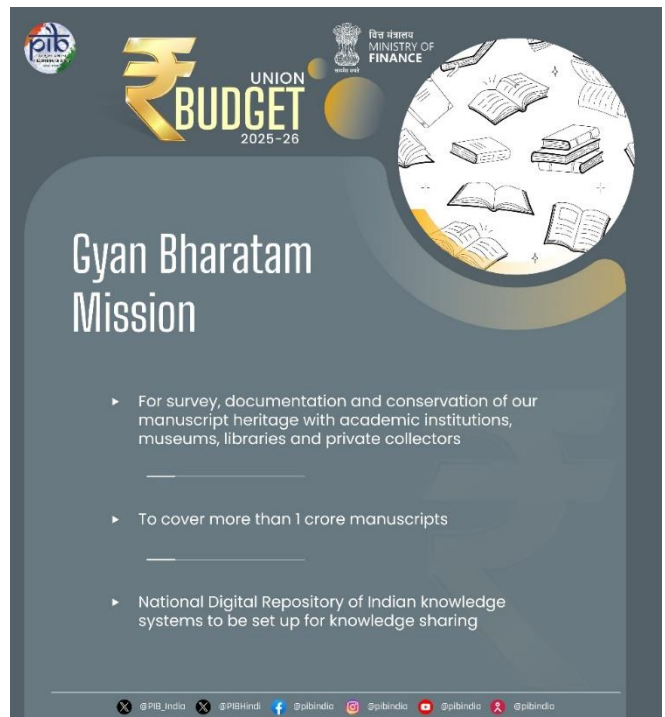
- Each play has **all the nine rasas**, including anger, humour, and sorrow. There is music with **a harmonium, a pakhawaj (a percussion instrument), and cymbals**.

- Musicians sit in a corner of the stage.

- A unique feature of **Dashavatar** is that men **play both male and female characters.** It requires **mastery of feminine mannerisms, expressions, and voice modulation.**

Gyan Bharatam Mission

New mission for manuscripts announced in Union Budget

To accommodate the 'Gyan Bharatam Mission', budget allocation for the National Manuscripts Mission (NMM) has been hiked from ₹3.5 crore to ₹60 crore.

Updated - February 01, 2025 10:57 pm IST - New Delhi

Bakhshali manuscript (Third or fourth century A.D.), an ancient Indian mathematical text **written on birch bark**, is considered to be **earliest recorded example of use of zero (dot symbol).**

The dot symbol is significant for two reasons:

1. The **dot evolved to become zero.**

2. Indian astronomer and mathematician, **Brahmagupta wrote a text called Brahmasphutasiddhanta in 628 AD**, the first document to **discuss zero.** The manuscript proves zero was developed in India, the number we all use today.

Gyan Bharatam Mission(Union Budget 2025-26):

- The **Gyan Bharatam Mission, a** special mission for **survey, documentation, and conservation** of India's **manuscript heritage,** aims to **preserve and digitize** India's rich manuscript heritage, ensuring **knowledge accessibility for future generations.**

- Manuscripts from **academic institutions, museums, libraries**, and **private collectors** to be surveyed and documented.

- Over **one crore** manuscripts will be digitized under this mission, leading to the creation of a **National Digital Repository**. This repository will enable scholars and researchers worldwide to **access India's historical, traditional knowledge and wisdom.**

- **AI technologies** are employed in the Gyan Bharatam Mission to assist in **cataloging, organizing, and making the digitized content more accessible and searchable.**

- To accommodate this new initiative, **the budget allocation for the National Manuscripts Mission (NMM),** whose aim is to identify and document manuscripts and make the manuscript heritage accessible across the country, has been **hiked from ₹3.5 crore to ₹60 crore.**

- **NMM** was **launched by the Ministry of Culture in 2003** under the **Indira Gandhi National Centre for Arts (IGNCA).**

- **IGNCA** was established in **1987** as an **autonomous institution for research, academic pursuit, and dissemination in the arts**.

A manuscript is a **handwritten composition** created on **paper, bark, cloth, metal, or palm leaf**, and it must be **at least 75 years old.**

India holds an estimated **5 million manuscripts**, probably the largest collection in the world.

Modern Indian History

Ajit Singh and Pagri Sambhal Jatta Movement

News / Explained / Explained History / On his birth anniversary, meet Bhagat Singh's uncle Ajit Singh, who started Pagri Sambhal Jatta movement

🏆 Premium

On his birth anniversary, meet Bhagat Singh's uncle Ajit Singh, who started Pagri Sambhal Jatta movement

Who was Bhagat Singh's uncle Ajit Singh, and why is he an important figure for protesting farmers? What was the 'Pagri Sambhal Jatta' movement? We explain.

Written by Raakhi Jagga (Follow)
Ludhiana | Updated: February 23, 2025 13:11 IST   NewsGuard

Context: On February 23, 2021, Pagri Sambhal Diwas was observed by farmers protesting at the Punjab and Haryana borders to honor Ajit Singh's contributions and recognize the continuing struggles of farmers.

SARDAR AJIT SINGH

Pagri Sambhal Jatta Movement

- Ajit Singh was born on **February 23, 1881**, and was the **younger brother of Sardar Kishan Singh and the uncle of Shaheed Bhagat Singh,** the visionary and revolutionary thinker.

- Singh attended the DAV College in Lahore after graduating from the Anglo-Sanskrit High School in Jalandhar in 1894.
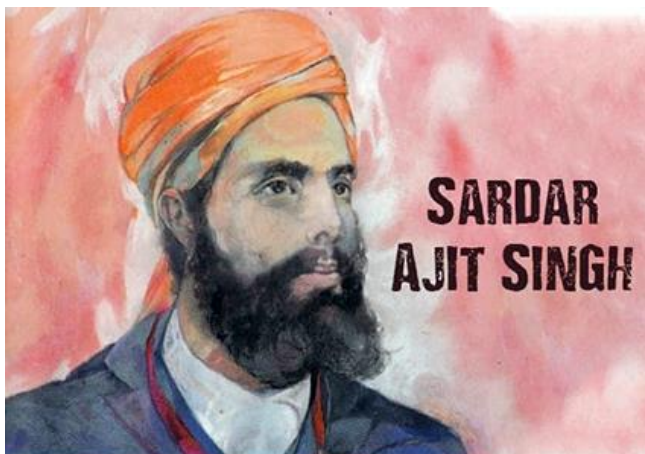
- He later enrolled at Bareilly College to study law, but he dropped out.

- In **1905**, **Ajit Singh and his brother Kishan Singh worked among the people in famine-stricken areas** like Barar (Madhya Pradesh) and Ahmedabad, as well as flood and earthquake-affected areas like Srinagar and Kangra.

- Ajit Singh was arrested and **deported to Myanmar's Mandalay jail in 1907 for leading the Pagri Sambhal Jatta, a peasant agitation**.

Singh, along with other Congress leaders, rallied peasants in opposition to new colonial laws,

- The two laws were: **The Punjab Land Colonisation Act, 1906; and The Doab Bari Act, 1907.**

  - The **Punjab Land Colonisation Act** gave the **British control over land ownership** in the newly developed **Chenab Colony** (now in Pakistan). Farmers had to transfer their land to the British government upon death instead of passing it to their heirs.

  - The **Doab Bari Act, 1907,** too, took away farmers' **ownership rights over their lands,** effectively reducing them to contract workers.

  - The British also **raised taxes on agricultural land and water for irrigation,** and thus, forced many small farmers and peasants into **debt and land loss.**

- The slogan, Pagdi Sambhal Jatta, the name of the movement, was **inspired**

by the song by **Banke Lal, the editor of the Jang Sayal newspaper.**

- Ultimately, **the laws were revoked in May 1907**, but **Lala Lajpat Rai,** also a speaker at some of these meetings, was arrested on May 9 and **Ajit Singh on** June 2.

- Both were **deported to the Mandalay prison in Burma for six months under Regulation III of 1818.**

- Both were released on **November 11, 1907.**

- After being released from Mandalay prison, Ajit Singh attended the **Congress session in Surat** and went on to found the **Bharat Mata Society, a revolutionary organization, in 1907.**

Many young revolutionaries like **Sufi Amba Prasad, Zia-ul-Haq, Lal Chand Falak, Din Dayal Banke, Kishan Singh and Lala Ram Saran Das** were among the **members of Bharat Mata Society.**

- Singh traveled to Paris after spending some time in Iran, leaving behind his colleague Amba Prasad to continue the work in Iran.

- In Paris, Singh established a network of solidarity with people fighting for India's liberation throughout Europe.

- During this time, he also established the **Indian Revolutionary Association (Bharatiya Krantikari Sangh).**

- Ajit Singh moved to **Brazil in 1913 and** formed close ties with the **Ghadar Party** and its leaders, including **Bhai Rattan Singh, Teja Singh Swatantra, and Baba Bhagat Singh Bilga.**

- **In 1932,** he returned to Europe. One of Singh's most significant achievements **in Italy** was the establishment of **Azad Hind Fauj.**

- **Singh was apprehended by allied forces in May 1945, following Italy's defeat.**

- He was imprisoned in various jails throughout Italy and Germany until December. His health suffered as a result of his lengthy incarceration.

- **Ajit Singh arrived in London in 1946 and then returned to Karachi.** However, the increasing communal violence on the eve of partition broke his heart.

- With his health deteriorating, he was transferred to the hill station of Dalhousie, where **he died on August 15, 1947, the day India gained independence.**

Chandra Shekhar Azad

Context: February 27, 2025, marked the anniversary of the martyrdom of **Chandra Shekhar Azad**, a legendary figure in India's freedom struggle.

Chandra Shekhar Azad (1906–1931):

- Born on **July 23, 1906**, in **Bhabhra, Madhya Pradesh**.

- Deeply influenced by the **Jallianwala Bagh massacre**, joined the **Non-Cooperation Movement** at a young age.

- When arrested during the movement, he famously declared his name as **"Azad"** (meaning Free) in court and was punished with **15 lashes**.

- On **February 27, 1931**, Azad was surrounded by British police at **Alfred Park, Allahabad**. Choosing death over capture, he used his last bullet on himself, keeping his vow never to be taken alive.

Major Contributions to the Freedom Struggle:

Joined Hindustan Republican Association (HRA) (1924):

- Became a key figure in the HRA, led by **Ram Prasad Bismil**.

- Raised funds for revolutionary activities, including conducting political raids (dacoities).

Kakori Train Robbery (1925):

- Played a major role in the famous **Kakori Train Robbery**, where revolutionaries seized British treasury funds from a train.

Formation of Hindustan Socialist Republican Association (HSRA) (1928):

- Alongside **Bhagat Singh** and others, restructured the HRA into the **HSRA** to promote socialist ideals and armed struggle against British rule.

John Saunders' Assassination (1928):

- Planned the assassination of **James A. Scott**, who was responsible for the death of **Lala Lajpat Rai** due to police brutality.

- However, due to mistaken identity, **John Saunders** was killed instead.

Attempt to Assassinate Lord Irwin (1929):

- Azad and his team attempted to blow up **Lord Irwin's train**, but the plan ultimately failed.

Geography

Climatology

Why temperatures at north pole reached 20 degrees Celsius above average

- **Context :** Temperatures increased by more than **20 degrees Celsius above average at the north pole, crossing the threshold for ice to melt.**

Why did the north pole experience such high temperatures?

- The current unusually mild temperatures in the region during the depths of the polar winter (it is from November to February) were **due to a deep low-pressure system — a region where the atmospheric pressure is lower than that of surrounding locations — over Iceland.** The **system opened gates for the arrival of warmer air from lower latitudes, effectively bringing heat to the region.**

- Another factor was **really hot sea surface temperatures in the north-east Atlantic, which further intensified the wind-driven warming.**

- As a result, the daily average temperatures at the north pole were more than 20 degrees Celsius above average on February 2, with absolute temperatures being more than -1 degrees Celsius.

Why has the Arctic warmed faster than the global average?

- The global temperatures have increased by around 1.3 degrees Celsius compared to the 1850-1900 baseline.

- **However, this rise in temperatures is not uniform across the planet. For instance, the Arctic has warmed 3.8 times faster than the global average since the late 1970s, according to a 2022 study.**

- There are multiple factors behind the Arctic's rapid warming. **One of the most prominent factors is the albedo effect or how much sunlight a surface reflects. Sea ice keeps temperatures down in the polar regions, as its bright, white surface reflects more sunlight back to space than liquid water. As the ice cover in the Arctic is melting, more land or water is getting exposed to the Sun and more heat is getting absorbed, leading to a rise in temperatures.**

- **The lack of convection in higher latitudes such as the Arctic is another reason.** Convection occurs when air close to the ground is heated by the warm surface of the Earth. In the tropics, where more sunlight can reach the surface compared to the Arctic, strong convection takes place, causing warm air to rise.

- **This vertical mixing distributes heat throughout the atmosphere.**

- **However, in the Arctic, due to weak convection, the extra warming from**

the greenhouse gases is not able to mix vertically and the heat remains concentrated near the surface.

Global Sea ice cover has dipped to record low — what this means

Context : Global sea ice cover dipped to a new record low .

- Over the five-days leading up to February 13, the combined extent of Arctic and Antarctic sea ice dropped to 15.76 million sq km, down from the previous five-day record low of 15.93 million sq km in January-February 2023, according to BBC analysis of data from the US National Snow and Ice Data Center (NSIDC).

- **Sea ice refers to the free-floating ice in the polar regions**. While it generally expands during the winter and melts in the summers, some sea ice remains year-round. **Note that this is different from icebergs, glaciers, ice sheets, and ice shelves, which form on land**.

- **Sea ice plays a crucial role in cooling the planet by trapping existing heat in the ocean, and thus precluding it from warming the air above. Therefore, a reduction in sea ice cover can have disastrous consequences for Earth.**

The dip

- Currently, **Arctic sea ice is at its lowest recorded extent for the time of year.** Meanwhile, Antarctic sea ice is close to a new low, based on satellite records going back to the late 1970s. But given historical trends, this is not all that surprising. Since the late 1970s, NSIDC

has estimated that some 77,800 sq km of sea ice has been lost per year.

- Between 1981 and 2010, Arctic sea ice extent in September — when it reaches its minimum extent — shrunk at a rate of 12.2% per decade, according to the National Aeronautics and Space Administration (NASA).

- **In the Antarctic, the situation is a bit different. Until 2015, the region actually witnessed a slight year-on-year increase in sea ice.** Between **late 2014 and 2017, however, the Antarctic lost two million square km of sea ice** — an area equivalent to roughly four times the size of Spain, according to the Copernicus Marine Service. Sea ice levels again increased in 2018.

- In 2023, maximum Antarctic sea ice reached historically low levels. Sea ice cover was more than two million sq km lower than usual — an area about 10 times the size of the UK.

- Last year, the cover was higher than in 2023 but still 1.55 million sq km below the average maximum extent from 1981-2010.

Behind the dip

- Experts suggest that the 2025 low could be due to **a combination of warm air, warm seas and winds breaking apart the ice**, the BBC reported.

- **Antarctic sea ice is particularly vulnerable to ice-breaking winds**. Unlike Arctic ice, it is surrounded by the ocean instead of continents and is thus more mobile, and also comparatively thinner. The situation

has been made worse this year due to warmer air and warmer waters towards the end of the southern hemisphere summer (December to February).

• **Higher air temperatures led to the melting of the edges of the Antarctic ice sheet — also known as ice shelves** — which extend over the ocean. "[The] ongoing ocean warming is setting the backdrop to all of this," Tom Bracegirdle, research scientist at the British Antarctic Survey, told the BBC.

• In the Arctic, where winter lasts from November to February, sea ice remained low because of a delayed freezing around the Hudson Bay, a large saltwater body in northeastern Canada. **The delay occurred as unusually warm oceans took a longer time to cool down.**

The region also witnessed some storms which broke apart ice around the Barents Sea, located off the northern coasts of Norway and Russia, and the Bering Sea, the stretch between Alaska and Russia. Experts say that Arctic ice has become thinner and more fragile over the years, and hence more susceptible to breaking by storms.

• **Higher than usual air temperatures in areas such as Svalbard, Norway, resulted in further loss of sea ice.**

What dip means

• **Less sea ice cover means that more water is getting exposed to the Sun and more heat (solar radiation) is getting absorbed, leading to a further rise in temperatures**.

• Notably, **sea ice keeps temperatures down in the polar regions, as its bright, white surface reflects more sunlight back to space than liquid water**.

• **The loss of sea ice cover could be one of the reasons why the polar regions are getting warmer at a faster rate than the rest of the world.**

• **Studies have found that melting sea ice is also slowing down the flow of water through the world's oceans.** This is happening because freshwater from melting ice enters the ocean, and reduces the salinity and density of the surface water, thereby diminishing that downward flow to the sea's bottom. **A slowdown of ocean overturning can severely impact the global climate, the marine food chain, and the stability of ice shelves.**

Miscellaneous

Gulf of Mannar

Context : Deep sea region identified in T.N. for oil, gas exploration

• An area of 9,990.96 sq km in southern **Tamil Nadu's deep sea region of the Gulf of Mannar has been included in a recent tender for hydrocarbon**

exploration issued by the Ministry of Petroleum and Natural Gas.

• This is a part of the Ministry's **10th round of the Open Acreage Licensing Policy, which invites companies to submit bids for its exploration right.**

- The Ministry has identified potential hydrocarbon reserves in deep sea areas off the coast of **Tamil Nadu in the Gulf of Mannar, covering Ramanathapuram and Thoothukudi districts.**

- **However, environmentalists have raised concerns over the impact of oil and gas exploration on marine life and local fishing activities**

- The Gulf of Mannar Biosphere Reserve is home to rare and endangered species such as dugongs, turtles, and marine mammals.The ecosystem is rich in coral reefs and seagrass, which support a variety of marine organisms.

- Environmentalists and fishermen have pointed out that the Union government's push for hydrocarbon exploration could **result in an irreversible damage to environment and threaten the livelihoods of local communities.**

- Additionally, the government has included four deep-sea blocks near the Andaman and Nicobar Islands in the tender

Open Acreage Licensing Policy (OALP)

- OALP was launched in **2016 under Hydrocarbon Exploration and Licensing Policy (HELP).**

- Under the **Open Acreage Licensing Policy, Companies can put in an Expression of Interest (EoI) for any area throughout the year** but such interests are accumulated thrice in a year.

- The Government will examine the interest and if it is suitable for award, then the government will call for competitive bids after obtaining necessary environmental and other clearances.

- Successful implementation of OALP **requires building of National Data Repository.**

National Data Repository (NDR)

- Operational since 2017

- it is a centralized database of geological and hydrocarbon information.

- It provides reliable exploration and production data allowing potential investors to make informed decisions.

- It functions under Ministry of Petroleum and Natural Gas.

Teesta River

Context : The Union Ministry of Environment, Forest and Climate Change (MoEF&CC) has approved the proposal for rebuilding the Teesta-III dam, despite concerns over its design and stability.

- The new structure will be a 118.64-metre-tall concrete gravity dam.

- The original 1,200 MW Teesta-III Chungthang hydroelectric dam was destroyed in a flash flood on October 3-4, 2023. The flood, triggered by a Glacial Lake Outburst Flood (GLOF) from the South Lhonak Lake, washed away the 60-metre-tall concrete dam, claiming 40 lives.

- The project is located on the main Teesta River in Mangan district, utilising a drop of approximately 800 metres between Chungthang and Sankalang villages.

- In a meeting held on January 10, 2025 the environment ministry's Expert Appraisal Committee (EAC) raised concerns about the extensive damage caused by the flood, including the washing away of the dam structure and the severe flooding of the underground powerhouse, which brought operations to a halt.

Assignment

Soil Health Card

- **Context :** Celebrating a Decade of Soil Health Cards

- The Soil Health Card Scheme was introduced by Prime Minister Shri Narendra Modi on 19th February, 2015

at Suratgarh, Rajasthan. The scheme was launched to assist State Governments to issue soil health cards to all farmers in the country.

- **Soil health card provides information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.**

- The Soil Health Card Portal (www.soilhealth.dac.gov.in) facilitates generation of Soil Health Cards for the benefit of farmers in uniform and standardized format across country in all major languages and 5 dialects.

- The Soil Health Card contains status of the soil with respect to **12 parameters, namely N,P,K, S (Macronutrients); Zn, Fe, Cu, Mn, Bo (Micro - nutrients) ; and pH (Acidity or Basicity), EC (Electrical Conductivity) and OC (Organic Carbon).**

- Based on this**, the card will also indicate fertilizer recommendations and soil amendment required for the farm.**

- **Soil Samples are taken generally two times in a year, after harvesting of Rabi and Kharif Crop respectively or when there is no standing crop in the field.**

Sleepy Classes IAS
Awakening Toppers
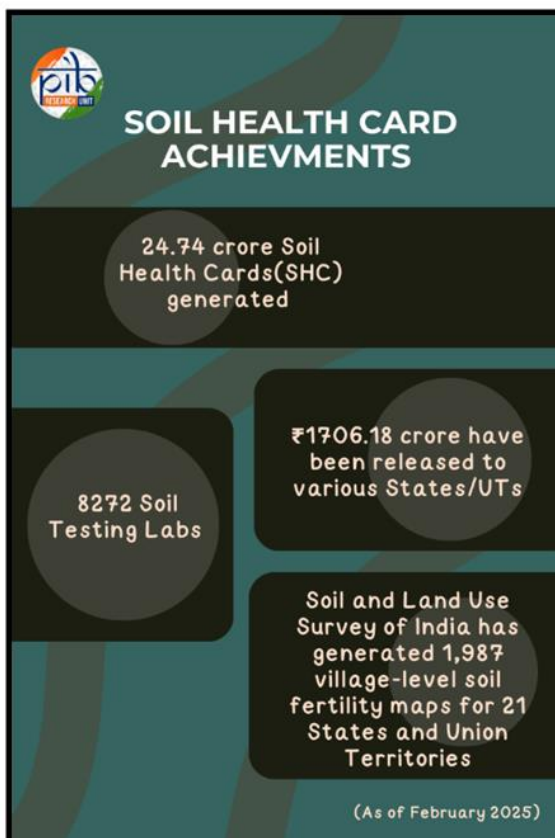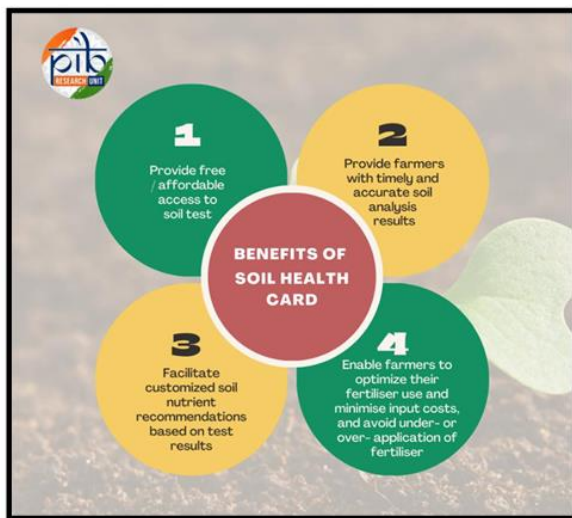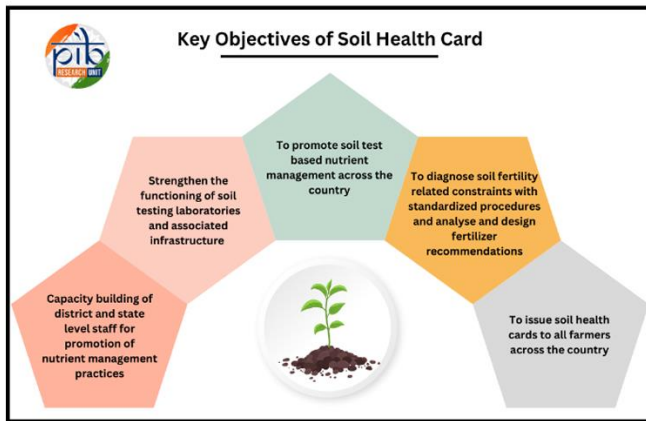
- The Guideline of Village Level Soil Testing Labs (VLSTLs) was issued in June 2023. VLSTLs can be set up by individual entrepreneurs i.e. rural youth and community-based entrepreneurs, including Self Help Groups (SHGs), Schools, Agriculture Universities etc.

