

ANURAG BACHAN'S DROANACHARYA-IAS

MAY 2025

Comprehensive Coverage of **CURRENT** **AFFAIRS**

ENTIRE CONTENT OF **APRIL 2025**

- ✓ Polity and Governance
- ✓ International Relations
- ✓ History, Art & Culture
- ✓ Internal Security
- ✓ Science & Technology
- ✓ Economy
- ✓ Indian Society
- ✓ Environment
- ✓ Disaster Management
- ✓ Awards
- ✓ Important Personalities
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HISTORY, ART AND CULTURE

Protests against Bodh Gaya Temple Act

Context

Since February 2025, protests have erupted across India and abroad against the Bodh Gaya Temple Act (BTA), 1949. Buddhist monks and global Buddhist organisations are demanding exclusive control over the Mahabodhi Temple in Bodh Gaya, Bihar. The temple is the most sacred site in Buddhism, believed to be the place where Lord Buddha attained enlightenment under the Bodhi Tree.

Management Conflict

The Bodh Gaya Temple Management Committee (BTMC) was formed under the BTA. It is headed by the District Magistrate of Gaya as the ex-officio Chairperson. Protestors demand the dissolution of this joint committee and seek a Buddhist-only management system. Historically, Buddhists managed the site until the 13th-century invasion by Bakhtiyar Khilji. In the 16th century, a Hindu math was established by Ghamandi Giri. After independence, in 1949, the Bihar government transferred management to a shared arrangement. Monks argue that the temple must return to its original religious custodianship.

Cultural Significance

The temple, initially constructed by Emperor Ashoka in 260 BCE, is an architectural remnant of the Gupta period. It has been recognised as a UNESCO World Heritage Site and holds deep spiritual and historical value. The protests reflect a growing demand for religious autonomy and cultural restitution.

Sarhul Festival

Context

Adivasi communities across Jharkhand and Chhotanagpur are celebrating the Sarhul festival. It marks the beginning of spring and the agricultural season.

Rituals and Meaning

Sarhul means “worship of the Sal tree.” It symbolises the union of the Sun and Earth, represented by the male priest and his wife. The main rituals are performed in Sarna Sthals, which are sacred groves protected communally.

Tribal Participation

Celebrated by Oraon, Munda, Santal, Khadia, and Ho tribes, the festival reflects their environmental and spiritual values. Over time, Sarhul has evolved from a hunting-based ritual to an agricultural celebration. Due to migration, the festival is now observed in Assam, the Andaman Islands, Nepal, and Bangladesh as well.

Unveiling Copper Plates of Devaraya I's Reign

Context

On April 2, 2025, a set of copper plates from the reign of Devaraya I (Vijayanagara Empire) were unveiled. These plates, inscribed in Sanskrit, Kannada, and Nāgarī, date back to his coronation year, 1406 CE. They offer fresh insights into state affairs, religion, and administrative systems of medieval South India.

Historical Background

- Devaraya I ruled the Vijayanagara Empire from 1406 to 1422 CE.
- He succeeded Harihara II, following internal succession disputes.
- His reign was marked by military reform, urban planning, and literary patronage.
- He belonged to the Sangama Dynasty, the first among the four dynasties of the Vijayanagara Empire.

Significance of the Copper Plates

- The plates confirm the coronation date of Devaraya I—1406 CE—for the first time.
- They reveal a unique royal seal depicting Vamana, unlike the traditional Varaha symbol associated with the dynasty.
- Offer genealogical details, including the names of Devaraya's five sons, enriching Sangama dynasty records.
- They represent a land grant of Gudipalli village to Brahmins, reflecting religious patronage and socio-political customs.

Cultural and Literary Legacy

- Devaraya I was a patron of Kannada literature and supported Jain and Hindu scholars.
- Poets like Madhura, active in his court, made significant contributions to Jain texts.
- He commissioned architectural marvels like the Hazara Rama Temple at Hampi, a Deccan masterpiece known for Ramayana reliefs on its walls.

Urban and Irrigation Initiatives

- Recognising the scarcity of water, Devaraya I initiated major irrigation projects.
- Built a barrage on the Tungabhadra River and a long aqueduct to supply water to Vijayanagara city.
- These steps turned Vijayanagara into one of the largest and most advanced urban centers of the 15th century.

Military Campaigns and Diplomacy

- Faced military threats from the Bahmani Sultanate and Velamas of Telangana.
- Strengthened his army with skilled archers and diplomatic alliances.
- Defeated Firoz Shah of Bahmani Sultanate, expanding southern territorial control.
- Promoted religious integration by including Muslim soldiers in his army and respecting religious diversity.

Conclusion

The discovery of Devaraya I's copper plates offers valuable insights into the administrative clarity, cultural depth, and secular policies of the Vijayanagara Empire. These records reaffirm his legacy as a visionary ruler, who laid foundations for urban development, military strength, and literary excellence in medieval South India.

The World Tipitaka in news

Context

Prime Minister Narendra Modi was presented with *The World Tipitaka: Sajjhaya Phonetic Edition* by Thai Prime Minister Paetongtarn Shinawatra during a diplomatic exchange.

About Tipitaka

The word *Tipitaka* means "Three Baskets" in Pali. It refers to the three primary divisions of the Buddhist canonical scriptures, forming the foundation of Theravāda Buddhism.

The Three Baskets

- **Vinaya Pitaka (Basket of Discipline):** This section outlines the rules, conduct, and disciplinary procedures for Buddhist monks and nuns. It ensures order in the monastic community.
- **Sutta Pitaka (Basket of Discourses):** It contains the teachings of the Buddha, delivered in the form of sermons, dialogues, and narratives for followers.
- **Abhidhamma Pitaka (Basket of Higher Doctrine):** It provides a detailed and philosophical analysis of the Buddha's teachings, focusing on mental processes and metaphysical concepts.

Historical Background

The Tipitaka was compiled after the Buddha's death in the 5th century BCE during the First Buddhist Council held in Rajagaha (present-day Rajgir, Bihar). This compilation aimed to preserve and standardise the oral teachings of the Buddha for future generations.

Bharani Festival

Kodungalloor Bharani is a major temple festival celebrated at the Sree Kurumba Bhagavathy Temple in Thrissur, Kerala. It takes place in the Malayalam month of Meenam (March–April).

The festival celebrates the birth of Goddess Bhadrakali, who was believed to have emerged from Lord Shiva's third eye to slay the demon Darika.

A highlight of the festival is the participation of oracles (Velichappadu) dressed in red, who enter a trance-like state during rituals. The event combines folklore, ritual drama, and spiritual intensity.

Warangal Chapata Chilli gets GI Tag

Context

The Warangal Chapata chilli, locally called Tomato chilli, has received the Geographical Indication (GI) tag from the GI Registry of India on March 28, 2025. This development is significant for Telangana's farmers, especially in Warangal district, as it is expected to improve their market access and income.

