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GS-II

- INDIA'S NEW DOCTRINE, "NO PEACE, NO PRIVILEGES"
- INDIA-SAUDI ARABIA RELATIONS
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DISCLAIMER

*T*he current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

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★ ★ ★ ★ ★

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SECTION -A
MAINS ISSUES

RAINFALL DISASTER IN JAMMU & KASHMIR

Context

The **Ramban tehsil of Jammu and Kashmir** witnessed **torrential rainfall and hailstorms**. According to the **India Meteorological Department (IMD)**, the region received **16.9 mm of rainfall in just 24 hours**, which is a **575% increase over the normal** of 2.5 mm. Government authorities and meteorological experts flagged the situation using terms like **"flash flood," "landslide," and "cloudburst"** — all of which are natural disaster events commonly witnessed in Himalayan and other hilly regions.

What is a Cloudburst?

⊙ A **cloudburst** is a **very intense and sudden rainfall event** — defined as **10 cm (100 mm) or more rainfall in an hour over a small area**, typically **10 km × 10 km**.

⊙ Cloudbursts are most common in **mountainous regions** such as the Himalayas due to a process called **orographic lifting**:

➤ Warm, moist air from plains moves towards the mountains.

➤ As it rises along the slopes, the air cools due to lower atmospheric pressure.

➤ The cooling air condenses rapidly, forming dense clouds.

➤ When saturation is reached and the water cannot be held any longer, the entire mass of water **"bursts" out as a violent downpour**.

🗋 Challenges

➤ **The phenomenon is highly localized** – makes

them **hard to predict** with current radar or satellite technologies.

➤ It can result in sudden and devastating impacts in very short time spans.

➤ **It leads to flash floods, landslides, and infrastructure destruction.**

What is a Flash Flood?

⊙ A **flash flood** is a **rapid flooding** of low-lying areas, often caused by **intense rainfall over a short duration**. In hills, they occur because:

➤ **Rocky terrain doesn't absorb water** well.

➤ Water rapidly flows down slopes, entering streams, nullahs, and rivers suddenly.

DIFFERENCES FROM RIVER FLOODS		
Feature	**Flash Flood**	**River Flood**
Onset	Sudden (within hours)	Gradual (over days or weeks)
Duration	Short (a few hours)	Long-lasting
Common terrain	Hilly or semi-urban	Plains and floodplains
Risk focus	Loss of life due to surprise	Infrastructure and crop damage

➤ When these water bodies can't carry the load, **water spills over**, flooding roads, homes, and fields.

What is a Landslide?

• A **landslide** is the **downward movement of**

WHAT IS A CLOUDBURST?

Cloudburst is a sudden, very heavy rainfall, usually local in nature and of brief duration. Cloudbursts are especially common in mountainous areas.

Cloudbursts occur

only via orographic lift i.e. a situation when a warm air parcel mixes with cooler air, resulting in sudden condensation.
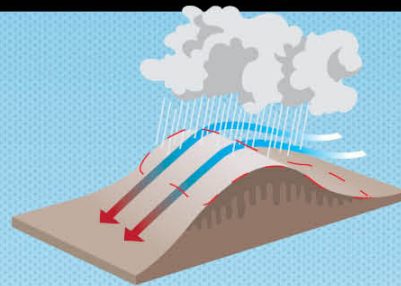
Orographic Lifting And Cloudburst

3 Violent upward flow of air prevents the condensing raindrops from falling to the ground

4 Lack of upward air prevents dissipation of moisture

5 Whole of the stored **water falls at one time**

6 Steep slope causes flash floods

2 Rising air cools and condenses; clouds develop

1 Moist air encounters a mountain or hill and is forced to rise

NEWS18 creative
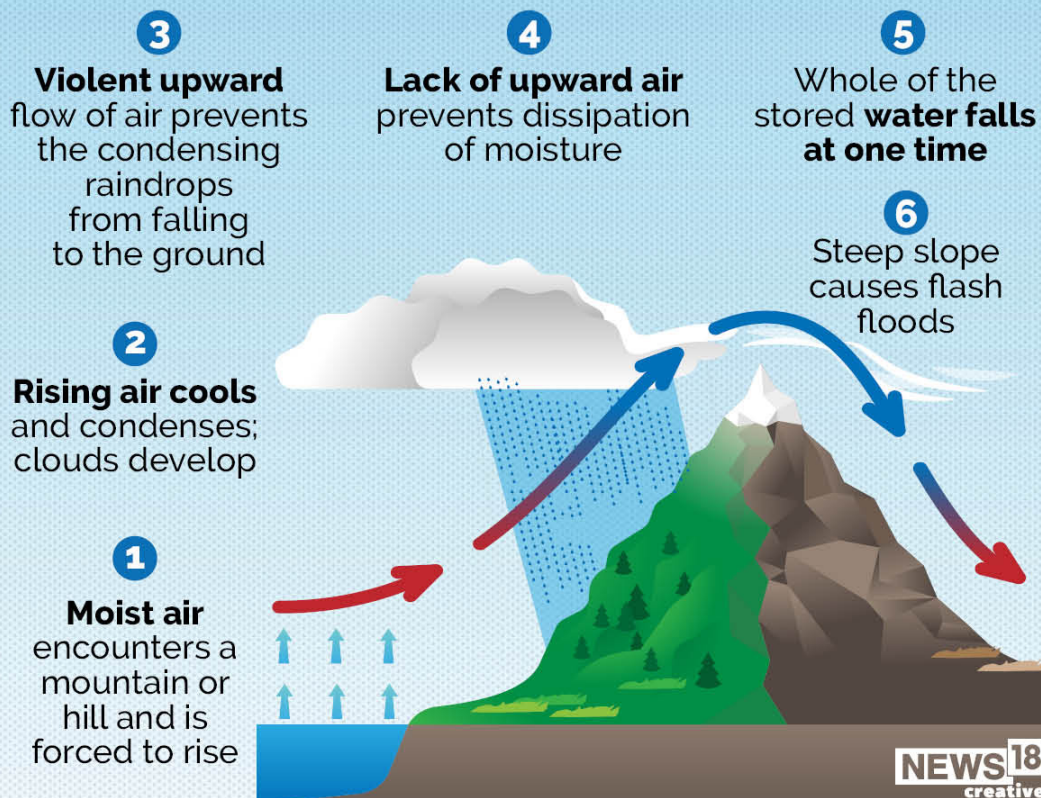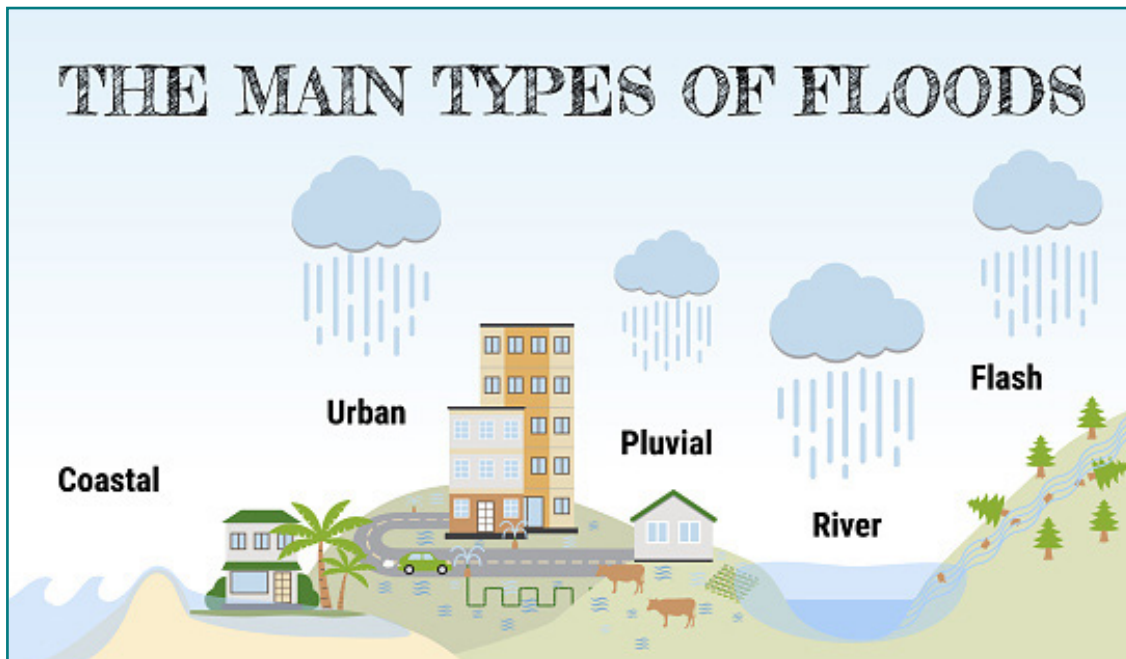
Figure No. 01

Figure No. 02

rock, earth, or debris on a slope. It occurs when the **force of gravity** becomes greater than the material's ability to resist sliding. This can be caused by:

➤ **Heavy rain (like cloudbursts or flash floods)**

➤ **Earthquakes**

➤ **Human activities** such as road-cutting, deforestation, and unplanned construction

➤ **Water is a critical trigger**. It adds **weight** to soil and rocks. It r**educes internal friction**, making it easier for the material to slides.
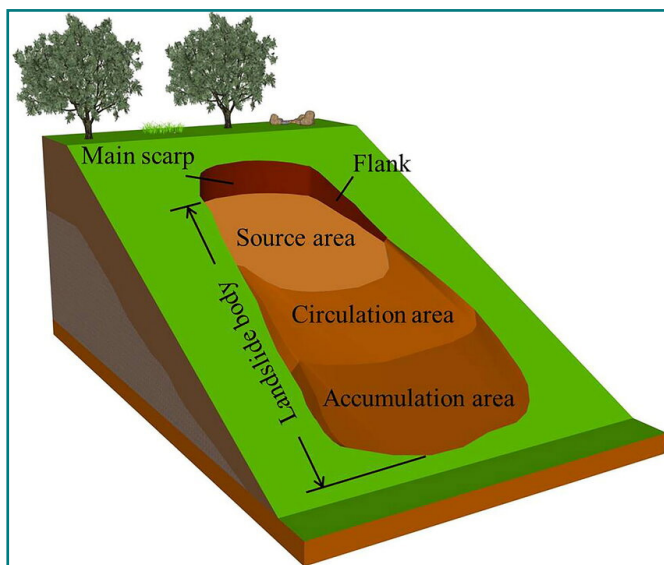
Figure No. 03

Why Are These Events Common in Jammu & Kashmir?

◉ **Mountainous Terrain**: The region lies in the **Himalayan fold belt**, with **steep slopes**, fragile rocks, and unstable

geology — all of which are conducive to landslides and flash floods.

◉ **Changing Rainfall Patterns**: With **climate change**, the region is seeing m**ore frequent extreme weather events** and s**hort, intense spells of rain** instead of steady, moderate rainfall

◉ **Unplanned Urbanization and Deforestation**: Construction in ecologically sensitive areas, deforestation, and improper land use contribute to **soil erosion** and destabilization of slopes.

◉ **Inadequate Drainage Infrastructure**: Many towns and villages in the region lack **stormwater drainage** systems, making them vulnerable to **waterlogging and flooding**.

Policy and Preparedness Dimensions

◉ **Early Warning Systems (EWS):** IMD and local meteorological stations need to improve **real-time alerts**, radar coverage, and forecasting models, especially in hilly and remote areas.

• **Disaster Preparedness Plans:** District administrations must regularly update and conduct **mock drills**, prepare **evacuation plans**, and stock emergency materials.

• **Infrastructure Resilience:** Roads, power lines, and houses must be designed to **withstand floods and landslides**, following **eco-sensitive building codes**.

• **Climate Adaptation Strategies:** There's a need to shift focus from just relief to **climate-resilient development**, which includes:

➤ Afforestation

➤ Watershed management

➤ Risk zonation maps

INDIA'S NEW DOCTRINE, "NO PEACE, NO PRIVILEGES"

Context

Following the deadly terrorist attack took place in Pahalgam, Jammu and Kashmir, the Cabinet Committee on Security (CCS), India's apex security decision-making body, took strong diplomatic steps against Pakistan, which is alleged to support terror groups operating across the border. Among these measures, it announced that the Indus Waters Treaty would be held in abeyance until Pakistan takes credible and irreversible steps to stop cross-border terrorism.

Other Measures Taken by India

This decision on the IWT is part of a wider 5-point response plan:

- **Closure of the Attari-Wagah Border Post** – Halting all goods and people movement.
- **Cancellation of SAARC Visa Exemptions for Pakistani Nationals** – Expelling Pakistani nationals in 48 hours.
- **Expulsion of Pakistani Military Advisers from India** – And reciprocal withdrawal from Pakistan.
- **Reduction of Indian Diplomatic Staff in Islamabad** – Bringing it down from 55 to 30 officials.

What is the Indus Waters Treaty?

- The Indus Waters Treaty was signed in 1960 between India and Pakistan, with the World Bank as a mediator and guarantor.

- The treaty governs the sharing of river waters from the Indus River system, which flows through both countries.
- According to the treaty, the rivers were divided into two groups:
  - The eastern rivers (**Ravi, Beas, and Sutlej**) were given to India for exclusive use.
  - The western rivers (**Indus, Jhelum, and Chenab**) were allocated to Pakistan, although they originate in India.
- India is allowed limited use of the western rivers for non-consumptive needs such as hydropower, irrigation, and navigation, but must not interfere with their flow in a way that affects Pakistan's share.
- The treaty is often cited as an example of successful water-sharing cooperation despite ongoing tensions and conflicts between the two countries.

Why is this a Big Deal?

- **Linking Water and Security:** Until now, India has kept water diplomacy separate from security and terrorism issues. This suspension breaks that tradition — signaling that support for terrorism will now invite consequences, including on vital resources like water.
- **Impact on Pakistan's Water Security**: Pakistan is heavily dependent on the Indus River system, particularly for Agriculture (90% of irrigation), Drinking water, Hydropower. Any disruption in flows, or even the fear of reduced cooperation, could:
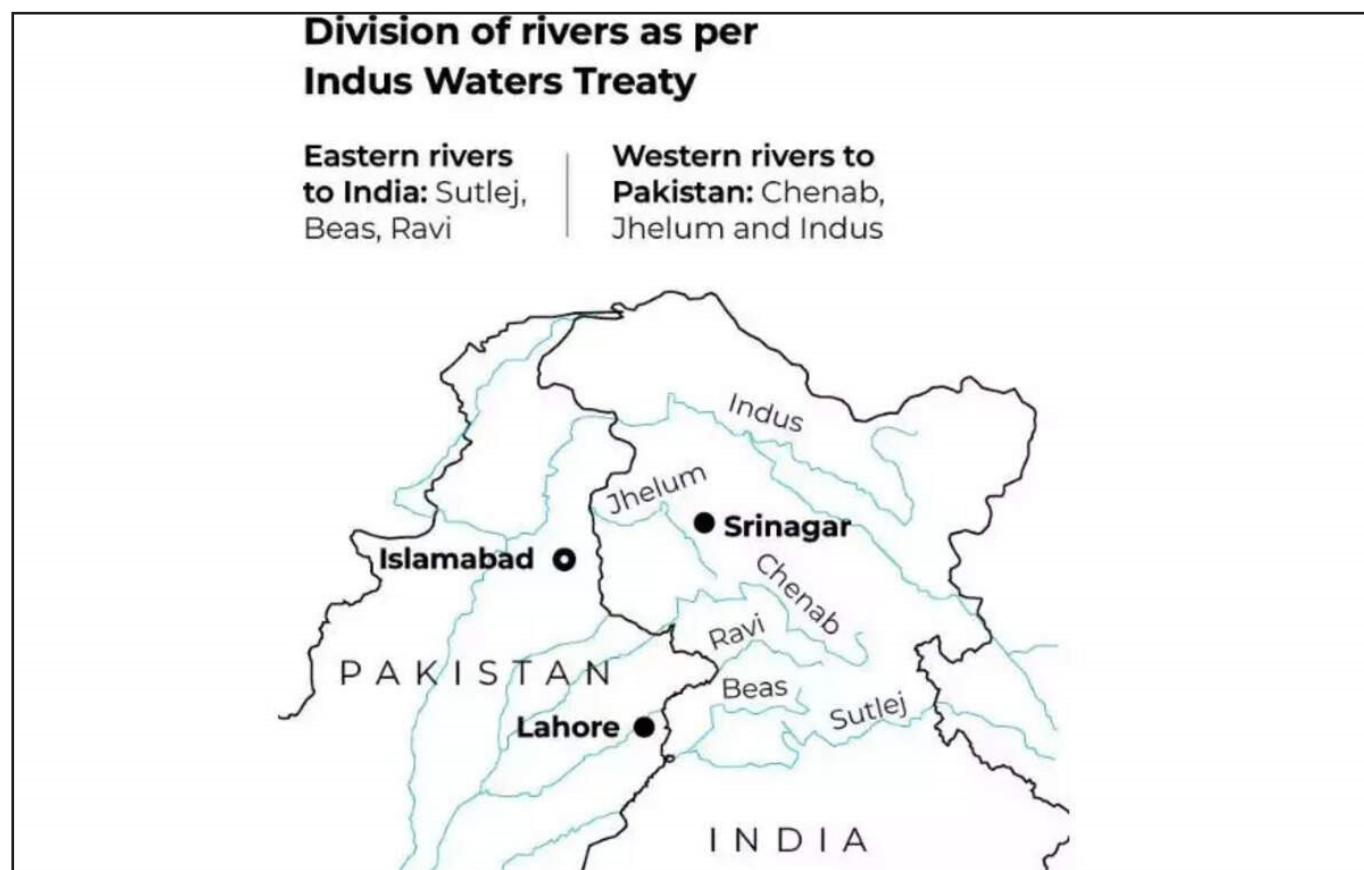

Figure No. 04

➤ Exacerbate water stress, especially in Punjab and Sindh

➤ Reduce crop yields and impact food security

➤ Create internal political pressure on Pakistan's civilian and military leadership

◉ **Diplomatic Pressure and Global Optics**: India has traditionally been seen as a responsible actor in international treaties. By choosing **abeyance over abrogation**, India is still upholding the legal framework, while sending a tough political signal.