- The beneficiary/village level entrepreneur should be a youth whose age should not be below 18 years and should not be more than 27 years. Self Help Groups, Farmers Producers Organisation (FPO) can also be enrolled as VLSTL. As of February 2025, 665 Village-level Soil Testing Labs have been established in 17 States.

School Soil Health Programme

- A pilot project on School Soil Health Programme has been undertaken by Department of Agriculture and Farmers Welfare in (DA&FW) collaboration with Department of School Education & Literacy (DSE&L), Indian Council of Agricultural Research (ICAR) and State Governments in 20 schools (10 Kendriya Vidyalaya & 10 Navodaya Vidyalaya) in rural areas.

- The aim is to make students aware about soil health for sustainable agriculture practices.

- 20 soil health labs were set up in these schools. Modules for students from class VI to XII and teachers were developed and disseminated.

- Under the programme, soil samples were collected by School Students and

soil testing were also done by students and SHCs were generated Students also educated farmers about the recommendation of Soil health card for judicious use of fertilizer and crop recommendation. As of 2024, 1020 schools are implementing the School Soil Health Programme, with 1000 soil testing labs set up and 125,972 students enrolled

Neotethys Oceanic Plate and Tectonic Movements

- Oceanic plate between **Arabian and Eurasian continental plates is breaking away.**

- An international research team has investigated the influence of the forces exerted by the Zagros Mountains in the Kurdistan region of Iraq on how much the surface of the Earth has bent over the last 20 million years.

- Their research revealed that in the present day, deep below the Earth's surface, the Neotethys oceanic plate -- the ocean floor that used to be between the Arabian and Eurasian continents -- is breaking off horizontally, with a tear progressively lengthening from southeast Turkey to northwest Iran.

- Their findings show how the evolution of the Earth's surface is controlled by processes deep within the planet's interior.
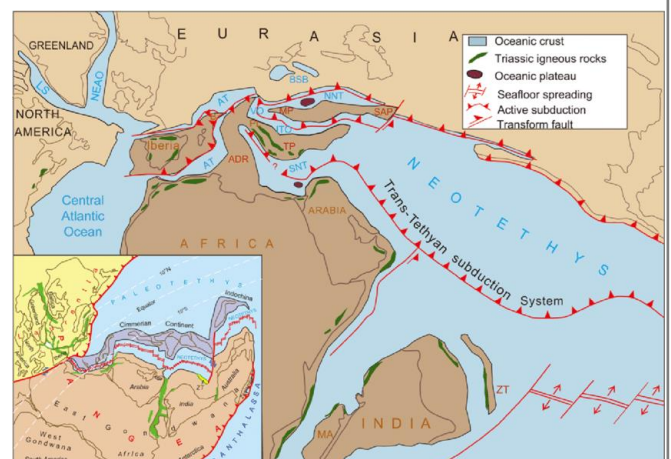
Physical Geography

Inner Core

Context : A study published in Nature Geoscience reveals that Earth's inner core is undergoing structural changes.

- **A recent study has suggested it is undergoing structural changes.**

- The team scrutinised data from 121 repeating earthquakes recorded between 1991 and 2024 near Antarctica's South Sandwich Islands. **These quakes, occurring in the same locations over time, provided a rare opportunity to detect subtle changes in seismic wave behaviour.**

- The **inner core's rotation appears to be slowing down, which could subtly alter the length of a day on Earth**.

- The **physical activity could be due to structural changes in the inner core, the researchers hypothesised**. This could be the result **of viscous deformation — a phenomenon where materials flow in response to stress, similar to how honey or magma moves.**

- The study ultimately suggested that the near surface of the inner core is not as rigid as previously assumed. **Instead, it appears to be experiencing structural changes due to its dynamic relationship with the turbulent outer core.**

Lithium Exploration and Mining MOU

Context : India and Argentina Strengthen Cooperation in Lithium Exploration and Mining with a MoU

- Union Minister for Coal and Mines, Shri G. Kishan Reddy, along with Secretary, Ministry of Mines, and senior officials of the Ministry of Mines, held a meeting with H.E. Raúl Alejandro Jalil, Governor of Catamarca, Argentina, in New Delhi.

- The discussions focused on expanding cooperation in the mining sector, particularly in lithium exploration and investment opportunities.

- A key highlight of the meeting was the signing of a Memorandum of Understanding (MoU) between **Mineral Exploration and Consultancy Limited (MECL), a PSU under the Ministry of Mines, and the Provincial Government of Catamarca, Argentina**, which will pave the way for deeper collaboration in exploration and resource development of critical minerals.

- Argentina, known for its vast lithium reserves as part of the 'Lithium Triangle,' is a crucial partner for India in securing essential minerals required for electric vehicle batteries and renewable energy storage.

- The discussions covered ongoing lithium exploration efforts by **Khanij Bidesh India Ltd. (KABIL)** & Greenko in Catamarca and the possibilities of

increasing participation of Indian companies in mining projects of Argentina.

- Both sides explored avenues for investment, long-term supply agreements, and joint ventures that would help strengthen India's access to this critical mineral.

- Senior officials from both sides engaged in discussions on policy frameworks, regulatory aspects, and sustainable mining practices to ensure a mutually beneficial partnership. Additionally, there was a strong emphasis on knowledge exchange and infrastructure support to enhance India's engagement in Argentina's mining sector.

- With the signing of the MoU, India and Argentina have reaffirmed their commitment to strengthening ties in the critical minerals domain. This collaboration is expected to accelerate lithium exploration projects, enhance resource security, and create new opportunities for Indian companies in the Latin American mining landscape.

Lithium Triangle

Critical Minerals

QUICK POINTERS

- **There is no universal classification of critical materials.**

- **Critical minerals** are metals and non-metals that are considered **vital for the economic well-being of the world's major** and **emerging economies,** yet **whose supply may be at risk due to geological scarcity, geopolitical issues, trade policy or other factors.**

Micro diagram From - Report of the Committee on Identification of Critical Minerals
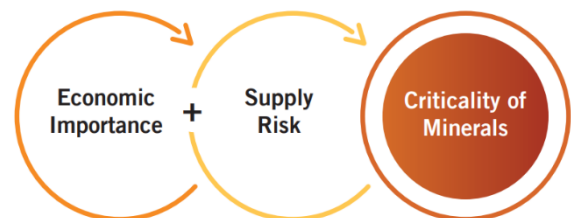
- Some examples include mineral such as - **Rare-earth elements (REE),** lithium, cobalt, tungsten, platinum, magnesium, molybdenum, antimony, vanadium, nickel, chromium, manganese etc.

- These minerals are now required everywhere, **from mobile phones and computers to flat screen monitors, wind turbines, electric cars and solar panels. Efficient batteries,** which can be charged quickly, require lithium, cobalt, nickel and copper. Neodymium and other rare earths are required to make powerful magnets, which are important for the **manufacture of wind turbines and electric vehicles.**

The Indian Critical Minerals Identification process tries to address five core objectives:

1	2	3	4	5
Supporting economic growth, competitiveness, and job creation	Driving research, innovation, and exploration	Enhancing global security and partnerships with allies	Raw material security for state-of-the-art defence	Promoting climate action and environmental protection

Issues associated with Critical Minerals

High geographical concentration:

- **Production of critical minerals is highly concentrated.**

- **Example According to a report by the International Energy Association**, China produces 63 per cent of the world's rare earth elements, including 45 per cent of molybdenum.

- China has also taken a majority stake in the cobalt mines of Democratic Republic of Congo, which in turn produces 70 per cent of the world's output.

Complex Supply Chains:

- **High levels of concentration, compounded by complex supply chains, increase the risks that arise from major producing countries.**

- **Example - China dominates value chains** across mining, processing and producing magnets and has a major role in the global supply chains of rare earths metals. The supply of these critical minerals can thus be **disrupted**

easily due to trade wars, conflict or civil unrest.

- **China, the world's top processor of rare earths, banned the export of technology to make rare earth magnets, adding it to a ban already in place on technology to extract and separate the critical materials..**

- **Note : As per Economic Survey 2023 – 24 - China's dominance over a large number of product categories creates a risk of economic coercion, where the government restrains access to crucial inputs for political leverage. This is most evident in the case of the export of rare earth and critical minerals which are of high priority in the green transition efforts of countries.**

- **Long Project development times: As per IEA analysis** It takes 16.5 years **on average for mining projects from discovery to first production.** This poses risk for ramping up supply if demand were to pick up.

- **Resource as 'Diplomatic weapon':** It is a form of economic sanction, where a government withholds (or threatens to withhold) supply of a natural resource to extract some kind of concession from a target.

- **For example:** In 2010, rare earth minerals were subject of trade conflict between China and Japan, which had originally begun over disputed Senkaku/DiaoyuIslands.

- **Higher exposure to climate risks:** Mining assets are exposed to growing climate risks.

- **Example** - Copper and lithium are particularly vulnerable to water stress given their high-water requirements. **Over 50% of today's lithium and copper production is concentrated in areas with high water stress levels.**

- **Environmental risks:** Production and processing of mineral resources leads to toxic and radioactive by-products dumped in the environment that harms flora-fauna and local communities

- **Example -** Cobalt supplies could be disrupted if labour and environmental standards are brought to bear on the Democratic Republic of Congo.

- **Declining resource quality:** In recent years ore quality has continued to fall across a range of commodities. **Extracting metal from lower-grade ores requires more energy and leads to higher production costs, greenhouse gas emissions and waste.**

- **Example -** For example, the average copper ore grade in Chile declined by 30% over the past 15 years.

- **Low number of market players:** The complexity of the value chains, **high investment overheads for processing** and small markets imply only a **handful of businesses or countries participate in the critical materials market.**

Way Forward
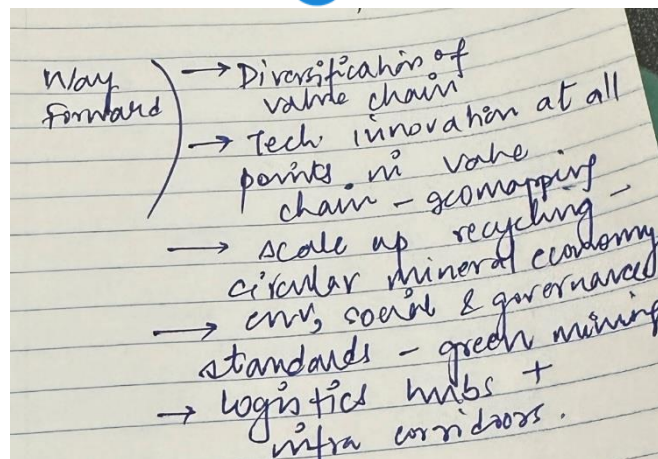
Delhi Earthquake

Context : Earthquake of 4.0 magnitude struck Delhi in February.

Why did the tremors feel so strong?

- **Epicentre within Delhi**: Since the earthquake originated beneath the city, seismic waves had less distance to travel, making the tremors feel more intense.

- **Shallow depth**: Earthquakes that occur closer to the Earth's surface generate stronger shaking compared to deeper quakes of similar magnitude.

- Delhi, which falls in **Seismic Zone IV, is prone to moderate-to-strong earthquakes**, making localised tremors more pronounced .

- **Urban infrastructure**: High-rise buildings in Delhi, Noida, and Ghaziabad sway more due to their height, amplifying the sensation of shaking.

- **Soil composition:** Soft alluvial soil in some areas of Delhi can amplify seismic waves, further intensifying the tremors.

Why did the earthquake occur?

- Delhi sits near active **fault lines, including the Delhi-Hardwar Ridge and the Mahendragarh-Dehradun fault, making it prone to moderate seismic activity.**

- The tremors were caused by tectonic plate movement along one of these fault lines, where stress builds up over time and is eventually released as an earthquake

Another Way to understand it

Aravalli-Delhi Fold Belt

- Delhi lies in what is known as the **Aravalli-Delhi Fold Belt, a seismically-active geological belt extending from southern and eastern Rajasthan to Haryana and Delhi.**

- This region is characterised by the **presence of deformed layers of rock that have been folded or bent due to geological processes hundreds of millions of years ago.**

- These **deformities have created stress which is sometimes released in the form of earthquakes.**

- The Aravalli-Delhi Fold Belt was much more seismically active in the past than it is now. Over the years, the tectonic activity in the region has slowed down considerably, leading to greater geological stability. But some faults still remain, which give rise to occasional mild earthquakes.

Note - This is a very different mechanism from the one that triggers earthquakes in the Himalayan region, which is one of the most quake-prone regions in the world. The Himalayan region has been witnessing the subduction of the Indian tectonic plate under the Eurasian plate — one pushing against the other — which results in a lot of stress building up.

Monday's earthquake strongest in Delhi in five years

Earthquakes originating within a 40-km radius of Delhi, 2020-25

Source: National Center for Seismology

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Earthquake hazard map

Himalayans and north–east are among the most earthquake–prone regions of the world

■ **ZONE V: Very High Damage Risk Zone (MSK* IX or more)**

■ **ZONE IV: High Damage Risk Zone (MSK VIII)**

■ **ZONE III: Moderate Damage Risk Zone (MSK VII)**

□ **ZONE II: Low Damage Risk Zone (MSK VI or less)**

*MSK scale measures susceptibility of an area to an earthquake. Based on the local geology and other factors, two places can feel a quake differently, even if equidistant from epicentre

Source: Vulnerability Atlas of India by Building Materials and Technology Promotion Council (BMTPC)

Important towns and earthquake zones they fall in

City	State	Zone
Bhuj	Gujarat	5
Darbhanga	Bihar	5
Guwahati	Assam	5
Imphal	Manipur	5
Jorhat	Assam	5
Kohima	Nagaland	5
Mandi	Himachal Pradesh	5
Port Blair	Andaman & Nicobar	5
Sadiya	Assam	5
Srinagar	Jammu & Kashmir	5
Tezpur	Assam	5
Almora	Uttrakhand	4
Ambala	Haryana	4
Amritsar	Punjab	4
Baharich	Uttar Pradesh	4
Barauni	Bihar	4

Source: Ministry of Earth Sciences

THE SOUND OF A QUAKE

MANY IN DELHI reported having heard a peculiar sound as the earth shook on Monday morning. The sound convinced many that this earthquake was "different".

EARTHQUAKES sometimes produce sound, but it is not always heard. Earthquakes are energy waves travelling through the ground, causing vibrations along the way.

VIBRATIONS and shaking do sometimes produce low-frequency sounds that are beyond the hearing capacity of human beings. Sounds in the audible range are relatively rare.

Earthquake

Context : An earthquake of magnitude 5.2 struck the Andaman Sea on Thursday morning near Malaysia, according to the National Centre for Seismology

Economic Geography

Reclassification of Major Minerals

- The Ministry of Mines vide gazette notification dated 20th February, 2025 has shifted minerals **Barytes, Felspar, Mica and Quartz from the list of minor minerals to the category of major minerals.**

- Quartz, Felspar and Mica are found in pegmatite rocks, which are an important source of many critical minerals such as Beryl, Lithium, Niobium, Tantalum, Molybdenum, Tin, Titanium, Tungsten, etc.

- These minerals have vital role in various new technologies, in energy transition, spacecraft industries, healthcare sector, etc.

- **When the leases of Quartz, Felspar and Mica are granted as minor mineral leases, the lease holders do not declare existence of critical minerals or extract the critical minerals associated with it such as Lithium, Beryl, etc. as their primary objective is to use these minerals as minor minerals for construction, glass / ceramic making, etc.**

- **Consequently, the critical minerals associated with these minerals are neither getting extracted nor reported**.

- Similarly, Baryte has various industrial applications which is used for oil and gas drilling, electronics, TV screens, rubber, glass, ceramics, paint, radiation shielding and medical applications. Baryte is used to make high density concrete to block x-ray emissions in hospitals, power plants, and laboratories. Baryte often occurs as concretions and vein fillings in limestone and dolostone. **It is found in association with ores of Antimony, Cobalt, Copper, Lead, Manganese and Silver. Baryte with iron ore occurs in pocket type of deposit which cannot be mined in isolation. While mining either of the minerals, the production of associated mineral is inevitable.**

- In view of the importance of these minerals, the Inter-Ministerial Committee on Mines & Minerals Sector constituted under the chairmanship of Dr. V. K. Saraswat, Member NITI Aayog, **recommended that these minerals be shifted from the list of minor minerals to the category of major minerals**.

- Once categorized as major minerals, **there would be an increase in exploration and scientific mining of these minerals which are an important source of many critical minerals.**

- Reclassification of minerals Barytes, Felspar, Mica and Quartz will not adversely affect the lease period of the existing leases. As major minerals, the leases for these minerals will get extended to a period of 50 years from the date of grant or till the completion of renewal period, if any, whichever is later as per section 8A of the MMDR Act, 1957.These mines will gradually register with the Indian Bureau of Mines and will be regulated as major

minerals. A transition time of four months, that is, up to 30th June, 2025 has been provided. The revenue from mines of these minerals will continue to accrue to the State Government as earlier.

Note - Major Minerals : Regulated by the Central Government under the Mines and Minerals (Development and Regulation) Act of 1957 (MMDR Act).

Watershed Yatra

Context : Watershed Yatra" is a mass outreach campaign to create awareness about **Watershed Development activities carried out under Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (**WDC-PMKSY 2.0) project areas across 27 States and 2 Uts.

- It will help in achieving **"Community Driven Approach" (JanBhagidari), which needs to be adopted for implementation of watershed projects, as per extant guidelines and also galvanise the implementation machinery at field level.**

Q. In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India?
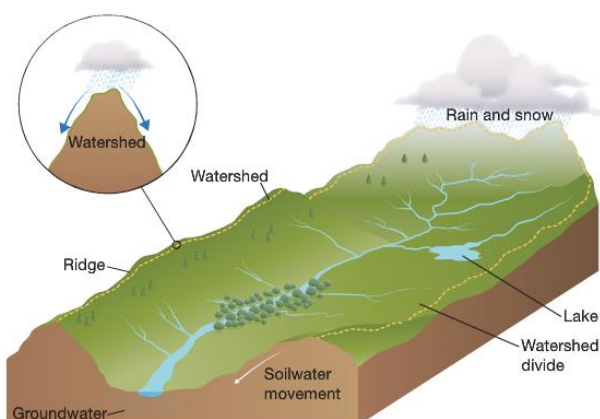
- Micro-watershed development is a targeted and localized approach to water resource management aimed at addressing the challenges of water scarcity, particularly in drought-prone and semi-arid regions of India. It involves implementing a series of conservation measures within small, geographically defined units known as micro-watersheds. These measures focus on sustainable land use, soil conservation, and efficient rainwater harvesting to enhance water availability and mitigate the impact of water stress in vulnerable areas.

Components of Micro-watershed Development Projects

- **Check Dams and Nala Bunding**: In the **Ralegan Siddhi village of Maharashtra**, social activist **Anna Hazare** led a watershed development project that included the construction of check dams. These structures **slowed down water flow, allowing for better groundwater recharge and preventing soil erosion.**

- **Contour Trenching and Terracing**: **The Watershed Organization Trust (WOTR)** implemented contour trenching and terracing in the **Dewas district of Madhya Pradesh**. By creating trenches along the contours of the land, rainwater was harvested, **reducing soil erosion and improving moisture retention.**

- **Afforestation and Vegetative Cover**: In **the Kumbharwadi village of Maharashtra**, afforestation was a key component of a micro-watershed development project. **Planting native**

trees and vegetation helped in soil stabilization, preventing erosion and improving overall watershed health.

- **Water Harvesting Structures**: **The Bilgaon micro-watershed project in Gujarat included the construction of percolation tanks to capture and store rainwater**. These tanks not only provided a direct source of water for agriculture but also facilitated groundwater recharge.

- **Soil and Water Conservation Measures**: In the Alwar district of Rajasthan, **the Tarun Bharat Sangh organization implemented soil and water conservation measures**. By constructing check dams, building contour trenches, and promoting vegetative cover, the project transformed the landscape and improved water availability.

- **Community Participation**: **The Adarsh Gaon Yojana in Maharashtra emphasized community participation.** Villagers actively contributed to the planning and implementation of micro-watershed projects, fostering a sense of ownership and ensuring the sustainability of the interventions.

Impact on Water Conservation

- **Groundwater Recharge:** Micro-watershed development projects facilitate the recharge of groundwater aquifers by allowing rainwater to percolate into the soil. This is exemplified in the success story of the Rajasamadhiyala village in Gujarat, where check dams and percolation tanks significantly contributed to raising groundwater levels.

- **Increased Soil Moisture Content:** The implementation of contour trenching and terracing helps in increasing the moisture content of the soil. In the Mendha-Lekha village in Maharashtra, these measures led to improved soil moisture retention, enabling farmers to sustain agriculture during dry periods.

- **Reduction in Soil Erosion:** Micro-watershed development projects effectively reduce soil erosion. The Comprehensive Wadi Development Project in the Osmanabad district of Maharashtra, by promoting vegetative cover and constructing check dams, successfully curbed soil erosion, preserving fertile topsoil.

- **Sustainable Agriculture Practices:** By adopting sustainable agricultural practices, such as rainwater harvesting and agroforestry, micro-watershed development projects contribute to the efficient use of water in farming. The Andhra Pradesh Community-Based Tank Management Project exemplifies the integration of sustainable agriculture practices within micro-watershed management.

- **Enhanced Livelihoods:** Improved water availability resulting from micro-watershed development positively impacts local livelihoods. In the Jalgaon district of Maharashtra, the Mutha Micro-Watershed Project led to increased agricultural productivity,

benefiting the economic well-being of the local community.

- **Community Participation and Empowerment:** Successful micro-watershed projects often involve active community participation. In the watershed development projects led by the Watershed Organization Trust (WOTR) in various regions, community involvement played a crucial role in decision-making, implementation, and maintenance, fostering a sense of empowerment.

Challenges and Recommendations

Funding and Resource Allocation

- **Challenge**: Inadequate funding and resource allocation can hinder the successful implementation of micro-watershed projects.

- **Recommendation**: There is a need for increased investment from both government and private sectors. Exploring innovative financing mechanisms and establishing partnerships with NGOs and international organizations can help ensure sustained funding.

Monitoring and Evaluation

- **Challenge**: Effective monitoring and evaluation mechanisms are essential but can be challenging to implement consistently.

- **Recommendation:** Regular assessments should be conducted to measure changes in groundwater levels, soil moisture content, and overall watershed health. Leveraging technology, such as remote sensing

and GIS mapping, can enhance monitoring capabilities.

Scaling Up and Replication

- **Challenge:** While successful at the micro-level, scaling up and replicating successful models can be challenging

- **Recommendation:** Adapting successful strategies to local contexts, incorporating traditional knowledge, and disseminating best practices through capacity-building initiatives can facilitate the scaling up of micro-watershed development projects.

Climate Change Resilience

- **Challenge:** Climate change poses additional challenges to water conservation efforts.

- **Recommendation**: Micro-watershed development projects need to incorporate climate-resilient strategies, such as the **introduction of innovative technologies and adaptive agricultural practices, to address changing precipitation patterns and increased temperatures.**

Conclusion

- Micro-watershed development projects play a pivotal role in water conservation in India's drought-prone and semi-arid regions. **By adopting a localized and holistic approach, these projects contribute to groundwater recharge, increased soil moisture content, and sustainable agricultural practices.** Success stories from villages like Ralegan Siddhi, Hiware Bazar, and Tikamgarh highlight the transformative impact of micro-watershed development on water

availability and community well-being.

• While challenges exist, innovative solutions, increased funding, and a commitment to scaling up successful models can pave the way for more widespread implementation of micro-watershed development projects. The success of micro-watershed development ultimately lies in the integration of technological advancements, community participation, and adaptive strategies to create resilient and water-secure landscapes.

Inland Waterways in India

Context : The Prime Minister, Shri Narendra Modi lauded the inauguration of the **Inland Waterways Transport (IWT) Terminal on the Brahmaputra (National Waterway-2) at Jogighopa in Assam.**

Inland Waterway Authority of India

• The Inland Waterways Authority of India (IWAI) came into existence **on 27th October 1986 for development and regulation of inland waterways for shipping and navigation**.

• The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways through grant received from Ministry of Shipping. The head office of the Authority is at Noida.