Characteristics of Warangal Chapata Chilli

This chilli variety is known for its bright red colour and round, tomato-like shape. It has low pungency, making it suitable for pickles and natural food colouring. It is rich in oleoresins, which are in high demand in global markets. The chilli is mainly grown across around 3,000 hectares in the districts of Warangal, Hanmakonda, Mulugu, and Bhupalpally.

Harvesting and Cultivation

Harvesting usually takes place between February and March. Farmers hand-pick the pods in two to three rounds. The plants bear fewer but larger pods with weak pedicle attachments, making the harvesting process easier and less labour-intensive.

Economic Impact

Nearly 20,000 farmers are expected to benefit directly from the GI tag. The chilli, which was priced at ₹300 per kg earlier, is now anticipated to be sold at around ₹550 per kg. This rise in price is due to enhanced recognition, quality branding, and increased domestic and international demand.

Market Demand and Export Potential

There is a rising global demand for natural pigments, especially oleoresins used in food, pharmaceuticals, and cosmetics. Countries like the United States, United Kingdom, Germany, and China represent major markets. With increasing restrictions on artificial colourants, this chilli variety has strong export potential.

Historical Background

The cultivation of Warangal Chapata chilli dates back more than 80 years and has been traditionally maintained by farming communities like the Velamas. In 2022, local farmer groups, with support from agricultural research bodies, filed for the GI tag to preserve and promote this indigenous crop variety.

GI Tag for Kannadippaya

Context

Kannadippaya, a traditional bamboo mat from Kerala, has been granted the Geographical Indication (GI) tag. This provides it with legal protection and promotes its unique identity in domestic and international markets.

About Kannadippaya

The term *Kannadippaya* means "mirror mat." It is known for its soft texture, reflective surface, and thermal comfort. These mats are traditionally woven using the inner layers of reed bamboo, especially *Teinostachyum wightii* and other bamboo varieties like *Ochlandra species*.

Kannadippaya is handcrafted mainly by tribal communities such as the Oorali, Mannan, Muthuva, Malayan, and Kadar. The weaving tradition is preserved in parts of Idukki, Thrissur, Ernakulam, and Palakkad districts of Kerala.

Cultural and Functional Significance

- The mat provides warmth in winter and a cooling effect in summer due to its breathable, natural material.
- Historically, Kannadippayas were presented to royal figures as a mark of respect and honour by tribal groups.
- It holds both cultural and utilitarian value, making it a symbol of indigenous craftsmanship and environmental sustainability.

National Archives Acquires Kalam's Papers

- The National Archives of India has acquired Dr. A.P.J. Abdul Kalam's personal papers. The collection includes photos, lectures, and ID documents like his Aadhaar and passport.
- NAI was founded in 1891. It stores valuable government and private records. It operates under the Ministry of Culture. It also implements the Public Records Act, 1993.
- Dr. Kalam was born in 1931 in Rameswaram. He was a scientist, missile technologist, and 11th President of India. He led India's first satellite launch and missile programmes. He guided Pokhran-II nuclear tests. He later became a professor and youth mentor. His books like *Wings of Fire* and *Ignited Minds* inspire students. He was awarded the Bharat Ratna, Padma Bhushan, and Padma Vibhushan.

Pandit Chatur Lal: Global Face of Indian Tabla

Pandit Chatur Lal played a historic role in introducing the tabla to international audiences. He combined classical rhythm with cultural diplomacy and became one of the earliest Indian musicians to perform in the West. The Department of Posts has honoured his contributions by announcing a commemorative stamp on his centenary.

Key Contributions and Life Events:

- **Early Life:** He was born in Udaipur into a family of court musicians. He received his early tabla training under Ustad Abdul Hafiz Ahmed Khan.
- **Career Start:** He joined All India Radio in 1947. His collaboration with Pandit Ravi Shankar at AIR shaped his future trajectory.
- **Global Recognition:** In 1952, violinist Yehudi Menuhin was mesmerized by his performance and invited him to New York. This performance significantly raised global awareness of the tabla.
- **Cultural Collaborations:** He performed with Ustad Ali Akbar Khan at prestigious venues abroad, making Indian classical rhythm known globally.
- **Fusion Initiatives:** He partnered with jazz drummer Papa Jo Jones, marking one of the earliest Indo-jazz fusions. This laid the groundwork for later groups like *Shakti*.

- **Oscar Recognition:** He was nominated for an Oscar in 1957 for his role in the Canadian short film *A Chairy Tale*.
- **Royal Appreciation:** In 1962, he performed for Queen Elizabeth II at Rashtrapati Bhawan.
- **Death:** He passed away in 1965 at just 40 due to complications from jaundice, ending a promising global journey.

His early demise left a void, but his legacy continues to influence generations of tabla players and global music fusion.

Raja Ravi Varma: Father of Modern Indian Art

Raja Ravi Varma is remembered as a pioneer who brought Indian culture onto the global artistic stage using Western techniques. His paintings portrayed Indian gods, epics, and national leaders in a realistic and relatable form.

Key Facts about His Life and Legacy:

- **Birth and Background:** Born on 29 April 1848 in Kerala, he belonged to an aristocratic family with artistic traditions.
- **Artistic Innovation:** He blended Indian mythological themes with European oil painting techniques. His use of realism made divine figures more accessible to the public.
- **Mass Appeal:** His works formed the basis of calendar art in India, making religious art more popular and widespread.
- **Social Impact:** Through his paintings, he advocated for women's education and protested against social evils like child marriage.
- **Support for Nationalism:** He painted portraits of key nationalist leaders like Bal Gangadhar Tilak and Dadabhai Naoroji.
- **International Awards:** His painting *Hamsa Damayanti*, inspired by the Mahabharata, won first prize at the 1873 Vienna Exhibition.
- **Recognition by British Government:** He received the Kaiser-i-Hind gold medal in 1904 for his contribution to Indian art.
- **Posthumous Honour:** In 2013, a crater on the planet Mercury was named after him.

Ravi Varma's legacy lives on through modern visual culture, Indian cinema, and national identity in art.

Rakhigarhi Findings in NCERT Books Added

Context

NCERT has decided to include new archaeological DNA findings from the Harappan site of Rakhigarhi in its history curriculum.

DNA Findings and Their Significance

- Ancient DNA studies from Rakhigarhi suggest the genetic roots of Harappans date back to 10,000 BCE.
- Findings show genetic continuity, indicating no major external migrations into the region.
- Most of the South Asian population today shares lineage with the Harappans.
- These results emphasize an inclusive and absorbing ancient Indian society.