"Held in Abeyance"

◉ "Held in Abeyance" is **not a formal withdrawal or termination of the treaty.**

◉ But India is **suspending all cooperation** under the treaty — including:

➤ **Technical meetings**

➤ **Data sharing**

➤ **Notification of water releases or flow**

➤ **Engagement on dispute resolution**

◉ Essentially, India is **pausing treaty obligations** as a **strategic signal** without violating international law on water treaties.

Attari-Wagah Border Post

◉ Attari, located just 28 kilometres from Amritsar, is **India's first Land Port** and the **only permitted land route for trade with Pakistan.**

◉ It is spread across 120 acres and directly connected to **national highway-I.**

◉ The check post has played a crucial role in cross-border trade, particularly in imports from Afghanistan.

◉ The Attari Land Port has long served as a critical trade conduit between India and Pakistan, handling a variety of goods.

◉ Key Indian exports through the route include **soybean, chicken feed, vegetables, red chilies, plastic dana, and and plastic yarn.**

Figure No. 05

INDIA-SAUDI ARABIA RELATIONS

Context

Prime Minister Narendra Modi visited Saudi Arabia to co-chair the second meeting of the India-Saudi Arabia Strategic Partnership Council. Modi also visited Jeddah (the first Indian Prime Minister in over 4 decades). The visit led to the signing of several Memoranda of Understanding (MoUs) and expansion of strategic cooperation, but was cut short due to a terror attack in Jammu and Kashmir's Pahalgam.

Key-highlights of the visit:

Strategic Partnership Council (SPC)

➤ The second meeting of the India–Saudi Arabia Strategic Partnership Council was co-chaired by Prime Minister Narendra Modi and Crown Prince Mohammed bin Salman in Jeddah.

➤ The Council reviewed progress in key sectors such as defence, energy, trade, and cultural cooperation.

➤ The structure of the SPC was expanded from two to four ministerial committees, with the inclusion of new committees on **Defence Cooperation and Tourism and Cultural Cooperation.**

MoUs and Agreements Signed

➤ **Space Cooperation**: A Memorandum of Understanding was signed between the **Saudi Space Agency and the Department of Space, Government of India.**

➤ **Health Cooperation**: An MoU was signed between the **Ministry of Health of Saudi Arabia and the Ministry of Health and Family Welfare,** Government of India to strengthen health systems and managing public health risks.

➤ **Anti-Doping Cooperation:** A bilateral agreement was signed between the **Saudi Anti-Doping Committee** and **India's National Anti-Doping Agency**.

➤ **Postal Services:** An MoU was signed between the **Saudi Post Corporation and India Post.**

Defence and Security Cooperation

➤ A **dedicated Ministerial Committee on Defence Cooperation** was established under the **Strategic Partnership Council framework.**

➤ India and Saudi Arabia reaffirmed growing collaboration through joint military exercises such as **SADA TANSEEQ and AL MOHED AL HINDI.**

➤ A **trilateral staff-level dialogue mechanism** among the three armed services was initiated.

Energy and Climate Cooperation

➤ Both countries agreed to work together to ensure the stability of **global oil markets** and improve mutual energy security.

➤ Joint collaboration was initiated in the areas of **green hydrogen development, renewable energy technologies, and strategic petroleum reserves.**

➤ Saudi Arabia reiterated its support for regional environmental initiatives such as the **Saudi Green Initiative** and the **Middle East Green Initiative.**

◻ ## Investment and Economic Engagement

➤ India and Saudi Arabia are collaborating on setting up **two major refinery projects and resolving bilateral tax-related challenges.**

➤ An **"India Desk"** was officially launched at the **Saudi Public Investment Fund (PIF)** to facilitate investor engagement.

➤ Both sides reaffirmed their commitment to finalizing the **Bilateral Investment Treaty** and initiating negotiations on the **India-GCC Free Trade Agreement.**

♦ The GCC bloc—comprising **Saudi Arabia, UAE, Qatar, Kuwait, Bahrain, and Oman**—represents a strategic economic zone for India.

Why Saudi Arabia is important for India?

◉ **IMEC:** Saudi Arabia sits at the heart of the IMEC corridor's proposed land and maritime routes.

➤ The IMEC is a planned economic corridor that aims to bolster economic development by fostering connectivity and economic integration between **Asia, the Persian Gulf and Europe.**

➤ The corridor is a proposed route from India to Europe through the **United Arab Emirates (UAE), Saudi Arabia, Israel and Greece.**

◉ **Energy:** India and Saudi Arabia's energy ties are foundational to the broader economic relationship. Saudi Arabia is a major oil supplier for India and is increasingly collaborating with India in areas like green hydrogen, refining, and petrochemicals.

◉ **Saudi Arabia's geographical position, investment capacity, and strategic importance** give it a central role in India's foreign policy. For India, engaging with Saudi Arabia strengthens its westward connectivity, elevates its global economic role, and helps craft a multipolar regional order.

Figure No. 06

What is the current state of India-Saudi Arabia relations?

- Diplomatic ties between India and Saudi Arabia were established in 1947.
- The relationship was elevated to a **Strategic Partnership** with the **Delhi Declaration (2006)** and **Riyadh Declaration (2010)** during PM Manmohan Singh's visit.
- In 2019, PM Narendra Modi's second visit led to the **formation of the Strategic Partnership Council (SPC)** to institutionalize high-level engagement.
- **Trade:** India is **Saudi Arabia's second-largest trading partner**, while Saudi Arabia is India's **fifth-largest**. In FY 2023–24, bilateral trade reached **USD 42.98 billion**, with:
  - Indian exports: **USD 11.56 billion**
  - Indian imports: **USD 31.42 billion**
- **Investment:** Indian companies have invested approximately **USD 3 billion** in Saudi Arabia across IT, telecom, pharma, and construction. Saudi investments in India are led by the **Public Investment Fund (PIF)**, with a total of **USD 10 billion** committed.
  - Saudi Arabia ranks **20th in FDI equity inflows** into India (cumulative FDI: **USD 3.22 billion**, 2000–2024).
- **Energy Partnership:** In FY 2023–24, Saudi Arabia was:
  - **India's 3rd largest source of crude oil** (14.3% of total imports)
  - **3rd largest supplier of LPG** (18.2% of total LPG imports)
- **Defence and Security Cooperation**: The first joint land military exercise, **EX-SADA TANSEEQ**, was held in 2024.
  - The **bilateral naval exercise 'Al Mohed Al Hindi'** has become a regular feature.
- The **Indian community in Saudi Arabia** (approx. **2.6 million**) is the **largest expatriate group**, widely respected and preferred.

FACT BOX

Jeddah

- Jeddah is the commercial capital of Saudi Arabia and the gateway to Mecca, Islam's holiest sites.
- It is located on the Red Sea and central to Saudi Arabia's global trade networks.
- It is the largest city in Makkah Province, the largest sea port on the Red Sea, and the second largest city in Saudi Arabia after the capital city, Riyadh.

(Figure No. 06 on previous page)

US'S ANTITRUST CASE AGAINST META

Context

In recent years, **Big Tech companies** have come under intense global scrutiny over their **growing dominance, control over data, and impact on competition**. Among them, **Meta** is facing a serious legal challenge in the U.S. The **U.S. Federal Trade Commission (FTC)** has accused Meta of engaging in **anti-competitive practices** to maintain its **monopoly** in what it calls the **Personal Social Networking (PSN) market**. This is a test of **how democracies regulate monopolies** in the digital age.

What is the Case About (Monopoly)?

- The FTC argues that Meta followed a **deliberate strategy** of acquiring potential rivals (WhatsApp, Instagram) to suppress competition, rather than innovate or compete fairly.
- Meta also imposed **restrictive terms on third-party developers** to prevent them from building competing services.
- These moves, the FTC claims, were not aimed at consumer benefit but at **consolidating control over the market**, making it difficult for any meaningful rival to emerge.

Meta says:

- It is not a monopoly, because users spend time across various platforms, not just Meta's.
- The FTC's definition excludes major rivals like TikTok, which is extremely popular among young users.
- Instagram and WhatsApp became successful because Meta invested billions in them — not because of unfair practices.
- The acquisitions were approved by regulators when they happened, over a decade ago.

- If the FTC wins the case, Meta could be forced to **sell off Instagram and WhatsApp**, a dramatic step that would **reshape the digital landscape** globally.

What is the 'PSN Market'?

- The FTC defines **Personal Social Networking (PSN)** platforms as those that allow people to **maintain personal profiles, connect with friends, and share**

content. Facebook and Instagram are seen as dominant players here.

- ◎ **Meta challenges this narrow definition**. It argues that it competes with a wide range of apps — including **TikTok, YouTube, Snapchat, X (formerly Twitter), and messaging apps** — that also serve social and content-sharing functions.

Why is this case so Important?

- ◎ **Rewriting Modern Antitrust Law:** Traditional antitrust laws focused on consumer pricing. But digital platforms offer free services — and gain power through data control, network effects, and digital influence. This case could help redefine how monopoly power is understood in the digital age.

- ◎ **Implications for Big Tech**: If the FTC wins, it would send a global message that even the largest tech companies can be broken up. It could affect other giants like Google, Amazon, Apple, and even foreign platforms.

- ◎ **Global Regulatory Trends**: Across the world, regulators are becoming more aggressive:
  - ➤ EU's Digital Markets Act targets similar monopolistic behavior.
  - ➤ India's Competition Commission (CCI) is probing Google and Apple.
  - ➤ Countries like Australia and the UK are also designing stronger digital competition rules.

- ◎ This trial fits into a larger global push to regulate Big Tech.

- ◎ **Political and Geopolitical Factors**: The case has also attracted attention because of Zuckerberg's recent closeness to former President Trump. There are reports that he met Trump privately before the trial. However, political lobbying has not stopped the legal proceedings.

Current Measures in India Against Big Tech Dominance

India **doesn't yet have a dedicated law** like the **European Union's Digital Markets Act**, but there are several existing measures, institutions, and policy initiatives that aim to deal with **anti-competitive practices in digital markets.**

- ◎ **Competition Act, 2002 (Amended in 2023):** This is India's main law to check monopolies and anti-competitive behavior.
  - ➤ **Enforced by**: Competition Commission of India (CCI)
  - ➤ **Covers**:
    - ♦ Abuse of dominant position
    - ♦ Anti-competitive agreements (e.g. price-fixing, market division)
    - ♦ Regulation of mergers that reduce market competition
  - ➤ *Limitations*:
    - ♦ CCI works **case by case**, meaning it can only act **after** a violation is detected — not preventively

- ♦ It lacks sector-specific rules for digital gatekeepers (unlike the EU DMA)

- ◎ **IT Rules (Information Technology Rules), 2021 (with amendments in 2023):** These rules were introduced to regulate **digital intermediaries**, including Big Tech platforms.
  - ➤ **Enforced by** the **Ministry of Electronics and Information Technology (MeitY)**
  - ➤ **Cover:** Social media platforms (e.g., Facebook, Twitter, YouTube), Digital news publishers, OTT platforms
  - ➤ Limitations:
    - ♦ Focus is more on **content regulation** and **platform accountability**, not competition or market dominance
    - ♦ Doesn't apply to app store behavior or payment systems

ONGOING RUSSIA-UKRAINE PEACE TALKS

Context:

Recently, reports have suggested that the **United States** may be willing to recognise **Russia's control over Crimea** as part of a **broader peace deal with Ukraine**. This potential shift is happening amid efforts by US President Donald Trump to negotiate a ceasefire between Russia and Ukraine, which remains one of the most severe armed conflicts in Europe since **World War II.**

What is Crimea and why is it controversial?

- ◎ Crimea is a peninsula that juts into the **Black Sea**, located in **southern Ukraine**, and is connected to mainland Ukraine by a narrow strip of land. To the east, it is separated from Russia by the **Kerch Strait**.

- ◎ **Area and Capital**: Crimea spans **27,000 sq. km** (roughly the size of Belgium). Its capital is **Simferopol**.

- ◎ **Strategic Bridge**: Russia constructed the **Kerch Bridge** linking Crimea with mainland Russia, but this has sustained **war-related damage** during the conflict.

▣ Background:

- ➤ **Russian Empire Era**: Crimea was absorbed into the **Russian Empire** by **Catherine the Great** in the 18th century. The **naval base at Sevastopol** was soon established.

- ➤ **Crimean War (1853–1856)**: The war was fought between Russia and the Ottoman Empire (aided by Britain and France); it reshaped European geopolitics and is seen as a precursor to **World War I.**

- ➤ **Soviet Period**: Crimea became part of the **Soviet Union** in 1921. In **1954**, **Nikita Khrushchev** (then Soviet Premier and a Ukrainian) transferred Crimea to **Soviet Ukraine**.

Figure No. 07

- ➤ **Post-Soviet Disputes**: After the **USSR's collapse in 1991**, disputes grew between **Russia and Ukraine** over Crimea's status.
- ◉ **Russian Annexation in 2014:** In **2014**, after the fall of Ukraine's pro-Russia President **Viktor Yanukovych**, Russia invaded Crimea and held a **controversial referendum**, claiming overwhelming support for joining Russia.
  - ➤ The annexation was rejected by the **United Nations General Assembly**, the **US**, and the **EU**.
  - ➤ **Sanctions** were imposed on Russia.
  - ➤ The Kremlin maintains that the issue is settled, despite **limited international recognition**.

◘ Agriculture and Industry:

- ➤ The region is important for crops like **wheat, corn, and sunflowers**.
- ➤ The **Kerch region** in eastern Crimea has **iron ore mining**.
- ➤ Two **grain storage terminals** exist — one in **Kerch** and one in **Sevastopol**.

What's Happening Now?

- ◉ Amid the ongoing war, which began in February 2022, there is growing diplomatic pressure to find a peace solution.
- ◉ The United States has been trying to push for a negotiated ceasefire.
- ◉ But the peace talks are progressing slowly, and US officials have expressed frustration, suggesting that Washington may withdraw from mediation if there is no breakthrough soon.

Why this matters?

- ◉ **International Law at Stake:** Recognising Crimea as Russian could legitimise forceful territorial expansion, weakening the global rules-based order.
- ◉ **US Policy Shift:** This move would represent a major shift in US foreign policy and could divide Western allies, many of whom oppose any concession to Russia.
- ◉ **Geopolitical Precedent:** If accepted, this deal may set a dangerous precedent for other countries with territorial ambitions — such as China in the South China Sea or Taiwan.
- ◉ **Ukraine's Sovereignty:** The proposed compromise undermines Ukraine's national sovereignty and long-standing aspirations to integrate with NATO and the EU.

KARNATAKA GIG WORKERS BILL

Context

The **Karnataka Platform-based Gig Workers (Social Security and Welfare) Bill, 2024** has gained significant attention due to its potential to be a pioneering law for the welfare of platform-based gig workers in India.

Why the Bill Was Needed?

◎ **Gig Economy in Karnataka**: Karnataka is home to around **2 lakh platform-based gig workers**. They enjoy flexibility in their work but **lack formal labor protection**, which exposes them to **exploitation.**

◎ **National Context**: The **gig economy** is a rapidly growing sector expected to provide **23.5 million jobs in India by 2030** (NITI Aayog, 2022). However, gig workers remain unprotected by **traditional labor laws**, leading to multiple instances of worker exploitation.

◎ **Legal Landscape**: In 2020, the **Central government** passed the **Code on Social Security (CoSS)** to define gig workers, but its **implementation is still pending**. In 2023, **Rajasthan** became the first state to introduce a law for gig workers. Karnataka's Bill aims to follow suit, protecting gig workers under a dedicated framework.

What the Bill Seeks to Address?

◎ **Lack of Worker Protection**: Gig workers often face arbitrary termination, unsafe working conditions, and lack of basic welfare benefits. The Bill aims to **provide social security** and welfare to these workers, filling the gap left by the absence of traditional labor laws.

◎ **Welfare Fund Creation**: The Bill proposes a **welfare fund** for gig workers. Platforms (aggregators) will be required to contribute a **welfare fee** of **1%-5%** of each transaction, which will go directly to the welfare fund.