• The Authority also has its regional offices at Patna, Kolkata, Guwahati and Kochi and sub-offices at Allahabad, Varanasi, Farakka, Sahibganj, Haldia, Swroopganj, Hemnagar, Dibrugarh, Dhubri, Silchar, Kollam, Bhubaneshwar and Vijayawada.

• India has about 14,500 km of navigable waterways which comprise of rivers, canals, backwaters, creeks, etc.

• About 133.03 Million Metric Tonnes(MMT) of cargo is being moved anually by Inland Water Transport (IWT), a fuel - efficient and environment -friendly mode.

• Its operations are currently restricted to a **few stretches** in the Ganga-Bhagirathi-Hooghly rivers , the Brahmaputra, the Barak river, the rivers in Goa, the backwaters in Kerala, inland waters in Mumbai and the deltaic regions of the Godavari - Krishna rivers. Besides these organized operations by mechanized vessels, country boats of various capacities also operate in various rivers and canals. and substantial quantum of cargo and passengers are transported in this unorganized sector as well.

• Nodal Ministry: Ministry of Ports, Shipping and Waterways + Headquarter: Noida, Uttar Pradesh.

Places in News

Mount Dukono

- **Context :** Indonesia's mount dukono erupts, triggers aviation warning and safety advisory

Quick Pointers :

- active volcano located in the northern part of Halmahera island, the largest of the Maluku Islands in Indonesia.

- The eruption, located on Halmahera Island, sent a column of ash as high as 2,000 meters into the sky, with thick white-to-grey clouds drifting south of the crater .

- To reduce the risks to aviation, a Volcano Observatory Notice for Aviation (VONA) was issued at the orange level, the second-highest warning. The advisory prohibits aircraft from flying within 5 km of the volcano and advises caution regarding ash clouds, which can disrupt flights.

Q. Mention the global occurrence of volcanic eruptions in 2021 and their impact on regional environment. Discuss (2021)

Introduction

- Volcanic eruptions are natural phenomena that occur globally, and their impacts can extend far beyond the immediate eruption site. **In 2021, various volcanic events around the world captured attention due to their varying magnitudes and consequences on the regional environment.**

Global Occurrences of Volcanic Eruptions in 2021

- La Soufrière, St. Vincent and the Grenadines (April 2021): La Soufrière, a stratovolcano on the Caribbean island of St. Vincent, erupted in April 2021 after decades of inactivity.

- Mount Nyiragongo, Democratic Republic of Congo (May 2021): Mount Nyiragongo, located in the Democratic Republic of Congo, experienced a volcanic eruption in May 2021.

- Fagradalsfjall, Iceland (March 2021): The Fagradalsfjall volcano in Iceland began erupting in March 2021.

- Semeru, Indonesia (December 2021): In December 2021, Semeru, one of Indonesia's most active volcanoes, erupted, releasing pyroclastic flows and ash clouds.

- **Hunga Tonga**-Hunga Hapai volcano erupted in December, 2021.

Impacts on the Regional Environment

Air Quality and Respiratory Health:

- Volcanic eruptions release ash particles and gases into the

atmosphere, impacting air quality and reducing visibility in the surrounding regions.

• Inhalation of volcanic ash can pose respiratory risks, leading to health concerns for both humans and animals.

Climate Effects:

• Large volcanic eruptions can release significant **amounts of sulfur dioxide into the stratosphere, leading to the formation of sulfate aerosols**. These aerosols can reflect sunlight, causing a **cooling effect on the Earth's surface.**

• Eruptions can also emit gases **like hydrogen sulfide which can have detrimental impact on surrouning air and ecosystem.**

• **Earthquakes :** Volcanic eruptions can **also trigger earthquakes in the area.**

Agricultural Impact:

• **Ashfall** from volcanic eruptions can have detrimental **effects on agriculture** by damaging crops and soil fertility.

• The deposition of volcanic ash, rich in minerals, **can be beneficial in the long term** but poses immediate challenges for farming.

Additional Points:

• **Infrastructure Disruption**: Volcanic eruptions, especially when accompanied by lava flows and ashfall, can disrupt infrastructure, including roads, buildings, and utilities.

• **Displacement of Communities**: Volcanic eruptions often lead to the displacement of communities living in proximity to active volcanoes.

• The global occurrences of volcanic eruptions in 2021, including events in the Caribbean, Africa, Europe, and Asia, underscore the diverse impacts these natural phenomena can have on the regional environment. As countries continue to grapple with the dynamic nature of volcanic hazards, international collaboration remains essential to foster a collective understanding of volcanic processes and enhance global resilience to these geological events.

Hawaii's Kilauea Volcano

Kolleru Lake

Context : NGT restrains Andhra Pradesh Government from undertaking six infra projects in Kolleru wetland.

- The Southern Zonal Bench of the National Green Tribunal (NGT) restrained the Andhra Pradesh (A.P.) Government from proceeding with the six infrastructure projects in Kolleru wetland area unless they are carried out in strict conformity with legal requirements and the Water Resources Department (WRD) obtained the requisite clearances.

- These clearances are to be secured from the Ministry of Environment, Forest and Climate Change (MoEF&CC), A.P. Coastal Zone Management Authority (CZMA), A.P. Pollution Control Board (PCB) and the National Board for Wild Life (NBWL)

Note :

- the lake is located between the Krishna and Godavari river deltas.

- declared a wildlife sanctuary in November 1999

- Declared a Ramsar Site in November 2002.

Lake Sapanca

- Context : Lake Sapanca, a critical freshwater source in northwestern Turkiye that faced significant environmental pressures due to urbanisation and industrial expansion, leading to habitat degradation along its shore.

Polity and Governance

Union and State Legislature

Delimitation Exercise

Context :

- There has been a renewed debate about delimitation after the issue was raised by the Chief Minister of Tamil Nadu.

- The delimitation of constituencies for the Lok Sabha and State Legislative Assemblies is to be carried out on the basis of the first Census after 2026.

Background :

- Delimitation is the process of fixing the number of seats and boundaries of territorial constituencies in each state for the Lok Sabha and Legislative Assemblies.

- It also involves determining the number of reserved seats for Scheduled Castes (SC) and Scheduled Tribes (ST).

- As per Articles 82 and 170 of the Indian Constitution, the number of seats and their division into constituencies must be readjusted after each Census.

- The Delimitation Commission, established by an act of Parliament, oversees this process.

- Previous exercises were conducted after the 1951, 1961, and 1971 Censuses.

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- Previous exercises were conducted after the 1951, 1961, and 1971 Censuses.

- The Lok Sabha seats were fixed at 494, 522, and 543 based on the 1951, 1961, and 1971 Censuses, respectively, with an increasing population per seat from 7.3 lakh in 1951 to 10.1 lakh in 1971.

- However, in an effort to promote population control, the number of seats was frozen based on the 1971 Census.

- This was achieved through the 42nd Amendment Act, which extended the freeze until 2000, and later by the 84th Amendment Act, which extended it until 2026.

- As a result, the number of seats currently corresponds to the 1971 population data.

• While the boundaries of constituencies and SC/ST reservations were adjusted after the 2001 Census, the total number of seats remained unchanged.

A similar adjustment is expected post-2026.

• Under normal circumstances, the next delimitation process would be based on the 2031 Census.

• However, with the 2021 Census postponed and 2026 approaching, there are rising concerns over the impending exercise.

Issues :

• The decision to freeze seats based on the 1971 Census was meant to encourage population control.

• However, population growth has been uneven across states. Northern states like Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan have seen significant increases, while southern states like Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh have managed to stabilize their populations.

Two options are being considered for the revised delimitation:

1. Retaining the existing 543 seats but redistributing them among states.

2. Increasing the total seats to 848, with proportional distribution.

Issues :

• In both cases, southern states, smaller northern states (Punjab, Himachal Pradesh, Uttarakhand), and northeastern states may lose representation compared to northern states.

• This would violate federal principles and lead to dissatisfaction in states that have successfully controlled their populations. The existing system, which rewarded population control, would be overturned, potentially disadvantaging states that adhered to it.

Table 1: If the number of seats is retained at 543 and reapportioned among States based on the projected population in 2026

State	Number of seats at present	Number of seats projected	Net gain/ loss
U.P.	80	91	11
Bihar	40	50	10
Rajasthan	25	31	6
M.P.	29	33	4
Tamil Nadu	39	31	-8
Andhra + Telangana	42	34	-8
Kerala	20	12	-8
Karnataka	28	26	-2
Punjab	13	12	-1
Himachal	4	3	-1
Uttarakhand	5	4	-1

Table 2: If the number of seats is increased to 848 based on the projected population in 2026

State	Number of seats at present	Number of seats projected	Net gain
U.P.	80	143	63
Bihar	40	79	39
Rajasthan	25	50	25
M.P.	29	52	23
Tamil Nadu	39	49	10
Andhra + Telangana	42	54	12
Kerala	20	20	-
Karnataka	28	41	13
Punjab	13	18	5
Himachal	4	4	-
Uttarakhand	5	7	2

International Examples :

1. United States: The House of Representatives has been capped at 435 seats since 1913.

- Despite a fourfold population increase (from 9.4 crore in 1911 to 33.4 crore in 2023), seats are redistributed after each Census using the 'method of equal proportion.'

- This prevents drastic gains or losses for any state.

- For instance, the 2020 reapportionment led to no change in 37 states, with Texas gaining two seats and seven states losing one seat each.

2. European Union (EU) Parliament:

- The EU follows 'degressive proportionality,' meaning smaller countries get more representation per capita.

- Denmark (60 lakh people) has 15 seats (4 lakh people per member), whereas Germany (8.3 crore) has 96 seats (8.6 lakh people per member).

Possible Solutions The core challenge is balancing democratic and federal principles. Some possible solutions include:

1. **Capping Lok Sabha seats at 543**: This ensures states do not lose representation.

2. **Increasing the number of MLAs**: State Assemblies can be expanded in proportion to the current population without altering Rajya Sabha seats.

3. **Empowering local bodies**: Panchayats and municipalities should be strengthened with greater financial and administrative autonomy.

Constitutional Framework

Internet Shutdown

Context :

- India recorded 84 internet shutdowns in 2024, making it the highest among democratic nations and second only to Myanmar, which saw 85 shutdowns

imposed by its military junta, according to a report by digital rights organization Access Now.

- This marks the first time in six years that India was not the country with the highest number of shutdowns globally.

Internet Shutdowns in India

Despite a decline from 116 shutdowns in 2023, India still imposed the most internet disruptions in any democracy. Out of the 84 shutdowns recorded in 2024:

- **41 were related to protests**

- **23 were triggered by communal violence**

- **5 were imposed during government job placement exams**

- **At least one shutdown occurred in over 16 Indian states and Union Territories**

State-Wise Shutdown Data

1. **Manipur** - 21 shutdowns (highest in India)

2. **Haryana** - 12 shutdowns

3. **Jammu & Kashmir** - 12 shutdowns

Legal Provisions for Internet Shutdowns in India

Telecommunications Rules:

- Internet shutdowns in India are governed by the Telecommunications (Temporary Suspension of Services) Rules, 2024 issued under the Telecommunications Act, 2023.

- These rules replace the Telecom Suspension Rules, 2017 and regulate the process of suspending telecom services, including the internet.

- Authority to Issue Shutdown Orders: Union Home Secretary (for national-level shutdowns) and State Home Secretary (for state-level shutdowns).

- **Code of Criminal Procedure (CrPC), 1973:** Up to 2017, internet shutdowns were primarily issued under Section 144 of erstwhile CrPC (Section 163 of Bharatiya Nagarik Suraksha Sanhita).

- Section 144 gave District Magistrate the powers to prevent unlawful gathering and direct any person to abstain from a certain activity.

- In unavoidable circumstances, a Joint Secretary-level officer (duly authorized) can issue an order, but it must be confirmed within 24 hours, or it will cease to exist.

Judicial Precedent:

- **Faheema Shirin versus State of Kerala 2019 :** Kerala High Court recognizes Right to internet as Fundamental right under Article 21.

- The Supreme Court of India in the case of Anuradha Bhasin v. Union of India, 2020 ruled that indefinite internet shutdowns are unconstitutional and that such curbs should meet the tests of necessity and proportionality.

- However, many shutdown orders lack proper documentation and justification.

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Reasons Cited for Internet Shutdowns

National Security and Anti-Terrorism Measures

- Authorities have justified internet restrictions as a tool to curb separatist activities and militant propaganda. For instance, in Jammu and Kashmir, shutdowns were frequently extended following the abrogation of Article 370 in 2019.

Preventing Communal Clashes and Social Unrest

- In response to ethnic violence, shutdowns were imposed in Manipur in 2023 to contain escalating tensions.

- Similarly, districts in Haryana experienced internet blackouts following communal clashes to prevent further violence.

Combating Misinformation and Online Hate Speech

- During the 2020 Delhi riots, authorities suspended internet services in affected areas to counter the spread of fake news and inflammatory content on social media.

Maintaining Law and Order During Protests

- Internet restrictions were imposed during the anti-Citizenship Amendment Act (CAA) and farm law protests to uphold public order at demonstration sites.

Preventing Cheating in Competitive Examinations

- In Rajasthan, internet services were suspended statewide to prevent malpractice during the Rajasthan Eligibility Exam for Teachers (REET) in 2021.

Consequences :

Economic Consequences

- According to Access Now, India incurred economic losses of $1.9 billion and missed out on $118 million in foreign investment due to internet blackouts in the first half of 2023.

- In 2020, internet restrictions caused losses amounting to $2.8 billion, affecting over 10.3 million individuals across 129 instances of shutdowns.

Rising Unemployment

- The Internet Society's NetLoss Calculator estimates that a single-day shutdown in India could result in job losses for up to 379 people.

Implications for Women's Safety and Human Rights

- Restrictions on internet access hinder the ability of women to report crimes such as assault, rape, and domestic violence, limiting access to justice.

Violation of Constitutional Rights

- Internet shutdowns restrict citizens' right to access information, thereby infringing upon fundamental rights such as freedom of speech and expression (Article 19) and the right to information.

Impact on Media and Press Freedom

- In 2019, journalists in Jammu and Kashmir faced immense challenges in reporting due to prolonged internet suspensions, forcing some newspapers

to shut down or relocate their operations.

Disruptions in Education and Healthcare Services

• Prolonged internet shutdowns negatively impact online learning, telemedicine, and emergency services, particularly affecting students and patients in remote areas.

Parliamentary committee recommendations :

Adoption of International Best Practices

• The Department of Telecommunications (DoT) should study internet shutdown policies in other democratic nations and adopt measures suited to India's context.

Defining Clear Grounds for Shutdowns

• There is a need to establish well-defined parameters and objective criteria for suspending internet services to ensure transparency and accountability.

Ensuring Proportionality in Shutdowns

• The DoT, in coordination with the Ministry of Home Affairs (MHA), should frame clear guidelines on the proportionality of shutdowns and establish a procedure for their timely revocation.

Incorporating Independent Oversight

• The current three-member review committee, primarily composed of executive officials, should be made more inclusive by adding retired judges and independent public representatives.

Partial Restrictions Instead of Complete Shutdowns

• The government should consider selective restrictions on certain online services instead of imposing blanket internet bans, thereby minimizing public inconvenience while curbing misinformation.

Assessing the Effectiveness of Shutdowns

• The DoT and MHA should conduct a study evaluating the impact of internet shutdowns on public safety and emergency response.

Supreme Court guidelines on Remission

Context :

• In a significant ruling, the Supreme Court directed that appropriate governments must proactively consider the premature release of eligible convicts without requiring them or their relatives to apply for remission.

Details :

• A Bench comprising Justices A.S. Oka and Ujjal Bhuyan held that when a state's jail manual or other departmental instructions contain policy guidelines for remission under Section 432 of the Criminal Procedure Code (CrPC) or Section 473 of the Bharatiya Nagarik Suraksha Sanhita 2023, the government is obligated to evaluate all eligible cases automatically.

- States lacking a formal remission policy must establish one within two months, as per the court's directive.

- The judgment emerged from a suo motu case titled "In re: Policy Strategy for Grant of Bail", with senior advocate Liz Mathew serving as amicus curiae

- The ruling affirms that conditions attached to remission orders should focus on preventing criminal tendencies and ensuring reintegration into society.

- However, these conditions must not be overly restrictive or impractical for the convict to comply with.

- Court relied on Mafabhai Motibhai Sagar v. State of Gujarat (2024) which held that the conditions imposed under Section 432 of the CrPC and Section 473(1) of the BNS must not be arbitrary

- Such conditions will stand vitiated for violation of Article 14 and also Article 21.

- Consideration of various factors which are mentioned by way of illustration is necessary before finalizing the terms and conditions;

- The conditions must aim at ensuring that the criminal tendencies, if any, of the convict remain in check and the convict rehabilitates himself in society;

- The conditions should not be so oppressive or stringent that the convict is not able to take advantage of the order granting permanent remission; and

- The conditions cannot be vague and should be capable of being performed.

Factors that need to be considered while imposing conditions for remission :

- Nature of crime

- Motive for committing the crime

- Criminal Background

- Public Safety

- Impact on society and victims of offence

- Proper rehabilitation and reintegration

Transparent and Accountable Remission Process

- The order granting or denying remission must include brief reasons and be immediately communicated to the convict through prison authorities.

- Furthermore, the convict should be informed of their right to challenge a rejection.

- The court also ruled that permanent remission cannot be revoked without providing the convict an opportunity to be heard.

Digital Monitoring of Remission Cases

- To ensure transparency, the Supreme Court mandated district legal services authorities to maintain records of eligible convicts and assist in the remission process.

- Additionally, state legal services authorities must develop an online

portal to update prisoner remission data in real time

Section 473 of BNSS contains the following salient provisions:

- The appropriate Government may suspend or remit sentences with or without conditions.

- Government may request the trial judge's opinion when considering applications.

- If conditions are not fulfilled, Government may cancel remission/suspension and the person may be arrested to serve the remaining sentence.

- Conditions may depend on the person's actions or be independent of their will.

- Government may issue rules about suspension and petition requirements, with specific provisions that:

- For sentences other than fines for persons over 18, petitions are only valid if the person is in jail.

- Petitions must be presented through jail officers or contain declaration that person is in jail.

- These provisions apply to any court order restricting liberty or imposing liability.

- "Appropriate Government" means:

Central Government for offenses against Union laws

State Government for other cases

Section 474 of BNSS provides for power to commute sentence:

The appropriate Government may, without the consent of the person sentenced, commute —

- a sentence of death, for imprisonment for life;

- a sentence of imprisonment for life, for imprisonment for a term not less than seven years;

- a sentence of imprisonment for seven years or more, for imprisonment for a term not less than three years;

- a sentence of imprisonment for less than seven years, for fine;

- a sentence of rigorous imprisonment, for simple imprisonment for any term to which that person might have been sentenced.

Section 475 of BNSS provides for restriction on powers of remission or commutation in certain cases:

- Notwithstanding anything contained in section 473, where a sentence of imprisonment for life is imposed on conviction of a person for an offence for which death is one of the punishments provided by law, or where a sentence of death imposed on a person has been commuted under section 474 into one of imprisonment for life, such person shall not be released from prison unless he had served at least fourteen years of imprisonment.

Governance and Social Justice

Global Coalition on Social Justice

Context :

- Union Minister of Labour & Employment and Youth Affairs & Sports, Dr. Mansukh Mandaviya inaugurated the two-day Regional Dialogue on Social Justice under the Global Coalition for Social Justice and the Observance of the 74th Foundation Day of the Employees' State Insurance Corporation (ESIC) on 24 February 2025 in New Delhi.

Details :

- The Global Coalition for Social Justice is a landmark initiative by ILO to bring global, regional and national actors together for policy and action coherence towards advancing social justice.

- Launched in November, 2023, the Coalition has been joined by 336 partners including 90 governments within a short span.

India's Role :

- Recognizing the need for collaboration between governments, businesses, and workers to promote social justice, India has decided to champion a key Coalition intervention "Responsible business practices for sustainable and inclusive societies."

- This intervention is part of a core thematic area of the Global Coalition i.e. "Expanding access to and capabilities for productive and freely chosen employment and sustainable enterprises."

ESIC :

- **About:** It is a statutory body formed under the Employees State Insurance Act, 1948 and functions under the Ministry of Labour and Employment.

- **Purpose:** It provides social security and health insurance to employees in establishments with 10 or more employees (in less than 10 employees if it's a hazardous industry e.g., firecrackers, toxic chemicals etc).

- **Eligibility:** Employees earning up to Rs 21,000 per month.

- **Benefits Provided:** Medical care, sickness benefit, Maternity benefit, disability benefit, dependent's Benefit, and unemployment allowance.

Absence of MP's

- Khadoor Sahib MP Amritpal Singh, currently incarcerated under the National Security Act (NSA), has approached the Punjab and Haryana High Court seeking permission to attend the ongoing Parliament session.

- His plea comes amid concerns that his prolonged absence could lead to the loss of his parliamentary seat.

Legal Basis for Seat Vacancy

- As per Article 101(4) of the Constitution, if a Member of Parliament (MP) is absent from all meetings of either House for a period

of sixty days without permission, the House may declare the seat vacant.

- However, the calculation of this period excludes any time when Parliament is adjourned for more than four consecutive days or is prorogued.

- Amritpal Singh, detained in Dibrugarh since April 2023, has attended only one sitting—the session in which he was sworn in July 2024. His continued detention has resulted in nearly 50 absences, raising concerns over his seat's status.

- **Parliamentary Leave Provisions** The provision in Article 101(4) allows MPs to seek permission for absence.

- The 'Committee on Absence of Members from the Sittings of the House' evaluates such applications and makes recommendations, which are then ratified by the House.

- Historically, applications for leave are rarely rejected, with reasons such as

illness or imprisonment being commonly accepted

- In 2023, Ghosi MP Atul Rai (Bahujan Samaj Party) sought and was granted leave for 23 consecutive sittings due to his imprisonment.

- Similarly, Amritpal Singh has the right to seek leave on the grounds of being in jail.

- **Likelihood of Losing Seat** Even if an MP remains absent beyond 60 days, the House must formally declare the seat vacant through a voting process.

- Former Lok Sabha Secretary General P. D. T. Achary noted that there is no precedent for an MP losing a seat under Article 101(4).

- Given this, it is unlikely that Amritpal Singh will lose his parliamentary position solely due to his absence from House proceedings.

Centre State Relations

Centre-Tamil Nadu Spar over NEP

Context :

- The Central government has withheld funds under the **Samagra Shiksha scheme** for Tamil Nadu due to the state's refusal to implement the **New Education Policy (NEP) 2020**.

- Tamil Nadu Chief Minister **M.K. Stalin** has written to the **Prime Minister**, seeking the release of **Rs 2,152 crore**, which remains pending under this centrally-sponsored scheme

supporting the **Right to Education (RTE) Act**.

Conflict Over the Three-Language Formula

- At the core of the dispute is the **three-language policy** outlined in NEP 2020.

- The **BJP-led Central government** argues that this policy enhances job opportunities across different regions.

- However, **Tamil Nadu's DMK government** views it as an attempt to impose **Hindi** on the state, which has a **long history of anti-Hindi agitations**.

- Tamil Nadu follows a **two-language policy**, teaching only **Tamil and English**, unlike other states that include Hindi in their curriculum.

- This linguistic stance has remained unchanged for nearly a century.

Historical Context of Language Policy in Education

- The **language debate in education**—regarding both the **medium of instruction** and the **teaching of languages**—has been contentious since **Independence**.

- The **University Education Commission (1948-49)**, chaired by **Dr. Sarvepalli Radhakrishnan**, recommended Hindi (Hindustani) as the federal language while allowing states to use their **regional languages**.

- However, the Commission acknowledged the **practical challenges of immediately replacing English**. It proposed a phased transition where English would remain a medium for **federal administration** until the regional languages were sufficiently developed.

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- It proposed a phased transition where English would remain a medium for **federal administration** until the regional languages were sufficiently developed.

- The **Radhakrishnan Commission** was the first to propose a **three-language formula** for education, which was later endorsed by the **Kothari Commission (1964-66)** and incorporated into the **National Policy on Education (1968)** under **Indira Gandhi's government**.

- The policy required students in **Hindi-speaking states** to learn **a modern Indian language, Hindi, and English**, while those in **non-Hindi-speaking states** had to learn **Hindi, their regional language, and English**.