About Rakhigarhi Site

- **Location:** 27 km from the Ghaggar river, in Haryana's Ghaggar-Hakra plain.
- **Time Period:** Dates back to 2600–1900 BCE, the Mature Harappan phase.
- **Status:** Recognized as the largest Harappan site in the Indian subcontinent.

Key Archaeological Findings

- **Granary:** Seven-chambered structure suggests organized grain storage.
- **Religious Practices:** Fire altars and apsidal temples highlight ritualistic practices.
- **Burials:** Cemetery from the Mature Harappan period found with eight burial sites.

Rongali Bihu: Assam's Celebration of Spring and New Beginnings

Introduction

Rongali Bihu is also known as Bohag Bihu. It is one of the most important festivals of Assam. It is celebrated in mid-April. It marks the Assamese New Year and the beginning of the agricultural cycle. It symbolises joy, renewal, and the arrival of spring.

Historical Context

The festival has deep cultural roots in Assam. It is traditionally linked with farming and seasonal changes, Rongali Bihu celebrates the onset of the sowing season and the end of the harvesting period. Though it has evolved over time, it continues to represent the agrarian lifestyle and cultural identity of the Assamese people.

Duration and Structure

Rongali Bihu is celebrated over seven days, commonly referred to as 'Xaat Bihu.'

- The first day is Goru Bihu, focused on cattle.
- The second day is Manuh Bihu, centred around human festivities.
- The third day is Gosain Bihu, dedicated to deities.

Each day has its own rituals and significance, making the festival a vibrant, week-long celebration.

Rituals and Traditions

The rituals of Rongali Bihu are diverse and meaningful.

- On Goru Bihu, cattle are washed, decorated with garlands, and worshipped to show gratitude for their role in farming.
- Manuh Bihu involves feasting, wearing new clothes, and exchanging greetings. Elders are honoured, and families gather to celebrate together.
- On Gosain Bihu, people offer prayers to household deities and seek blessings for the year ahead.

Culinary Specialties

Food is an integral part of the celebrations.

- Traditional dishes such as *Chira* (flattened rice), *Pitha* (rice cakes), *Laru* (sweet balls), and *Doi* (curd) are commonly prepared.
- These homemade delicacies are shared among friends and family, enhancing the warmth and spirit of the festival.

Cultural Importance

Rongali Bihu is not just a festival but a reflection of Assamese culture, unity, and rural life. Folk songs (*Bihu geet*), traditional dance performances, and local fairs are organised across the state. It also plays a key role in preserving regional identity and promoting community harmony.

New built Pamban Bridge

Context

Prime Minister Narendra Modi inaugurated the newly built Pamban Bridge, which replaces the over 100-year-old sea bridge connecting Rameswaram to mainland India.

Historical Background

The original Pamban Bridge was completed in 1914 and became India's first sea bridge. It served as a critical infrastructure link for trade and religious pilgrimage between Tamil Nadu and Rameswaram, and onwards to Sri Lanka.

In 1964, a devastating cyclone struck the region, washing away a passenger train and damaging the bridge. The structure was later restored under the guidance of E. Sreedharan, known for his engineering excellence, with the assistance of local fishermen. The restoration was completed in just 46 days.

About the New Pamban Bridge

The new bridge has been constructed by Rail Vikas Nigam Limited (RVNL), a Navratna PSU under the Ministry of Railways.

Key features include:

- A vertical lift span of 72.5 meters that can rise up to 17 meters to allow the passage of ships.
- The bridge stands 3 meters higher than the old bridge, enhancing safety and clearance.
- It is designed to carry both heavy freight trains and modern semi-high-speed trains like Vande Bharat.
- Total length: 2.08 kilometers.
- Expected lifespan: 58 years.
- It is India's first vertical lift railway sea bridge, constructed using corrosion-resistant and marine-grade materials to withstand harsh coastal conditions.

Significance

The Pamban Bridge is vital for regional connectivity, especially for pilgrims visiting the holy town of Rameswaram. It also has historical importance as a trade route to Sri Lanka.

The new bridge aims to:

- Reduce operational disruptions caused by corrosion and maintenance challenges in the old structure.
- Improve maritime navigation through its lift span.
- Strengthen trade and tourism links with southern Tamil Nadu and the broader Bay of Bengal region.
- Support economic activity by facilitating the movement of people and goods through a modern and reliable infrastructure.

Conclusion

The new Pamban Bridge blends engineering innovation with historical legacy. It represents a major step forward in India's coastal infrastructure and reaffirms the commitment to modernising key national transport corridors.

Dokra Art and tribal communities

Context

Prime Minister Modi recently presented a Dokra Brass Peacock Boat with a Tribal Rider to the Prime Minister of Thailand, showcasing India's rich traditional metal craft.

About Dokra Art

- Dokra is an ancient form of non-ferrous metal casting practiced by tribal communities in eastern India. Its origins trace back over 4,000 years to the Indus Valley Civilization, with the famed "Dancing Girl" statue of Mohenjo-daro being a classic example of this tradition.
- The name "Dokra" is derived from the Dhokra Damar tribes of West Bengal, who have historically practiced this art. Today, artisans from Odisha, Chhattisgarh, Jharkhand, and Madhya Pradesh also continue this legacy.
- Dokra art relies on the lost-wax casting method. The entire process is labor-intensive, where the mold is destroyed after each casting, ensuring that every piece is unique and cannot be exactly replicated.
- The Dokra craft from Bankura in West Bengal received the Geographical Indication (GI) tag in 2008, recognizing its cultural and artistic value.

Lodhi Garden celebrates 89 years

Context

Lodhi Garden in New Delhi celebrates 89 years since its opening to the public, blending Mughal history with British landscaping aesthetics.

About

Originally known as Bagh-e-Jud, Lodhi Garden dates back to the 14th and 15th centuries and served as a burial site during the Sayyid and Lodi dynasties. It is connected historically with the Dargah of Hazrat Nizamuddin Auliya. The British developed it into a public garden, inaugurated by Lady Willingdon on April 9, 1936.

Architectural Landmarks

- Tomb of Muhammad Shah: Belongs to the third ruler of the Sayyid dynasty.
- Tomb of Sikandar Lodi: Octagonal structure, typical of Lodi architectural style.
- Sheesh Gumbad: Houses unidentified graves, decorated with blue glazed tiles.
- Bada Gumbad: A gateway to a mosque, characterized by three domes.
- Khairpur Satpula Bridge: Built by Nawab Mirza, associated with the Mughal era.

Post-Independence Development

The modern design of the garden was shaped by architect Joseph Allen Stein. The garden features natural landscapes like mounds and water bodies. Lodhi Garden is also known for hosting Nauroz celebrations every March.

106th Anniversary of Jallianwala Bagh Massacre

Context

Prime Minister Modi paid homage to the martyrs of the Jallianwala Bagh massacre on its 106th anniversary.