GIG, A NEW-AGE ECONOMY

BENEFITS
- Creation of jobs on mass scale
- Freedom and flexibility of work
- Easy access to services
- Price advantage for consumers

DOWNSIDE
- Inconsistency in services
- Partners arm-twisted by service providers
- Difficult to trust a service provider without a recommendation from someone you trust

CHALLENGES FOR GOVT
- Highly unregulated
- Lack of policies on job structure, tax, privacy
- Exponential growth

FEW KEY PLAYERS
UBER, OLA, ZOMATO, FOODPANDA, SWIGGY, AIRBNB, UPWORK

CRUISE MODE
- Ola, Uber offered fat incentives in the initial years
- Targets were pretty achievable
- Hundreds of thousands availed bought cars to partner with Ola, Uber
- Few claimed to earned Rs 1 lakh a month

FOR OLA, UBER DRIVERS

REVERSE GEAR
- Drivers hit downhill road as Ola, Uber gained market share
- Incentives became unattractive
- Needed more trips to meet targets, had to face growing traffic
- Crimes on passengers compounded problems

Figure No. 08

Key Features of the Bill

- **Definition of Gig Workers**: A **gig worker** is someone working on a platform-based model where work and payment are based on a contract, with no formal employer-employee relationship.
  - ➤ The Bill aims to **ensure social security** benefits for these workers without applying full labor laws.
- **Welfare Fund and Fee**: A **welfare fee** (1%-5%) will be deducted from the workers' payments, and this amount will go towards a **welfare fund**.
  - ➤ The **Gig Workers Welfare Board** will manage the fund, oversee worker registration, and implement social security schemes.
- **Safety and Work Conditions**: Platforms must ensure that workers have a **safe work environment** with adequate rest facilities. A **14-day notice period** is mandated for worker termination unless the worker has caused **bodily harm**.

Grievance Redressal:
- ➤ A **two-tier grievance redressal mechanism** will be put in place.
- ➤ If the internal dispute committee does not resolve the issue within **14 days**, the grievance will be forwarded to the Welfare Board.
- **Platform Obligations**: Platforms must provide details of all gig workers to the Welfare Board.
  - ➤ Platforms will also need to implement a **Welfare Fee Verification System (WFVS)**, which will track welfare fee payments.

🔍 FACT BOX

Who is a Gig Worker?
- According to the Code on Social Security, 2020, a gig worker is anyone who performs work or earns income outside the traditional employer-employee relationship, typically in on-demand jobs such as food delivery, ride-hailing or freelance work.

Government Initiatives for Gig Workers
- **Union Budget 2025** brought significant healthcare benefits for gig workers. Nearly 1 crore gig workers to receive health insurance under Ayushman Bharat-PMJAY, providing Rs 5 lakh coverage per family annually at 25,000+ empanelled hospitals.
- **Code on Social Security 2020:** Under this, gig workers are provided with recognition as a new occupational category.
- **E-Shram Portal**: The **E-Shram Portal** is a flagship initiative by the Government of India to support and empower the unorganized workforce, which forms the backbone of the nation's economy. It was launched by the Ministry of Labour and Employment.

- **Pradhan Mantri Shram Yogi Maandhan** is a government scheme meant for old age protection and social security of unorganized workers.

Initiatives taken by States:
- ➤ Rajasthan's Platform-Based Gig Workers (Registration and Welfare) Act, 2023
- ➤ Karnataka Platform-based Gig Workers (Social Security and Welfare) Bill, 2024

UPSC PYQ

Q: Examine the role of 'Gig Economy' in the process of empowerment of women in India. (2021)

INDIA'S TEMPORARY TARIFF ON STEEL IMPORTS

Context

India is likely to impose a **12% temporary safeguard duty** on imports of stainless steel to counter the surge of cheap imports, mainly from **China, South Korea, and Japan**. The move comes in response to concerns over injury to the domestic steel industry, especially smaller producers.

India's Position in Global Steel Market:

- Steel is considered a **strategic and infrastructure-critical sector**. Ensuring its health is vital for long-term economic growth, defence needs, and energy infrastructure
- India is the second-largest producer of crude steel globally.
- India has registered a **38 per cent surge in imports of finished steel** to 8.319 million tonnes (MnT) over 6.022 MnT imported during the preceding 2022-23 fiscal. The surge in predatory imports from China is a big threat to the Atmanirbharta in steel.
  - ➤ **Finished steel** includes non-alloyed offerings, alloyed ones and stainless steel. Finished steel imports reached a **9-year high** at **9.5 million metric tons**.
- **Countries Dominating Imports:** China, South Korea, and Japan account for **78% of India's total finished steel imports**.
- **Domestic Industry Concerns:** Indian steelmakers have urged the government to take corrective steps as cheaper imports have forced **smaller domestic mills** to cut production and consider **job losses**.

Rationale for the Tariff

- **Protect Domestic Industry:** Prevent long-term harm to domestic producers due to underpriced foreign imports.

- **Reduce Trade Imbalance:** Control the increasing dependency on imported finished steel.
- **Support Employment:** Avoid job losses in small and medium steel enterprises (SMEs).
- **Trade protectionism**: Many countries are taking **protective trade measures** against Chinese steel exports, which are accused of **dumping** — selling below market price to gain market share. The move aligns India with global trends of **trade protectionism**, particularly in strategic sectors.

Impact on Indian Economy

Positive:	Negative:
- Likely boost for domestic production and investment in the steel sector. - Protection for smaller mills and employment.	- Could raise input costs for downstream industries (e.g., construction, auto). - May trigger trade tensions or WTO disputes (as seen in the US-India case on steel duties).

UPSC PYQ

Q: Account for the present location of iron and steel industries away from the source of raw material, by giving examples. (2020)

Q: Account for the change in the spatial pattern of the Iron and Steel industry in the world. (2014)

INDIA'S RESILIENCE AMID GLOBAL ECONOMIC UNCERTAINTY

Context:

The global economy is currently facing significant challenges, including trade tensions, slowing growth, and geopolitical uncertainties. These factors have created headwinds for many countries. Despite these global challenges, India's domestic growth engines — consumption and investment — remain relatively resilient, which has allowed India to maintain a positive economic outlook. This is the central argument presented in an article titled *"State of the Economy"* published in the **Reserve Bank of India's (RBI) April 2025 bulletin.**

India's Domestic Growth Drivers: Consumption and Investment

India's domestic economy is powered by two key drivers: **consumption** and **investment**.

- **Consumption**: India's large and growing consumer base provides a strong foundation for domestic growth. The demand for goods and services within the country continues to rise, fueled by increasing income levels, urbanization, and a youthful population.

- **Investment**: Investments, both domestic and foreign, have remained steady. India's attractiveness as an investment destination is enhanced by its rapidly growing economy, a stable financial sector, and a diversified economy that includes services, manufacturing, and agriculture.

The RBI's article highlighted that while global demand for exports may weaken due to trade tensions and the economic slowdown in advanced economies, these two domestic drivers will help shield India from the worst effects of these global headwinds.

India's Macroeconomic Strengths

Several factors contribute to India's resilience in the face of global economic uncertainty:

- **Low External Vulnerability**: India's external vulnerability is relatively low. The country has a modest external debt-to-GDP ratio of **19%**, which is considered manageable. Additionally, India's **foreign exchange reserves** are substantial, covering about **11 months of import needs**. This gives India a buffer against external shocks such as sudden changes in oil prices or global capital flow disruptions.

- **Macroeconomic Stability**: India's macroeconomic framework has been strong, with a focus on maintaining fiscal discipline, low inflation, and sound monetary policies. The country's inflation rate moderated to **3.3%** in March 2025, a 67-month low, mainly due to a slowdown in food prices. However, the RBI article noted that risks from heatwaves and abnormal temperature rises, which could impact food production, should be monitored.

- **Resilient Financial Sector**: India's financial sector, which includes both **public and private banks** as well as **non-banking financial companies (NBFCs)**, has shown resilience to global shocks. The sector has become more robust and diversified over the years, which has helped it weather macroeconomic challenges.

Opportunities Amid Global Volatility

Despite the global slowdown, India is poised to turn this volatility into an opportunity. The RBI article mentions several reasons why India's economy is in a strong position to benefit from global changes:

- **Supply Chain Realignment**: The shifting of global supply chains, especially following disruptions from the COVID-19 pandemic and geopolitical tensions (such as trade conflicts between the U.S. and China), offers India an opportunity to strengthen its position as a global manufacturing hub. India can attract more foreign direct investment (FDI) as companies seek alternatives to China and other supply chain hubs.

- **Diversified Sources of FDI**: India's growing appeal to international investors is linked to its large market size, young workforce, and improving infrastructure. The article suggests that India's **trade linkages** and favorable investment climate make it an attractive destination for global investors seeking resilience and growth potential.

- **Services Exports and Remittances**: India has consistently performed well in services exports, particularly in IT and

software services, which remain strong even in uncertain global markets. Additionally, **remittance inflows** from the Indian diaspora provide a stable source of foreign exchange, helping to buffer the current account.

- **Agricultural Sector**: India's agricultural sector is also showing positive trends.
  - ➤ The country is expecting bumper **kharif** and **rabi harvests** (the major crop seasons), which, combined with favorable reservoir conditions for irrigation, could support sustained agricultural growth. This can help maintain food security and contribute to the rural economy.

WORLD ECONOMIC OUTLOOK (WEO) REPORT 2025

Context

The **International Monetary Fund (IMF),** through its **World Economic Outlook (WEO) April 2025** report, has projected that India will remain the fastest-growing major economy in the world in 2025 and 2026. The growth rate is expected to be **6.2% in 2025 and 6.3%** in 2026.

- This is higher than global growth, which is projected at **2.8% in 2025 and 3.0% in 2026.**
- In contrast, China's growth is estimated at just 4% in 2025, and the US economy is expected to grow by 1.8%.

What is supporting India's Growth?

- **Strong Private Consumption**, especially in **rural areas**, is one of the key drivers. This shows a **broad-based economic recovery**.
- **Government reforms and public investments** in infrastructure, digital connectivity, and welfare delivery have also strengthened resilience.
- India's focus on **financial inclusion**, startup ecosystems, and **manufacturing-led exports** (like electronics and semiconductors) are beginning to pay off.
- The **banking sector** is relatively healthier today (lower NPAs, better credit growth), which helps finance economic activity.

What challenges Does India Face?

While the IMF outlook is positive, it's important to understand that the path ahead is **not without risk**:

- **Global Trade Tensions**: As the WEO notes, there is a rise in **tariffs and trade barriers** globally. India is not immune, especially as it aspires to increase exports.
- **Climate and Resource Stresses**: Water stress, urban pollution, and extreme weather events may increasingly affect **agriculture, health, and productivity**.
- **Employment Quality**: While growth is high, **employment generation**, especially **quality formal jobs**, has to match the pace. Informal employment remains high.
- **Fiscal Management**: Sustaining growth with **balanced fiscal health** is a challenge. Public investment needs to be maintained without causing unsustainable debt.

IMF's World Economic Outlook (WEO)

- The **World Economic Outlook (WEO)** is a **flagship publication of the International Monetary Fund (IMF)**.
- It provides a detailed analysis of:
  - ➤ Global economic trends and forecasts,
  - ➤ Risks to economic stability,
  - ➤ Growth projections for countries,
  - ➤ Key policy recommendations.
- It is **published twice a year** (usually in **April and October**), with interim updates in January and July.
- The WEO helps countries, policymakers, investors, and scholars understand how global and regional economies are performing — and where they're headed.

Coverage

- ➤ **Growth Projections**: GDP forecasts for advanced, emerging, and developing economies.
- ➤ **Inflation Trends**: Estimates and drivers of price rise across economies.
- ➤ **Policy Challenges**: Analysis of monetary, fiscal, and trade policy responses.
- ➤ **Risks and Uncertainty**: From geopolitical tensions to financial volatility.
- ➤ **Sectoral Insights**: On trade, capital flows, debt, employment, climate economy, etc.

HEAT STRESS IN ANIMALS

Context

Rising global temperatures and extreme heat waves are becoming increasingly frequent and intense due to **climate change**, bringing renewed attention to **heat stress in animals**.

What is Heat Stress?

- Heat stress happens when an animal is **unable to regulate its internal body temperature** effectively under high external heat.
- Animals naturally try to cool themselves by sweating, panting, lying in shade, or drinking water.
- But when the **heat load from the environment exceeds their cooling capacity**, their bodies become overwhelmed.
- This leads to a condition where their **cells, organs, and systems start malfunctioning**. In the short term, this can cause: **Heat exhaustion, Dehydration, Rapid breathing or panting, Loss of appetite, Reduced productivity (like milk yield or weight gain)**
- In more serious cases, it can lead to: **Organ damage, Fertility problems, Hormonal imbalance or even Death.**

How Does Heat Stress Disrupt Animal Hormones?

- **Animals survive and function normally because of a finely balanced** endocrine (hormonal) system**, which regulates metabolism, stress response, reproduction, and more.** Heat stress throws this balance off.

- **Some major effects observed in animals under heat stress:**

- **Cortisol & HPA Axis Activation**: Cortisol is a key **"stress hormone"** released by the **adrenal glands.** In heat stress, the **HPA axis (hypothalamus–pituitary–adrenal axis)** is constantly activated. This leads to elevated cortisol, which initially helps manage heat but later causes **chronic stress, immune suppression, and fatigue.**

- **Thyroid Hormones (Thyroxine and Triiodothyronine):** These control metabolism and body temperature. Under heat stress, levels of these hormones drop, which slows metabolism and reduces energy production. In dairy cows and goats, this results in **reduced milk yield, sluggishness, and poor growth**.

- **Reproductive Hormones (Testosterone, Estradiol, LH, FSH):** Heat affects reproductive organs and hormones.

  - **In males (like rats, pigs),** it damages testes, reduces testosterone, and leads to low sperm quality.

  - **In females (like cows, sows),** heat disrupts ovulation and may cause **'summer infertility'.**

- **Insulin and Glucose Metabolism**: Cows under heat stress show increased insulin, which reflects altered glucose metabolism and may indicate early metabolic disorders.

- **Other Stress Hormones (Catecholamines):** Hormones like **epinephrine and norepinephrine** stay elevated, which puts constant pressure on the heart and blood vessels, risking long-term damage.

Why this matters in India (Basic Animal Husbandry Statistics 2024)?

- India has a large **livestock population** (especially dairy cattle, goats, and poultry), many of which live in **hot and humid** climates.

- India's **milk production** has increased by **3.78%** to reach **239.30 million tonnes** in **2023-24**. Alongside milk, there has been an increase in **meat** and **egg** production as well. While milk growth has slowed in recent years.

- India continues to be the **world's largest producer** of milk.

▣ Milk Production:

- **Milk production** in India grew by **78%**, reaching **239.30 million tonnes** in **2023-24**.

- Despite this increase, growth has slowed compared to previous years (5.77% in 2021-22 and 3.83% in 2022-23).

- **India remains the world's largest producer of milk,** but officials stress the need to boost **dairy exports**.

- **Milk production from exotic/crossbred cattle** increased by **8%**, while **indigenous cattle** saw a larger growth of **76%**.

- However, **milk production from buffaloes** dropped by **16%** in the same period.

- **Meat Production: Meat production** grew by **95%** and is estimated to reach **10.25 million tonnes** in **2023-24**. India has been experiencing growth in its **meat production**, contributing to its position as a significant player in global markets.

- **Egg Production: Egg production** increased by **17%**, reaching **142.77 billion eggs** in **2023-24**. India remains the **world's second-largest producer of eggs**, with an average of **103 eggs per person annually**.

- **Wool Production:** India's total **wool production** stands at **69 million kg**.

HINDU KUSH-HIMALAYAN REGION SNOWFALL AT 23-YEAR LOW

Context

The **International Centre for Integrated Mountain Development (ICIMOD)** reported that **seasonal snowfall in the Hindu Kush-Himalayan (HKH) region** is **23.6% below normal**, the **lowest in 23 years**. This threatens water security for **nearly two billion people** dependent on snowmelt for freshwater.

Key Findings of the ICIMOD Report

- **Snow persistence** has dropped **23.6% below normal**, continuing a **three-year declining trend**.

- **Delayed and reduced snowfall** observed across winter months (especially late start in January).

- **Drought warnings** issued across several countries.

- **Snow loss in Mekong and Salween basins** reached around **50%**, affecting China and Myanmar.

▣ Impacts include:

- Reduced river flows

- Increased reliance on groundwater

- Greater risk of agricultural droughts and food insecurity

- **Countries Affected:** Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan

  - These nations are members of ICIMOD and depend heavily on glacial and snowmelt-fed rivers.

About the Hindu Kush-Himalayan (HKH) region

- The **Hindu Kush-Himalayan (HKH) region** spans **Afghanistan to Myanmar**, encompassing **12 major river basins** including the **Ganga, Brahmaputra, Indus, Salween, and Mekong**.