- Subsequent policies, including the **National Policy on Education (1986)** and **NEP 2020**, retained this approach.

- However, the **NEP 2020** introduced **greater flexibility**, stating that students could choose any two Indian languages **without mandating Hindi**.

National Education Policy 2020

4.13. The three-language formula will continue to be implemented while keeping in mind the Constitutional provisions, aspirations of the people, regions, and the Union, and the need to promote multilingualism as well as promote national unity. However, there will be a greater flexibility in the three-language formula, and no language will be imposed on any State. The three languages learned by children will be the choices of States, regions, and of course the students themselves, so long as at least two of the three languages are native to India. In particular, students who wish to change one or more of the three languages they are studying may do so in Grade 6 or 7, as long as they are able to demonstrate basic proficiency in three languages (including one language of India at the literature level) by the end of secondary school.

- The **Central government's stance** on the **three-language formula** has evolved over time. While education is listed in the **Concurrent List** of the **Constitution**, earlier governments stated that **language policy implementation was the responsibility of states**.

- In **2004**, **Congress leader Arjun Singh**, then Union Minister for **Human Resource Development (HRD)**, stated in Parliament that the Central government's role in implementing the **three-language formula** was **recommendatory**, and enforcement lay with the states.

- In **2014**, **BJP leader Smriti Irani**, then HRD Minister, reiterated that states had the authority to **determine their own language curricula**.

- Despite this earlier stance, the **Ministry of Education** has now **linked the release of Samagra Shiksha funds** to **NEP 2020 compliance**, effectively pressuring states to adopt the policy.

Panchayati Raj and Local Bodies

Devolution Index Report

Context :

- The Report titled **"Status of Devolution to Panchayats in States – An Indicative Evidence Based Ranking"** was unveiled by Union Minister of State, Prof. S. P. Singh Baghel, Ministry of Panchayati Raj and Ministry of Fisheries, Animal Husbandry & Dairying.

Assessment Parameters of Panchayat Devolution

- States and Union Territories (UTs) were ranked based on the overall Panchayat Devolution Index, which evaluates the devolution of powers and resources to Panchayats. The rankings were determined by six key dimensions:

1. **Framework**
2. **Functions**
3. **Finances**
4. **Functionaries**
5. **Capacity Enhancement**
6. **Accountability**

Key Findings of the Report

- **Increase in Devolution:** The report, prepared by the Indian Institute of Public Administration (IIPA), reveals that devolution has increased from **39.9% in 2013-14 to 43.9% in 2021-22**.

- **Capacity Enhancement:** Since the launch of the Rashtriya Gram Swaraj Abhiyan (RGSA) on April 21, 2018, the capacity enhancement component of the Index has significantly increased from **44% to 54.6%**, reflecting over a **10% improvement**.

- **Strengthening of Functionaries:** Efforts by the Government of India and States to provide physical infrastructure and recruit officials for

PRIs have led to a notable rise in the functionaries component of the Index, which has increased from **39.6% to 50.9%**.

Figure 1: Devolution Index of Panchayats
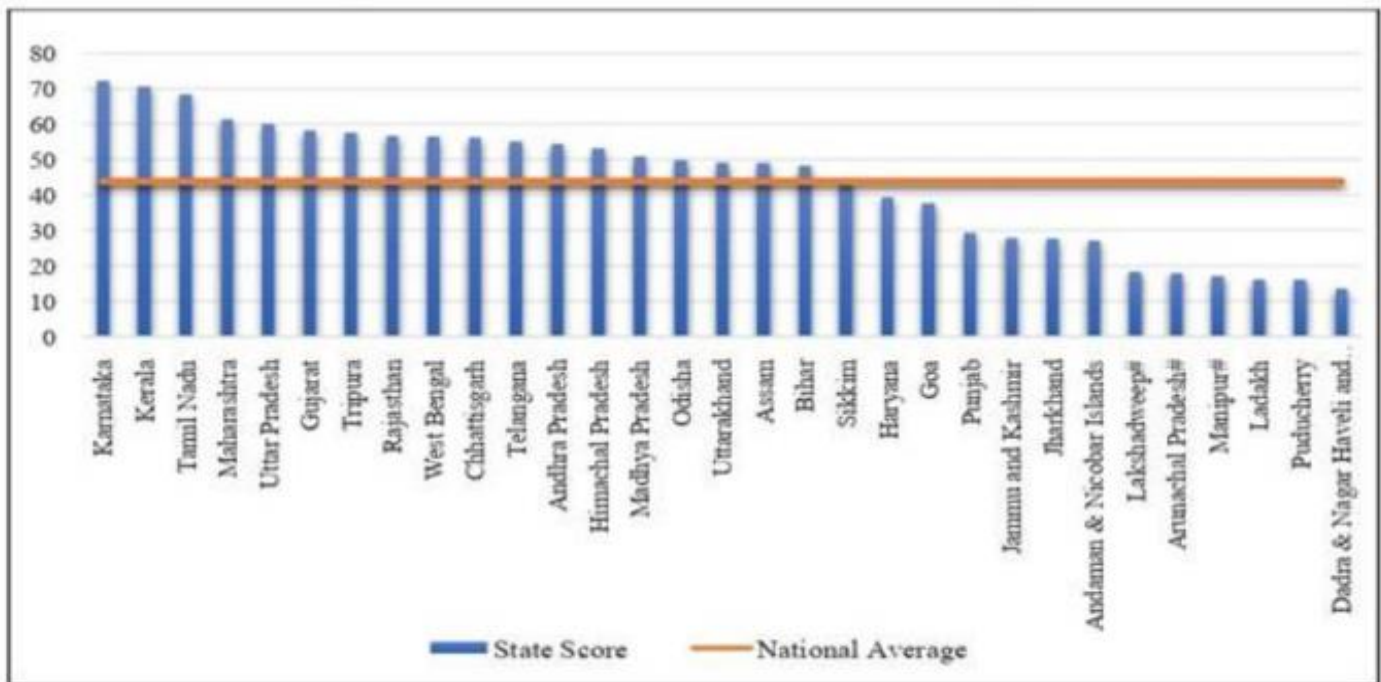
Notable Success Stories in Panchayat Reforms

1. **Uttar Pradesh:** The state made a remarkable leap from **15th to 5th place** in the rankings. This transformation was driven by governance reforms, enhanced accountability through transparency initiatives, and robust anti-corruption measures, particularly in financial accountability and audit compliance.

2. **Tripura:** The state advanced from **13th to 7th place**, significantly improving in **revenue generation and fiscal management**, showcasing that even smaller states can achieve excellence in local governance.

Judiciary and Criminal Law

Delhi High Court to decide on Parole powers

Context :

- A case challenging Delhi's prison rule on furloughs is currently being heard by the Delhi High Court.

- Convicts of the Hashimpura massacre have moved the HC against a rule that vests the power to grant furlough with

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the court where the appeal against conviction is pending.

• Generally, furloughs are granted by the executive, raising questions about why Delhi follows a different rule.

• Both parole and furlough originate from prison rules and jail manuals, falling under executive jurisdiction. They are conditional releases based on good behavior and specific conditions.

Furlough:

1. The sentence continues despite the convict being released for a specified period.

2. Example: A convict sentenced to 10 years is released for 30 days on furlough but is still considered to have completed the 10-year sentence.

3. It is granted in long-term imprisonment to prevent solitude, maintain family ties, and encourage good conduct.

4. Furlough is granted by the **Deputy Inspector General of Prisons**.

Parole:

• The sentence is suspended, and the duration of imprisonment remains unchanged.

• Granted in short-term imprisonment for exigencies like illness, family emergencies, or pursuing an appeal.

• Parole is granted by the Divisional Commissioner.

• Unlike furlough, parole can be granted multiple times but requires a specific reason.

Parameter	Parole	Furlough
Purpose	Granted for specific exigencies (e.g., illness, agriculture, legal appeal).	For preventing solitude, maintaining family/social ties, and encouraging good conduct
Applicability	Short term imprisonment	Long term imprisonment
Suspension of Sentence	Yes, parole duration not added to sentence	Sentence continues despite release, furlough days added in sentence duration
Nature	Conditional release which is subject to good behaviour	Conditional Release which is subject to good behaviour and not committing certain offences
Right	Not a legal right, can be denied even if sufficient case is laid out.	Non Absolute right and can also be denied based on considerations
Granted by	Divisional Commissioner	Deputy Inspector General of Prisons

Frequency	Multiple	Mostly limited
Supervision requirements	Monitoring allowed but not intrusive	Less Monitoring necessary
State wise difference	Yes	Yes

Delhi Prison Rules 2018 and the Challenge Before HC

- Chapter XIX of the **Delhi Prison Rules, 2018**, governs furlough and parole.

- **Note 2 of Rule 1224** states that if an appeal is pending in the High Court or the appeal period has not expired, the executive cannot grant furlough.

- Instead, the convict must seek permission from the appellate court.

- This rule was introduced under the **Parole/Furlough Guidelines, 2010**, approved by the then **Lieutenant Governor (L-G)** on February 17, 2010.

- It is now being challenged before the Delhi HC.

- A **single-judge Bench** has interpreted that 'High Court' in the rule includes the **Supreme Court** if the appeal is pending there.

A division Bench is now considering:

- Whether a furlough application should be filed before the **High Court** if the appeal is pending in the **Supreme Court**.

- Whether the rule violates **Article 14 (Right to Equality)** and **Article 21 (Right to Life and Liberty)**.

- Whether denying furlough despite a convict's good conduct contradicts the **reformative justice approach**.

- Whether jurisprudence on **parole** can be applied to **furlough** since furlough does not involve **sentence suspension**.

- The issue can be traced back to the **KM Nanavati case (1959)**, where the **Governor of Maharashtra suspended his sentence** before an appeal could be filed in the **Supreme Court**.

- The **SC ruled in 1960** that the Governor **cannot** suspend a sentence while the case is sub judice.

- The **National Legal Services Authority (NALSA)** informed the **Supreme Court in 2023** that some states do not provide furlough or parole if an appeal is pending before the HC.

NALSA emphasized that:

- **Parole and furlough are distinct from suspension of sentence or bail**.

- The **competent authority of the State Government** grants parole/furlough, while **HCs handle sentence suspension**.

- The SC noted that this issue requires **immediate attention** from the **Union Government and State Governments**.

- Eight states—**Uttar Pradesh, Bihar, Jharkhand, Maharashtra, Telangana, Haryana, Tamil Nadu, Punjab, and Madhya Pradesh**—were added as parties to the litigation.

- The application is pending before the SC.

Obscenity Laws in India

Details

- Officials of the Assam Police's crime branch unit reached comedian Samay Raina's residence in Pune on Thursday evening to serve him a legal notice in connection with the ongoing India's Got Latent controversy.

- This came after Maharashtra Cyber Police also booked him and other members for broadcasting obscene content.

Constitutional Basics

Right to Freedom

19. Protection of certain rights regarding freedom of speech, etc.—(1) All citizens shall have the right—

(a) to freedom of speech and expression;

[(2) Nothing in sub-clause (a) of clause (1) shall affect the operation of any existing law, or prevent the State from making any law, in so far as such law imposes reasonable restrictions on the exercise of the right conferred by the said sub-clause in the interests of [the sovereignty and integrity of India], the security of the State, friendly relations with foreign States, public order, decency or morality, or in relation to contempt of court, defamation or incitement to an offence.]

Relevant Laws

- Bharatiya Nyaya Sanhita 2023

Section 296 :

296. Whoever, to the annoyance of others,— Obscene acts and songs.

(a) does any obscene act in any public place; or

(b) sings, recites or utters any obscene song, ballad or words, in or near any public place,

shall be punished with imprisonment of either description for a term which may extend to three months, or with fine which may extend to one thousand rupees, or with both.

- Bharatiya Nyaya Sanhita 2023

Section 294 :

Sale, etc., of obscene books, etc. 294. (1) For the purposes of sub-section (2), a book, pamphlet, paper, writing, drawing, painting, representation, figure or any other object, including display of any content in electronic form shall be deemed to be obscene if it is lascivious or appeals to the prurient interest or if its effect, or (where it comprises two or more distinct items) the effect of any one of its items, is, if taken as a whole, such as to tend to deprave and corrupt persons who are likely, having regard to all relevant circumstances, to read, see or hear the matter contained or embodied in it.

- Bharatiya Nyaya Sanhita 2023

Section 79 :

of either description for a term which may extend to five years, and shall also be liable to fine.

Word, gesture or act intended to insult modesty of a woman. 79. Whoever, intending to insult the modesty of any woman, utters any words, makes any sound or gesture, or exhibits any object in any form, intending that such word or sound shall be heard, or that such gesture or object shall be seen, by such woman, or intrudes upon the privacy of such woman, shall be punished with simple imprisonment for a term which may extend to three years, and also with fine.

- Bharatiya Nyaya Sanhita 2023

Section 196:

Promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., and doing acts prejudicial to maintenance of harmony. 196. (1) Whoever—

(a) by words, either spoken or written, or by signs or by visible representations or through electronic communication or otherwise, promotes or attempts to promote, on grounds of religion, race, place of birth, residence, language, caste or community or any other ground whatsoever, disharmony or feelings of enmity, hatred or ill-will between different religious, racial, language or regional groups or castes or communities; or

- Bharatiya Nyaya Sanhita 2023

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Section 299:

299. Whoever, with deliberate and malicious intention of outraging the religious feelings of any class of citizens of India, by words, either spoken or written, or by signs or by visible representations or through electronic means or otherwise, insults or attempts to insult the religion or the religious beliefs of that class, shall be punished with imprisonment of either description for a term which may extend to three years, or with fine, or with both.

Deliberate and malicious acts, intended to outrage religious feelings of any class by insulting its religion or religious beliefs.

Obscenity Laws

Section 294

- Describes obscene material as something which is "Lascivious or appeals to Prurient interest"

- Content which could tend to deprave or corrupt persons likely to see the content

- **Lascivious** - feeling or showing strong sexual desire

- **Prurient** - having or showing too much interest in things connected with sex

- **Deprave** - to make somebody morally bad

- Punishment – 2 years or 5 years for repeat offender

Section 67 of Information Technology Act

- More Rigorous punishment in terms of fine

- Imprisonment upto 5 years for repeat offender

Supreme Court Judgements

Ranjit Udeshi versus State of Maharashtra 1964

- Case regarding the book *"Lady Chatterley's Lover"*

- Court used "HICKLIN TEST" to determine if the work was obscene

- This Hicklin test was established in Britain in the case *Regina versus Hicklin (1868)*

- According to this, work must be regarded as obscene if it tended to deprave and corrupt those whose minds are open to such immoral influences regardless of its artistic or literary merit.

- Threshold for obscenity to be judged from perspective of young and impressionable mind.

- Meanwhile, in the UK **"Obscene Publications Act** was passed in 1959.

- This stated that work must be considered as a whole before considering its effect on likely audiences

- United States also discarded Hicklin Test

- Roth versus United States 1957

- US SC held that test for obscenity was *"whether to the average person, applying contemporary community standards, the dominant theme of the material taken as a whole appeals to prurient interest."*

Aveek Sarkar vs State of West Bengal 2014

- Established Community Standards Test

- *Quashed obscenity proceedings against magazines carrying certain images of tennis player Boris Becker*

- *Applying the Hicklin test would amount to work being judged for obscenity based on isolated passages of work considered out of context and judged by their apparent influence on the most susceptible readers.*

March 2024

- SC quashed proceedings against creators of YT web series College Romance

- Complaints were filed under section 67 of IT Act and Section 292 of IPC

- SC held that while the literal meaning of the terms used my be sexual in nature , their usage does not arouse sexual feelings or lust in any viewer.

- Usage of these words is reflective of emotions of anger, rage, frustration grief or perhaps excitement.

Note – Provisions on different types of bails to be covered in next month current affairs

- Recent Steps Taken by the Indian Government

- IT Rules (Intermediary Guidelines and Digital Media Ethics Code) 2021: Introduced guidelines for OTT platforms and social media intermediaries to ensure content moderation.

- Mandated social media platforms to appoint a Grievance Redressal Officer, a Compliance Officer, and a

- Nodal Officer for law enforcement coordination.

Self-Regulation by OTT Platforms: Many digital streaming platforms have adopted content classification systems and parental controls.

- The Digital Publishers Content Grievance Council (DPCGC), under the aegis of the Internet and Mobile Association of India (IAMAI), serves as an industry-led self-regulatory body for content complaints.

- Censorship of Unlawful Content: The government can act against digital content that violates public decency and morality. Section 69A of the IT Act, 2000 empowers the government to block online content in the interest of sovereignty and security).

- India banned TikTok, PUBG, and 58 other Chinese apps in 2020 citing national security threats.

- Crackdown on deepfake videos: Following the rise of AI-generated deepfake videos, the government has pushed platforms for stricter AI content regulations.

Social Issues

Woman Related Issues

Deep-rooted Gender Bias in Unpaid Domestic Work: Insights from Govt Time Use Survey (2024)

The situation of unappreciated unpaid labour by women in families was shown in the movie Mrs.(PC:X)

Context

- Time Use Survey (2024) conducted by the Ministry of Statistics & Programme Implementation (Jan-Dec 2024) explored Indians' allocation of time across self-care, leisure, socialising, and unpaid domestic tasks.

Key Findings:

Gender disparity in unpaid work:

- Women spend significantly more time on unpaid domestic and caregiving activities.

- Average daily time spent by women: 426 minutes (7 hrs 6 mins).

- Average daily time spent by men: 163 minutes (2 hrs 43 mins).

- Percentage of daily activities:

    o Unpaid domestic work for women: 19.8%; for men: 2.7%.

    o Leisure and socialising for men: 20.3% (second-highest time-consuming activity).

Social Implications:

- Unpaid domestic labour by women is deeply internalised, becoming "invisible" and "normalised."

- Reflects deeply ingrained gender expectations—women primarily in domestic roles, men engaged in leisure activities.

- Generational cycle reinforces traditional family roles among children, perpetuating inequality.

Gender Gap in Employment:

- **Significant employment disparity:** Men's work-related activities occupy 19.9% of their time compared to women's 4.9%.

- **Participation rate for women (15-59 yrs)** slightly improved: 25% (2024) vs 21.8% (2019).

- **Daily average employment time:** Men (473 minutes) vs Women (341 minutes), highlighting persistent inequality in workforce participation.

Conclusion:

- Data underscores persistent structural gender inequality in Indian households.

- Achieving true gender equality requires recognising and addressing

the invisible yet pervasive burden of unpaid domestic work

Population and Associated Issues

Exclusive Ministry for senior citizens

Representational image only. File | Photo Credit: The Hindu

Context

- The Supreme Court of India declined to proceed with a petition that called for a separate Ministry dedicated to senior citizens.

- The petition underscored the vulnerability of older adults, noting their need for special measures under Article 21 of the Constitution, which safeguards the right to live with dignity.

- India's Ministry of Social Justice and Empowerment (MoSJE) is the nodal ministry responsible for the welfare of senior citizens

Definition of a Senior Citizen

- Under the Maintenance and Welfare of Parents and Senior Citizens Act (2007), any individual aged 60 or above qualifies as a senior citizen.

Demographic Overview

- **Projected Growth**: By 2046, India's older population (60+) is expected to surpass the number of children (0–14).

- **Old-Age Dependency**: In 2021, India had about 16 senior citizens for every 100 people of working age (15–59), with variations across regions (e.g., southern India at 20, northeastern areas at ~13).

- **Accelerated Aging**: Between 2010 and 2020, the country's elderly population doubled in just 15 years—nearly as rapid as some neighboring Asian regions.

- **Life Expectancy at 60**: On average, those aged 60 in India can expect 18.3 more years of life, with women (19 years) typically outliving men (17.5 years).

- **Regional Disparities**: Certain states, including those in southern India as well as Himachal Pradesh and Punjab, exceed the national average (10.5%) for older adults.

- **Fertility Impact**: Places with higher birth rates, such as Bihar and Uttar Pradesh, will likely experience a spike in their elderly population by 2036.

- **Ageing Index**: In 2021, there were around 39 individuals aged 60+ for every 100 children under 15, indicating a shift toward an older population in many regions.

Major Challenges Facing Older Adults

- **Economic Insecurity**: Nearly one-fifth of seniors have no reliable income. Only 11% of older men receive work pensions.

- **Healthcare Strain**: Chronic conditions (e.g., hypertension, diabetes, arthritis) affect roughly 30% of older women and 28% of older men, increasing medical expenses and family caregiving burdens.

- **Gender Disparities**: As women tend to outlive men, a larger cohort of elderly women—particularly widows—faces social isolation and greater financial vulnerability.

- **Rural Concentration**: About 71% of the older population resides in rural regions (per the 2011 Census), where limited health facilities, fewer income opportunities, and social isolation pose significant hurdles.

- **Growing 'Oldest-Old' Segment**: Those aged 75+ are increasing in number, intensifying the need for specialized services such as long-term care, nursing, and geriatric healthcare.

- **Workplace Barriers**: Many seniors encounter age-related discrimination, outdated skill sets, limited access to technology, rigid work hours, and lower wages.

- **Potential for Abuse**: Physical, emotional, or financial mistreatment of the elderly—often unreported—can stem from dependence on family members or caregivers.

- **Underdeveloped Silver Economy**: A shortage of tailored goods, services, and infrastructure for seniors persists, creating a gap between growing demand and actual provisions.

Strategies for Addressing Senior Needs

Promoting Multigenerational Living

- Encourage households where grandparents, parents, and children live together. This arrangement can foster emotional bonds, mutual support, and skill-sharing across generations.

Strengthening Healthcare and Telemedicine

- Develop more geriatric care services and improve affordability and accessibility. Telehealth can help older adults in remote regions access medical consultations.

Establishing Self-Help Networks

- Organize community-based groups for resource-sharing, companionship, and social inclusion among seniors.

Expanding Pension and Insurance Coverage

- Widen pension nets and health schemes (e.g., PM-JAY for those 70+) to provide financial security and reduce vulnerability.

Enhancing Community Support Services

- Develop short-term care solutions (like daycare centers), home-based meal programs, and health monitoring systems to support independent living.

Digital Inclusion and Skills Training

- Offer programs to boost digital literacy and technological proficiency among older adults, enabling them to

participate in e-commerce, online healthcare, and other digital arenas.

Policy Innovations and Workforce Inclusion

- Recognize care work in the formal economy and create a distinct category

for senior workers to harness what some refer to as the "Silver Dividend."

- Consider Japanese-inspired strategies such as robotic assistance and advanced monitoring devices to help seniors maintain autonomy

Social Empowerment

Legal Safeguards from abuse for Domestic Workers

Supreme Court of India. File. | Photo Credit: Sushil Kumar Verma

Context

- The Supreme Court of India has taken note of the pervasive mistreatment and exploitation of domestic workers.

- It directed the government to establish an inter-ministerial panel to assess the necessity of a dedicated legal framework safeguarding the rights of these workers.

Definition of a Domestic Worker

- As defined by the International Labour Organization (ILO), domestic workers handle tasks within a private household (or multiple households), offering direct and indirect care services.

- Their role is integral to the broader "care economy," given that they often perform childcare, elderly care,

cooking, cleaning, and other essential household responsibilities.

Demographics

- **Gender Disparities**: Out of the 39 lakh (3.9 million) domestic workers, approximately 26 lakh (2.6 million) are female.

- **Child Labor**: A significant share of these workers are minors (12.6 million), with 86% being girls. Around a quarter are under 14 years of age, rendering them exceptionally vulnerable.

Key Characteristics

- **Informal Nature**: Many lack formal job contracts, social security benefits, or any reliable legal protection.

- **Work Arrangements**: Some are live-in workers who reside with their employers, while others split their time among multiple households (part-time).

- **Migration Patterns**: An influx of workers moves from poverty-stricken regions (e.g., Jharkhand, Bihar, Odisha) to major Indian cities like Delhi, Bengaluru, and Mumbai, or abroad (Arab states), driven by poverty and limited local job prospects.

- **Marginalized Groups**: A large portion belongs to Scheduled Castes (SCs), Scheduled Tribes (STs), or Other Backward Classes (OBCs).

Major Concerns in Domestic Work

- **Insufficient Pay**: Many earn below the minimum wage and are denied overtime compensation despite lengthy work hours.