What was the Jallianwala Bagh Massacre

The Jallianwala Bagh massacre, also known as the Amritsar massacre, took place on 13th April 1919. Thousands of Indians had gathered in Jallianwala Bagh on the festival of Baisakhi to protest against the Rowlatt Act and the arrest of nationalist leaders Dr. Saifuddin Kitchlew and Dr. Satyapal. Without warning or provocation, Colonel Reginald Dyer ordered British Indian troops to open fire on the unarmed crowd. According to British records, at least 379 people were killed, though Indian estimates were much higher.

The Rowlatt Act

- Officially called the Anarchical and Revolutionary Crimes Act of 1919, the Rowlatt Act granted the British colonial government sweeping powers to arrest and detain individuals suspected of sedition without trial.
- It was based on the recommendations of the Sedition Committee chaired by Sir Sidney Rowlatt and modeled on the Defence of India Act, 1915.

British Response

- Martial law was imposed in Punjab following the massacre.
- The British set up the Hunter Commission (Disorders Inquiry Committee) in October 1919 to investigate the incident.
- The Commission censured Dyer for excessive use of force but imposed no real punishment. He was asked to resign from military service but was hailed as a hero by some sections in Britain.

Nationalist Response

- Rabindranath Tagore renounced his knighthood in protest.
- Mahatma Gandhi launched the Non-Cooperation Movement in 1920 and gave up the Kaiser-i-Hind title.
- This event became a turning point in India's freedom struggle, uniting moderates and extremists in the demand for full independence.

The Jallianwala Bagh Memorial

Today, the site is maintained by the Jallianwala Bagh National Memorial Trust. It houses bullet-marked walls, a memorial flame, a well into which people jumped to escape bullets, a museum, and galleries documenting the massacre.

Chittorgarh Fort

Context

The Rajasthan government has informed the Supreme Court that it is actively considering a complete ban on mining within a 10-kilometre radius of Chittorgarh Fort, a UNESCO World Heritage Site.

About

Chittorgarh Fort is one of the largest forts in India and a symbol of Rajput pride and resistance. It was built in the 7th century CE by Chitrangada Mori, a Mauryan ruler of Rajasthan. In 728 CE, it was taken over by the rulers of Mewar and became their capital.

Significance

The fort has witnessed several historic sieges, most notably by Alauddin Khilji in 1303 during his pursuit of Rani Padmini, as narrated in Malik Muhammad Jayasi's *Padmavat*. Chittorgarh was also attacked by Bahadur Shah of Gujarat and later by Emperor Akbar.

Architecture

It is spread over 700 acres and is accessed via seven massive gateways or *pols*. The fort has thick walls, strong ramparts, and numerous water bodies. Prominent structures inside include:

- **Vijay Stambh** (Tower of Victory): Built by Rana Kumbha to commemorate his victory over Mahmud Khilji.
- **Kirti Stambh** (Tower of Fame): Dedicated to Jain Tirthankaras and adorned with intricate Jain sculptures.

UNESCO Recognition

Chittorgarh Fort was inscribed in 2013 under the group 'Hill Forts of Rajasthan' for its historical, architectural, and cultural value.

Tripura organised a Jatra Utsav

Context

Tripura organised a Jatra Utsav with the aim of preserving its traditional art forms, culture, and heritage.

About

Jatra, also known as Jatrapala, is a traditional Bengali folk theatre form. It is typically performed in open-air arenas and is known for its interactive nature, allowing direct engagement between the performers and the audience. The term 'Jatra' translates to 'journey,' indicating its historical origin as a travelling theatrical performance.

Region

This folk tradition is especially popular in the states of West Bengal, Odisha, Assam, and Tripura. It reflects the region's linguistic and cultural diversity and plays an important role in rural social life.

Features

Jatra combines dramatic storytelling with music, dance, and theatrical elements. Performers wear elaborate costumes and use loud dialogue, dramatic gestures, and songs to engage audiences. The performances often convey moral, mythological, or social messages.

Themes

Common themes include episodes from Indian mythology, stories of historical significance, and dramatizations of contemporary social issues. These performances serve both entertainment and educational purposes for the local populace.

Significance

Jatra plays an important role in preserving and transmitting regional traditions, language, and performing arts. Organising a state-level Utsav provides a platform to revive this folk art, encourage local artists, and attract tourism.

Mahavir Jayanti

Context

Mahavir Jayanti is being celebrated with great devotion across India.

About

Mahavir Jayanti marks the birth of Lord Mahavir, the 24th and last Tirthankara of Jainism. It is a major religious festival for Jains and is observed in India and countries with Jain populations such as Nepal, the US, and the UK.

National Archives Acquires Kalam's Papers

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Raghuji Bhosale I and His Sword

- Raghuji Bhosale I was a key Maratha general. He lived from 1695 to 1755. He founded the Nagpur-based Bhosale dynasty. He served under Chhatrapati Shahu Maharaj. His title was 'Senasaheb Subha'. He led successful campaigns in Bengal in 1745 and 1755. He also expanded Maratha control in Odisha, Kurnool, and Cuddapah.
- His sword was recently reclaimed by the Maharashtra government. It is in the 'firangi' style, with a European blade and a locally made hilt. The hilt has gold inlay and a Devanagari inscription. The inscription names him as 'Senasaheb Subha Firang', proving it was used personally by him.

Muziris Heritage Project

- The Muziris Heritage Project was launched in 2009. It aims to restore Muziris, a historic port city in Kerala. Muziris was a major trade hub over 2,000 years ago. It connected India with Greeks, Romans, Arabs, and Egyptians. Trade included spices, silk, pearls, ivory, and gems.
- The port vanished from records, likely due to natural disasters. The project aims to conserve this cultural and trade legacy. It is one of the largest heritage conservation efforts in India. It promotes tourism and history awareness. UNESCO supports it. The project also highlights the importance of local history in global trade networks.

Gyan Post Initiative

Gyan Post is a new service under India Post. It will deliver educational, cultural, and religious books at affordable rates. It uses trackable surface transport to lower costs. Only printed books with publisher details are allowed.

The service starts from May 1. It supports the New Education Policy. It helps ensure educational access in rural and remote areas. The goal is to make learning materials accessible to all. It also strengthens the role of India Post in public service.

INDIAN SOCIETY

P4 Initiative

Context

The Andhra Pradesh government has launched the 'Zero Poverty - P4' initiative under the Swarnandhra 2047 vision. 'P4' stands for Public, Private, People Partnership. The aim is to eliminate poverty in the state by 2029. Target beneficiaries include the economically weakest families, called 'Bangaru Kutumbam'.