- It is **home to the third-largest ice and snow reserves in the world**, after the **Arctic and Antarctica**.
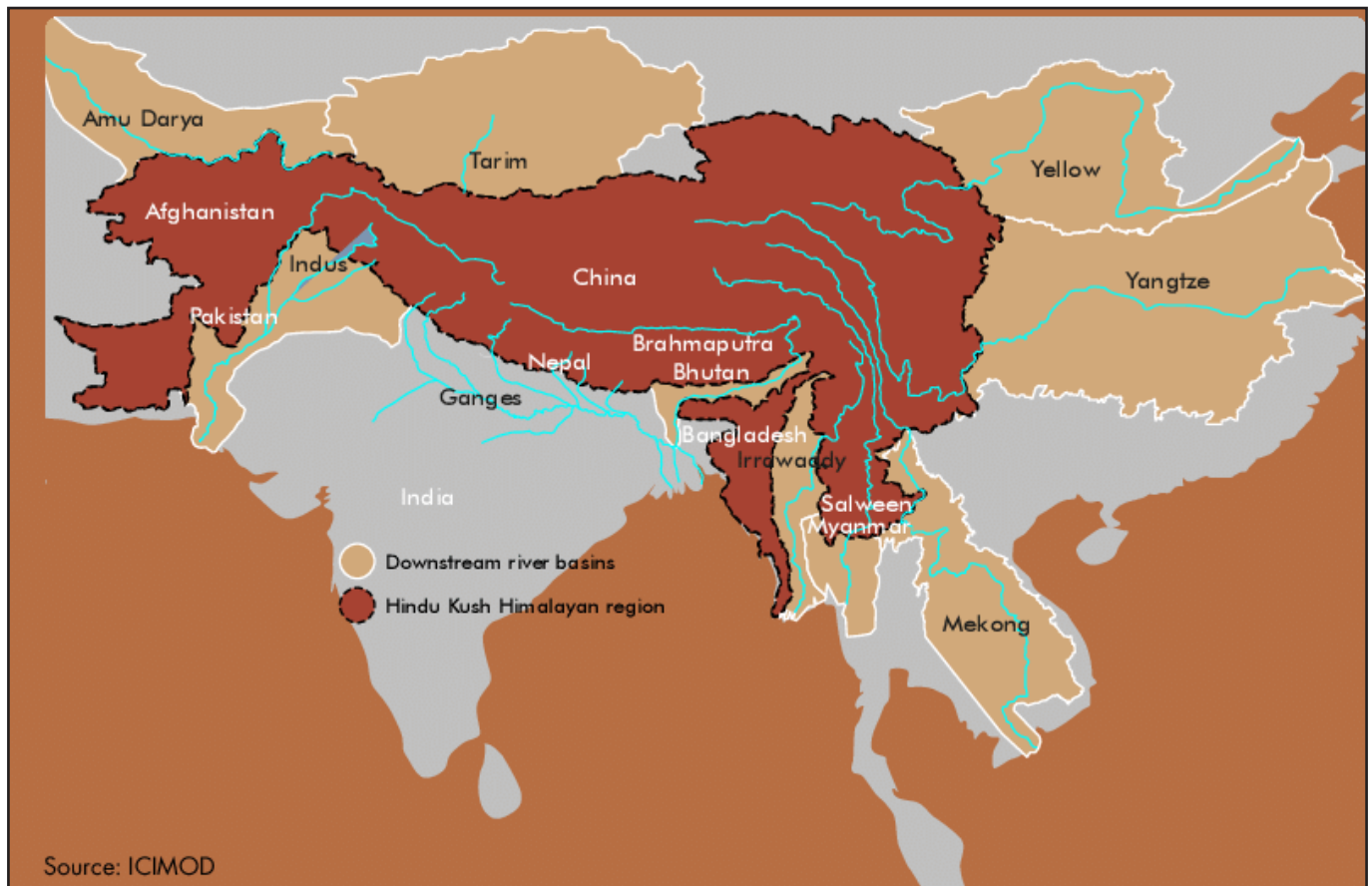
Figure No. 09

- The region is often referred to as the **"Third Pole"** due to its vast cryospheric extent.

- **Major rivers:** It is the source of ten large Asian river systems – the **Amu Darya, Indus, Ganges, Brahmaputra (Yarlungtsanpo), Irrawaddy, Salween (Nu), Mekong (Lancang), Yangtse (Jinsha), Yellow River (Huanghe), and Tarim (Dayan)**

- **India's area:** Entire territory of 11 mountain states **(Assam, Uttarakhand, Himachal Pradesh, Manipur, Jammu & Kashmir (Indian administered area), Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Arunachal Pradesh), & Darjeeling district of West Bengal state.**

Implications

- **Water Security:** Melting snow contributes significantly to pre-monsoon river flows. Lower snowfall disrupts agriculture, hydropower, and drinking water supply in Himalayan foothill regions. Greater reliance on groundwater raises concerns of aquifer depletion.

- **Food Security:** Upcoming harvests at risk, especially **rabi crops** like wheat. Drought and water stress may lead to crop failures, impacting food supply and rural livelihoods.

- Climate Change: Declining snowfall reflects climate-induced anomalies. ICIMOD warns of **"locked-in carbon emissions"** making such anomalies recurrent.

Required Measures

- **Regional Cooperation**: Rivers in the HKH region are transboundary, needing joint water governance mechanisms. ICIMOD calls for:
  - Improved water management
  - Drought preparedness
  - Early warning systems
  - Regional collaboration

FACT BOX

Cryosphere:

- The cryosphere refers to Earth's ice in all its forms.
- It includes snow on the ground; permafrost; lake and river ice; frozen ground and permafrost; Antarctic and Greenland Ice Sheets, ice caps, and glaciers; ice shelves and icebergs; sea ice

About International Centre for Integrated Mountain Development (ICIMOD)

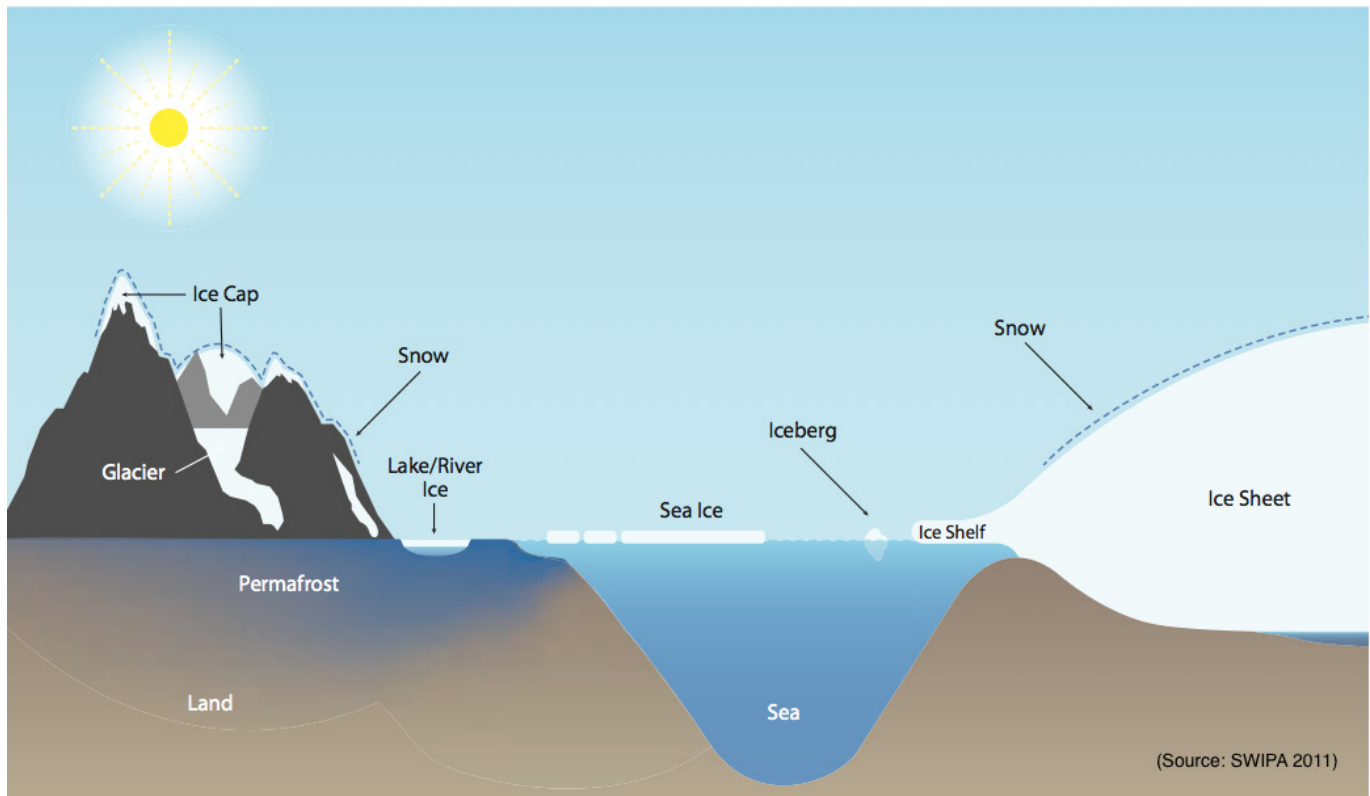- **Established in**: 1983
- **Based in**: Kathmandu, Nepal

Figure No. 10

- The International Centre for Integrated Mountain Development is a regional intergovernmental organization.
- It is working to make this critical region greener, more inclusive and climate resilient.
- **Eight regional member countries:** Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.

(Figure No. 10 above)

PAHALGAM TERROR ATTACK

Context

The **Pahalgam terror attack** on April 22, 2025, stands as one of the most devastating assaults on civilians in Jammu and Kashmir since the 2008 Mumbai attacks. This incident not only highlights the persistent security challenges in the region but also has significant implications for India's internal stability and its international relations. An outfit linked to the Lashkar-e-Taiba (LeT) known as The Resistance Front, has taken responsibility for the attack.

What does the attack show?

- **Pattern of 'Diplomatic Disruption':** The attack mirrors a longstanding pattern where high-profile terror strikes coincide with significant diplomatic events.
  - ➤ Clinton's visit in 2000 (Chittisinghpura massacre), or now with VP Vance in India and PM Modi abroad.

- ➤ The objective is to **internationalize the Kashmir dispute and embarrass Indian diplomacy**.
- **Pakistan's Doctrinal Continuity on Kashmir:** Statements like those of General Asim Munir labeling Kashmir as Pakistan's **"jugular vein"** reflect a consistent ideological position that fuels cross-border terrorism. Even without direct attribution, such rhetoric reinforces militant narratives and undercuts any peace prospects.
- **Challenge to Counterterrorism Diplomacy**: India's strategic outreach to West Asia, including enhanced security cooperation with Saudi Arabia and Gulf nations, is indirectly undermined by such incidents. These attacks seek to project India as an unstable partner in a region otherwise focused on economic and security cooperation frameworks.

Security Challenges in Post-370 Jammu & Kashmir

In 2019, the Indian government revoked Jammu and Kashmir's special autonomy under **Article 370** and split the region into two Union Territories: **Jammu and Kashmir, and Ladakh.**

- **Tourism as a Soft Target and Symbol of Normalcy:** The surge in tourism post-2019 (after Article 370 revocation) became a **key indicator of peace and socio-economic revival**. Attacks targeting tourists are intended to erode this perception of normalcy and deter civilian confidence, particularly from non-local visitors.
- **Revival of Civilian-Targeting Strategy**: Militant groups are reverting to high-visibility attacks on civilians rather than security forces, aiming to **maximize public fear**

and media traction. This is part of a broader asymmetric warfare strategy intended to destabilize economic confidence and local livelihood networks.

- **Security Apparatus Overstretch and Terrain Complexity**: The dispersed influx of civilians and the region's rugged topography present logistical challenges. While military infrastructure is well-established, civil tourist zones (like **Baisaran valley**) remain vulnerable due to limited real-time surveillance, inadequate manpower, and gaps in last-mile intelligence.

Partition of India (1947):

- India and Pakistan were created after British India's partition, with the princely states allowed to choose either of the two countries. Kashmir's Hindu ruler, **Maharaja Hari Singh**, chose to accede to India.
  - He signed the **Instrument of Accession** in October 1947, which led to the **first Indo-Pakistan war.**
- This territorial dispute has led to **multiple wars (1947, 1965)** and a **limited conflict (1999)** between the two nuclear-armed nations.
- **UN Intervention (1948)**: India took the Kashmir issue to the United Nations, which called for a ceasefire and a plebiscite to decide Kashmir's future.

UNSC Resolutions on Kashmir

- **Resolution 47 (1948)**: Called for a ceasefire and plebiscite for Kashmir's people to decide their future.
- **Resolutions 51, 80, and 91 (1950-1951)**: Reinforced the need for a plebiscite, which India has refused to implement.
- **Resolution 122 (1957)**: Declared any unilateral decision by India regarding Kashmir's status as invalid, further pushing for a plebiscite under UN supervision.

Indian Occupation and Military Presence

- **Military Deployment**: India has stationed over 500,000 soldiers in Kashmir, making it one of the most militarized zones in the world.
- **Legal Frameworks**: The **Armed Forces Special Powers Act (AFSPA)** and **Public Safety Act (PSA)** provide sweeping powers to Indian security forces, including immunity from prosecution.
- **Demographic Changes: Revocation of Article 370 (2019):** India revoked Jammu and Kashmir's special status under Article 370, allowing non-Kashmiris to settle in the region.

★ ★ ★ ★ ★

SECTION -B

QUICK BYTES

FOUNDING OF ROME

Context

April 21 is observed as the **traditional founding day of Rome**, one of the oldest continuously inhabited cities in the world. According to Roman legend, the city was founded on **April 21, 753 BCE** by **Romulus**, after killing his twin brother **Remus**. The date is still celebrated in Italy as **Natale di Roma** (Birthday of Rome).

About

- The city of **Rome** was founded on **April 21, 753 BCE**, according to Roman tradition.
- It was founded by twin brothers **Romulus and Remus**, sons of the god **Mars** and a mortal woman named **Rhea Silvia**.

Background:

- ➤ As per Roman mythology, **Romulus and Remus** were twin sons of **Mars**, the god of war, and **Rhea Silvia**, a vestal virgin and princess of **Alba Longa**, an ancient Latin settlement.
- ➤ The ruling king **Amulius**, fearing the twins as threats to his rule, ordered them to be drowned in the **Tiber River**. They survived and were nurtured by a **she-wolf**, later raised by a shepherd.
- ➤ After restoring their grandfather **Numitor** to the throne of Alba Longa, the twins set out to establish a new city.
- ➤ **Founding Conflict:** A dispute over the site of the new city led **Romulus to kill Remus**.
- ➤ Romulus established the city of **Rome**, naming it after himself, and became its first ruler.

- Rome eventually transformed into a **republic in 509 BCE**, later becoming the seat of the **Roman Empire**, influencing governance systems across Europe and beyond.

NEW EPIGRAPHIC DISCOVERIES BY ASI IN PUDUKKOTTAI

Context

The Archaeological Survey of India (ASI), through its Epigraphy Division, has recently documented rare temple inscriptions from Malayadipatti and Ponnamaravathi in the Pudukkottai district of Tamil Nadu. These inscriptions, some dating back to the Chola and Pandya periods, offer valuable insights into temple life, land administration, irrigation practices, and regional polity.

Key Findings from the Inscriptions

- **Malayadipatti Inscription – Irrigation and Land Administration (16th century):** The **partially damaged rock inscription** was found near **Kudambeeswarar Temple**, atop a hillock. It records a **land partition** agreement between the villages of **Sundara Chozhapuram and Sevvalur**.
  - ➤ The land division was meant for the **excavation of an oorani** (a traditional village pond or water reservoir).
  - ➤ This reflects the **local governance system**, **village-level cooperation**, and the **importance of water conservation** in agrarian Tamil society.
  - ➤ **Inscription near a** *Sunai* **(Natural Spring): This inscription r**efers to a **Pandya king**, **Raja Rajan Sundarapandyan**, and mentions **Udaiyan Perumal**, a local donor who helped develop the water body.

- ♦ It shows how **royalty and local citizens** collaborated in the construction of water structures.
- ♦ It highlights **public participation in temple-linked environmental activities**, typical of Tamilakam during medieval times.

⊙ **Ponnamaravathi – Chozheeswarar Temple Inscriptions:** One inscription from the **8th regnal year of Maravarman Kulasekara Pandyan** mentions the temple's name as **Chozheeswarar Udaiya Nayanar Temple**, falling under the **Uzhavalai Nadu** administrative unit.

  - ➤ It records a **donation of 40 panam** (currency) for the **lighting of five temple lamps**—evidence of **ritual continuity, patronage, and temple economy**.
  - ➤ Another inscription from the **6th regnal year of Raja Raja III (Chola period)** mentions the **jurisdiction of Rajendra Chola Vala Nadu**.
  - ➤ It details **ceremonial offerings**, including **rice, ghee, and milk**, reflecting the **ritual complexity** and **self-sustained ecosystems** around temples.

Chola Dynasty (9th-13th Centuary)

- ⊙ **Founded by:** Vijayalaya
- ⊙ The reign of the Cholas began in the 9th century when they defeated the Pallavas to come into power.
- ⊙ This rule stretched over for over five long centuries until the 13th century. This magnificence lasted until the arrival of the Pandyas in the early 13th century.
- ⊙ **Location:** Fertile Kaveri River delta (present-day Indian state of Tamil Nadu)
- ⊙ Reach: The Chola Dynasty, at its height in the eleventh century, ruled much of south India and as far as Sri Lanka and the Maldive Islands. Diplomatic missions reached Burma (Myanmar), Malaysia, and China.