- **Abuse and Violence**: Cases of physical and emotional harm are common, encompassing harsh living conditions, sexual harassment, forced labor, and, in the most severe instances, human trafficking—often targeting children.

- **ILO's Assessment**: The ILO has labeled domestic work a form of "modern slavery" given the rampant exploitation and the systemic vulnerability of workers, especially minors.

- **Sexual Harassment**: Female domestic workers experience frequent harassment or assault. Fear of retaliation or insufficient legal support often deters them from reporting abuses.

- **Exploitation by Placement Agencies**: Some agencies charge inflated fees but provide no assurance of fair wages, safe working conditions, or clarity regarding employment terms.

- **Pandemic Impact**: Covid-19 exacerbated these issues; a 2020 survey showed many domestic workers encountered discrimination or lacked adequate safety protocols.

Existing Legal Landscape

- **No Dedicated Central Statute**: Domestic workers do not typically fit within "workman" or "workplace" definitions found in mainstream labor legislation, marginalizing their rights.

- **Unsuccessful Legislative Attempts**: Although drafts such as the Domestic Workers (Conditions of Employment) Bill (1959) and Domestic Workers (Regulation of Work and Social Security) Bill (2017) were introduced, none became law.

- **National Domestic Worker Policy (2019)**: This policy sought to standardize agencies, establish fair wages and social protections, and recognize benefits. However, it was never formally enacted.

Proposed Reforms and Recommendations

Implement the Draft National Domestic Worker Policy (2019)

- Mandate fair contracts with clear wage structures and social security provisions.

- Regulate placement agencies through registration and oversight.

Adopt ILO Convention 189

- Formally acknowledge domestic work as legitimate employment.

- Introduce protective laws, ensuring robust enforcement and legislative backing.

Strengthen Anti-Trafficking Rules

- Require compulsory registration of staffing agencies to enhance transparency.

- Rigorously apply anti-trafficking statutes such as the Bharatiya Nyaya Sanhita, 2023, which imposes severe penalties (up to life imprisonment) for trafficking, including cases involving domestic workers.

Empowerment Strategies

- Promote <u>awareness of domestic workers' rights, offering legal aid and social support services.</u>

- Create a <u>dedicated grievance redressal mechanism</u> with statutory authority to address and resolve worker complaints effectively.

Ethics

Ethics and Human Interface

Ethical Dilemmas in Influencer Culture

Context

- A well-known YouTuber and social media influencer, also called "BeerBiceps" sparked a controversy with his Joke on Indias Got Latent Show. The specific joke in question was seen as crude or insensitive, allegedly targeting themes tied to family values or parental relationships. Although comedic freedom is often celebrated online, this particular remark was regarded by some viewers as crossing moral lines and offending cultural sensitivities. Some social media users and parents expressed disapproval, citing that jokes involving sensitive family matters or children are inappropriate. Demands arose for stricter content guidelines and more responsible self-regulation by influencers

Ethical Debates

Boundaries of Free Expression

- **Freedom vs. Responsibility**: Does a comedian or influencer have the moral right to joke about anything, or should they exercise restraint when it comes to topics that affect personal dignity (e.g., family, health, or religion)?

- **Cultural Sensitivity**: In a culturally diverse country like India, "offensive" is subjective, yet certain familial and moral values are widely upheld; jokes violating these can spark greater backlash.

Influencer Accountability

- **Power of Influence**: With large followings, influencers significantly shape public discourse and youth culture. When jokes trivialize core values, do creators bear added responsibility to uphold some level of moral decency?

- **Platform Policies**: Social media platforms often adopt content guidelines. Debates arise on whether these are effectively enforced or if comedic "gray areas" remain insufficiently regulated.

Impact on Family Values

- **Normalization of Crude Humor**: Critics argue that repeated exposure to crass jokes about family or parents erodes respect for traditionally sacrosanct relationships.

- **Parenting Concerns**: Offensive or coarse online content can make parenting more challenging, blurring lines for what is socially acceptable.

Commercial vs. Ethical Priorities

- **Clickbait Culture**: Some creators push boundaries to go viral and garner views. This raises the question: Should ethics take precedence over engagement metrics, or is any attention "good" attention in today's digital economy?

- **Entertainment vs. Harm**: Jokes that sensationalize taboo topics may generate short-term popularity, but critics highlight potential long-term harm—desensitization to disrespectful speech or behavior.

Thinkers and Philosophical Perspectives

John Stuart Mill – The Harm Principle

- Mill posits that freedom (including speech) should only be curtailed when it causes direct harm to others.

- In this controversy, the debate is whether jokes about parental figures or sensitive family issues cross from "harmless humor" into harmful territory—psychologically or culturally.

Immanuel Kant – Deontological Ethics

- Kant emphasizes that individuals must never be treated merely as means to an end.

- A joke that objectifies or ridicules core family bonds could be seen as violating respect for persons, turning them into subjects of mockery purely for entertainment.

Aristotle – Virtue Ethics

- Virtue ethics looks at character and the cultivation of virtues like respect, empathy, and prudence.

- From this angle, repeated "edgy" humor that undermines familial respect might reflect a deficit in moral character and hamper societal virtue.

Communitarian Ethics

- Focuses on the well-being of the community and shared moral standards.

- Many Indian traditions emphasize familial harmony and reverence for elders; a joke perceived as undermining these may strain cultural cohesion.

Social Learning Theory (Albert Bandura)

- People, especially children, learn behaviors and norms by observing influential figures.

- If a popular influencer normalizes coarse jokes about family, viewers may internalize disrespectful communication as acceptable or humorous.

Broader Implications

Digital Civility and Content Moderation

- The controversy highlights the challenges of moderating humor and satire in a vast digital landscape.

- Striking a balance between comedic freedom and protecting societal values is especially complex when comedic lines are subjective.

Evolution of Media Influence

- Traditional media once had stricter gatekeeping. Now, online platforms allow influencers to bypass editorial checks.

- This shift amplifies ethical dilemmas around self-regulation: Should comedic

creators voluntarily adopt guidelines to prevent public harm?

Societal Role of Education and Parenting

- As children increasingly absorb cultural cues from online personalities, <u>families and educators bear the responsibility to contextualize that content</u>, emphasizing critical thinking and empathy.

Conclusion

- **Respect and Responsibility**: <u>Being an influencer carries moral weight,</u> particularly when discussing deeply valued institutions like family.

- **Cultural Sensitivity Matters**: What some call a "harmless joke" may cause genuine offense in cultures where familial and moral values are paramount.

- **Balancing Freedom and Restraint**: Absolute freedom in comedic content can conflict with societal expectations for decency and empathy.

- **Educational and Parental Guidance**: <u>A strong foundation in ethics</u>—from home and school—<u>helps audiences discern harmless wit from harmful mockery.</u>

Other Ethical Ideas related to the Topic

- **Moral Panic** – A heightened societal reaction to a perceived threat to moral standards, often amplified by media, leading to exaggerated fear and demands for regulation.

- **Public Shaming & Cancel Culture (Digital Ethics)** – The practice of collectively condemning an individual or entity online for perceived unethical behavior, often resulting in reputational

damage, loss of opportunities, or exclusion from platforms.

Ethical Relativism vs. Universal Morality

- **Ethical Relativism** – The belief that morality is culturally and contextually dependent, meaning ethical standards vary across societies.

- **Universal Morality** – The belief that certain ethical principles, such as human dignity and respect, apply to all people regardless of culture or context.

- **Hyper-Moralization of Digital Speech** – The tendency to frame online discussions as moral crises, where even minor offenses are treated as severe ethical violations.

- **The Ethics of Audience Responsibility** – The idea that consumers of content, rather than just creators, have a moral duty to critically evaluate and self-regulate their media consumption instead of imposing censorship.

Virtue Signaling & Performative Outrage –

- **Virtue Signaling** – Publicly expressing moral opinions to gain social approval rather than out of genuine ethical concern.

- **Performative Outrage** – Expressing anger or condemnation over an issue primarily to signal one's moral stance rather than to seek real solutions.

Civil Service Values and Ethics in Public Administration

Criminalising beggars in India: A Colonial legacy

Context

- The district collector of Indore used the Bharatiya Nagarik Suraksha Sanhita (BNSS) to prohibit giving money to individuals deemed "beggars." This action is representative of broader state efforts to discourage panhandling and often leans on older legal frameworks.

Colonial-Era Laws Still in Force

- Many Indian states rely on legislation like the Bombay Prevention of Begging Act (1959), which has an expansive definition of "begging."

- Under such laws, not only direct solicitations but also performances or merely "appearing" destitute can fall under the term "begging."

- These regulations can facilitate the forced removal of marginalized groups, particularly during clean-up or "beautification" initiatives.

Ethical Debates

Balancing Public Order and Civil Liberties

- Authorities often justify bans by citing traffic management and public order.

- However, treating destitute individuals as criminals clashes with notions of fundamental rights and personal dignity.

Punitive Approaches vs. Support Networks

- Officials may argue that banning begging encourages participation in rehabilitation programs.

- In practice, these bans sometimes lack robust transition pathways—no clear job training, minimal shelter options—leading to further hardships.

Quick Fix or Sustainable Strategy?

- Restricting begging may offer a superficial solution to visible poverty without actually addressing the root causes (e.g., unemployment, mental health issues, lack of housing).

- Long-term investments in social welfare, healthcare, and education are essential for real change.

Public Safety Concerns vs. Compassion

- Bans often cite concerns about organized begging rings and substance abuse.

- A purely prohibitory stance risks overlooking the human dimension, where many resort to begging out of dire necessity.

Philosophical Perspectives

Utilitarian View

- Some interpret banning begging as beneficial if it leads to overall societal welfare (less perceived nuisance, better public safety).

- However, achieving genuine welfare demands tackling poverty head-on; a simple ban does not fulfill broader social well-being.

Duty-Based (Deontological) Ethics

- Emphasizes the obligation of government to respect individual rights.

- Labeling extremely poor people as criminals undermines core moral duties to protect human dignity.

Virtue Ethics

- Encourages compassion, empathy, and kindness within policy-making.

- Laws that punish vulnerable individuals rather than providing support reflect poorly on societal values of care and responsibility.

Ways Forward

Integrated Rehabilitation Programs

- **Offer comprehensive services:** mental health support, vocational training, and safe housing.

- Example: India's **SMILE** *(Support for Marginalized Individuals for Livelihood and Enterprise)*, scheme launched by the Ministry of Social Justice and Empowerment in February 2022. The scheme aims to help marginalized individuals through rehabilitation, education, and skill development.

Proactive Prevention

- **Tackle homelessness and job scarcity** directly to reduce reliance on alms.

- Example: **Leeds in the UK** focuses on addressing housing issues to diminish street begging.

Social Integration Efforts

- **Encourage skill-building workshops and community support** to help individuals re-enter mainstream society.

- Example: **Atchayam Beggars Rehabilitation Centre** in Erode, India, which has effectively reintegrated older beggars through skill development programs.

Ethical Giving and Public Awareness

- **Promote responsible charity,** such as donating to organized social welfare programs, rather than direct handouts that may perpetuate cyclical poverty.

- Coordinated community drives or campaigns can make a more lasting impact than sporadic alms.

Ethical Considerations in Foreign Aid

Context

- A 90-day pause in USAID *(U.S. Agency for International Development)* operations

by the United States has sparked debate about the wider impacts on countries that rely on these programs. It raises questions regarding ethical responsibility, the role of soft power in global affairs, and the fate of ongoing development projects.

Overview of USAID

- **Establishment**: Created in 1961 through an Act of US Congress.

- **Purpose**: Provides civilian aid worldwide to foster democratic values, peace, and prosperity.

- **Scope**: Active in over 100 countries, funding projects in economic development, healthcare, education, and humanitarian relief.

- **Partnerships**: Works alongside governments, NGOs, and private entities via grants, technical support, and development funding.

Rationale for Foreign Aid

- **Philosophical and Moral Grounds**: Utilitarian (maximizing well-being), rights-based (ensuring basic human rights), and communitarian (respecting local values).

- **Strategic Reasons**: National security interests, stabilizing regions, and fostering alliances.

- **Economic Objectives**: Encouraging infrastructure and market growth in developing nations, which can also open new opportunities for donor countries.

- **Humanitarian Concerns**: Providing immediate help in emergencies like natural disasters or conflicts.

Ethical Considerations

Positive Aspects

Sustainable Growth

- *Example:* The **Marshall Plan** (post–World War II) helped rebuild European infrastructure and jump-start local industries, leading to long-term economic recovery.

- *Example:* **India's investments in Bhutan's hydropower sector** have fostered energy independence and generated revenue through electricity exports.

Food Security

- *Example:* **USAID-supported agricultural programs** in Ethiopia introduced drought-resistant crops, substantially reducing malnutrition rates in historically famine-prone areas.

- *Example:* **India's partnerships in African agriculture** involve training farmers on better irrigation techniques, boosting crop yields in water-scarce regions.

Health Improvements

- *Example:* **Global Polio Eradication Initiative** (involving USAID, WHO, etc.) provided vaccines worldwide, nearly eliminating polio.

- *Example:* **PEPFAR (U.S. President's Emergency Plan for AIDS Relief)** significantly increased access to antiretroviral therapy in sub-Saharan Africa, reducing HIV/AIDS mortality.

Disaster Response

- *Example:* **USAID's role in post-earthquake Haiti** (2010) included emergency shelters, medical supplies, and reconstruction support.

- *Example:* **India's relief efforts in Nepal** (2015 earthquake) provided swift rescue teams, medical aid, and long-term rebuilding resources.

Potential Drawbacks

Dependency

- *Example:* Certain countries in **sub-Saharan Africa rely on external funding** for a large portion of their national budgets, making them vulnerable if aid suddenly decreases.

Corruption

- *Example:* **Humanitarian funds in conflict zones** sometimes get **diverted by local power brokers**, undermining the intended relief efforts.

- *Example:* **Sri Lanka's economic crisis** revealed cases where **foreign grants and loans were mismanaged**, contributing to financial instability.

Cultural Insensitivities

- *Example:* In some conservative regions, **women's health programs faced backlash from local religious leaders** who viewed certain reproductive health services as culturally inappropriate.

- *Example:* **Educational reforms** introduced by external donors **may conflict with traditional schooling methods**, causing community resistance.

Political Manipulation

- *Example:* **"Debt-trap diplomacy" accusations** have arisen where nations receive large-scale infrastructure loans, then struggle to repay, allowing creditors to gain strategic assets.

- *Example:* During Cold War–era aid programs, funds were sometimes used to secure political loyalty rather than purely to foster development.

Way Forward

- **Transparency**: Adopt public dashboards and audits to bolster trust and accountability.

- **Sustainability**: Integrate climate resilience and renewable energy measures into aid projects.

- **Local Engagement**: Involve community leaders and NGOs to ensure culturally relevant, recipient-led initiatives.

- **Capacity Building**: Transition from short-term relief to long-term empowerment, focusing on governance, education, and self-reliance.

India's Neighborhood

India-China diplomatic thaw: What the fine print of their statements reveals

- In a major diplomatic breakthrough, New Delhi and Beijing have decided on a slew of measures to repair bilateral ties:

1. **Resuming Kailash Mansarovar Yatra this summer**

2. Restoring direct flights between the two capitals

3. Issuing visas for journalists and think tanks

4. Sharing trans-border river data.

- These decisions were arrived at after Foreign Secretary Vikram Misri, during a recent China visit

India-China Relations

- India said they "reviewed the state of India-China bilateral relations comprehensively" and agreed to take certain **"people-centric steps to stabilize and rebuild ties".**

- So, the focus is on **"review" and "people-centric steps"**.

- China said that they were discussing measures for the "improvement and development" of **China-India relations**, and that the two sides reached "consensus" on specific measures.

Mansarovar Yatra, Flights

- On Kailash Mansarovar Yatra, the two statements almost echo each other, but the Chinese statement reflects more urgency, **with a mention of "as soon as possible".**

- The Indian statement said the two sides "decided to resume the Kailash Mansarovar Yatra in the summer of 2025; the relevant mechanism will **discuss the modalities for doing so as per existing agreements".**

- The Chinese statement said: "The two sides agreed to resume the Indian pilgrims' visit to Kailash Mansarovar in Xizang Autonomous Region, China in 2025, and will discuss relevant arrangements as soon as possible."

- On direct flights, a careful reading of the two statements shows that **Delhi wants a new pact, while China has linked it to visas and resident journalists.**

- Chinese and Indian airlines had 539 scheduled direct flights a month between the two countries as of December 2019, with a cumulative seat capacity of over 1.25 lakh.

- They were paused during the Covid-19 pandemic in 2020, and with the Galwan clash in June that year, were never resumed.

- The Indian statement said: "They agreed in principle to **resume direct air**

services between the two countries; the relevant technical authorities on the two sides will meet and negotiate an updated framework for this purpose at an early date".

- China said: "The two sides agreed to resume direct flights between Chinese mainland and India, support the competent authorities of the two countries to coordinate and push it forward, and take measures to facilitate personnel flows and exchanges of resident journalists".

India currently has only one resident journalist in China, while the Chinese have none.

75th Anniversary of India China Bilateral Ties

- While China claims it is issuing a large number of visas to Indian nationals, Indian visa issuances to Chinese nationals have **reportedly crashed from around 2 lakh in 2019 to a few thousands in 2024**.

- In January 2024, the Chinese embassy in Delhi had said that **over 180,000 Chinese** visas were issued to Indian citizens in 2023.

- Indian statement reads: "The two sides recognise that 2025, being the 75th anniversary of the establishment of diplomatic relations between India and China, **should be utilised to redouble public diplomacy efforts to create better awareness about each other and restore mutual trust and confidence among the public**.

- The two sides will conduct a number of commemorative activities to mark this anniversary."

- China said, "The two sides agreed to jointly commemorate the 75th anniversary of the establishment of diplomatic relations between China and India in 2025, and **carry out media and think tank exchanges, Track II dialogues and other people-to-people exchanges.**"

Trans Boundary Rivers

- On trans-border rivers like the Brahmaputra, both sides agreed to hold an early meeting of India-China Expert Level Mechanism.

- This will involve sharing of data, which has been an issue recently.

- In January 2025, after Beijing cleared the construction of the world's largest dam on the Brahmaputra close to the Indian border, **triggering worries in the lower riparian states of India and Bangladesh**, Delhi said it has conveyed its concerns to the Chinese side.

Taming the 'rogue' river

The Brahmaputra is a transboundary Himalayan river basin spanning four riparian countries. This map shows its flow from the Tibetan Autonomous Region in China through Bhutan and India into Bangladesh.
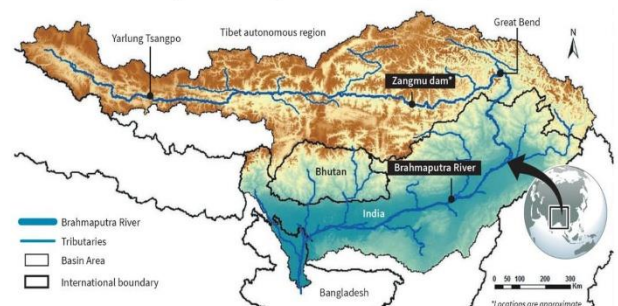
WATER POWER

| 1 DAGU 640 MW | 2 JIEXU 510 MW | 3 ZANGMU 510 MW | 4 JIACHA 320 MW |

Context of The Dam

- The ambitious plan to build a mega-hydropower dam across the Brahmaputra at the **Great Bend region of the Medog county** in the Tibetan Autonomous Region (TAR) in China, has been in the drawing boards of **Chinese hydrocracy for decades**.

- The clearest signalling to this effect happened in 2020 when this project was included in China's 14th Five-Year Plan.

Hydrocracy

- **Hydrocracy** refers to a governance system where **water management and control are centralized in the hands of bureaucratic institutions, technocrats, and policymakers**.

- It is often used to describe how states, organizations, or agencies manage water resources, particularly in contexts where access, distribution, and infrastructure are highly regulated.

Context of The Dam

- Its approval was granted on December 25, 2024.

- India, Bhutan and Bangladesh will have serious downstream implications of this 60 GW hyper-dam built upstream by China.

Trans Boundary Rivers

- **India was not informed by the Chinese side about the dam project**, which is the convention between the two countries, and learnt of it from media reports.

- Indian officials then reached out to their **Chinese counterparts about sharing information in advance**, and consulting India and Bangladesh.

- China agreed to hold an early meeting of the India-China Expert Level Mechanism to discuss resumption of provision of hydrological data and other cooperation pertaining to trans-border rivers.

- The two sides agreed to advance trans-border river cooperation, and maintain communication on holding a new round of meeting of the China-India Expert Level Mechanism on Trans-border Rivers at an early date.

Conclusion

- Chinese side stressed that both sides should view and handle China-India relations on the **basis of the fundamental interests** of the two countries and two peoples and from **a strategic height and long-term perspective**.

Africa

What is Happening in Congo?

DRC- Map

- Rwandan-backed M23 rebels in the Democratic Republic of Congo are seeking to advance south towards **Bukavu, the capital of South Kivu province**, in an attempt to expand their area of control in the country's east after **capturing the city of Goma**.

- The latest fighting is part of a major escalation of a decades-old conflict over **power, identity, and resources** that has killed hundreds of thousands of people and **displaced more than one million** since its recent resurgence.

North Kivu & South Kivu
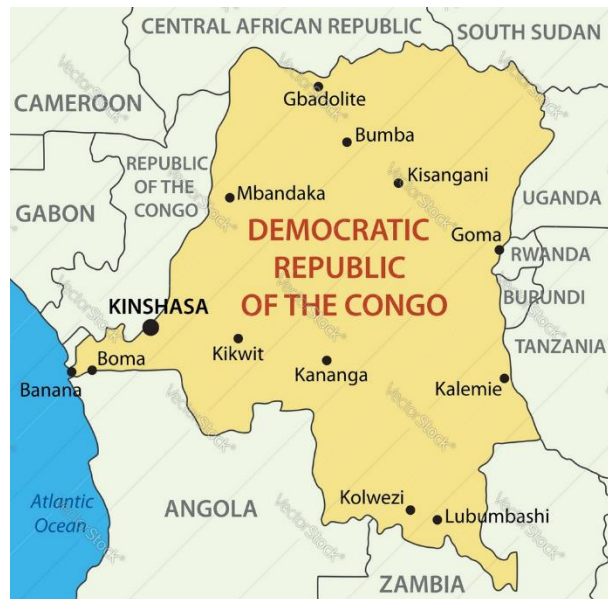
Context

- The rebels entered Goma, the capital of North Kivu province, on January 27 night and had seized control of the city's airport by January 28 evening, after facing pockets of resistance in strategic areas.

- Hundreds of government troops and allied militia laid down their weapons. By January 30 morning, the rebels were in control of the devastated city, where corpses still lay in the streets.

- Since then, **M23 fighters have pushed southwards into South Kivu**, battling

the Congolese army and its allies including Burundian troops.

- The involvement of Burundian and Rwandan troops on the ground has added to fears the fighting could spiral into a regional conflict.

What is M23?

- **M23, which refers to the March 23, 2009**, accord that ended a previous Tutsi-led revolt in eastern Congo, is the latest group of **ethnic Tutsi-led insurgents** to take up arms against Congolese forces.

- It launched the current rebellion in 2022.

- The group has accused the government of Congo of **not living up to the peace deal** and fully integrating **Congolese Tutsis into the army and administration.**

- It also vows to defend Tutsi interests, particularly against **ethnic Hutu militias** such as the Democratic Forces for the Liberation of Rwanda (FDLR).

- The FDLR was founded by Hutus who fled Rwanda after participating in the 1994 genocide of close to one million Tutsis and moderate Hutus.

- For more than a year, M23 has controlled Congo's **coltan-mining region of Rubaya**, generating an estimated $800,000 per month through a production tax, according to the UN.

- **Coltan is used in the production of smartphones and other equipment.**

- Well-trained and professionally armed, M23 is the latest in a long line of Rwandan-supported, **Tutsi-led rebel movements** to emerge in Congo's volatile eastern borderlands in the wake of two successive wars stemming from Rwanda's 1994 genocide.

- UN estimates suggest that the fighting, which began in January, has taken the lives of more than 2,900 people, displaced close to 7,00,000 and injured many more.

Rwandan Genocide

- With Hutus at the helm, there was systematic repression of the Tutsis.