Support Model

The wealthiest 10% of the population are encouraged to adopt the bottom 20 lakh families. These benefactors, called 'Margadarsis', provide financial aid, mentorship, and long-term support. Key provisions include housing, sanitation, solar energy, internet connectivity, and entrepreneurship support.

Impact

The initiative seeks to create a new model for inclusive economic development by blending government policy with community participation and private support.

Konda Reddi tribe's indigenous knowledge

Context

The indigenous knowledge of the Konda Reddi tribe about the Indian laurel tree's water-retaining ability has been validated by the Andhra Pradesh Forest Department.

About the Tribe

- The Konda Reddi tribe resides in the Papikonda hill range in the Godavari region of Andhra Pradesh.
- They are classified as a Particularly Vulnerable Tribal Group (PVTG) due to their distinct socio-economic characteristics.
- Their knowledge of local flora, such as the Indian laurel tree (*Terminalia tomentosa*), has proven to be ecologically valuable.
- Forest officials in Alluri Sitharama Raju district confirmed that this tree indeed stores water, especially in summers, as claimed by the tribe.
- The Indian laurel, also known as Indian Silver Oak, holds significant commercial value due to its quality timber.

Particularly Vulnerable Tribal Groups (PVTGs)

The Dhebar Commission in 1973 recommended a separate classification for the most vulnerable tribal communities, initially termed Primitive Tribal Groups (PTGs). In 1975, 52 such groups were identified. Later, 23 more were added in 1993. In 2006, they were renamed as PVTGs. There are currently 75 PVTGs in India, living in isolation and facing multiple developmental challenges.

Characteristics of PVTGs

- Pre-agricultural level of technology
- Dependency on hunting and gathering
- Very low literacy levels
- Declining or stagnant population
- Remote habitat and social isolation

Need for Focused Support

More developed tribal groups often benefit disproportionately from development schemes. Therefore, targeted schemes and enhanced fund allocation are essential for PVTGs to bridge the developmental gap. According to the 2011 Census, Odisha has the highest number of PVTGs, followed by Madhya Pradesh.

Significance

The Konda Reddi tribe's ecological knowledge underlines the importance of integrating traditional wisdom in environmental conservation. It also strengthens the case for community-led natural resource management, especially in ecologically fragile zones like the Eastern Ghats.

NITI NCAER States Economic Forum Portal

Context

The NITI NCAER States Economic Forum Portal was inaugurated on 1 April 2025 through a collaborative initiative between NITI Aayog and the National Council of Applied Economic Research (NCAER). It provides a single digital platform for comprehensive data on economic, fiscal, social, and demographic indicators across Indian states, covering more than three decades.

Key Features of the Portal

The portal consists of four major components:

1. **State Reports** – These offer concise overviews of each of the 28 Indian states, highlighting macroeconomic and fiscal performance using structured indicators like demography and economic structure.
2. **Data Repository** – This section is categorized under five verticals: Demography, Economic Structure, Fiscal, Health, and Education, enabling direct access to extensive historical datasets.
3. **Fiscal and Economic Dashboard** – It provides visual tools and graphical representations of economic variables over time, with easy access to raw data and summary tables.
4. **Research and Commentary** – Offers analytical insights based on research in the field of state finance and fiscal policy.

Purpose and Benefits

The portal addresses the longstanding need for integrated and reliable state-level data. It enables comparison across states and against national benchmarks, helping stakeholders understand long-term socio-economic and fiscal trends.

Policy Relevance and Impact

The portal serves as a robust research and decision-making hub. It empowers policymakers, researchers, and civil society with evidence-based insights. By enhancing transparency and fostering informed public discourse, it supports better fiscal management and cooperative federalism.

***** Legally restricted North Sentinel Island

Context

A US national was arrested for attempting to enter North Sentinel Island in the Andaman and Nicobar Islands, a region legally restricted to protect the indigenous Sentinelese tribe.

Geographical Features

North Sentinel Island is situated in the Bay of Bengal, about 50 km west of Port Blair. The island is encircled by coral reefs and dense forests, making maritime access difficult. After the 2004 tsunami, the island was uplifted slightly due to tectonic activity, expanding its coastline.

Sentinelese Tribe

The Sentinelese are one of the last uncontacted tribes on Earth. They live as hunter-gatherers and are known for rejecting all contact with the outside world. Their estimated population ranges between 50 to 150 individuals. They use bows, arrows, and spears for hunting and defense.

Legal Protections

Travel within 5 nautical miles of the island is prohibited under the Andaman & Nicobar Islands (Protection of Aboriginal Tribes) Regulation, 1956. The law protects the tribe's isolation and exempts them from prosecution for any defensive acts. In 2018, India relaxed travel norms for some islands but kept North Sentinel off-limits.

“Women and Men in India 2024” Report

Context

The Ministry of Statistics and Programme Implementation (MoSPI) released the 26th edition of its publication titled “Women and Men in India 2024: Selected Indicators and Data”.

About the Publication

The publication offers a comprehensive overview of the gender landscape in India, presenting selected indicators and data across key areas like population, education, health, economic participation, and decision-making, all sourced from various Ministries/Departments/Organizations.

Key Highlights

- **Education:** The Gender Parity Index (GPI) for enrolments at both primary and higher secondary levels increased in FY24 compared to FY23 and FY22, indicating more girls being enrolled in school. At the upper primary and elementary levels, the enrolment numbers were nearly equal for both boys and girls.
- **Labour Force Participation:** The Labour Force Participation Rate (LFPR) for women aged 15 years and above saw a significant improvement from 49.8% in 2017–18 to 60.1% in 2023–24, reflecting growing inclusion of women in the workforce and economic activity.
- **Financial Inclusion:** Women owned 39.2% of all bank accounts in India as of the latest data and contributed 39.7% to total deposits in banks. Women's presence is most prominent in rural areas, where they make up 42.2% of account holders.
- **Entrepreneurship & Economic Independence:** The number of female-headed proprietary establishments across manufacturing, trade, and services has been rising consistently between 2021–22 and 2023–24. Startups with at least one woman director (DPIIT-recognized) increased from 1,943 in 2017 to 17,405 in 2024, marking more than an 800% increase in 7 years.
- **Political Participation:** Female voter turnout has seen variations over the years, rising to 67.2% in 2019, followed by a modest dip to 65.8% in 2024.
- **Violence against Women:** Nearly 31.9% of married women aged 18 to 49 in India report experiencing spousal violence, with the highest prevalence observed in Karnataka (48.4%), Bihar (42.5%), and Manipur (41.6%).

Global health challenges and World Health Day 2025

Context

World Health Day is observed annually on 7 April to draw attention to pressing global health challenges and to encourage collective action toward improving public health outcomes.