Pandya Dynasty

- ⊙ The **Pandyas** were one of the **three ancient Tamil kingdoms** (with Cholas and Cheras), known collectively as the **Muvendar**. Their capital was **Madurai**, and their port **Korkai** facilitated trade with the **Graeco-Roman world**.
- ⊙ **Phases of the Pandya Dynasty**
  - ➤ **Early Pandyas (4th century BCE – 3rd century CE)**
    - ♦ Mentioned in **Sangam literature**: Purananuru, Akananuru, Mathuraikkanci.
    - ♦ Known for **maritime trade** with the **Roman Empire** (Pliny, Strabo, Periplus).
    - ♦ Promoted **Tamil literature, classical music, dance, and Shaivism**.
    - ♦ Capital: **Madurai**.
    - ♦ Declined due to pressure from Cholas, Cheras, and internal weakness.

  - ➤ **Medieval Pandyas (6th century CE – 14th century CE)**
    - ♦ Rise marked by revival under **Kadungon**, who expelled the Kalabhras.
    - ♦ **Major rulers**:
      - • **Maravarman Avani Culamani** – Patron of Tamil revival.
      - • **Varagunavarman I** – Patron of Sanskrit and Tamil.
    - ♦ Conflict and rivalry with Cholas, Cheras, Pallavas.
    - ♦ Significant territorial control across **Tamil Nadu and parts of Kerala**.
    - ♦ Strong support for **Tamil poetry, architecture**, and **temple patronage**.
  - ➤ Later Pandyas (14th – 16th century CE)
    - ♦ Notable rulers:
      - • **Jatavarman Sundara Pandyan** – Strong resurgence.
      - • **Maravarman Kulasekara Pandyan** – Expanded influence.
      - • **Jatavarman Veerapandiyan** – Fought against Alauddin Khilji.
    - ♦ Decline began due to **Delhi Sultanate invasions** and ended with defeat by the **Vijayanagara Empire**.
  - ➤ **Administration of the Pandyas: It was d**ecentralized; regions ruled by **Palaiyakkarar (Poligars)**. Important officials:
    - ♦ **Yuvaraja** – Heir and administrator.
    - ♦ **Manradiar** – Chief Minister.
    - ♦ **Amatya** – Finance.
    - ♦ **Duta** – Diplomacy.
    - ♦ **Maha Samanta** – Military commander.
    - ♦ **Velir** – Nobility.
- ⊙ **Revenue**: Based on land tax and trade levies.
- ⊙ **Justice**: Courts were led by **Nyayakarars**, based on **Dharmashastras**.
- • **Architecture and Cultural Contributions:** They followed **Dravidian architectural style**:
  - ➤ **Gopurams** (temple towers), **mandapas**, and **sculpted pillars**.
    - ♦ Examples: **Meenakshi Temple, Kallalagar Temple, Alagar Koyil**.
    - ♦ They built **rock-cut cave temples** and **temple tanks** and encouraged both **Shaivism and Vaishnavism**.
- ⊙ **Decline of the Pandya Dynasty**
  - ➤ **Internal reasons**: Dynastic disputes, weak rulers, factionalism.

> ➤ **External pressures**: Defeats by **Cholas**, **Hoysalas**, **Delhi Sultanate**. Final blow by **Vijayanagara rulers** in 16th century.
>
> ➤ Later periods saw gradual absorption into **colonial and regional empires**.

VILLAGE-LEVEL SURVEY OF ANTIQUITIES

Context

Karnataka is set to become **India's first state to complete a village-level survey of antiquities**, as announced during the **World Heritage Day**.

About Heritage Survey

- ◎ Karnataka has launched a **village-level antiquities survey** across the state. It is a first-of-its-kind survey.
- ◎ This is being done by the **Department of Archaeology, Museums and Heritage**
- ◎ The aim is to **document all antiquities** in villages — including:

Key-Initiatives to protect Heritage Sites

- ◎ Adopt a Heritage' Scheme
- ◎ National Mission on Monuments and Antiquities (NMMA)
- ◎ Must See Portal

> ➤ **Inscriptions**
> ➤ **Sculptures**
> ➤ **Monuments**

- ◎ Karnataka has completed the documentation in 119 taluks, aiming to cover the rest by end of FY 2024–25.
- ◎ Every antiquity is being geo-tagged, which will create a spatial database for better protection and policy planning.
- ◎ Once completed, it will serve as a template for other states to digitally preserve and manage their heritage.
- ◎ **Scope of Karnataka's Monuments:** The state has:
  > ➤ Over **800 monuments protected by the State Government**
  > ➤ More than **600 protected by the Archaeological Survey of India (ASI)**

KAILASH MANSAROVAR YATRA

Context

The Ministry of External Affairs (MEA) of India has announced that the Kailash Mansarovar Yatra will resume in 2025, after a four-year suspension. The Yatra was halted in 2020, initially due to the COVID-19 pandemic, but later extended due to serious border tensions between the two countries — especially after the deadly Galwan Valley clash in June 2020.

What is the Kailash Mansarovar Yatra?

- ◎ The **Kailash Mansarovar Yatra** is a **spiritual pilgrimage** undertaken by people of **multiple faiths** — primarily **Hindus**, but also **Buddhists**, **Jains**, and followers of the **Tibetan Bon tradition**.
- ◎ It involves traveling to two sacred sites in **Tibet's Ngari Prefecture** (now part of the **Tibet Autonomous Region, China**):
  > ➤ **Mount Kailash (6,638 meters):** Mount Kailash is considered the celestial home of Lord Shiva and Goddess Parvati. It is believed that Lord Shiva meditates on the mountain's summit.

Figure No. 01

- ♦ **Height:** 21,778 feet (6,714 meters), located in Tibet at the center of the Himalayas.
- ♦ **Significance for different religion:**
  - • **Buddhism**: Mount Kailash is revered as the home of the **Buddha Demchok**.
  - • **Jainism**: Mount Kailash is considered the site of spiritual enlightenment for **Rishabhanatha, the first Tirthankara (spiritual leader).**
  - ♦ The mountain is also described as the cosmic axis (or **Mount Meru**) connecting heaven and earth in Tibetan Buddhism.
- ➤ **Lake Mansarovar (4,600 meters):** It is a sacred lake situated at the foot of Mount Kailash, it holds a special place in Hinduism, Buddhism, and Jainism. According to Hindu belief, the lake was first visualized by **Lord Brahma** and later materialized on Earth.
  - ♦ It is said that **Goddess Sati's hands** fell near the lake, making it one of her **51 Shaktipeeths (sacred spots).**
- ◉ Pilgrims not only visit the lake but also undertake a **'parikrama' (circumambulation)** of Mount Kailash, a deeply symbolic act believed to wash away sins and bring blessings.
- ◉ **Key-Routes:** There are **three main routes** used by Indian pilgrims:
  - ➤ **Lipulekh Pass Route** (via Uttarakhand): It is the shortest path to Tibet border. It requires **around 200 km of high-altitude trekking**. It is the most traditional route (operational since the 1980s).
  - ➤ **Nathu La Route** (via Sikkim): Fully **motorable till the lake** (only trekking required for Mount Kailash circuit). **It is longer route**, but physically easier. It opened in 2015 for pilgrims who may not be fit for trekking.
  - ➤ **Nepal Route** (via Kathmandu or Nepalgunj): It is operated by **private tour operators**. Often **more expensive**, and subject to **Chinese visa and permit rules**. Sometimes includes **aerial 'darshan' flights** for those unable to travel by land.

THREE-LANGUAGE FORMULA IN MAHARASHTRA

Context

The Government of Maharashtra recently approved a plan to implement the Three-Language Formula in schools, making Hindi a compulsory third language from Classes 1 to 5, starting from the next academic year.

While this is part of the broader implementation of the National Education Policy (NEP) 2020, it has sparked strong reactions in the state, especially from language and identity-based groups.

What is the Three-Language Formula?

- ◉ The **Three-Language Formula** was introduced by the **Kothari Commission (1964–66)** and later adopted in **National Policies on Education (1968, 1986, 1992, and 2020)**.

- ◉ As per the formula:
  - ➤ **First language**: Mother tongue or regional language (e.g. Marathi in Maharashtra)
  - ➤ **Second language**: English or Hindi (depending on region)
  - ➤ **Third language**: Hindi or another modern Indian language not already studied
- ◉ The **aim** is to **promote multilingualism**, **national integration**, and **language equity**, while ensuring students learn both their **regional language and one link language** (usually Hindi or English).

Why is there opposition?

The issue has become sensitive due to concerns about **language imposition**, **regional identity**, and **autonomy of states** in education:

- ◉ **Marathi identity concerns:** Maharashtra has a long-standing tradition of asserting and preserving the Marathi language and culture. There is fear that mandating Hindi may dilute Marathi linguistic space, especially in urban areas like Mumbai.
- ◉ **Federalism and state rights**: Education is on the **Concurrent List of the Constitution**, but many believe that language policy in schools should be the **state's prerogative**.
- ◉ **Demographic diversity**: Unlike some southern states, Maharashtra has a **sizeable Hindi-speaking population**, especially in Vidarbha, Marathwada, and parts of Mumbai. However, historical movements for a separate Marathi-speaking state (**Samyukta Maharashtra Movement**) have created a strong **sentiment for language-based self-assertion.**
  - ➤ **Samyukta Maharashtra Movement** was led to creation of the Marathi-speaking state of Maharashtra in 1960. It was rooted in the demand for a linguistically unified state with Mumbai as capital.

NATIONAL CIVIL SERVICES DAY

Context

Every year on **April 21**, India observes **National Civil Services Day** to recognize the **contributions and commitment** of civil servants. The day acknowledge their role in **nation-building** and ensuring the **smooth functioning of administration**

Historical Background

- ◉ The date April 21 holds **historical significance**:
- ◉ On **April 21, 1947**, **Sardar Vallabhbhai Patel**, India's first Home Minister, addressed the first batch of **Administrative Services Officers** at **Metcalfe House, Delhi**.
- ◉ In this speech, he called civil servants the **"steel frame of India"**, symbolizing their foundational role in holding the country's administration together.
- ◉ **Sardar Patel laid down core values for civil servants:**
  - ➤ **Discipline** and **team spirit** (esprit de corps)

➤ **Integrity and incorruptibility**

➤ **Political neutrality** — civil servants must **not engage in politics or communal issues**

➤ Uphold the **dignity** of the service and the **public trust**

◎ These ideals are still taught and emphasized in civil services training today.

◎ This national observance was first marked on April 21, 2006. This year (2025) marks the 17th Civil Services Day.

Role of Civil Servants

◎ Civil Services forms a **basis of Government** without which there is no administration.

◎ Civil Services are the permanent executive branch of the Government of India. They implement policies and deliver public services. The three main All-India Services are:

➤ Indian Administrative Service (IAS)

➤ Indian Police Service (IPS)

➤ Indian Forest Service (IFS)

◎ There are also Central Services like IRS (Income Tax/Customs), IFS (Foreign), etc. They are recruited through the UPSC Civil Services Examination.

◎ Civil servants are officials in the **executive wing** and are essential for the functioning of government. It is the body of government officials who are employed in civil occupations.

➤ They act as the main channel to articulate people's needs and implement government policies on the ground.

➤ They provide the necessary inputs, identify policy areas, analyse various alternatives, offer multiple solutions to societal issues and give robust advice to the ministers, policy makers and legislators.

◎ *Article 311* of the Constitution provides **safeguards to civil servants** against arbitrary dismissal. Only the **President of India** can officially dismiss IAS, IPS, or IFS officers.

◎ **Functions and Responsibilities:** Civil servants play multiple roles:

➤ **Policy formulation** through research and analysis

➤ **Advisory role** to ministers with impartial and expert inputs

➤ **Execution of welfare schemes** and government programs

➤ **Crisis response** (disasters, pandemics, conflicts)

➤ **Maintaining law and order**

➤ **Revenue collection** and regulatory compliance

◎ Their work impacts the daily lives of millions, from issuing ration cards to disaster relief, from building roads to managing elections.

◎ **Challenge of Corruption and Accountability**

➤ However, one of the major challenges civil services face today is **corruption**—both in perception and in reality. From **bribes** to **misuse of funds**, instances of corruption reduce public trust and affect policy outcomes.

➤ But it's important to remember:

➤ Even **strong laws are ineffective** if administered by unprincipled civil servants

➤ On the other hand, **dedicated officers** can overcome systemic flaws to ensure effective governance

➤ This is why **ethics, training, vigilance, and transparency** are essential for maintaining trust in the civil services.

Initiatives taken to enhance the efficiency, accountability and responsiveness of the Civil Services

◎ **Enhancing Efficiency:** The Government has undertaken the '**Initiative for Increasing Efficiency in Decision Making in Government**' in alignment with the policy of '**Minimum Government, Maximum Governance**'.

◎ **Mission Karmayogi** is an initiative of the central government to enhance the attitudes, skills and knowledge of the Government employees.

◎ **IGOT Karmayog**: A key feature of the Mission Karmayogi, is the digital learning platform – IGOT Karmayogi. It provides more than 1500 courses to help civil servants upgrade their skills in governance, policy implementation, and technology.

MANIPUR'S ETHNIC CONFLICT

Context

The **Indigenous Tribal Leaders' Forum (ITLF)** — a major organisation representing the **Kuki-Zo tribal communities** in Manipur — has announced that **May 3 will be observed annually as 'Separation Day'**. This is to mark what they call **"two years of total separation" from the Meitei community**, following a violent ethnic conflict that began on May 3, 2023.

About Manipur's Ethnic Conflict

◎ **Ethnic Composition of Manipur**: Manipur is home to multiple ethnic groups:

➤ **Meiteis**: Mostly reside in the **Imphal Valley**, form a majority (~53% of the population), and are predominantly Hindu.

♦ **Kuki-Zo and Naga Tribals**: Mostly live in the **hill districts**, are Christian by faith, and have **Scheduled Tribe (ST) status**.

◎ **Triggering Incident (ST Demand by Meiteis)**

➤ The conflict began when the Meitei community demanded **Scheduled Tribe status**, citing historical disadvantages.

➤ This was **opposed by tribal communities**, who feared that Meiteis — with political dominance and access to the Valley — would gain land rights in the hills, threatening tribal autonomy and land security.
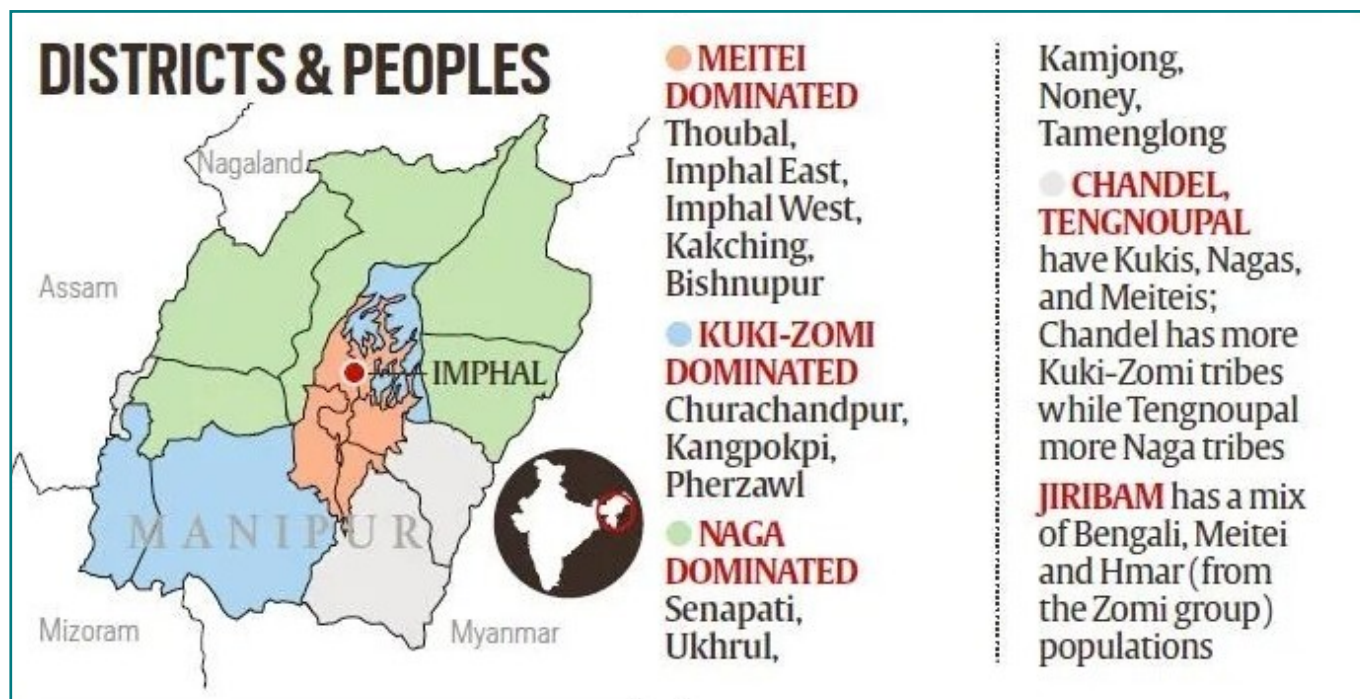
Figure No. 02

➤ A tribal solidarity march organized on May 3, 2023, in protest against this demand led to clashes that soon spiraled into widespread violence, arson, killings, and forced displacements.