- This led to the formation of the Tutsi rebel group, the **Rwandan Patriotic Front (RPF), which launched a civil war in 1990.**

- The war reached its inflection point in April 1994, when an aircraft carrying Rwandan President Juvenal Habriyamana and his Burundi counterpart Cyprien Ntarynira — **two Hutus** — was shot down

- Blaming the RPF for the attack, the Rwandan military and the Hutu Interahamwe militia went on a

rampage, **murdering almost 8,000 people per day**.

- By the time the campaign ended 100 days later, some **8,00,000 Tutsis** and a moderate number of Hutus had been killed.

THE M23 MILITIA

- One of about 100 armed factions vying for a foothold in mineral-rich eastern DRC
- Rwandan-backed group which consists primarily of Tutsis who failed to integrate into the Congolese army
- Led major insurgency against the DRC government in 2012, took up arms again in 2022. The group is estimated to have 6,500 fighters

DEM. REP. OF CONGO
Kinshasa   Goma

500km
310 miles

Jan 27-28, Goma: While M23 rebels claim control of the city, they are reportedly facing resistance from army and pro-government militias

▲ Mount Nyiragongo

Direction of M23 advance

5km
3 miles

Sake   DEM. REP. OF CONGO

Keshero   Munigi   RWANDA
GOMA

Bulenga

Goma International Airport

Gisenyi

UN experts estimate up to 4,000 Rwandan forces are fighting alongside M23

LAKE KIVU   Port   "Great Barrier" border crossing

- Latest rebel advance has forced thousands to flee Goma. The city of two million people is a vital humanitarian aid hub for the region
- The UN and other global powers fear that the conflict could spiral into a regional war similar to those of 1996-1997 and 1998-2003

Background of M23

- Formed in 2012, the M23 stands for Movement du 23 Mars — an abortive **agreement signed on March 23, 2009**, between the DRC government and the Tutsi-led National Congress for the Defence of the People (CNDP).

- According to the pact, the CNDP, which fought the government forces between 2006 and 2009, **was to take the form of a political party and its fighters** were to be absorbed into the DRC Army.

- Claiming to protect Tutsis, the group managed to capture Goma for the first time in 2012.

- Following a series of setbacks at the hands of the Congolese Army and UN forces, **the group retreated after it was assured the protection of the Tutsis.**
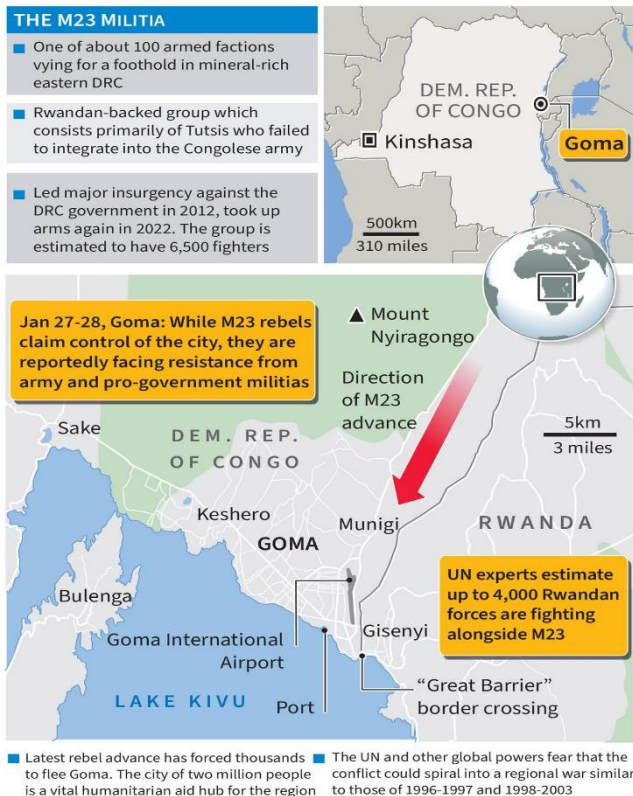
Beyond Ethnic Tensions

- Ethnic strife forms only one part of the story. The mineral-rich regions in the DRC's east, coveted by nations and armed groups alike, form the other part.

- **The DRC is home to Coltan, the ore from which Tantalum is produced**.

- This blue-grey metal is used in smartphones and other electronic devices for it can hold a **high charge over a range of temperatures, making it conducive for the manufacturing of capacitors that store energy.**

What is South Africa's new land law that Trump says is 'egregious' and 'immoral'?

- United States President Donald Trump has signed an Executive Order ending financial assistance to South Africa for its alleged "unjust and immoral practices" that include the enactment

of a **new domestic land law**, and taking "aggressive positions" against the US and Israel at the International Court of Justice (ICJ) and **"reinvigorating its relations with Iran"**

What is South Africa's new land law that Trump says is 'egregious' and 'immoral'?

- Trump had accused South Africa of "confiscating land and treating certain classes of people VERY BADLY".

- This, he alleged, was a "massive Human Rights VIOLATION", and promised to "cut off all future funding to South Africa" until the matter had been investigated.

New Expropriation Act

- In January 2025, South Africa implemented the new Expropriation Act, **which allows the state to seize land without compensation for public purposes or in the public interest** in certain circumstances.

- The law, which was discussed for five years, including public consultations, provides a legal framework for expropriation by the state in accordance with **Section 25(2) of the South African constitution.**

- In most cases, the expropriating authority is **required to negotiate with the property owner to reach an agreement** on acquiring the property before resorting to expropriation.

- President Ramaphosa clarified on X that the "Expropriation Act is not a **confiscation instrument, but a**

constitutionally mandated legal process that ensures public access to land in an equitable and just manner as guided by the constitution".

Wrongs of Apartheid

- When racist minority rule over South Africa ended in 1994, about 86% of agricultural land was controlled by white people, who constituted 10.9% of the population.

- The need for the new law, which repealed and replaced the apartheid-era Expropriation Act of 1975, arose from the highly skewed pattern of land ownership in South Africa.

- A land audit from 2017, the most recent available, showed that white people still owned 72% of agricultural landholdings.

- Today, whites are only about 7% of South Africa's 62 million population.

- The Expropriation Act of 1975 was a South African law that governed the process by which the state could expropriate (compulsorily acquire) private property for public purposes.

- It was enacted during the apartheid era and was primarily used to implement policies such as forced removals under the Group Areas Act.

- Compensation was provided to property owners, but it was often based on the **market value of the property** or what the government deemed as "just and equitable."

- However, many critics argued that compensation was often inadequate,

especially in cases where non-white property owners were displaced.

- Land reforms to address this situation, including the new Expropriation Act, is part of the South Africa National Development Plan 2030, which aims to eliminate poverty and reduce inequality by uniting South Africans.

USA- South Africa Relations Strain

- Trump administration has all but shut down the US Agency for International Development (USAID), which coordinates the **President's Emergency Plan for AIDS Relief (PEPFAR),** the world's largest effort to combat HIV/AIDS.

- PEPFAR has been critical to South Africa's fight against the disease – of the $320 million aid committed to the country by the US in 2024, more than $220 million went to support its HIV/AIDS program.

- South Africa is estimated to have more than 9 million HIV-positive people, more than any other country.

West Asia

Jaishankar's UAE visit: Abu Dhabi's role in post-ceasefire Gaza

- The India-UAE calendar of diplomatic interactions has been among the most crowded in the last five years.

- For the third time since his reappointment as External Affairs Minister, Dr S Jaishankar visited the UAE in January 2025.

How is the UAE positioned in the current regional crisis?

- The UAE seems to have agreed 'in principle' to help Gaza's post-war administration, at least as per Israeli reports.

- Since the beginning of the Gaza war, Abu Dhabi has prioritised the continuation of diplomatic ties with Israel and leveraging that to influence Israeli actions in Palestine, rather than break away from the Abraham Accords or pursue punitive measures against Tel Aviv.

- But Abu Dhabi's criticism of Israel in multilateral fora has been scathing, supporting Arab/Gulf characterisations of Israeli actions in Gaza as 'genocide', condemning its 'collective punishment', and consistently re-affirming that an independent Palestinian state is the only path to stability.

Abu Dhabi's Position is built on 2 Pillars

- First, both Gaza and the West Bank **should be united "under a single, legitimate Palestinian Authority"** that is "led by an empowered, credible and independent new Prime Minister.

- Two, the UAE's potential involvement in post-war Gaza has been made contingent on the **withdrawal of Israeli security presence in Gaza** and Israel's cooperation in establishing a Palestinian state.

What are the UAE's regional priorities?

- Along with Saudi Arabia, the United Arab Emirates is the other engine driving the Gulf's economic diversification, which necessitates a push away from forever wars in the Middle East and towards stability.

- **The UAE holds the world's second largest sovereign wealth fund**, cumulatively amounting to over two trillion US dollars, second only to China, and the **world's eighth largest proven oil reserves.**

- This has also allowed the Emirates to take greater risks and push for a larger leadership role in the region, for which it competes with Saudi Arabia.

- In Palestine, the UAE is motivated less by ideological affinity and more by a recognition of the need for long-term stability, which can only be achieved by full statehood and economic development.

India UAE Ties

- The UAE's approach to resolving the Israel-Palestine issue is closest to what India itself envisages as a 'negotiated solution' that includes all parties.

- But India-UAE alignment goes beyond Palestine.

- UAE hosts the largest population of the Indian diaspora, which contributes to approximately 18% of all remittances.

- Apart from a Comprehensive Economic Partnership Agreement, both states have carved out special cooperative arrangements across sectors, such as a Bilateral Investment Treaty and civil nuclear cooperation.

- While both states are each other's second largest trading partners, India-UAE trade ties have also largely weathered the current crisis in the Red Sea — bilateral trade fell from $84.84 billion in 2022-2023 to $83.65 billion in 2023-2024, a marginal dip compared to India-Israel or India-Saudi Arabia trade for instance.

- However, the biggest geopolitical step for India, UAE and other partner states that was contingent on a post-Abraham Accords stable Middle East was the mega India Middle East Europe economic corridor (IMEEC).

- Hence, it is in both New Delhi's and Abu Dhabi's core interest to ensure that order is not disrupted by the eruption of regional fault-lines again.

India & World

Indian migrants sent back from US: Why Trump is using expensive military planes for deportation

- US President Donald Trump won the recent election on the plank of cracking down on illegal immigration and has been vigorously pursuing this ever since he took office. Illegal immigrants are being deported by the planeload,

including, significantly, on military planes.

Indian migrants sent back from US: Why Trump is using expensive military planes for deportation

- The use of military planes for deportation is unusual in the US, it is also very expensive.

- Recently, **Colombia had refused to let a military flight** carrying deportees land, with President Gustavo Petro saying he would only accept civilian planes.

Military Planes VS Civilian Planes

- The US usually carries out deportations on commercial charters that look like regular commercial planes, and are operated by US Customs and Immigration Enforcement (ICE).

- While these planes are still ferrying illegal immigrants out, they have received less attention than the huge, imposing military C-17s.

- A recent military deportation flight to Guatemala, it said, "likely cost at least $4,675 per migrant.

- This is more than five times the $853 cost of a one-way first class ticket on American Airlines.

- The estimated cost to operate a C-17 military transport aircraft is $28,500 per hour, the same report said.

- The deportation flight to India is the longest yet. So far, such flights have gone to Guatemala, Peru, Honduras, and Ecuador.

- A military plane had flown for Colombia too, but the country sent its own planes to bring back the immigrants.

Why does Trump want to use military planes for deportation?

- It has to do with symbolism - Trump has frequently termed illegal immigrants "aliens" and "criminals" who have "invaded" America.

- The visuals of immigrants being loaded onto military planes seems to be part of the message that Trump is tough on such "crimes".

- Shackling and handcuffing the immigrants as they are loaded into planes also seems in line with this.

What US designating Mexican cartels as Foreign Terrorist Organizations means

- The United States designated eight Latin American criminal groups as Foreign Terrorist Organizations (FTOs).

- FTOs are foreign organisations that are designated by the Secretary of State — in the latest instance Marco Rubio — in accordance to Section 219 of the Immigration and Nationality Act.

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BREAKING: U.S. State Department under President Trump has officially designated the following as Foreign Terrorist Organizations:

- Tren de Aragua
- MS-13
- Sinaloa Cartel
- Jalisco New Generation Cartel
- United Cartels
- Northeast Cartel
- Gulf Cartel
- Michoacán Family

Background

- According to the Act, the Secretary is "authorised to designate an organisation as a foreign terrorist organization" on the condition that it either "engages in terrorist activity" or "retains the capability and intent to engage in terrorist activity or terrorism", and that this activity threatens the security the US and its citizens.

- The term "terrorism" is rather broadly defined by a number of US laws, and can include a gamut of criminal offences such as sabotage, kidnap, hijacking, killing or causing bodily harm, etc.

- FTOs must be re-designated every two years.

What Designation Entails?

- According to the website of the US State Department, FTO designations are critical in the United States' "fight against terrorism and are an effective means of curtailing support for

terrorist activities and pressuring groups to get out of the terrorism business."

- There are 77 listed FTOs at the moment, including the likes of Al Qaeda, ISIS (and its multiple offshoots), Hamas, Indian Mujahideen, Jamat ud Dawa, etc.

PM Modi's Visit to USA

- In February 2025, Prime Minister Narendra Modi and President Donald Trump met for their first bilateral meeting after Trump returned to office.

- The two leaders discussed new initiatives and issues at length, across various fields, from trade, defense, and issues related to peace and conflict, marking the start of a new chapter in US-India relations.

Relevance of Issue

- India's bilateral relations with the United States are central to its foreign policy.

- Thus, it is important to not only understand the key highlights of Prime Minister Modi's visit to the USA but also to analyze them in a broader context, as they have significant implications for various sectors, including the economy, defense, and science and technology.

Trade & Investment

- Mission 500 : As Trump prepares to impose reciprocal tariffs by spring, he has provided India with the opportunity to negotiate a "fair trade"

arrangement in the coming months and both countries have set the new goal for bilateral trade — "Mission 500" — aiming to double bilateral trade between the two countries from the current $200 billion-level to $500 billion by 2030.

- **Bilateral Trade Agreement (BTA)** : Prime Minister Narendra Modi and US President Donald Trump announced plans to negotiate the first tranche of a mutually beneficial, multi-sector BTA by fall of 2025. It demonstrates mutual commitment to address bilateral trade barriers.

- **Recognition of Indian investments in US** : Indian companies ongoing investments worth over $7.355 billion — 3,000 high-quality jobs for local families.

Do You Know?

- The US is one of the largest trading partners of India with overall bilateral trade in goods and services of $190 billion for the calendar year 2023.

- India's goods trade surplus with the US has been rising, particularly after the Covid-19 pandemic, doubling from $17.30 billion in 2019-20 to $35.33 billion in 2023-24, alongside a notable shift in the export basket.

- Meanwhile, India's imports from the US over the past five years have grown at a slower pace compared to its exports.

US TRADE WITH INDIA, OTHER KEY COUNTRIES

TABLE 1

TOP IMPORTS FROM THE US

Top 5 items that comprise 60% of India's imports from US (2023-24)

Items	Value
Mineral fuels & oils	12.96
Precious, semi precious stones	5.16
Nuclear reactors, boilers	3.75
Electrical machinery	2.3
Aircraft and parts	2.25

TOP EXPORTS TO THE US

Top 5 items that comprise 67% of India's exports to US (2023-24)

Items	Value
Engineering goods	17.62
Electronic goods	10.49
Gems and jewellery	9.9
Drugs and pharmaceuticals	8.72
Petroleum products	5.83

Value in $billion

TABLE 2

TARIFF DIFFERENTIAL WITH US (%PP, WEIGHTED AVG, 2022)

Products	India	China	Canada	Mexico	Vietnam
Animal	30.2	9.3	29.3	28.9	9.4
Chemical	10.2	2.4	0	3.3	1.2
Footwear	17.2	− 5.8	0	11.9	− 8.9
Fuels	6.8	2.6	0	0	0
Hides and skins	3.0	− 4.6	0.3	4.7	− 6.4
Machinery	6.0	1.1	0	0	2.0
Metals	7.8	1.7	0	5.0	0.6
Minerals	8.6	0.7	0	0	0.6
Vegetables	20.5	13.2	0.2	10.5	4.3
Transportation	14.4	9.8	0	6.9	4.0

%pp = percentage points. *Source: Ministry of Commerce and Industry, WITS, Emkay Research*

BTA

- Due to job losses in several areas — particularly the United States' industrial belt following China's entry into the WTO — sentiment among US lawmakers has turned against granting more market access to foreign goods.

- Trade experts suggest that a BTA would likely require India to lower tariffs to allow greater entry of American goods, rather than the US reciprocating, as average tariffs in the US are already among the lowest in the world.

COMPACT Initiative

- Hence, to adapt to the new trade and investment landscape, India should develop a strategy to effectively use COMPACT to address non-tariff barriers and improve market access for its products.

Defence Partnership

- <u>10-year Defence Partnership</u>: As part of 10-year Defence Partnership, India will get the Javelin anti-tank missile, Stryker combat vehicles, and more P-81 maritime patrol aircraft.

- Plus, the US will co-produce AI-enabled unmanned systems for underwater domain awareness.

- Not mentioned in the official statements, but featured in Trump's remarks, is also the promise to consider selling India the F-35 combat aircraft.

- **RDP Agreement:** The leaders also called for opening negotiations this year for a "Reciprocal Defence Procurement (RDP) agreement" to better align their procurement systems and enable the reciprocal supply of defence goods and services.

- **New initiatives:** PM Modi and US President Trump will activate new initiatives under the Quad grouping and convene partners from the India-Middle East-Europe Corridor and the I2U2 Group to announce new initiatives.

- **Autonomous Systems Industry Alliance (ASIA):** ASIA refers to India-US cooperation in the area of underwater domain awareness technologies.

- The US has offered a few co-production and co-development opportunities for UDA technologies, on commercial basis.

- India is the very first country with whom US defence industry has offered to work with on these sensitive technologies.

- For far too long, India has relied on Russian weaponry.

- Russia may have won battles in Ukraine, but even after nearly three years, it has not yet won the war against its smaller neighbour.

- Among other things, it speaks ill of the quality of Russian weapons.

- India must diversify its sources of arms as well as engage in co-production and technological upgrading.

- Though defence supplies are aimed at boosting bilateral trade figures, the underlying strategic objective has been to counter China's belligerence in the Indo-Pacific, and in securing India's land, air and maritime borders.

Technology Partnership

- **Transforming Relationship Utilizing Strategic Technology (TRUST) initiative**: Taking forward the Biden administration's Initiative on Critical and Emerging Technologies (iCET), India and the US decided to rename it and launch the US-India TRUST initiative.

- It aims to catalyse collaboration among governments, academia and the private sector to drive innovation in defence, artificial intelligence, semiconductors, quantum computing, biotechnology, energy and space.

- **Launch of INDUS-Innovation**: It an innovation bridge modelled after the successful INDUS-X platform, that will advance US-India industry and academic partnerships and foster investments in space, energy, and other emerging technologies.

- **Launch of the Strategic Mineral Recovery initiative**: A new US-India cooperative program to recover and process critical minerals (including lithium, cobalt, and rare earths) from heavy industries like aluminium, coal mining and oil and gas.

- **Launched Indian Ocean Strategic Venture:** It is a new bilateral, whole-of-government forum to advance coordinated investments in economic connectivity and commerce.

Who are PKK, the Kurdish armed group fighting against Turkey?

- For more than four decades, Turkey has been fighting an armed insurgency by the Kurdistan Workers' Party, or PKK, a militant group that says it seeks greater rights for the country's Kurdish minority.

Who are PKK?

- The group launched an armed insurgency against the Turkish state in the early 1980s, originally seeking independence for the Kurds, who are believed to make up about 15% or more of Turkey's population.

- Starting from the mountains in eastern and southern Turkey, PKK fighters attacked Turkish military bases and police stations, prompting harsh government responses.

- Later, the conflict spread to other parts of the country, with devastating PKK bombings in Turkish cities that killed many civilians.

- Over the past decade, the Turkish military has routed PKK forces from major Kurdish cities in southeastern Turkey.
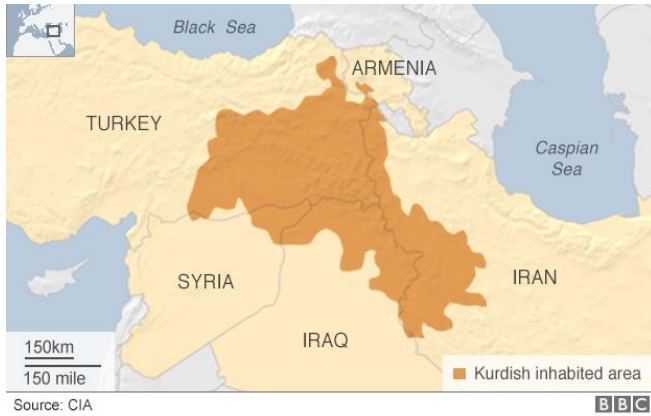
PKK Workers Active in South East Turkey
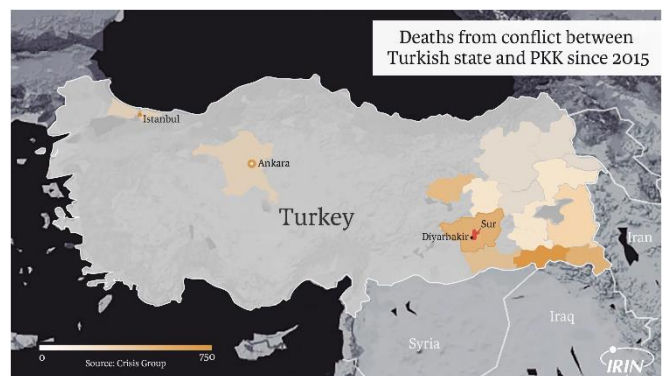
Who are Kurds?

- The Kurds are an ethnic group of roughly 40 million people — there are widely varying estimates — concentrated in Iran, Iraq, Syria, and Turkey.

- They speak multiple dialects of Kurdish, a language not directly related to Turkish or Arabic.

- Most of them are Sunni Muslims.

Kurds Inhabited Area

Source: CIA — BBC

- The Kurds were promised a nation of their own by world powers after World War I, but that was never granted.

- There were Kurdish rebellions in various countries over the following generations, and Kurds have faced state suppression of their language and culture.

- Since the 1991 Gulf War, the largely Kurdish northern region of Iraq has been semiautonomous.

Peace Efforts

- Now, PKK's founder, Abdullah Ocalan, has called on Kurdish fighters to lay down their arms.

- However, it remains unclear how effective his plea will be and what, if anything, the Turkish government is offering the group in exchange for ending the fighting.

- Multiple efforts to freeze or end the Turkey-PKK conflict have been made, starting with a ceasefire in 1993, but all of them collapsed.

- Violence flared on and off until a new round of peace talks began in 2011.

- But the process collapsed in mid-2015, with each side blaming the other for the failure

Abdullah Ocalan- Leader of PKK
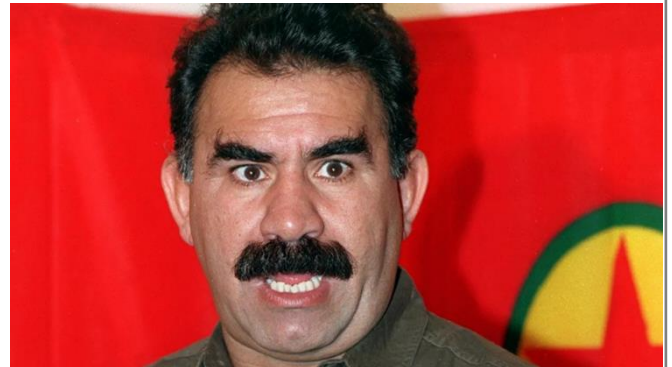
Internal Security

Military Exercises

Exercise Desert Hunt

- Exercise Desert Hunt 2025 was conducted at Air Force Station Jodhpur from 24 to 28 February 2025.

- It is an **integrated Tri-Service** Special Forces exercise conducted by the Indian Air Force.

- The exercise involved **elite Special Forces units from all three branches** of the Indian Armed Forces, including Para (Special Forces) from the Indian Army, Marine Commandos (MARCOS) from the Indian Navy and Garud (Special Forces) from the Indian Air Force.