Global Health Challenge

According to WHO, nearly 300,000 women die annually due to complications from pregnancy and childbirth. Additionally, over 2 million babies die within their first month of life, and another 2 million are stillborn. Based on the current trajectory, four out of every five countries are not on course to meet the global targets for maternal survival by 2030.

India's Progress in Maternal and Child Health

- The Maternal Mortality Ratio (MMR) in India decreased from 130 in 2014-16 to 97 in 2018-20 per 1,00,000 live births.
- The Infant Mortality Rate (IMR) declined from 39 in 2014 to 28 in 2020 per 1,000 live births.
- The Neonatal Mortality Rate (NMR) fell from 26 in 2014 to 20 in 2020 per 1,000 live births.

Challenges in India's Healthcare System

- Limited access to healthcare in rural and remote areas due to a lack of facilities and trained medical personnel.
- Poor infrastructure, especially in underdeveloped regions, with shortages in hospitals, sanitation, and medical equipment.
- High disease burden from both communicable and non-communicable diseases.
- Significant out-of-pocket expenses that put financial pressure on low-income households.
- Geographic and economic disparities in access to quality healthcare.
- Shortfall in trained medical professionals, including doctors and nurses.
- Fragmentation between public and private healthcare systems, leading to inefficiencies.

Key Government Initiatives

- **Maternal Death Surveillance and Response (MDSR):** A program to identify causes of maternal mortality and improve obstetric care by acting on facility and community-level data.
- **Reproductive and Child Health (RCH) Portal:** A digital tracking system for pregnant women and newborns to ensure timely health services during pregnancy, childbirth, and postnatal periods.
- **Anaemia Mukh Bharat (AMB):** A nationwide initiative under POSHAN Abhiyan to address anaemia through prevention, testing, and treatment, especially among adolescent girls and pregnant women.
- **National Health Mission (NHM):** A comprehensive mission aimed at improving healthcare access and outcomes, particularly in maternal and child health, by enhancing infrastructure and service delivery.
- **Ayushman Bharat Digital Mission (ABDM):** A digital initiative that connects patients, healthcare providers, and medical records through a secure and interoperable health system.

Achievements in Disease Elimination

- India achieved a 69% reduction in malaria cases and a 68% drop in deaths from malaria between 2017 and 2023.
- Trachoma was officially eliminated as a public health concern in 2024.
- The National Tuberculosis Elimination Programme reported a 17.7% drop in TB incidence from 2015 to 2023.
- India successfully declared the elimination of Kala-azar in 2024.

Conclusion

Ensuring maternal and newborn health is vital to the overall health of communities. It reduces long-term complications for both mothers and children and contributes to economic stability and social development.

Regular antenatal check-ups and strong postnatal care can prevent many avoidable complications. India's achievements in maternal and child health are evidence of its sustained commitment to inclusive healthcare and public well-being.

Palna Scheme Under Mission Shakti

In Context

The Palna Scheme aims to support working mothers by providing access to crèche facilities, allowing them to pursue employment without compromising their children's care.

About

The Palna Scheme, formerly the National Crèche Scheme, was revamped in 2022 under the 'Samarthya' sub-scheme of 'Mission Shakti'. It operates as a centrally sponsored scheme with shared funding responsibilities: 60:40 between the Centre and State Governments (90:10 for North Eastern and Special Category States, and 100% for UTs without legislatures).

The scheme offers safe and secure crèche facilities for children aged 6 months to 6 years. Services include nutritional support, growth monitoring, cognitive development, and immunization. It benefits all mothers, regardless of employment status.

Registration of Births and Deaths (Amendment) Act, 2023

Context

The Union Ministry of Home Affairs has drafted new Model Rules under the Registration of Births and Deaths (Amendment) Act, 2023. These rules require parents to record the religion of both the father and mother while registering the birth of a child, replacing the earlier provision of recording only the "religion of the family."

Key Features of the Amendment Act

1. Digital and Centralized Registration

- The Registrar General of India is mandated to maintain a national database of registered births and deaths.
- All births and deaths are to be digitally recorded and integrated into a centralized system.

2. Linking with Other Government Databases

- The national database may be shared with agencies managing the following:
 - National Population Register (NPR)
 - Electoral rolls
 - Ration card databases
 - Other notified databases for better policy planning and delivery of services

3. Single Digital Birth Certificate

- A digitally issued birth certificate under this Act will serve as a single document for:
 - Admission to schools and colleges
 - Issuance of driving license and passport
 - Voter registration
 - Employment in government services
 - Other purposes notified by the central government

4. Expanded Data Requirements

- Aadhaar numbers, mobile numbers, and email IDs of both parents are now required (if available).
- Religion of father and mother is to be recorded separately in birth registrations.
- Similar rules apply for adoption registrations.

5. Changes in Forms

- The proposed "Form No.1-Birth Report" will include individual religion entries for both parents.
- Existing legal forms are being modified to reflect enhanced data requirements, aiding in disaggregated policy analysis.

Statistical and Legal Components of Birth Records

Core points	Earlier Provision	New Provision (Post-Amendment)
Religion Data	Religion of the family	Religion of father and mother separately
Contact Information	Not mandatory	Aadhaar, email, and mobile (if available)
Integration with Other DBs	Limited	Permitted across central/state systems
Birth Certificate Use	Basic identity proof	Single source for multiple services

National Population Register (NPR)

- First prepared in 2010 and updated in 2015.
- Already has data on over 119 crore residents.
- Serves as a foundation for future citizen and demographic records.

Concerns and Implications

- **Privacy:** Collecting detailed personal information, including religion and Aadhaar, has triggered concerns over data protection and religious profiling.
- **Legal Validity:** The requirement must align with the Right to Privacy judgment and data protection laws under consideration.
- **Administrative Burden:** State governments and registrars need updated digital infrastructure and trained personnel to handle expanded forms.

Conclusion

The Registration of Births and Deaths (Amendment) Act, 2023 seeks to modernize civil registration through digitization and integration. While enhancing administrative efficiency and enabling data-driven governance, the expanded scope of information collected necessitates strong privacy safeguards and transparent implementation.

9 Years of Stand-Up India Scheme

Context

The Stand-Up India Scheme, launched on April 5, 2016, completed nine years of implementation. The scheme supports inclusive growth by enabling entrepreneurship among underrepresented groups.

About the Scheme

The scheme is run by the Ministry of Finance and facilitates bank loans ranging from ₹10 lakh to ₹1 crore to:

- Scheduled Caste (SC) and Scheduled Tribe (ST) entrepreneurs
- Women entrepreneurs above the age of 18

The loan is intended for starting greenfield enterprises in sectors such as:

- Manufacturing
- Services

- Trading
- Agriculture and allied activities

Eligibility Criteria

- Applicant must be SC/ST or a woman aged above 18 years.
- For non-individual entities, at least 51% of shareholding and control must be held by an eligible entrepreneur.