◉ **Territorial Division:** Since the outbreak of violence, Meitei and Kuki-Zo populations have remained physically separated. The **ITLF's term "total separation"** reflects this de facto partition, where:

➤ Meiteis avoid hill areas.

➤ Kukis avoid the Valley.

◉ The idea of 'Separation Day' reflects a symbolic hardening of this division.

DEEMED-TO-BE UNIVERSITY

Context

The **Film and Television Institute of India (FTII), Pune** and the **Satyajit Ray Film and Television Institute (SRFTI),** **Kolkata),** two of India's premier institutions for film and media education, have now been granted the status of **"Institutions Deemed to be Universities"** under the **distinct category** by the **Ministry of Education,** based on recommendations by the **University Grants Commission (UGC).** They are now recognised under **Section 3 of the UGC Act, 1956**, which provides the legal framework for Deemed University status.

What is a Deemed-to-be University?

◉ In India's higher education system, **Deemed-to-be University** is a special recognition given to **high-performing institutions** that may not be established through legislation (like Central or State Universities), but have achieved a level of academic and research excellence in a specific domain.

◉ The term "Deemed-to-be University" means that the institution is **considered at par with a university** and enjoys full **academic autonomy**.

Feature	Central University	State University	Deemed-to-be University
Established By	Act of Parliament	State Legislature	Ministry of Education (on UGC advice)
Funding	Central Government	State Government	Autonomous (Govt + Own funds)
Academic Autonomy	High	Moderate	Very High
Degree-Granting Power	Yes	Yes	Yes (if approved)
Examples	JNU, DU	Mumbai University, Osmania University	BITS Pilani, IISc, FTII (now)

Table No. 01

Key features of a Deemed-to-be University:

- **Can design their own syllabus and courses** tailored to their academic focus
- **Conduct their own admissions and examinations**
- **May grant degrees** (if permitted by the UGC)
- **Greater flexibility in curriculum innovation and research**
- Must **comply with UGC regulations and NEP 2020 guidelines**

How is this different from Central or State Universities?

(See Table No. 01 previous page)

JUDICIAL REVIEW AND JUDICIAL ACTIVISM

Context

In recent times, several Supreme Court judgments—especially on **Article 370, Article 142, and the powers of Governors**—have sparked debates over judicial overreach and the balance of power among the constitutional organs. Critics argue the judiciary is encroaching upon executive and legislative functions, raising concerns over whether India is witnessing *judicial despotism*.

What is the issue?

- India is governed by a written Constitution, where powers are divided among three key organs—**Legislature, Executive, and Judiciary**. Ideally, these organs should function independently while maintaining a healthy balance.
- But in recent times, **questions are being raised about whether the judiciary—especially the Supreme Court—is overstepping its limits**, thus disturbing this balance.
- Terms like **"judicial overreach," "judicial activism," and even "judicial despotism"** are being used to describe the court's interventions in matters typically under the domain of the executive or legislature.

What is Judicial Review and Judicial Activism?

- **Judicial Review** is the power of the **constitutional courts (High Courts and Supreme Court)** to examine the legality or constitutionality of legislative and executive actions.
  - Though the phrase is not explicitly mentioned in the Constitution, **Article 13** empowers courts to declare any law violating Fundamental Rights as void.
- **Judicial Activism**, on the other hand, refers to a **more proactive role taken by the judiciary**, sometimes stepping into governance-related areas, especially when the legislature or executive fails to act.

- It became prominent during the post-Emergency era when the Supreme Court liberalised **locus standi** rules and developed **Public Interest Litigation (PIL)** to make justice more accessible.

ARTICLE 142

Context

In a landmark judgement, in *State of Tamil Nadu v The Governor of Tamil Nadu*, the Supreme Court invoked Article 142 of the Constitution to grant *deemed assent* to ten bills that had been pending with the Governor without action, reigniting the debate over the scope and limits of judicial powers under Article 142.

What is Article 142?

- Article 142(1) empowers the Supreme Court to **"pass such decree or make such order as is necessary for doing complete justice in any cause or matter pending before it."**
- It is often considered a **residual power**, to be used when no other provision in law provides an adequate remedy.
- The power is discretionary and **not meant to override or replace existing laws**, but rather to **supplement them in exceptional circumstances**.

Precedents Supporting Article 142

- In **A.G. Perarivalan v State of Tamil Nadu (2023),** the Court used Article 142 to override gubernatorial delays in a remission matter.
- In **Savelife Foundation (2016),** Article 142 was used to enforce road safety guidelines in absence of enabling legislation.
- In **Samaj Parivartana Samudaya (2013),** the Court cancelled illegal mining leases using Article 142, as statutory remedies were inadequate.
- **Court's Own Constraints on Article 142**
  - In **Supreme Court Bar Association v Union of India (1998)**, the Court held that Article 142 may **supplement, but not supplant** substantive law.
  - In **Shilpa Sailesh (2023),** the Court stated that Article 142 must be used **in accordance with fundamental public policy**, such as secularism, federalism, and fundamental rights.

Cases Where Article 142 Was Refused

- *Jomon K.K. v Shajimon P. (2025):* The Court declined relief under Article 142 where the appellant lacked required qualifications.
- *Ashok Sadarangani v Union of India (2012):* The Court refused to interfere in a criminal matter where property rights were unclear.
- *Pravasi Bhalai Sangathan (2014):* The Court denied directions against hate speech due to enforcement limitations.

ISRO SATELLITES FORECAST WHEAT PRODUCTION

Context

The **Indian Space Research Organisation (ISRO)** has used **satellite technology** to forecast that **India's wheat production** from its eight major wheat-growing states will be around **122.724 million tonnes** for the **2024–25 Rabi season**. This marks a growing use of **remote sensing in agriculture monitoring** — a crucial step in **tech-driven precision farming and food security planning**.

What did ISRO do?

- ISRO's **National Remote Sensing Centre (NRSC)** used a system called **CROP – Comprehensive Remote Sensing Observation on Crop Progress.**
- This is a **semi-automated and scalable satellite monitoring framework** that:
  - Tracks **crop sowing, growth, and harvesting** in near real-time.
  - Uses data from Indian satellites like:
    - **EOS-04 (RISAT-1A)** – for Synthetic Aperture Radar (can penetrate clouds).
    - **EOS-06 (Oceansat-3)** – mainly for atmospheric and coastal data.
    - **Resourcesat-2A** – for high-resolution land use and crop mapping.
- By combining data from these satellites, ISRO:
  - Mapped wheat crop area across states.
- Monitored crop health using **optical and radar images**.
- Estimated sowing progress and growth status during the Rabi season.
- Used **crop simulation models** (mathematical models that mimic how crops grow under certain weather and soil conditions) to forecast production.

Key Findings by ISRO (as of March 31, 2025)

- **Wheat sown area**: **330.8 lakh hectares** (satellite data). Very close to the figure from the **Ministry of Agriculture** (324.38 lakh hectares as of Feb 2025).
- **Estimated wheat production** in **eight major wheat-growing states**: **122.724 million tonnes**.
- These 8 states are: **Uttar Pradesh**, **Madhya Pradesh**, **Rajasthan**, **Punjab**, **Haryana**, **Bihar**, **Gujarat**, **Maharashtra**. These states account for **almost the entire wheat output** of the country.

Wheat in India's Agriculture

- Wheat is one of India's **main staple food crops**, next only to rice. Wheat is a **Rabi crop.**
- It is a **Rabi (winter) crop** — sown from **October to December** and harvested from **March to May**.

- It requires **cool weather during growth** and **warm, dry weather at harvest time**.
- It needs **moderate irrigation** and **well-drained loamy soil**.
- **India's Wheat Production Profile:**
  - India is the **second-largest wheat producer in the world**, after China.
  - **Uttar Pradesh** is the top wheat-producing state, followed by **Madhya Pradesh, Punjab, and Haryana**.
  - On average, India produces **around 110–115 million tonnes of wheat** annually (increasing over the years).

Indian Wheat Growing Zones:

The entire wheat growing areas of the country has been categorized into 6 major zones as follows:

Zones	States/Regions Covered
Northern Hill Zone(NHZ)	Hilly areas of J&K (except Jammu, Kathua and Samba districts), Himachal Pradesh (except Una & Paonta valley), Uttarakhand (excluding Tarai region) & Sikkim
North Western Plains Zone(NWPZ)	Punjab, Haryana, Western UP (except Jhansi Div), Rajasthan (excluding Kota & Udaipur div), Delhi, Tarai region of Uttarakhand, Una & Paonta valley of HP, Jammu, Samba & Kathua districts of J&K and Chandigarh.
North Eastern Plains Zone(NEPZ)	Eastern UP (28 dist), Bihar, Jharkhand, West Bengal, Assam, Odisha and other NE states (except Sikkim)
Central Zone	MP, Gujarat, Chattisgarh, Kota & Udaipur Div of Rajasthan & Jhansi Div of UP.
Peninsular Zone	Maharashtra, Tamil Nadu (except Nilgiris & Palani Hills), Karnataka & Andhra Pradesh
Southern Hill Zone(SHZ)	Nilgiris & Palani Hills of Tamil Nadu

SECTION 80C OF THE INCOME TAX ACT

Context

After the changes announced in the **Union Budgets of 2023 and 2024,** the government has tried to encourage

more people to shift to the **new tax regime**. The new tax regime offers **lower tax rates** but removes most deductions and exemptions, including **Section 80C.** This has led to a debate on whether investments under 80C are still relevant.

What is Section 80C?

- Section 80C of the Income Tax Act is one of the most widely used sections for tax-saving in India.

- It allows taxpayers to reduce their taxable income by up to **one lakh fifty thousand rupees** every financial year if they invest or spend in certain specified instruments.

Key 80C options

> **Employee Provident Fund (EPF) and Public Provident Fund (PPF):** EPF is compulsory for salaried employees in many cases and helps in retirement planning. PPF is a government-backed scheme with tax-free returns and is considered very safe. These options are still useful even without tax benefits because they promote saving and long-term planning.

- **Equity Linked Saving Schemes (ELSS):** ELSS is a type of mutual fund that invests in equities and has a three-year lock-in. Earlier, many people chose ELSS mainly for tax-saving. Now, with no tax benefit in the new regime, you can choose from a wide variety of equity mutual funds based on your goals.

- **Life Insurance**: A pure term insurance plan gives a large cover at a low cost. This is useful for people with dependents.

- **Small Savings Schemes**: These include options like **Sukanya Samriddhi Yojana, Senior Citizen Savings Scheme, and National Savings Certificate**. These are safe and backed by the government.

- **Tax-saving Fixed Deposits**: These are five-year fixed deposits offered by banks that were earlier used mainly for tax-saving. They can still be considered if they offer better returns than normal FDs and you are comfortable locking in your money.

- This deduction is available only under the **old tax regime**. It is **not allowed under the new tax regime**.

Old Tax Regime vs New Tax Regime

Old Regime	New Regime
- Higher tax rates - Deductions and exemptions like HRA, LTA, 80C, 80D are allowed	- Lower tax rates - No major deductions allowed, including 80C - Default option for all taxpayers from financial year 2023-24 onwards - Suitable for people who do not have many investments or deductions

- People who have large deductions may still benefit more under this system	Because 80C is not allowed in the new tax regime, people who choose it do not get tax benefits from these investments anymore.

UNDERTAKINGS FOR COLLECTIVE INVESTMENT IN TRANSFERABLE SECURITIES (UCITS)

Context

For Indian investors eyeing opportunities beyond domestic borders, a sophisticated investment route is worth a closer look—UCITS, or Undertakings for Collective Investment in Transferable Securities.

About

- The **Undertakings for the Collective Investment in Transferable Securities (UCITS)** is the European Commission's regulatory framework for managing and selling mutual funds.

- UCITS funds can be registered and sold in any country in the European Union using unified regulatory and investor protection requirements.

- A UCITS is similar to a **mutual fund**. They are registered in countries that belong to the European Union and regulated by the member states where they are registered.

- With **built-in tax** advantages and seamless global access, they offer a compelling alterative to direct US holdings.

- They offer a **tax-efficient, transparent and liquid** pathway to global markets.

FACT BOX

Mutual Funds

- Mutual Funds mainly work by pooling investors' money in a diversified portfolio of stocks, bonds, or other assets.

- A **fund manager** oversees and controls the portfolio, making decisions on asset allocation based on the fund's strategy.

- The fees charged by mutual funds are regulated and are subject to certain limits specified by the **Securities and Exchange Board of India (SEBI)**.

- Types of Mutual Funds

> **Equity Funds**: They are investments in companies' stocks, focusing on capital appreciation over the long term.

- **Debt Funds:** They primarily invest in **fixed-income securities** like bonds, which offer stable returns and lower risk.

- **Money Market Funds**: They invest in **short-term debt instruments**, such as **treasury bills and commercial paper**, offering modest returns and low risk.

- **Hybrid Funds**: Hybrid funds are investments of **equities and debt securities** in a mixed format, having a balance of risk and returns.

- **Growth Funds**: Growth funds are investments that emphasise the investment plan with a company with higher potential returns and are in upward trends.

  - **Aggressive Growth Funds:** They seek **maximum capital appreciation** by investing in high-risk assets like small-cap stocks. They are perfect for those who can tolerate higher risk.

  - **Income Funds**: Income funds primarily invest in **fixed-income securities** that provide regular income through interest payments for those looking for steady income.

- **Liquid Funds**: Liquid funds invest in **short-term, highly liquid instruments**, which gives easy access to funds and has less risk.

- **Tax-saving Funds**: Tax-saving funds, such as ELSS, offer tax benefits under **Section 80C** while investing primarily in equities, combining tax savings with potential capital.

- **Capital Protection Funds**: They aim to protect investors' capital while offering modest returns by investing in a mix of debt and equity securities.

- **Fixed Maturity Funds**: They invest in debt securities with fixed maturity times and give investors an idea of returns over a specific time frame.

- **Pension Funds:** They are mainly used to build a retirement corpus by investing in a mix of equities and debt instruments. They hold long-term growth potential with a lock period.

Modes of Investing in Mutual Funds

- ➤ Lump Sum Investment
- ➤ Systematic Investment Plan (SIP)

  (Table No. 02 given below)

LIQUIDITY COVERAGE RATIO (LCR)

Context

The RBI's recent circular on the **Liquidity Coverage Ratio (LCR)** aims to improve banks' liquidity resilience while providing them with more resources for lending. By reducing run-off rates on certain deposits, the circular enhances credit growth potential and aligns with global standards, effective from April 2026.

About Liquidity Coverage Ratio (LCR):

- The **Liquidity Coverage Ratio (LCR)** is a measure designed to ensure that banks have enough liquidity to meet short-term obligations in times of financial stress.

- It requires banks to hold an adequate amount of **high-quality liquid assets (HQLAs)** that can easily be converted into cash if needed.

- In simpler terms, LCR is about ensuring that banks can survive a period of financial turmoil lasting for **30 days**, without running out of cash or selling off assets at a loss.

  - ➤ **HQLA** are assets that are easily liquidated without losing value. These include assets like **government bonds**, **Treasury bills**, and **state development loans**.

  - ➤ Under the **Basel III** standards, the global banking community was required to maintain an **LCR of at least 100%**. This means banks should have HQLAs worth at least as much as their expected cash outflows during a 30-day stress scenario.

Feature	UCITS	Indian Mutual Funds
Regulatory Body	European Commission / EU regulators	SEBI
Global Access	Direct exposure to global markets	Limited (some international fund-of-funds)
Tax Efficiency	Generally more efficient in international taxation	Subject to Indian capital gains tax
Transparency & Protection	High, standardized across EU	High, but restricted to domestic norms
Liquidity	Daily or bi-weekly redemption	Daily redemption
Diversification	Access to global equities/debt	Mostly Indian market focused

Table No. 02

Key-Concepts

Run-off Rate:

➤ The **run-off rate** refers to the **percentage of deposits** that a bank anticipates could be withdrawn (or transferred) during a **stressful situation**. When there is financial uncertainty or market turmoil, depositors may want to pull their money out of the bank, which could lead to a **liquidity crisis**.

♦ The **run-off rate** determines how much of the bank's deposits it should consider as being "at risk" of being withdrawn. For instance, if a bank expects 10% of a certain type of deposit to be withdrawn during a stressful period, it assigns a **run-off rate of 10%** to that category of deposits.

♦ A **higher run-off rate** means the bank needs to hold more liquid assets to cover the potential outflow. Conversely, a **lower run-off rate** means the bank can hold less, freeing up more resources for lending or investment.

High-Quality Liquid Assets (HQLAs):

⊙ These are assets that are easily and quickly convertible into cash, without significant loss of value. **Examples include:**

➤ **Government bonds**

➤ **Treasury bills**

➤ **State development loans**

⊙ The key characteristic of HQLAs is that they are very safe and highly marketable, meaning that in times of financial stress, banks can sell them quickly to meet cash demands.