Objective: The primary objective of the exercise was to **enhance interoperability, coordination, and synergy** among the Special Forces of the three services.

Significance: The exercise provided a crucial platform for fostering **seamless inter-service cooperation**, demonstrating the commitment of the Indian Armed Forces to **strengthening national security** through joint operations.

Drill Included Activities Such As

- Airborne insertion of troops into hostile environments,

- Precision strikes on designated enemy targets,

- Hostage rescue operations in critical situations,

- Counter-terrorism operations to neutralize threats,

- Combat free-fall exercises to simulate real-world scenarios and urban warfare drills to test battle readiness in built-up areas.

Dharma Guardian Exercise

- The Indian Army contingent has departed for the 6th edition of India-Japan Joint Military Exercise – DHARMA GUARDIAN, scheduled from 24th February to 9th March 2025 at the East Fuji Manoeuvre Training Area, Japan.

- This is an annual joint military exercise, held alternately in India and Japan.

- The previous edition (2024) was conducted in Rajasthan, India.

Participating Forces

- **Indian Contingent**: 120 personnel, primarily from a battalion of the MADRAS Regiment includes troops from other arms and services.

- **Japanese Contingent**: Similar strength from the 34th Infantry Regiment of Japan Ground Self-Defence Force (JGSDF).

Objectives

- Enhancing Interoperability between Indian and Japanese forces.

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- Joint Urban Warfare & Counter-Terrorism Operations under a UN mandate.

- High Physical Fitness Training, joint planning, and tactical drills.

- Tactical Drills & Disaster Response Strategies to improve operational capabilities.

- Strengthening Defence Cooperation and refining combat skills.

Significance

- Strengthens Bilateral Defence Relations between India and Japan.

- Builds on the momentum of the Chief of the Army Staff's visit to Japan (14-17 October 2024).

- Promotes Regional Security & Stability in line with the Indo-Pacific vision.

- Fosters Military & Cultural Ties, reinforcing trust and cooperation.

Exercise Komodo

- Recently, Indian Navy participated in the International Fleet Review (IFR) 2025 and the Multilateral Naval Exercise Komodo in Indonesia.

- **Exercise Komodo is a multilateral naval exercise hosted by Indonesia**.

- It focuses on enhancing maritime security cooperation among participating navies.

Objectives

- Strengthen maritime interoperability among regional and global navies.

- Enhance coordination in humanitarian assistance and disaster relief (HADR) operations.

- Promote maritime security through collaborative efforts and shared strategies.

- The Indian Navy is participating with INS Shardul and P8I Long-Range Maritime Surveillance aircraft.

- Indian naval forces will take part in tactical floor games, symposiums, and multinational activities.

- This engagement reinforces India's commitment to regional security and maritime cooperation.

Activities During Exercise

- **Naval maneuvers and interoperability drills with other countries**.

- Search and rescue exercises for better coordination during emergencies.

- Disaster response simulations to improve regional HADR capabilities.

- Environmental conservation activities, such as **coral & mangrove plantation** and beach cleaning.

Significance of Exercise

- Strengthens **regional security cooperation** in the Indo-Pacific.

- Enhances **India-Indonesia naval relations** and broader multilateral maritime ties.

- Supports the vision of Security and Growth for All in the Region (SAGAR).

- Encourages peaceful and rules-based maritime operations

COMPACT Initiative

- US President Donald Trump and Indian Prime Minister Narendra Modi launched the US-India COMPACT (Catalyzing Opportunities for Military Partnership, Accelerated Commerce & Technology) for the 21st Century.

- The US-India COMPACT (Catalyzing Opportunities for Military Partnership, Accelerated Commerce & Technology) initiative aims to **enhance defence collaboration, facilitate technology transfer**, and boost bilateral trade while strengthening strategic ties between the two nations.

Key Objectives of Initiative

1. **Strengthening Defence Relations**: The initiative marks a significant expansion of US-India defence cooperation, with plans to sign a **10-year Framework** for the US-India Major Defence Partnership within the year.

2. **Advanced Defence Procurements**: India is set to increase military purchases worth billions of dollars, including advanced weaponry and military platforms such as the **Javelin Anti-Tank Guided Missiles**, Stryker Infantry Combat Vehicles, and additional P-8I Maritime Patrol aircraft.

3. **Potential F-35 Deal**: While discussions on acquiring the F-35 stealth fighter jets are in the early stages, this move signals a major step towards advanced aerial defence capabilities for India.

4. **Technology Transfer & Joint Production**: The two nations have agreed to expand defence co-production and explore joint development in areas such as autonomous systems, missile defence, maritime security, and undersea warfare technologies.

5. **Interoperability & Logistics**: The initiative will enhance maintenance, repair, and supply-chain cooperation, ensuring smoother operational capabilities for US-origin defence equipment in India.

Strategic Significance

- The US-India COMPACT aligns with broader geopolitical objectives.

- It is a key driving force behind the agreement is **countering China's growing influence in the Indo-Pacific region**.

- The initiative **reinforces regional security** by enhancing **India's military preparedness** and deepening strategic cooperation.

TROPEX- 25

- TROPEX-25 Exercise is currently being conducted in the **Indian Ocean Region (IOR) from January to March 2025.**

- The **Theatre Level Operational Exercise (TROPEX)** is the Indian Navy's flagship biennial operational exercise.

- This large-scale exercise involves the active **participation of the Indian Navy, Army, Air Force, and Coast Guard**, ensuring a coordinated and

integrated approach to maritime security.

- **Goal:** To **validate the core warfighting skills** of the Indian Navy while ensuring an integrated and synchronized approach to maritime security.

- **Aim:** The exercise aims to strengthen India's ability to respond to a **contested maritime environment**.

- **Conventional threats** posed by enemy naval forces.

- **Asymmetric threats** such as piracy, terrorism, and unconventional warfare.

- **Hybrid threats** that combine traditional and non-traditional security challenges.

- Additionally, the exercise seeks to enhance joint operations and interoperability among the Indian Navy, Army, Air Force, and Coast Guard, ensuring a seamless and effective response to potential threats.

- TROPEX-25 plays a crucial role in enhancing India's maritime dominance and **regional security in the Indian Ocean.**

- The exercise prepares the Indian Armed Forces for joint operations in **real-world combat scenarios**, ensuring their ability to respond effectively to security challenges.

- It also **reinforces India's ability to project power**, safeguard maritime trade routes, and counter emerging threats in the region.

Police Reforms

BharatPol

- Bharatpol — broadcast hub for assistance and real-time action against transnational crimes via international police cooperation — was developed by the **Central Bureau of Investigation (CBI).**

- It will **allow central and state agencies** to easily connect with the Interpol and speed up their investigations.

- The CBI, as National Central Bureau for Interpol (NCB-New Delhi) in India, **connects all law enforcement agencies** in India to law enforcement agencies in 195 other countries through Interpol.

- Currently, all central agencies and the **police forces of various states** and Union Territories coordinate with the CBI, Interpol liaison officers (ILOs), and unit officers **concerned through letters, emails, and faxes**, due to which they often face delays in their investigation.

- The decision to develop this portal was **taken amid the rise in transnational crimes**, including cyber-crime, financial crimes, **online radicalisation, organised crimes, drug trafficking**, and human trafficking.

- In such cases, real-time international assistance is **needed for criminal investigations.**

Key Features of BharatPol

- **Unified Platform**: This portal integrates the CBI as the Interpol (NCB-New Delhi) with all law

enforcement authorities in India, down to Superintendents of Police (SPs) and Commissioners of Police (CPs).

- **Simplified Request Mechanism**: This portal allows front-line police officers to easily and **promptly request international assistance from 195 Interpol** member countries using standardised templates.

- **Rapid Information Dissemination**: This portal enables the CBI as the NCB to **rapidly share criminal intelligence and inputs from 195 countries** with all law enforcement agencies in India.

- **Increase utilisation of Interpol notices**: This portal will enable easy drafting of Red Corner Notice requests and other colour coded notices of Interpol.

- **This will lead to effective tracking of crime, criminals and proceeds of crime globally.**

- **Capacity Building and Training**: This portal also provides access to relevant documents, templates, and training

resources, **enhancing the capability** of frontline officers to conduct investigations abroad and **seek foreign assistance effectively through Interpol**.

Modules of BharatPol

- There are five key modules — Connect, INTERPOL Notices, References, Broadcast, and Resources.

- Through Connect, all our law enforcement agencies will essentially function **as an extension of Interpol's NCB-New Delhi**.

- The system will ensure quick, secure, and structured transmission of requests for Interpol Notices, enabling a scientific mechanism to **swiftly locate criminals from India and across the globe**, within India.

- Requests for assistance from the 195 member countries of INTERPOL will be available on the **Broadcast module**, while the Resources module will make it easy to exchange and manage documents and resources.

Defence Indigenization

AK-203 Rifle Joint Venture and India–Russia Defence Cooperation

- In 2018, the governments of India and Russia inked an intergovernmental agreement to establish a joint venture (JV) for the production of AK-203 rifles in India.

- Additionally, at the 20th India–Russia Bilateral Summit in Vladivostok in 2019, an Inter-Governmental Agreement (IGA) on 'Mutual Cooperation in Joint Manufacturing of Spares, Components, Aggregates and other Material related to Russian/Soviet Origin Arms and Defence Equipment' was signed.

- By enabling the Indian industry to produce spare parts and components domestically through JVs and

partnerships with Russian original equipment manufacturers (OEMs), the **IGA seeks to improve the 'After Sales Support'** and operational availability of **Russian-origin equipment currently** in use in the Indian armed forces.

- On 18 February 2019, a Protocol was signed to alter the agreement on 'cooperation in the sphere of producing small arms of the Kalashnikov series', thus establishing the **Indo-Russian Rifles Private Limited (IRRPL) JV in 2019.**

- This JV has been formed between Rosoboronexport JSC and the Kalashnikov Group (subsidiaries of the Rostec State Corporation) from the Russian side and Advanced Weapons & Equipment India Limited (AWEIL) and Munitions India Limited (MIL) from the Indian side.

- Under the terms of the military–technical cooperation agreement for 2021–2031, India agreed to purchase **601,427 units of** 7.62 x39mm assault rifles (AK–203) through IRRP, the contract for which was signed on 6 December 2021.

- This is a component of a multi-crore agreement that Russia and India signed to purchase more than 770,000 AK-203 rifles.

- **Over 100,000 of these were to be imported directly from Russia, with the rest to be produced locally**

India Russia Defense Relations- Background

- India and Russia share a deep-rooted defence relationship that dates back to the Soviet era.

- Over the decades, this partnership has been characterised by large-scale arms transfers, licensed production agreements and joint research initiatives.

- Even after the dissolution of the Soviet Union, Russia continued to be a key supplier of defence equipment.

- India's procurement of advanced Russian systems, such as anti-ship missiles, T-90 tanks, MIG 29 and Su-30 fighter aircraft, etc., reinforced Moscow's role as a critical supplier of high-end military technology

- From 1998 onwards, the Indo-Russian defence cooperation diversified towards license manufacturing and JVs.

- This was done with the objective of reducing imports from Russia and creating indigenous capabilities.

- Despite growing diversification in India's defence procurement strategy, **Russia remained an important defence supplier, supplying nearly 36 per cent of India's defence imports in recent years.**

- India's objective of strengthening domestic defence production under the 'Atmanirbhar Bharat' initiative aligns with Russia's commitment to engage in co-production and technology transfer, under this project.

- While Indian companies have engaged in JVs with various countries, joint ventures with Russia hold particular

significance due to India's history of defence cooperation with Russia.

- IRRPL aims to jointly manufacture the AK-203 rifles in India with 100 per cent localisation.

- **One of the key benefits of a JV is that it enables both the countries to share risks as well as costs.**

- The shared burden of initial investments **needed mitigates risks** and creates ease-of-business for India as well as Russia.

- This pooling of resources, capabilities and **mutual strenghts is crucial** for making the project profitable.

Brighter Prospects for India

- IRRPL envisions becoming a key driver in the manufacturing of small arms in India, positioning itself as a leader in South and Southeast Asia.

- IRRPL also seeks to support the growth of Micro, Small and Medium Enterprises (MSMEs) in India by establishing an ecosystem conducive to innovation and growth.

- This allays the concerns that foreign countries would not be interested in 'Make-in-India' projects which seek to

substitute defence imports with local manufacturing.

- Countries in Africa and West Asia have been showing interest in the Indian-made AK-203 rifles.

- **Defence analysts note that the sanctions placed on Russia by the US and other Western countries account for this increased interest.**

Way Forward

- India has been actively diversifying its defence imports, strengthening partnerships with the US, France and Israel.

- Recent high-profile acquisitions demonstrate India's intent to avoid overdependence on any single supplier.

- India's goal is to cut import dependency across the board, rather than just shifting from one supplier to another.

- **But instead of abruptly reducing defence imports from partner countries, India could also engage them in joint ventures for indigenous manufacturing.**

Border Management

Connectivity and the Northeast: Challenges to India's Neighbourhood First and Act East Policies

- India's Northeast has risen to the forefront of its foreign policy aspirations in the past decade.

- Composed of eight states and bordering five neighbouring countries, the Northeast's geostrategic position was realised with the renewed thrust to its Neighbourhood

First policy and the launch of the Act East Policy in 2014

- The region is a land bridge between the rest of India and Southeast Asia, is the hinterland for Bangladesh, and is a transit territory for Nepal and Bhutan to access the Bay of Bengal.

Context

- For years, this geography had remained out of the strategic spotlight, riddled with political turmoil and ethnic violence.

- However, peace accords signed between various rebel groups and the Government of India over the past few years ushered in stability, enabling the geopolitical potential of this region to be harnessed through developmental initiatives.

- These are **mostly devoted to building connectivity infrastructure** as functional networks form the bedrock of improved transport and are fundamental to developing other

sectors of bilateral cooperation, such as trade and energy.

- Unfortunately, the resurgence of disturbances within the Northeast, Bangladesh, and Myanmar have stalled several bilateral connectivity projects.

- In this volatile environment, it is crucial to revisit the viability of these initiatives.

Challenges to India-Bangladesh connectivity

- Multiple connectivity projects have been undertaken in the past 15 years of partnership between the Government of India and the Awami League administration in Bangladesh, often referred to as the "Golden Chapter" in bilateral ties.

- India has emerged as Bangladesh's foremost development partner, with a development portfolio of US$8 billion.

- However, the regime change in Bangladesh in August 2024, former Prime Minister Sheikh Hasina's flight to India, and the establishment of the interim government under Chief Advisor Muhammad Yunus have dramatically altered bilateral ties.

- As relations remain strained, with the anti-India rhetoric and Hasina's extradition dilemma heightening tensions, connectivity projects remain in limbo.

- Former PM Hasina had endowed India with increased **use of Bangladesh's Chattogram and Mongla ports** to

provide the Northeast with a maritime outlet.

- Accordingly, India secured the operating rights to a terminal in Mongla port in June 2024.

- It also funded the construction of the **Khulna-Mongla Port rail link**, connecting the port to the rail network in Khulna.

- This project aims to **reduce logistical hurdles and cargo transportation costs** between West Bengal and the Northeast.

- As such, commerce between India's Northeast and Bangladesh has reportedly declined since the regime change, with border closures, issues with customs clearances, and increased security surveillance hindering the smooth flow of goods between the two countries.

- India's exports to Bangladesh fell by 13.3 percent between April and October 2023, with imports dipping by 2.3 percent

- **The once bustling Benapole-Petrapole land ports at the India-Bangladesh border, which cater to nearly 30 percent of bilateral trade, now witness significantly less traffic.**

RAIL LINKS ON **INDO-BANGLA BORDER**
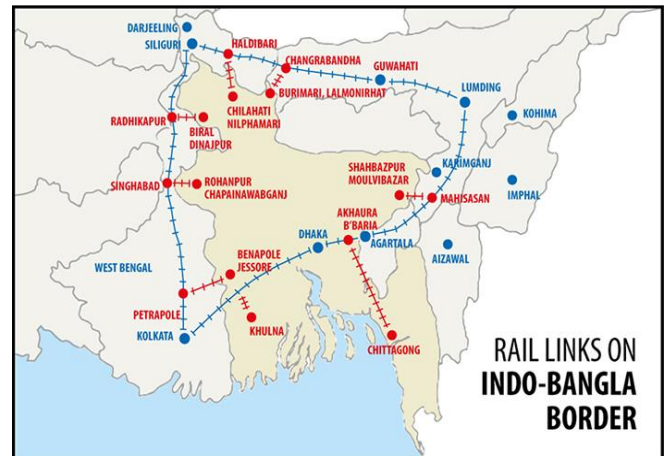
Myanmar Dilemma

- The AA has reportedly seized control of 15 out of 18 townships in Rakhine State and secured key border points with Bangladesh and Paletwa in Chin State—areas vital to the Kaladan Multi-Modal Transit Transport Project (KMMTTP).

- India's connectivity projects with Myanmar, which shares borders with the Indian states of **Manipur, Mizoram, Nagaland, and Arunachal Pradesh**, are integral to broader regional and sub-regional initiatives like the Act East Policy and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

- The operational stability of Sittwe Port, a critical component of the KMMTTP project operationalised in 2023 and secured by India in 2024, faces challenges as instability persists.

- The AA's rejection of a Chinese-proposed ceasefire indicates a protracted conflict, threatening supply chains and logistics.

- Indian Ambassador to Myanmar Abhay Thakur's visit to

Sittwe Port in January 2025 reflects India's commitment to monitoring and addressing these challenges.

- The **109-kilometre long Paletwa-Zorinpui highway,** a vital road link for the KMMTTP, remains incomplete due to legal and logistical issues, which are compounded by security threats.

- Despite initial resistance, the AA now seems to be supporting the project to protect local interests.

- Still, junta airstrikes and ongoing conflicts continue to disrupt progress.

- On the Indian side, unresolved land disputes and inadequate infrastructure in Mizoram exacerbate delays.

- Key highways connecting Zorinpui to Lawngtlai and Aizawl require upgrades to handle increased trade volumes.

- These combined challenges demand immediate attention to ensure that the **Kaladan corridor achieves operational efficiency soon**.

- The IMT-TH, aimed at linking India's Northeast with Thailand via Myanmar, is equally significant for

regional connectivity, trade, and socio-economic integration.

- Proposals to extend the highway to Cambodia, Laos, Vietnam, and potentially Bangladesh underscore its strategic importance.

- In 2024, India's External Affairs Minister S. Jaishankar emphasised the project's alignment with the India-Middle East-Europe Economic Corridor (IMEC), highlighting its potential to connect the **Pacific and Atlantic while strengthening land-based connectivity in the Indian Ocean.**

Conclusion

- India's Northeast remains crucial to its Neighbourhood First and Act East policies.

- However, ongoing instability in Bangladesh and Myanmar continue to disrupt India's connectivity projects, including the IMT-TH and the Kaladan project.

- Security concerns stem from an increasing influx of displaced people, insurgent activities, and cross-border smuggling.

- Trade through key land ports, such as Petrapole (West Bengal) and Dawki (Meghalaya), faces disruptions, while investment in infrastructure remains uncertain.

- Instability in Myanmar has not only restricted trade through Moreh (Manipur) and Zokhawthar (Mizoram) but also delayed crucial border road and rail projects, weakening regional integration.

Science & Technology

Space

Tech from ISRO missions

Context-IN-SPACe has identified at least 166 technologies developed for various ISRO missions that can be shared with industry to be utilised for other purposes.

- Since all these agreements are non-exclusive, this technology can be shared with multiple companies, though ISRO continues to hold the intellectual property rights.

Technologies

- **Technology used in Chandrayaan-3** - Camera, software and algorithms used for Chandrayaan-3 landing can be used by the **automotive industry to prevent collisions**. Or the pressure sensors that are used to keep a check on propellants during a launch can be used to determine when airbags should open

- **3D LiDAR (Light Imaging Detection and Ranging) camera**, developed by the Space Application Centre for navigation in space. The camera generates a 3D image with information on the depth of various objects in the frame. The camera provides this information by correlating the light reflected from these objects. This technology could have multiple uses, including **detection and counting of people in heavily crowded places like mark**ets, measurement of parcels

before they are posted, near-terrain flight assistance for helicopters and hazard or pedestrian detection to avoid collisions.In the field of healthcare, body measurements, like waist and hip size, done using the 3D LiDAR camera could be used to predict the risk of lifestyle diseases. This technology may also have an impact in the field of home devices, including gesture recognition in mobile phones, televisions or gaming platforms

- **Lithium-ion (li-ion) batteries**-The space agency will also transfer its technology on developing **cost-effective lithium-ion** (li-ion) batteries. It will help in greening the transportation systems as li-ion batteries are essential for upcoming sectors like electric vehicles.

- **Vibration management systems** - Space agency's technology on vibration management systems was developed to **protect the delicate electronic and optical systems** on satellites from vibrations, shock and noise that they experience on their journey, especially during a take-off. Besides its possible applications in seismic isolation, a technique that **enables buildings and other structures to remain safe** during an earthquake, vibration management systems could also have applications in air, road, and sea transportation.

- **Corrosive resistant paint**-NRCM-204 is a highly corrosion-resistant coating. Unlike conventional coatings that cannot withstand such a corrosive environment, NRCM-204 can protect metals and composites from almost all types of corrosion, including by various acids.

- **ISRO's Benzoxazine polymer** can be used for encapsulation in electronics or for printed circuit boards. Easily processable, this polymer remains stable in different temperatures and is a good flame retardant.

Significance

- These technologies have either been provided to space start-ups to use as they are or to other industries to be adapted for their own applications. The companies are selected on the basis of their technology absorption capability. If we look at the automotive industry alone, most sensors are currently procured from other countries. While ISRO has developed niche sensors that are not produced at high volumes, production and scaling up within the country will definitely lead to multifold reduction in prices of these sensors eventually.

IN-SPACe

- Established in 2020, **In-SPACE is a single-window autonomous agency under the Department of Space**.

- Although it has turned out to be crucial for space tech start-up players in all things related to permissions, integrations, launches and so on, industry players have often highlighted the **lack of a legislative mandate of IN-SPACe**.

- Now, they have a reason to rejoice as the space policy **clarifies the responsibilities of this body**. Although other aspects such as **organisation structure, appointments, tenure etc is still not clear.**

IN-SPACe's responsibilities

- IN-SPACe will provide **authorisations to both government bodies and NGEs for space activities,** such as establishment and/or operation of space objects, launch of rockets, establishment of launchpads, planned re-entry of space objects, and so on.

- **On the promotion side**, it will work with space sector-centric industry clusters, work towards establishing India as a preferred service provider for foreign requirements of products and services, work with academia to enable industry-academia linkages, and so on.

- It will also **define frameworks for developing space industry standards**, based on global standards. IN-SPACe will authorise the use of space objects for communication/broadcast services in coordination with the departments concerned.

- IN-SPACe will **ensure a level playing field for the utilisation of all facilities created** using public expenditure, by prioritising their use among Government entities and NGEs. For this, IN-SPACe will **formulate**

appropriate procedures for prioritisation, and the decisions of IN-SPACe shall be binding on the operators of such facilities.

- Apart from that, the policy states that the body will **incentivise NGEs that acquire new orbital resources** through filings in the UN's International Telecommunication Union (ITU), and so on.

Einstein ring

Context-The European Space Agency's (ESA) Euclid space telescope has discovered a rare ring of light, known as an **Einstein ring**, around a galaxy nearly 590 million light-years away from Earth.

What is an Einstein ring?

- An Einstein ring is a ring of light **around a form of dark matter, galaxy or cluster of galaxies.**

- It is essentially an **example of gravitational lensing**.