Progress So Far

- Thousands of loans have been sanctioned across states.
- The scheme has played a role in job creation, especially in rural and semi-urban areas.
- It complements the government's broader push for financial inclusion and grassroots entrepreneurship.

Significance

Stand-Up India bridges the gap in credit availability for marginalized groups, helping build a more equitable business ecosystem. It also contributes to women's empowerment and social upliftment through self-employment.

Technology and Innovation Report 2025: Inclusive AI for Development

Context

The United Nations Conference on Trade and Development (UNCTAD) has released the *Technology and Innovation Report 2025*, focusing on the role of inclusive artificial intelligence in development.

About the Report

The report guides governments in navigating the AI landscape and in designing inclusive science, technology, and innovation policies.

India's Performance

- India ranked 10th globally in terms of private investment in AI, receiving USD 1.4 billion in 2023.
- The US led with USD 67 billion, followed by China with USD 7.8 billion.
- India improved its rank to 36th in 2024 on the Readiness for Frontier Technologies Index, up from 48th in 2022.

Concerns Highlighted

- **Investment concentration:** 100 companies, mostly from the US and China, account for 40% of global R&D investment.
- **Global South underrepresentation:** 118 countries are currently absent from global AI policy discussions.
- **Job displacement risk:** Up to 40% of global jobs may be affected by AI-related disruptions.

Recommendations for Developing Countries

To prevent technological marginalisation, the report suggests strengthening three key areas:

1. **Infrastructure:** Provide affordable internet and computing power.
2. **Data Ecosystems:** Build legal and technical frameworks for secure data usage.
3. **Skills Development:** Enhance digital skills and problem-solving capabilities among citizens.

Global Proposals

- A shared global facility for equitable AI access, ensuring developing countries have access to tools and infrastructure.
- A public disclosure framework for AI, similar to ESG standards, to promote accountability, transparency, and responsible innovation.

Hamari Parampara Hamari Virasat Initiative

Context

The Union Ministry of Panchayati Raj, in partnership with the Government of Jharkhand, hosted a national event in Delhi to promote the 'Hamari Parampara Hamari Virasat' initiative, celebrating tribal heritage and governance.

About the Initiative

- Launched on 26th January 2025 by the Department of Panchayati Raj, Jharkhand, with support from the Union Government.
- Over 3,000 tribal villages have participated by pledging to preserve their traditional cultural and governance practices.

Objectives

- Preserve and document tribal heritage, including festivals, folk songs, traditional worship, and oral histories.
- Transmit these traditions to future generations, strengthening community identity and continuity.

Alignment with PESA Act (1996)

- The initiative is directly linked to the Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA).
- PESA empowers Gram Sabhas in Scheduled Areas to safeguard tribal customs and traditions, and encourages self-governance at the grassroots level.

Significance

- Promotes cultural preservation alongside local self-governance.
- Strengthens community institutions by integrating heritage with democratic decision-making.
- Supports inclusive development rooted in the identity and autonomy of tribal communities.

WHO Finalises World Pandemic Treaty

Context

A global treaty has been finalised by WHO member states to address pandemic preparedness and response, and will be submitted at the 78th World Health Assembly.

Treaty Objective

The treaty aims to foster global cooperation, equitable access to healthcare resources, and improve emergency preparedness.

Why This Treaty Is Essential

The COVID-19 pandemic revealed systemic gaps in global response coordination, data sharing, and supply chain resilience. The treaty seeks to rectify these failures through stronger global frameworks and cooperation mechanisms.

Core Features of the Draft Treaty

- **Pathogen Sharing and Equity:** Introduces mechanisms for sharing pathogens and ensuring fair access to health products.
- **One Health Surveillance:** Promotes integrated monitoring of human, animal, and environmental health.
- **Technology and Skills Transfer:** Aims to close R&D gaps through shared access and production capabilities.
- **Global Response Workforce:** Establishes a rapid-response medical task force.
- **Supply Chain Stability:** Creates a coordinated system for uninterrupted medical supply flow during health crises.
- **Emergency Financing:** Proposes a fund to support pandemic response, especially in vulnerable nations.

The International Health Regulations (IHR) and the GOARN network, while useful, have limited enforceability and fail to ensure equitable access or timely responses.

Increasing trend of Opting Abroad for Surrogacy Option

Context

Due to restrictions under India's surrogacy laws, many Indians are increasingly choosing surrogacy services abroad, particularly in countries like the United States, where legal frameworks are more flexible and inclusive.

Why Indians Are Going Abroad for Surrogacy

India's Surrogacy (Regulation) Act, 2021 prohibits commercial surrogacy and allows only altruistic surrogacy under strict conditions. In contrast, countries like the United States permit gestational surrogacy with clearly defined legal rights for both the intending parents and the surrogate. Healthy couples can create embryos using their own gametes and choose the gender of the child. Children born in the U.S. through surrogacy receive U.S. citizenship by birth and can be brought back to India as Overseas Citizens of India (OCI).

Surrogacy (Regulation) Act, 2021: Key Provisions

Definition

Surrogacy is defined as a practice in which a woman gives birth to a child for an intending couple with the intention to hand over the child after birth.

Altruistic Surrogacy Only

The Act permits only altruistic surrogacy. Commercial surrogacy, involving monetary compensation beyond medical expenses and insurance, is prohibited.

Permissible Purpose

Surrogacy is allowed only for couples suffering from proven infertility or specific medical conditions. It is not allowed for convenience, non-medical reasons, or for foreign nationals (except OCI cardholders).

Eligibility Criteria for Intending Couple

The couple must be legally married for at least five years. The female partner must be aged between 23 and 50 years, and the male partner between 26 and 55 years. The couple should not have a surviving biological, adopted, or surrogate child. An exception exists if the existing child has physical or mental disabilities or a life-threatening disorder.

Eligibility to be a Surrogate Mother

The surrogate must be a close relative of the couple. She should be married, have at least one biological child, and be between 25 and 35 years of age. She can act as a surrogate only once in her life and must have medical and psychological fitness certifications.

Insurance and Medical Support

The intending couple must provide 16 months' insurance coverage to the surrogate to ensure support in case of post-delivery medical complications.

Regulatory Framework

The Act provides for the constitution of a National Surrogacy Board (NSB) and State Surrogacy Boards (SSBs) to oversee regulation, grant permissions, monitor standards, and investigate violations. Surrogacy clinics must register under this law and follow prescribed ethical and medical standards.

Penalties for Violation

Violations such as commercial surrogacy, sale of embryos, abandonment of a surrogate child, or exploitation can lead to imprisonment of up to 10 years and fines up to ₹10 lakh.