Basel III Framework:

⊙ The **Basel III** standards are global regulatory guidelines set by the **Basel Committee on Banking Supervision** to strengthen the regulation, supervision, and risk management within the banking sector.

⊙ Basel III aims to increase the **capital reserves** of banks, improve liquidity management, and reduce systemic risks.

MUMBAI INTERNATIONAL CRUISE TERMINAL

Context

In a significant step towards enhancing India's maritime infrastructure and cruise tourism potential, the Union Minister of Ports, Shipping and Waterways flagged off cruise operations from the newly inaugurated **Mumbai International Cruise Terminal (MICT)** at Ballard Pier. This development marks a major milestone under the Centre's ambitious **Cruise Bharat Mission**.

Key Features of MICT

⊙ **Mumbai International Cruise Terminal (MICT)** is capable of handling one million passengers annually

⊙ It is equipped to accommodate five cruise ships simultaneously

⊙ It spans 4.15 lakh sq ft, featuring 72 immigration counters

⊙ It is built with modern architectural elements reflecting Mumbai's coastal heritage, including a wavy ceiling, rose-gold accents, and wave-shaped seating

⊙ It is designed to meet international cruise standards, promoting ease of movement and better security.

Cruise Bharat Mission

⊙ **Launched in:** 2024

⊙ Cruise Bharat Mission aims to provide whole of government approach by involving various Central and State Government agencies to transform India into a major hub for cruise tourism.

⊙ India has significant capabilities in cruise tourism for coastal & river sector. This is due to the presence of:

➤ **12 Major and 200 Minor Ports** along the 7500 km long coastline across the west and east

➤ **Network of more than 20000 kilometres long navigable 110 waterways** connecting around 400 rivers.

➤ There are multiple states, union territories and 1300 islands in India which are along the coastline or along the banks of states and interstate rivers or national waterways.

The long-term objective is to develop:

SEGMENTS UNDER CRUISE TOURISM

1 **OCEAN CRUISES** (INTERNATIONAL CRUISES)

2 **COASTAL AND ISLAND SMALLER SHIPS AND LUXURY YACHTS CRUISES-** INCLUDING FOR EXPEDITION STYLE WITH DIVING ACTIVITIES (DOMESTIC & REGIONAL COVERING THE NEIGHBOURING COASTAL AND ISLAND COUNTRIES)

3 **NATIONAL WATERWAYS CRUISES** (INTERSTATE AND CROSS BORDER AND DAY CRUISES ACROSS RIVERS, LAKES, CANALS BACKWATERS, YACHTS & RESERVOIRS)

4 **ISLAND & COASTAL & RIVER BANK ASSETS** (LIGHTHOUSES SHIPPING MUSEUMS, SEA AND RIVER WATER FRONT & WALKWAYS)

➤ 10 sea cruise terminals and 100 river cruise terminals

➤ Generate over 4 lakh employment opportunities by 2029

➤ Integrate with **Sagarmala** and **PM Gati Shakti initiatives** for seamless multimodal connectivity

NON-TARIFF BARRIERS (NTBS)

Context

US Vice President JD Vance urged India to drop **non-tariff barriers**, give greater access to its markets. Indian products too face these issues in the international markets including in America, EU, China, Japan, and Korea.

What are non-tariff barriers (NTBs) in the international trade parlance?

◉ **Non-Tariff Barriers (NTBs)** are trade restrictions **that do not involve traditional taxes or tariffs** on imports and exports.

◉ These include **regulations, standards, procedures, certifications, quotas, import licensing, subsidies, testing requirements**, and more.

◉ NTBs arise when these rules **go beyond reasonable justification**—they may **discriminate against foreign goods**, create **delays**, or **raise costs** without clear health, safety, or environmental reasoning.

➤ **Example:** An Indian fruit exporter may be required by the EU to prove compliance with specific **pesticide residue standards** through costly lab tests. Even a small deviation or delay in paperwork can lead to shipment rejection.

◉ It is essential to **differentiate between non-tariff measures (NTMs) and NTBs.**

➤ Non-Tariff Measures (NTMs) are legitimate regulations for public health, safety, and environmental protection. NTM may be

♦ **"Technical" measures** like regulations, standards, testing, certification, pre-shipment inspection

♦ **"Non-Technical" measures** like quotas, import licensing, subsidies, government procurement restrictions, etc.

➤ NTBs are unreasonable or opaque versions of NTMs that appear to unfairly block trade.

WORLD EARTH DAY 2025

Context

Earth Day, celebrated every year on April 22, is one of the most widely observed global events focused on environmental protection and raising awareness about the growing threats to our planet. The theme for 2025 is "Our Power, Our Planet", and it highlights a crucial global priority: the transition to clean, renewable energy.

About Earth Day

◉ Earth Day was first celebrated in 1970 in the United States. The day is also known as **International Mother Earth Day.**

◉ The idea came from **Senator Gaylord Nelson** and was organized with the help of **Denis Hayes**, a young student activist.

➤ They chose April 22 as the date because it fell between Spring Break and final exams, helping to attract maximum participation from students.

◉ This year, Earth Day marks its 55th anniversary with global activations aimed at mobilising a billion people worldwide to take transformative action for our planet for a sustainable future.

◉ **India's Sustainable Policy Shifts**

➤ **COP26 and Panchamrit Goals**: India announced a five-point climate agenda at COP26, including net-zero emissions by 2070 and 50% renewable energy by 2030.

➤ **Solar and Electric Push**: With the **International Solar Alliance** and missions like **PM-KUSUM**, India is leading solar growth. **FAME and Indian Railways' net-zero target** by 2030 support clean mobility.

➤ **Conservation and Legal Progress**: Wildlife conservation efforts like **Project Tiger**, NCAP for air quality, and legal frameworks for e-waste and plastic management have strengthened ecological governance.

Key-Initiatives for Environment Conservation

◉ **Ek Ped Maa Ke Naam Campaign**: Launched on World Environment Day (5 June 2024)

◉ **Eco-mark Scheme (Revised):** New Eco-mark Rules notified in 2024. They are aligned with the 'LiFE' (Lifestyle for Environment) mission.

◉ **Climate Action and Net-Zero Targets**: India achieved a 33% reduction in emission intensity (2005–2019).

➤ As of Oct 2024, 46.52% of installed power capacity is non-fossil fuel based.

➤ Updated NDCs:

♦ 45% reduction in emission intensity by 2030.

♦ 50% installed capacity from non-fossil fuels by 2030.

➤ CCUS (Carbon Capture Utilisation and Storage) promoted for clean energy transition.

◉ **National Clean Air Programme (NCAP):** It covers 130 cities across 24 States/UTs.

➤ Goal: 40% PM reduction by 2025-26 (from 2017-18 levels).

◻ **Tiger Conservation and Wildlife Cooperation**

➤ 57 Tiger Reserves in India now.

- ♦ **New:** Guru Ghasidas-Tamo Pingla, Ratapani, Madhav NP.
  - ➤ **Total tiger reserve area:** 82,836.45 sq km (~2.5% of India's area).
- ▫ **Other key-schemes**
  - ➤ Circular Economy & Extended Producer Responsibility (EPR)
  - ➤ India Cooling Action Plan (ICAP)
  - ➤ MISHTI Scheme – Mangrove Restoration
  - ➤ Biological Diversity (Amendment) Act, 2023 in force from 1 April 2024.
  - ➤ India submitted National Biodiversity Targets and Action Plan under Kunming-Montreal Framework.
  - ➤ Biological Diversity Rules, 2024 notified on 22 Oct 2024.
    - ♦ Nagar Van Yojana (Urban Forestry)
    - ♦ Carbon Markets and National Carbon Credit Framework

MP TO DEVELOP BUFFER ZONES AROUND TIGER RESERVES

Context:

Madhya Pradesh, home to a significant tiger population, is focusing on strengthening its tiger conservation efforts. With the increasing tiger population in the buffer zones of its nine tiger reserves, the state government has approved the development of buffer zones to further protect tigers and their habitats.

Key Highlights:

- ◉ **Tiger Population Increase**: The tiger population in buffer zones of the State's nine tiger reserves has increased from **526 to 785** over four years.
- ◉ **Cabinet Approval**: The Madhya Pradesh Cabinet approved the **"Development of Buffer Zones in Tiger Reserves"** scheme with a **Rs 145 crore** budget for 2025-26 to 2027-28.
- ◉ **Key Activities Under the Scheme**:
  - ➤ **Chain-link Fencing** in ecologically sensitive buffer areas.
  - ➤ Development of **grasslands** and **water resources** to support wildlife.
  - ➤ **Wildlife protection** and **fire safety** measures.
  - ➤ **Health monitoring** and treatment for wild animals.
  - ➤ **Skill development** programs for local communities.
- ◉ **Overall Goal**: To protect tiger habitats, reduce human-wildlife conflict, and involve local communities in sustainable conservation practices.

- ◉ **Madhya Pradesh's Role in Tiger Conservation:** Madhya Pradesh, often referred to as the "Tiger State" of India, has consistently been a leader in tiger conservation.
  - ➤ The state is home to several well-known tiger reserves, including **Kanha**, **Bandhavgarh**, **Pench**, and **Satpura**, which are crucial to India's tiger population.
  - ➤ In March 2025, **Madhav National Park** was added as the **ninth tiger reserve** in the state, further reinforcing Madhya Pradesh's commitment to protecting this majestic species.

GANDHI SAGAR SANCTUARY WELCOMES FIRST CHEETAHS

Context

Two male cheetahs, named *Pawak* and *Prabhash*, were released into the **Gandhi Sagar Wildlife Sanctuary** in Madhya Pradesh's Mandsaur district. These cheetahs, aged around six years, had originally arrived from South Africa in 2023 and were kept at **Kuno National Park** before being relocated. With this move, **Gandhi Sagar has become the second location in India** (after Kuno) where cheetahs are being reintroduced under the ambitious **Project Cheetah**.

About Project Cheetah:

- ◉ **Project Cheetah** is India's plan to reintroduce cheetahs in the wild, after the species was declared **extinct in the country in 1952.**
- ◉ India is the **first country in the world** to relocate cheetahs from one continent to another for species revival.
- ◉ The project was launched in **2022**, when the first batch of cheetahs arrived from Namibia.
- ◉ It is being carried out by the **National Tiger Conservation Authority (NTCA)** in collaboration with wildlife institutions and international partners.
- ◉ The **main goal** is to restore the ecological role of the cheetah in India and promote biodiversity.
- ◉ Currently, **Kuno National Park** in Madhya Pradesh has around **26 cheetahs**, including adults and cubs.
  - ➤ However, several challenges have arisen at Kuno—**limited space**, **interactions with other predators**, and **some cheetah deaths** due to stress, infection, or climate factors.
  - ➤ This is why the government is looking to spread cheetahs across **multiple protected areas**, not just one.

Concerns

- ◉ **Mixing of Sub-species**: The cheetahs from South Africa and those possibly coming from Botswana or Kenya may be **different sub-species**.
  - ➤ International protocols (like from IUCN) advise **not to mix sub-species** in one habitat to preserve genetic purity and avoid complications.

◉ **Logistics and Habitat Suitability**: Relocating and adapting cheetahs to Indian conditions is complex. There are concerns over **space, climate, prey density**, and **long-term monitoring**.

◉ **Long-Term Viability**: For cheetahs to survive and breed naturally, multiple relocation sites and **genetic diversity** are required.

About Gandhi Sagar Wildlife Sanctuary

◉ Gandhi Sagar is a **wildlife sanctuary** located at eastern Madhya Pradesh.

◉ The forest of this sanctuary is part of **Khathiar-Gir dry deciduous forest**. Trees like Salai, Kardhai, Dhawda, Tendu, Palash etc, can be found here.

◉ It is part of World famous **Chaturbhuj Nala rock shelters**. It was notified in the year 1974 and added to the list of sanctuary in 1984.

◉ This sanctuary is spread over the area surrounding to **Gandhi Sagar dam backwater**.

◉ **Wildlife species**: Wild Dogs (Dholes), Chinkara, Leopard, Otter, Mugger crocodile, Spotted Deer, Sambar, Gray Langur etc.

About Kuno National Park:

◉ Kuno National Park is situated almost in the centre of Kuno Wildlife Division of Sheopur district and it is a part of the Central Indian Vindhyan Hills.

◉ Formerly a Wildlife Sanctuary, Kuno was declared a National Park in 2018.

◉ **Kuno River**, one of the major tributaries of **Chambal River** flows through the entire length bisecting the National Park division.

◉ **Flora:** Tropical dry deciduous forests mainly consist of Anogeissus pendula (Kardhai), Senegalia catechu (Khair) Boswellia serrata (Salai) and associated flora.

◉ **Fauna:** Indian Leopard, Indian Wolf, Golden Jackal, Sloth Bear, Indian Fox, Striped Hyena, Spotted Deer, Sambhar, Nilgai, Chousingha and Blackbuck.

◉ Kuno Park is known for the **leopard, Jackal, Chinkara**.

SIMILIPAL TIGER RESERVE

Context

A recent move by the Odisha government to **allot 100 acres of land for a private hotel project near the Similipal Tiger Reserve** has triggered strong opposition from local citizen groups and tribal communities. The land, located just **700 metres from the reserve's boundary** in **Laxmiposi village (Mayurbhanj district)**, lies within the **Eco-Sensitive Zone (ESZ)** of Similipal.

Concerns

◉ **Ecological Sensitivity:** The proposed land lies within the **Eco-Sensitive Zone (ESZ)** of Similipal Tiger Reserve. The area is a **wildlife corridor**, frequently visited by wild animals from the reserve.

◉ **Tribal livelihood:** Similipal's indigenous tribes — such as the **Ho, Santhal, and Munda** — rely on the forest for food, firewood, and medicinal plants. The area includes sacred groves, which are worshipped by the tribal communities and considered part of their customary religious practices.

◉ **Environmental Impact:** Clearing this land for tourism infrastructure may lead to deforestation, soil erosion, groundwater depletion, and fragmentation of wildlife habitats.

Similipal Tiger Reserve

◉ **Similipal Tiger Reserve** is one of India's earliest and most prestigious tiger conservation areas under **Project Tiger (1973)**.

◉ It is **Asia's second-largest biosphere reserve** and has been part of the **UNESCO World Network of Biosphere Reserves** since 2009.

◉ It is **the only place on Earth that shelters black (pseudo-melanistic) tigers** — extremely rare and unique to this landscape.

◉ **Eco-Sensitive Zones (ESZs)** are areas within 10 km of protected areas that are meant to act as buffer zones. Any construction here requires careful impact assessment.

PEROVSKITE SOLAR CELLS

Context

A new **environmentally friendly method** to recycle **perovskite solar cells** has been developed by scientists. Instead of using **toxic organic solvents**, which are harmful to both humans and the environment, they have now created a **water-based method** to recover and reuse the valuable components of these cells, especially **lead-containing perovskites**.

What is the New Breakthrough?

◉ Scientists have developed a **water-based recycling method** for perovskite solar cells that:

➤ **Avoids toxic solvents**

➤ **Recovers high-quality perovskite crystals**

➤ **Allows reusing other layers like electrodes and glass sheets**

◉ The solar cell has multiple layers — the **perovskite material, electrodes (often metal), and protective layers like glass**. The recycling method focuses on recovering **each layer**, especially the **lead-based perovskite layer**, in an eco-friendly way.

◉ **Recycling Chemistry:** To recover the perovskite layer using water, researchers added:

➤ **Sodium Acetate** – Helps bind lead into a water-soluble form (lead acetate).

➤ **Sodium Iodide** – Helps rebuild the perovskite structure by providing iodide ions.

➤ **Hypophosphorous Acid** – Stabilizes the water solution, so it can be reused and ensures high-quality crystal formation.
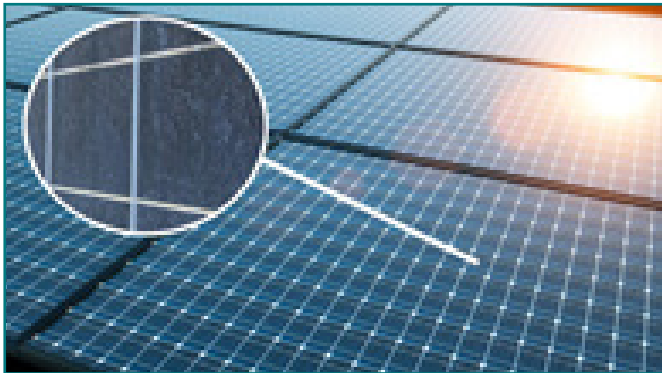

Figure No. 04

◉ Using this process, they were able to **regenerate high-purity perovskite crystals** and rebuild the solar cell, which still worked **with nearly the same efficiency as new** cells — even after five recycling cycles.

• This new method aligns with the idea of a **circular economy**:

◉ India is aiming for **500 GW of renewable energy capacity** by 2030. Perovskite solar technology, especially if made greener and cheaper, can play a big role.

What are Perovskite Solar Cells?