- **Gravitational lensing** is a phenomenon which occurs when a massive celestial body — such as a galaxy or cluster of galaxies — creates a gravitational field which distorts and amplifies the light from distant galaxies that are behind it but in the same line of sight

- Einstein rings are named after mathematician and physicist Albert Einstein, whose general theory of relativity predicted that **light could bend and brighten around objects across the cosmos.**
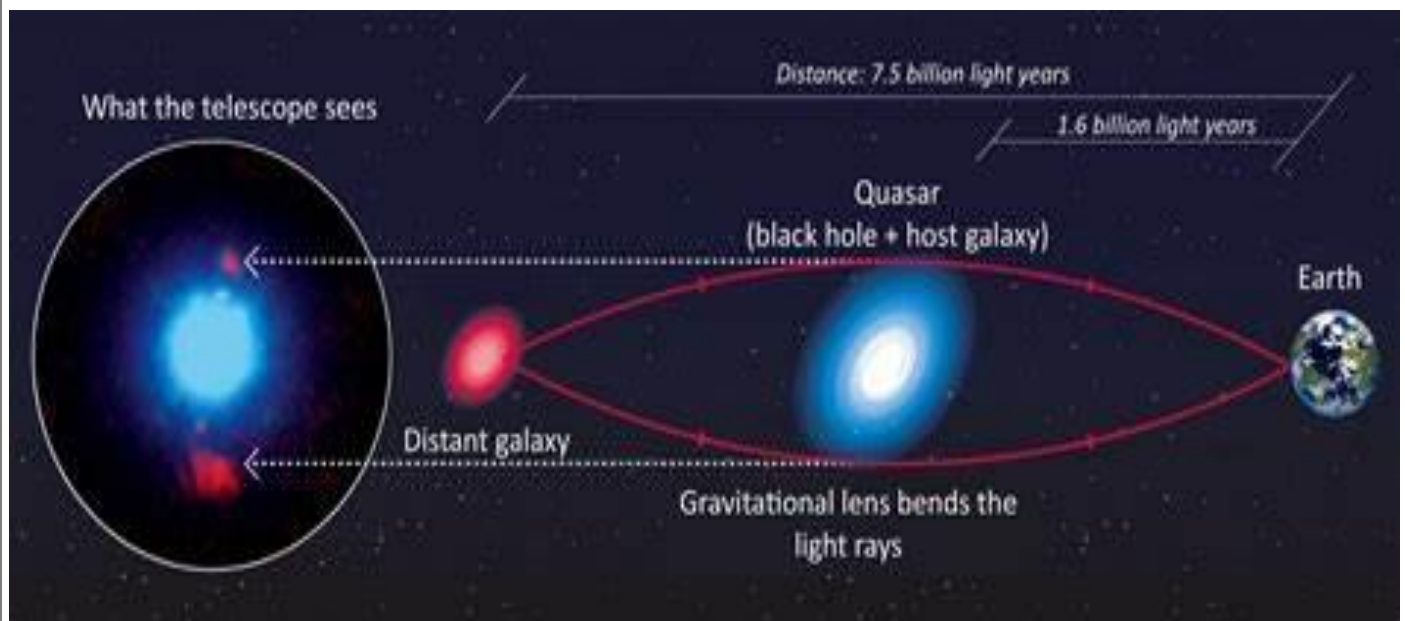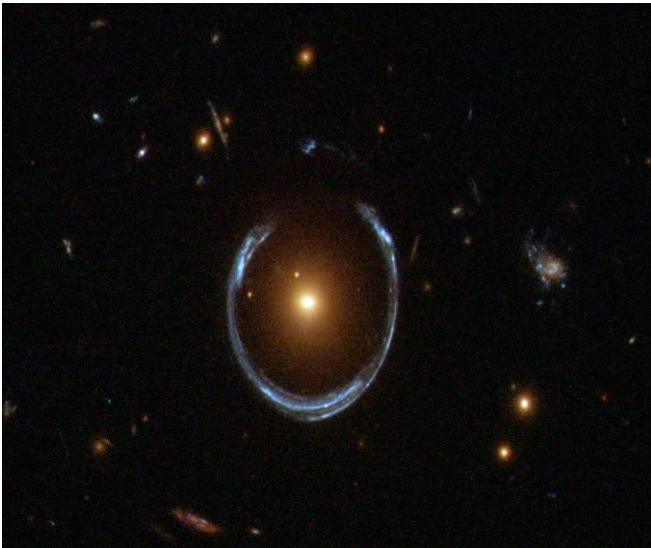
Significance

- These rings help scientists **investigate dark matter**.

- This dark matter does not interact with light, but it does have a gravitational effect

- Gravitational lensing therefore is sensitive to the presence of this dark matter, allowing us to indirectly detect it.

- Moreover, Einstein rings enable scientists to **learn about distant galaxies**, which otherwise might not be visible.

- They can also provide information about the **expansion of the universe** as the space between the Earth and other galaxies — both in the foreground and the background — is stretching.

Asteroid 2024 YR4

Context-A newly discovered asteroid — called **2024 YR4** — has slightly **more than 1% chance of crashing into Earth in 2032** as per National Aeronautics and Space Administration (NASA)

About

- The near-Earth asteroid is as big as a football field, measuring **40 to 100 metres across**. It came closest to Earth on Christmas Day — passing within roughly **800,000 kilometres of Earth, about twice the distance of the moon**

- It will eventually fade from view over the next few months, and will not be visible again until it passes Earth's way again in 2028

- To **check how large an asteroid is**, astronomers examine the **brightness of the object — brighter objects are bigger**. However, it is difficult to tell the exact measurements as the brightness depends on **how reflective the asteroid's surface is** (asteroids do not emit a light of their own, they only reflect sunlight). As a result, it is a challenge to distinguish between a large, dark-colored asteroid and a small, highly reflective one.

- Astronomers use something called the Torino Scale to categorise an object's destruction potential. The NASA has currently rated the **2024 YR4 a 3** on a scale from 0 to 10.

- The 2024 YR4 is expected to release **8 to 10 megatons of energy** in case of a crash, according to scientists. The asteroid that hit **Chelyabinsk, Russia**, on February 15, 2013, released **energy equivalent to about 500 kilotons of TNT** — about 30 times more than the Hiroshima atomic bomb

Torino Impact Hazard Scale

- The Torino Scale, adopted by the IAU in 1999, is a tool for categorizing potential Earth impact events.

- An integer scale ranging from 0 to 10 with associated color coding, it is intended primarily to facilitate public communication by the asteroid impact hazard monitoring community.

- The scale captures the likelihood and consequences of a potential impact event, but does not consider the time remaining until the potential impact. More extraordinary events are indicated by a higher Torino Scale value.

No Hazard (White Zone)	0	The likelihood of a collision is zero, or is so low as to be effectively zero. Also applies to small objects such as meteors and bodies that burn up in the atmosphere as well as infrequent meteorite falls that rarely cause damage.
Normal (Green Zone)	1	A routine discovery in which a pass near the Earth is predicted that poses no unusual level of danger. Current calculations show the chance of collision is extremely unlikely with no cause for public attention or public concern. New telescopic observations very likely will lead to re-assignment to Level 0.
Meriting Attention by Astronomers (Yellow Zone)	2	A discovery, which may become routine with expanded searches, of an object making a somewhat close but not highly unusual pass near the Earth. While meriting attention by astronomers, there is no cause for public attention or public concern as an actual collision is very unlikely. New telescopic observations very likely will lead to re-assignment to Level 0.
	3	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of localized destruction. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
	4	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of regional devastation. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
Threatening (Orange Zone)	5	A close encounter posing a serious, but still uncertain threat of regional devastation. Critical attention by astronomers is needed to determine conclusively whether or not a collision will occur. If the encounter is less than a decade away, governmental contingency planning may be warranted.
	6	A close encounter by a large object posing a serious but still uncertain threat of a global catastrophe. Critical attention by astronomers is needed to determine conclusively whether or not a collision will occur. If the encounter is less than three decades away, governmental contingency planning may be warranted.
	7	A very close encounter by a large object, which if occurring over the next century, poses an unprecedented but still uncertain threat of a global catastrophe. For such a threat, international contingency planning is warranted, especially to determine urgently and conclusively whether or not a collision will occur.

Nano-Technology

DNA nanorafts

Context- Recently Scientists created synthetic cells that mimic key functions of biological cells.

- By using DNA as a programmable building material, researchers have found a way to engineer membranes that can change shape, open and close transport pathways, and respond to specific molecular signals.

About

- The nanorafts were integrated with **giant unilamellar vesicles (GUVs),** which serve as simplified models of biological cell membranes. By attaching DNA nanorafts to the surface of these synthetic cells, scientists were able to induce and control changes in their membrane structure.

- Membrane shape is critical to many cellular processes, including transport, engulfing nutrients, sending signals, moving through tissues, and division.

- **DNA nanorafts** — tiny, flat assemblies of DNA strands that change shape in response to chemical signals.

- The innovation here is that the DNA nanorafts are not passive structures. They are designed to switch between different shapes and, in doing so, they actively influence the behaviour of the membranes they are attached to, marking a major advance in synthetic biology. It opens up new possibilities for engineering artificial life-like systems.

- Initially **the nanorafts are in a square-like conformation**; but when exposed to specific DNA strands called **'unlocking strands',** they elongate into a rectangule, which applies force on the membrane and deforms it in a controlled way.

- Equally important is the ability to reverse these shape changes using a different set of 'locking strands'.

- Beyond reshaping membranes, the DNA nanorafts enable another crucial function: **forming and sealing synthetic channels within the membrane.** Transporting molecules across cell membranes is one of the fundamental functions of life, allowing cells to absorb nutrients, remove waste, and communicate with their surroundings.

- Importantly, these pores are not permanent. Once the membrane regains its original shape, the pores close and seal off the transport pathway. This control over membrane permeability is a major step forward in creating artificial cells that can selectively regulate molecular transport.

Significance

- The ability to reshape membranes and create selective transport channels has significant implications for **drug delivery, bio-sensing, and artificial cell research.** Imagine a synthetic cell that can absorb a drug molecule in one environment, travel through the body, and release it at a specific site, such as a tumour. Programmed DNA nanorafts promise highly precise drug delivery with minimal side effects.

- Synthetic cells can also serve as **biosensors to detect disease markers, toxins, or bacterial infections** by responding to specific molecules and changing their membrane structure accordingly. They could provide real-time medical and environmental diagnostics.

- In fundamental research, DNA nanorafts can help us understand how biological membranes function and gain new insights into the fundamental principles of cell biology.

- While natural cells have evolved complex mechanisms for regulating their shape and transport processes, the new findings suggest that we can design artificial systems with similar and, potentially, enhanced capabilities.

Information Technology

Project Waterworth

Context-Meta introduced Project Waterworth with the intention of improving internet connectivity and enabling AI advances across the U.S., India, Brazil, South Africa, and other locations

- Subsea Cable are high-capacity optic fibre cables laid on the ocean floor

What is Fiber Optics?

- Fiber optics refers to the technology and method of **transmitting data** as light pulses along a glass or plastic strand or fiber. **Fiber optic cables** are used for long-distance and high-performance **data networking**. They are capable of transmitting data over longer distances and at higher bandwidths (data rates) than electrical cables, making them a critical component in **modern telecommunications**, **internet**, and **computer networking**.

Advantages of Fiber Optics

- Fiber Optics supports bandwidth with higher capacities.

- Electromagnetic Interference is very little with Fiber Optics.

- Fiber Optics are stronger and lighter than copper cables.

- Very little Maintenance is required in Optical Fiber.
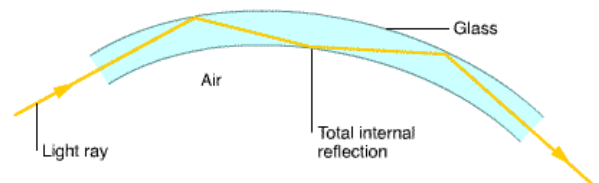
Nuclear-Technology

Artificial Sun

Context-Chinese scientists reported that they were able to maintain a plasma at a temperature of 100 million degrees C for about 1,066 seconds in a nuclear fusion reactor called the Experimental Advanced Superconducting Tokamak (EAST).

Artificial sun - Experimental Advanced Superconducting Tokamak (EAST)

- It is an advanced **nuclear fusion** experimental research device located at the Institute of Plasma Physics of the Chinese Academy of Sciences (ASIPP) in **Hefei, China**

- The purpose of the artificial sun is to replicate the process of nuclear fusion, which is the same reaction that powers the sun.

- EAST project is **part of the International Thermonuclear Experimental Reactor (ITER) facility**

ITER (International Thermonuclear Experimental Reactor)

- It is an **international nuclear fusion research and engineering megaproject,** which will be the world's largest magnetic confinement plasma physics experiment.

- It is a collaboration of **35 nations** launched in **1985.**

- It is located in **France.**

- It aims to build the world's **largest tokamak** to prove the feasibility of fusion as a large-scale and carbon-free source of energy.

- The ITER members include China, the European Union, **India**, Japan, South Korea, Russia and the United States

Biotechnology

Bio bank

Context-the country's first 'bio bank' in a zoo is up and running at Padmaja Naidu Himalayan Zoological Park, better known as Darjeeling Zoo

About

- In collaboration with the **Centre for Cellular and Molecular Biology (CCMB), under the Ministry of Science and Technology**, the facility collects and preserves cell and tissue samples from endangered animals, as well as reproductive cells from deceased animals.

- These can be used for future research and potentially even bring back critically endangered species that have gone extinct or are on the verge of extinction.

- The biobank, also known as **'frozen zoo'**, was established last year in July and till date DNA materials — cellular and tissue samples — from 60 animals of 23 species have been collected.

- So far we have collected DNA, cellular and tissue samples from 60 animals of 23 species. Our priority is the endangered species.

- Scientists are also collecting gammets from dead animals. All samples are being preserved in **minus 196 degree Celsius in liquid Nitrogen in cryogenic state**.

Cryogenics

- Cryogenics is the scientific study of materials and their characteristics observed at a very low temperature. The word has Greek origins, with *cryo-* meaning "cold" and *–genic* meaning "producing"

- Cryopreservation is a method to preserve cells and tissues for longer periods at the freezing points typically at **-196 degrees** Celsius. However, this cooling is carried out carefully and involves the use of cryoprotectants that prevent the **crystallization** of cellular materials.

- Cryopreservation is carried out when we need to preserve any biological specimen like **eggs**, **sperm, stem cells,** or other biological components for an extended period without killing them. Cryopreservation involves the preservation of specimens at the freezing points typically at -196 degrees Celsius. However, this cooling is carried out carefully and involves the use of cryoprotectants that prevent the **crystallization** of cellular materials.

Application

- There are several applications of cryogenics.

- It is used to produce **cryogenic fuels for rockets**, including liquid hydrogen and liquid oxygen (LOX).

- The strong electromagnetic fields needed for nuclear magnetic resonance (NMR) are usually produced by supercooling electromagnets with cryogens. **Magnetic resonance imaging (MRI)** is an application of NMR that uses liquid helium.

- **Infrared cameras** frequently require cryogenic cooling.

- Cryogenic **freezing of food** is used to transport or store large quantities of food.

- Liquid nitrogen is used to produce **fog for special effects** and even specialty cocktails and food.

- Cryogenic temperatures are used to **store tissue and blood specimens** and to preserve experimental samples.

- Cryogenic cooling of **superconductors may be used to increase electric power transmission** for big cities.

Significance

- It is of immense importance in the conservation of critically endangered species. With environmental change and other factors many species of animals **may go to the brink of extinction**.

- Aim is to **store the cells and the germ plasm** (genetic material) of such animals that if needed the species could be brought back to life again

- Animals like **American black-footed ferret,** which had once only eight individuals left once declared extinct but revived through **captive breeding and using preserved DNA** (its first clone was made public in 2021 using DNA preserved since 1988) and **northern one-horned rhino** (the last male member died in 2018) are being brought back through this process.

In-Vitro Gametogenesis (IVG)

Context-As researchers **grow sperm and eggs from stem cells to** produce life in a lab, will it change the concept of birth and gene pools
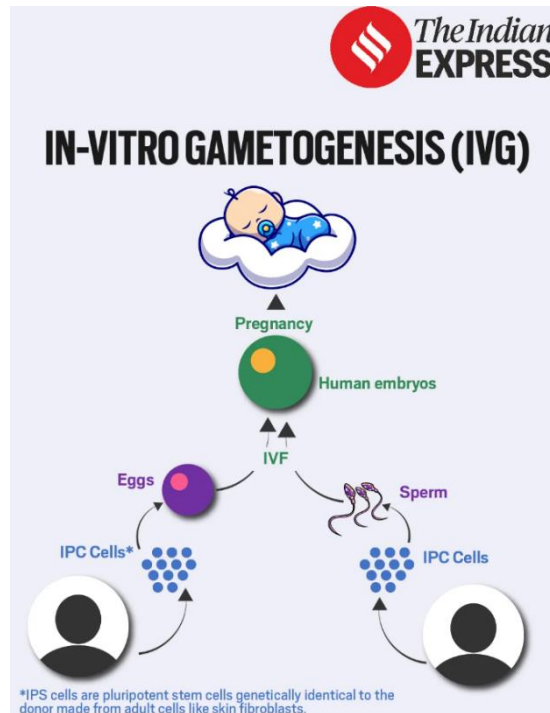
In-Vitro Gametogenesis (IVG)

- Doctor uses **stem cells, collected from your skin, hair strand or blood** and converts them to **reproductive cells — eggs or sperm**. These are then fertilised to develop an embryo to be implanted into a surrogate who can carry the baby to term. In other words, you have a lab-grown baby.This innovation, called In-Vitro Gametogenesis (IVG)

Significance

- It Could **help infertile couples,** older women and **same-sex partners** have biological children.

- Additionally, their **harmful genetic traits could be edited out**, potentially revolutionizing reproductive medicine.

- Men with low sperm counts and women with poor quality and a low number of eggs, could still have their

babies with their stem cells. These can self-renew, mimic other cells, reprogramme themselves and become like them. So this holds out hope in cases where traditional assisted reproductive techniques fail.

IN-VITRO GAMETOGENESIS (IVG)

*IPS cells are pluripotent stem cells genetically identical to the donor made from adult cells like skin fibroblasts.

Feature	In Vitro Gametogenesis (IVG)	In Vitro Fertilization (IVF)
Definition	Technology that creates gametes (sperm or egg) from somatic or stem cells in the lab.	Fertility procedure where sperm fertilizes an egg outside the body.
Cell Type Used	Pluripotent stem cells (PSCs) or somatic cells (e.g., skin cells)	Natural gametes (sperm and egg) from the reproductive organs.
Ploidy of Gametes	Converts diploid cells into haploid gametes through lab-based differentiation.	Uses naturally haploid gametes (sperm and egg).

IVG vs law

- The Assisted Reproduction Technology (Regulation) Act 2021, limits the age (50 for women, 55 for men), reasons and gender of people seeking to use IVF. It has no provision for IVG, drafted as it was before it was developed. However, there is no ban on new research or technology.

Alternative energy sources

Highentropy alloy (HEA)

Context-A new, **efficient alloy based catalyst** developed for improved **hydrogen production** through electrolysis of water can pave the way for clean energy production.

• This innovative approach using a **highentropy alloy (HEA)** could reduce reliance on expensive materials like platinum for clean energy production.

Highentropy alloy (HEA)

• Alloys are usually metallic sub-stances composed of **two or more elements**, and are prepared by adding relatively small amounts of secondary elements to a primary metal.

• HEAs, on the other hand, are advanced materials that **contain multiple elements** (usually five or more) in almost equal concentrations

• In electrolysis, a **catalyst like platinum plays a crucial role in accelerating the chemical reactions** that split water into

hydrogen and oxygen, making the process more efficient (by reducing the 'activation energy').

• Researchers have developed a novel HEA catalyst consisting of **platinum, palladium, cobalt, nickel and manganese.**

Significance

• This HEA catalyst **cuts platinum use by seven times**, compared with a commercial catalyst, and offers improved catalytic efficiency than pure platinum

• It also demonstrates good performance in practical set tings, including alkaline seawater, **maintaining stability and efficiency for over 100 hours without degradation**.

• This advancement could pave the way for **cleaner, more affordable hydrogen** production, benefiting industries and renewable energy technologies.

Health

Lymphatic Filariasis

Context-Union Minister for Health and Family Welfare launched the Annual Nationwide Mass Drug Administration (MDA) Campaign for Lymphatic Filariasis (LF) Elimination

About

• The program focuses on the **door-to-door administration of anti-filarial**

medication, ensuring that every eligible individual consumes the prescribed medicine to stop the transmission of the disease. LF, commonly known as "**Hathi Paon''**.

• The MDA campaign, will cover 111 endemic districts across **13 states**— Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh,

Maharashtra, Odisha, Uttar Pradesh, and West Bengal.

- While the MDA medication is extremely safe and effective, it should not be consumed on an empty stomach. The following groups should not consume the drugs:
  - Children below 2 years of age
  - Pregnant women
  - Seriously ill individuals

Lymphatic Filariasis

- Lymphatic filariasis (LF), commonly known as elephantiasis, is a neglected tropical disease. Infection occurs when **filarial parasites** are transmitted to humans through mosquitoes. Infection is usually acquired in childhood and causes hidden damage to the lymphatic system.

- Lymphatic filariasis is caused by infection with parasites classified as nematodes (roundworms) of the family Filariodidea. There are 3 types of these thread-like filarial worms:

1. *Wuchereria bancrofti*, which is responsible for 90% of the cases

2. *Brugia malayi*, which causes most of the remainder of the cases

3. *Brugia timori*, which also causes the disease.

- Lymphatic filariasis is transmitted by different types of mosquitoes, for example by the *Culex* **mosquito**, widespread across urban and semi-urban areas, *Anopheles*, mainly found in rural areas, and *Aedes*, mainly in endemic islands in the Pacific.
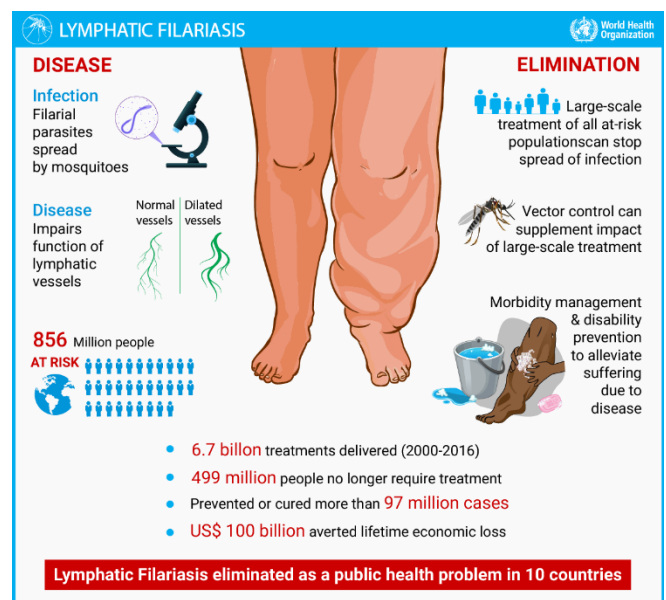
Defence

VSHORAD

Context-DRDO carries out three consecutive tests of **Very Short-Range Air Defence system**

VSHORAD

- It is a **man portable air defence system** designed and developed indigenously by Research Center Imarat in collaboration with other DRDO laboratories.

- They have a maximum range of 8 kilometres and can engage targets at altitudes of 4.5 km.

- The missile system has the capability to meet the needs of all the three branches of the armed forces — the **Army, Navy and the Air Force**,.

- The VSHORAD is a critical requirement for the Army as it offers close air defence protection for mobile formations, especially in the growing threat of drones and loitering munitions.

- It is surface-to-air missiles that can be fired by individuals or small groups to destroy aircraft or helicopters.

Miscellaneous

Polar bear fur-solution to 'forever chemicals'

Context-A new study revealed that the **fur of polar bears contains an oily substance that helps them remain dry** despite the creatures sliding on ice and diving into the water to hunt.

- This finding could potentially help develop an alternative to replace Per- and polyfluoroalkyl substances or **PFAs, also called "forever chemicals".**

About

- Upon testing the unwashed samples against ice, they were found to **contain sebum comparable to fluorinated ski skins**.

- These **materials are used in skis to grip them on ice and help them glide**.

- However, **fluorinated skins contain PFAs**. Though extensively used **in making nonstick cookware, water-repellent clothing and grease-resistant products**, these chemicals **do not break down** and can remain in the environment for prolonged periods. PFA exposure has also been linked to **decreased fertility and developmental effects in children.**

- Analysing the properties of **fur sebum revealed that it lacks squalene**, a substance that is predominant in human sebum.

- The fur sebum also contains cholesterol and other fatty acids.

- The findings **could help design naturally-sourced coatings** that could reduce current dependence on PFAs. If we do it in the right way, we have a chance of making them environmentally friendly.