◉ **Perovskites** are a class of materials with a crystal structure that makes them ideal for capturing solar energy.

◉ In recent years, perovskite solar cells (PSCs) have gained popularity because:

➤ They are **cheaper to manufacture** than traditional silicon solar panels.

➤ They have **high efficiency** in converting sunlight into electricity.

➤ They can be **flexible and lightweight**, which makes them useful in newer applications like wearables or portable solar panels.

◉ But these benefits come with some **serious challenges**.

➤ **Toxicity of Lead:** Perovskite solar cells often use lead, a toxic heavy metal. This creates disposal and recycling issues once the panel reaches its end-of-life.

➤ **Shorter Lifespan:** Perovskites degrade faster than silicon, meaning they need to be replaced or recycled more frequently.

➤ **Existing Recycling is Harmful:** Until now, recycling these cells involved harmful organic solvents like **dimethylformamide (DMF)**, which are toxic and environmentally unsafe.
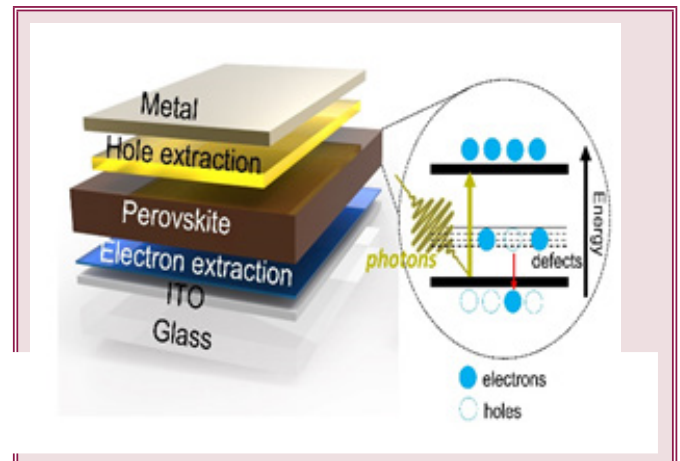
ANGSTROM-SCALE CHIPS

Context

Scientists from the **Indian Institute of Science (IISc)** has proposed a cutting-edge research initiative to **develop next-generation angstrom-scale semiconductor chips** — much smaller than current chips. The focus is on using **2D materials** (a new class of semiconductors) to replace silicon and push chip miniaturization beyond current limits.

What Are Angstrom-Scale Chips?

◉ An **angstrom (Å)** is **0.1 nanometers** (1 Å = 0.1 nm = 10^{-10} meters). It is one-tenth the thickness of today's chips.

◉ Current leading-edge chips are at **3 nanometer scale**, made by global tech giants like **Samsung, TSMC**, and **MediaTek**.

◉ Angstrom-scale chips aim to reduce this by **up to 10 times**, enabling **faster, smaller, and more energy-efficient electronics**.

◉ To achieve this, researchers must go beyond conventional silicon-based semiconductors. This is where **2D materials** such as **graphene and transition metal dichalcogenides (TMDs)** enter the picture. These extremely thin materials may be used to construct the next generation of high-performance, energy-efficient chips.

◉ This marks a **paradigm shift** in semiconductor engineering, as traditional silicon reaches its **physical limits of miniaturization**.

What Are 2D Materials?

◉ 2D materials are **ultra-thin layers** of material, typically just one atom thick.

◉ The most famous example is **graphene** (carbon atoms arranged in a honeycomb lattice), but many others exist — **molybdenum disulfide (MoS_2)**, **hexagonal boron nitride (h-BN)**, etc.

◉ These materials have **excellent electrical, thermal, and mechanical properties**.

- They are ideal candidates for **next-generation semiconductors** because they can:
  - Maintain conductivity at ultra-small thicknesses
  - Reduce heat loss
  - Enable **heterogeneous chip design** (integrating different materials on one chip)

India's Semiconductor Ecosystem:

- India launched the **Semicon India Programme** in 2021 with incentives to attract chip fabs.
- The largest approved fab is a Rs 91,000 crore Tata-PSMC (Taiwan) project in Gujarat.
- While manufacturing is one part, deep R&D in materials science and design (like IISc's project) is essential to move up the value chain.
- India must invest not just in chip factories, but also in intellectual property, innovation, and technology leadership.

QUANTUM GRAVITY GRADIOMETER PATHFINDER (QGGPF)

Context:

NASA's Jet Propulsion Laboratory (JPL) is preparing to launch a groundbreaking mission to test a new quantum gravity sensor from space. This mission, called the **Quantum Gravity Gradiometer Pathfinder (QGGPf)**, is designed to test how **quantum sensing technologies** can be used to detect gravitational anomalies with much higher precision than traditional methods.

About Quantum Gravity Gradiometer Pathfinder (QGGPf)

- The **Quantum Gravity Gradiometer Pathfinder (QGGPf)** will use **ultra-cold rubidium atoms** cooled to near absolute zero to measure tiny variations in gravity from space.
- It will be able to detect gravitational anomalies, which are variations in gravity caused by mass redistributions beneath the **Earth's surface**, such as changes in water reservoirs, underground geology, or even tectonic shifts.

How the Technology Works:

- The mission uses a technique called **atom interferometry**, which relies on ultra-cold atoms behaving as matter waves.
- The technology compares the acceleration of two clouds of rubidium atoms in free-fall to measure gravity's effect. These measurements help detect **gravity gradients**, or differences in how fast objects fall over short distances.

- Atom interferometry is highly sensitive and more stable over time than traditional mechanical sensors, which can drift or be affected by environmental noise.

Technological Advantages:

- The QGGPf is much smaller and lighter than traditional gravity sensing instruments, occupying only **0.25 cubic meters** and weighing around **125 kg**.
- Despite its small size, the quantum system is expected to achieve **up to ten times greater sensitivity** than current classical gravity sensors.
- The ultra-cold atom-based sensors are less prone to external disturbances like thermal noise, making them ideal for space-based measurements.

SUCCESSFUL DOCKING OF SPADEX SATELLITES (FOR SECOND TIME)

Context

ISRO successfully conducted the **second docking experiment** of the **SPADEX mission**, involving two satellites — **SDX-01 and SDX-02**. This time, the docking was performed **fully autonomously** from a distance of **15 metres**. Following this, ISRO also demonstrated **inter-satellite power transfer**, marking a significant milestone in India's space technology capabilities.

What is 'Docking' in Space?

- **Docking** refers to the process where **two spacecraft physically connect with each other while in orbit**.
- It involves aligning and bringing together one spacecraft with another, typically to transfer crew, materials, or resources like power and fuel.
- Docking is critical for:
  - Space station operations
  - Satellite servicing and refuelling
  - Multi-spacecraft missions
  - Human spaceflight support systems
- It can be **manual, semi-autonomous**, or **fully autonomous**, depending on the mission design and technology.

Key-Details of the Second Docking Experiment

- **Autonomous Docking:** The second docking was conducted **without manual intervention**, unlike the first attempt in 2023 where a manual hold was placed at 3 meters.
  - This time, docking occurred completely autonomously **from 15 metres to contact**.
  - Prior to this attempt, **extensive ground simulations and in-orbit trials** were conducted using insights from the first experiment.

◎ **Power Transfer Demonstration:** Power was transferred from **SDX-02 to SDX-01** and vice versa. The power supported the operation of a heater element in the receiving satellite.

🔍 FACT BOX

(SPADEX Mission)

◎ **Launched in:** 2024

◎ **SPADEX** stands for **Space Docking Experiment**.

◎ It is a "cost-effective technology demonstrator mission" for the demonstration of in-space docking using two small spacecraft launched by PSLV.

◎ The mission aims to **demonstrate technologies** related to **orbital rendezvous, docking, and proximity operations.**

◎ SpaDeX involves two small satellites, designed for in-orbit operations such as **rendezvous, docking, and resource sharing**:

  ▸ SDX01 (Chaser)

  ▸ SDX02 (Target)

BULLSEYE GALAXY DISCOVERY

Context

Astronomers have discovered a unique galaxy, named the **Bullseye Galaxy (LEDA 1313424)**, that contains **nine concentric rings** — more than any previously known ring galaxy. This rare celestial structure was observed using the **Hubble Space Telescope** and the **W.M. Keck Observatory in Hawaii**. Researchers believe this galaxy may also offer valuable insights into the formation of **giant low surface brightness (GLSB) galaxies**, which are crucial to understanding **dark matter** in the universe.

What is the Bullseye Galaxy?

◎ **LEDA 1313424**, or the Bullseye Galaxy, is an unusually large galaxy around **250,000 light-years in diameter** — about **2.5 times the size of the Milky Way**.

◎ It contains **nine ring-like structures** — an exceptional feature, since most known ring galaxies have only two or three rings.

◎ This makes it a **rare cosmic object**, captured during a brief stage of its evolution.

◎ How Did the Rings Form: A Galactic Collision

  ▸ About **50 million years ago**, a **blue dwarf galaxy** passed **directly through the centre** of the Bullseye Galaxy.

  ▸ This rare **head-on collision** triggered **gravitational ripples** in the gas of the Bullseye Galaxy.

  ▸ These ripples caused **gas compression** and **new star formation**, which created the **distinct concentric rings** seen today.

◎ **Ring Formation Mechanism:** Although the stars' orbits remained unaffected, the **gas and star clusters realigned**, forming **wave-like patterns** that resulted in ring formation. The presence of a **gas trail** between the two galaxies, even though they are **130,000 light-years apart**, supports the collision theory.

🔍 FACT BOX

(LSB and GLSB Galaxies)

Low Surface Brightness (LSB) Galaxies:

◎ These galaxies have **very faint disks**, with low surface brightness and little visible star formation.

◎ Despite containing **large amounts of hydrogen gas** (required for star formation), they **form very few stars**.

◎ They are rich in **dark matter**, which makes them critical to studying the **dark matter distribution** in the universe.

Giant Low Surface Brightness (GLSB) galaxy

◎ A subclass of LSBs, **Giant LSBs** are **massive spiral galaxies** with **very diffuse stellar disks**.

◎ **Example: Malin 1**, the largest known spiral galaxy — about **6.5 times wider than the Milky Way**.

◎ These galaxies often appear in **isolation**, far from other galaxies.

◎ Their **central black holes are smaller** than those in other massive galaxies, suggesting they are **less evolved**.

DHRUV HELICOPTER

Context

In the aftermath of the **Pahalgam terror attack** in Jammu and Kashmir, the **Indian Army has now permitted limited flying of the Dhruv fleet**, but only for **critical counter-terror operations**.

What is the Dhruv Helicopter?

◎ The **Advanced Light Helicopter (ALH) Dhruv** is an **indigenously designed and developed multi-role helicopter** produced by **Hindustan Aeronautics Limited (HAL)**.

◎ It is a flagship platform under India's push for **self-reliance in defence manufacturing**.

  ▸ **Class**: 5.5-tonne weight category

  ▸ **Type**: **Twin-engine**, **multi-role**, **multi-mission**

➤ **Users**: Indian Army, Air Force, Navy, Coast Guard, and several foreign militaries and civil users.

➤ It is used for a wide range of purposes — from **logistics and surveillance** to **casualty evacuation, reconnaissance, anti-terror ops, disaster relief**, and **maritime roles**.

Design and Features

➤ It is developed by **HAL's Rotary Wing Research and Design Centre (RWR&DC)**.

➤ It is designed for **both high-altitude and all-weather operations** — crucial for missions in Himalayan and border regions.

➤ It can carry **troops, weapons, sensors, or equipment** depending on configuration.

Key versions include:

➤ **ALH Mk I/II** – Early models, utility variants.

➤ **ALH Mk III** – Improved avionics and systems.

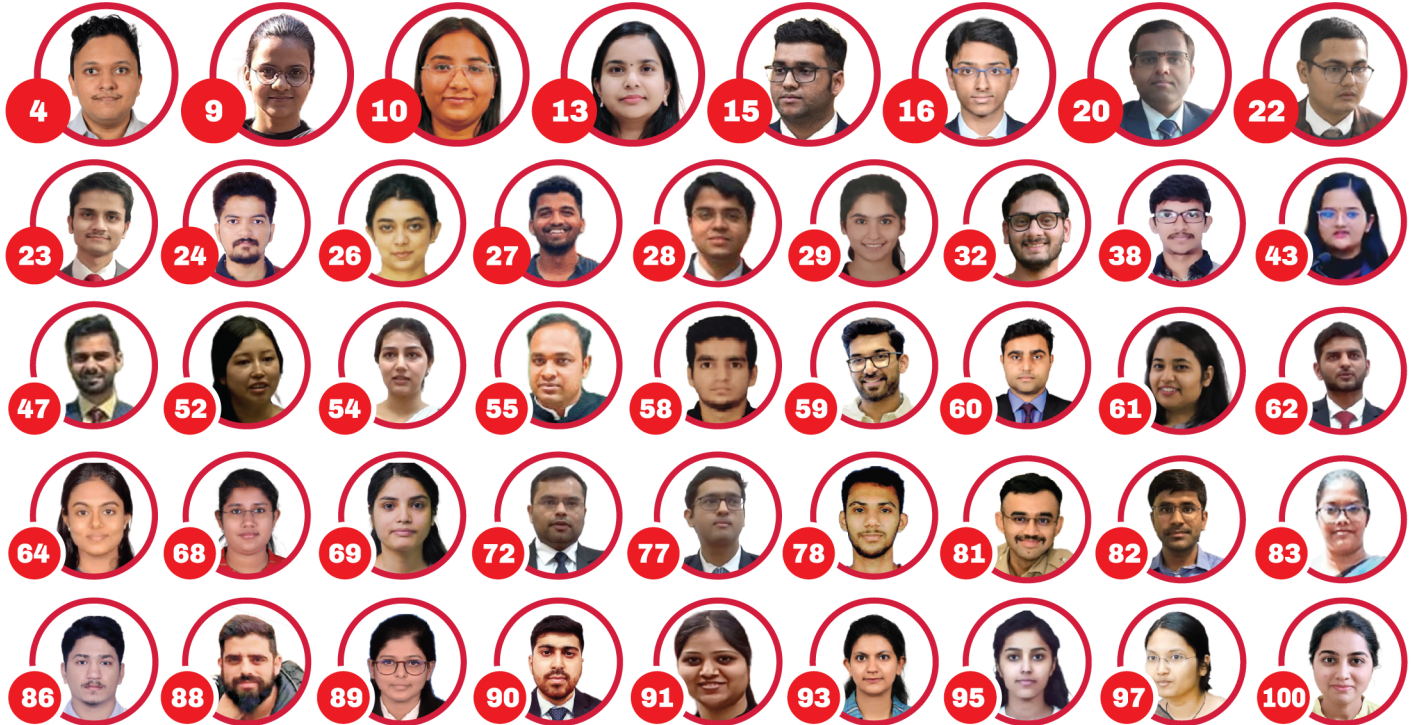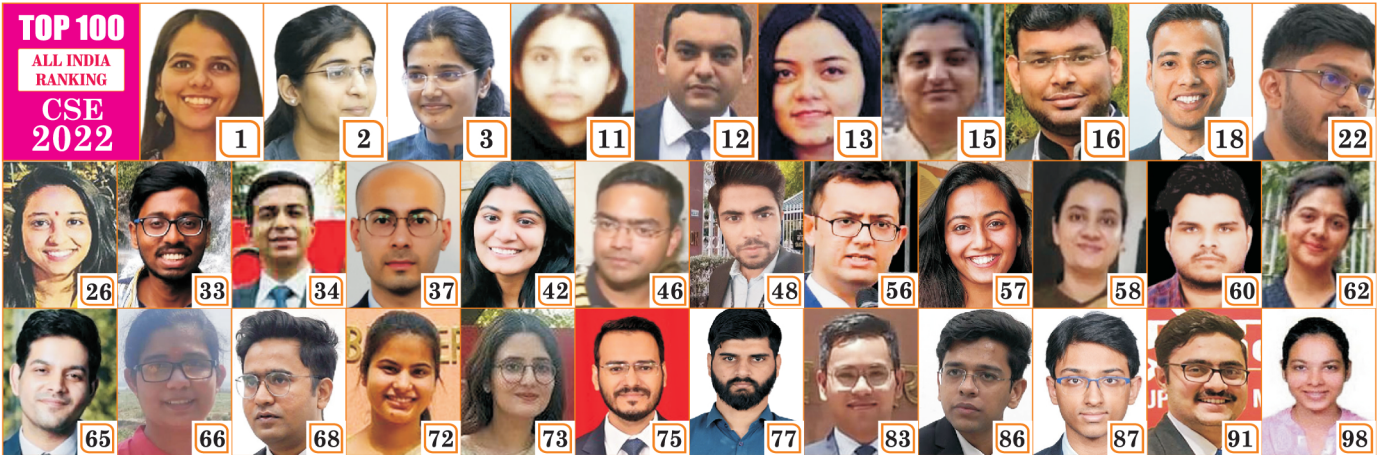➤ **ALH Mk IV (Rudra)** – Armed variant with weapon systems for combat.

★ ★ ★ ★ ★

GS SCORE
An Institute for Civil Services

CSE RESULT

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64 · 68 · 69 · 72 · 77 · 78 · 81 · 82 · 83
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