Challenges and Criticisms

- **Exclusionary Framework:** The Act limits surrogacy to heterosexual married couples, excluding single individuals, same-sex couples, and live-in partners. This has raised concerns regarding reproductive autonomy, equality, and discrimination.
- **Lack of Surrogate Autonomy:** The law assumes goodwill from close relatives acting as surrogates, but it does not sufficiently safeguard against coercion or ensure informed consent. Surrogates have limited legal autonomy under the current framework.
- **Economic Implications of the Ban:** Many women, especially from low-income backgrounds, had found in surrogacy a better-paid, safer alternative to other exploitative jobs. The commercial ban has eliminated a significant income source for them without offering alternatives.
- **Inequitable Access:** While affluent Indians can travel abroad for surrogacy services, many middle-class or economically weaker couples remain without options due to domestic restrictions.

Way Forward

The Act should be re-evaluated through a reproductive rights and justice lens. Policies must aim to protect surrogate mothers from exploitation while allowing them agency and informed choice. A regulated, ethical, and transparent commercial surrogacy model should be explored. This should include mandatory counselling, medical safety, fair compensation, and legal clarity for all parties. The framework should ensure inclusivity by allowing access to all categories of individuals, including single parents and members of the LGBTQIA+ community.

India's surrogacy law must strike a balance between ethics, reproductive rights, and socio-economic realities to serve both surrogate mothers and intending parents justly.

Living Wage Policy in India

Context

India is preparing to adopt a Living Wage policy by 2025 with technical support from the International Labour Organization (ILO).

What is a Living Wage?

- A living wage refers to the amount needed to ensure a decent standard of living, including food, housing, healthcare, education, and social security.
- It is usually higher than the minimum wage, which is the legally mandated floor for worker pay.

ILO Definition

- A living wage should enable workers and their families to afford essential goods and services.
- It should reflect local living costs and be aligned with the country's economic conditions.

India's Present System

- The current national minimum wage floor is ₹176/day, unchanged since 2017.
- Implementation varies across states, leading to wage disparities.
- As of 2018, India's estimated living wage was ₹10,300/month.

Problems with the Current System

- Non-permanent workers are often paid less than the minimum wage.
- Prime Database data shows only 20% of top listed companies pay minimum wages to all contract staff.

Impacts of Living Wage Policy

- **Positive:**
 - Boosts consumption and demand.
 - Reduces income inequality.
 - Improves quality of life for contractual workers.
- **Challenges:**
 - May cause cost pressures on small and medium enterprises.
 - Could trigger wage-push inflation.

Way Forward

- India must develop a region-wise living wage framework.
- Ensure compliance and enforcement mechanisms.
- Balance wage reforms with support for SMEs to absorb cost increases.
- Align reforms with ILO standards for decent work and fair income.

Shukre Panel on Maratha Quota

Context

The Justice Shukre Commission has highlighted socio-economic backwardness in the Maratha community, justifying a 10% quota.

Background

- Maharashtra passed a law granting 10% reservation in education and jobs.
- The report claims "extraordinary conditions" permit exceeding the 50% reservation ceiling.

Legal Framework

- **Article 16:** Reservation for backward classes.
- **103rd Amendment:** EWS quota introduced.
- **Indira Sawhney Case (1992):** Set the 50% cap on reservations but allowed exceptions.

Arguments

- **In favour:** Ensures social justice, addresses historical marginalization.
- **Against:** Hurts merit, fosters resentment, and quotas become permanent.

Way Forward

- Ensure reservation doesn't lead to further social division.
- Policy should be data-driven and legally sound.
- Alternatives like better education access and job creation must be strengthened.

New Rules to Get Equivalence Certificates for Foreign Degrees

Context

The University Grants Commission (UGC) has notified a new regulation to streamline the process for obtaining equivalence certificates for foreign academic qualifications.

What is an Equivalence Certificate?

It is a document that certifies a foreign educational qualification (such as a degree or diploma) is comparable to its Indian counterpart. It is essential for further studies or employment in India.

New Conditions for Equivalence

The foreign institution must be recognized in its home country. The academic program must mirror Indian standards in terms of entry requirements and structure, including credit systems and practical components.

Degrees from offshore campuses will also be eligible if they meet the legal standards of both the host country and the parent institution's country.

Hike in Prices of Essential Medicines

Context

The National Pharmaceutical Pricing Authority (NPPA) has approved a price hike for essential medicines, including antibiotics, anti-infectives, and painkillers, effective from April 2024.

About Essential Medicines

Essential medicines are those that satisfy the priority healthcare needs of the population. They are intended to be:

- Available at all times,
- In adequate amounts,
- In appropriate dosage forms,
- Of assured quality and at affordable prices.

India follows the National List of Essential Medicines (NLEM), which is revised periodically. The latest version was updated in 2022.

About NPPA

- Established in 1997 under the Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers.
- An autonomous body tasked with fixing and revising the prices of pharmaceutical drugs and ensuring their availability.
- Regulates drug prices through the Drug Price Control Order (DPCO), 2013.

Recent Price Hike

- NPPA allowed an increase of over 12% in ceiling prices of drugs listed under NLEM.
- This hike is based on the Wholesale Price Index (WPI) inflation for the calendar year 2023.
- It affects around 800 formulations, including life-saving drugs such as paracetamol, azithromycin, amoxicillin, ciprofloxacin, metformin, and others.

Rationale Behind the Hike

- **Rising input costs:** Key raw materials (active pharmaceutical ingredients or APIs) are becoming expensive.
- **Global disruptions:** Supply chain issues and inflationary pressures have increased production costs.
- **Sustainability:** Manufacturers argued that without price adjustments, continued production would be unviable.

Impact on Public

- **Affordability Concerns:** Even a small increase may affect out-of-pocket expenses, especially for low-income families.
- **Access to Treatment:** Some patients may avoid or reduce medication use due to price hike, leading to poor health outcomes.

Government Measures to Balance Impact

- NPPA uses WPI-linked formula for transparent revisions.
- Ensures prices do not rise arbitrarily and remain within affordable limits.
- Encourages generic drug availability through Jan Aushadhi Kendras to offer cheaper alternatives.

Some important points

- The first country to adopt an Essential Medicines List was Tanzania in 1970.
- India adopted its first NLEM in 1996.
- Drugs in the NLEM are identified using scientific evidence, public health relevance, and cost-effectiveness.

Conclusion

While the price hike is rooted in economic necessity, it underlines the importance of strengthening public healthcare infrastructure and ensuring access to affordable medicine for all sections of society. India must continue to monitor pricing without compromising public health priorities.

Niveshak Didi Initiative

Context

The Investor Education and Protection Fund Authority (IEPFA) and India Post Payments Bank (IPPB) launched Phase 2 of the “Niveshak Didi” initiative.

About the Initiative

- Trains women postal workers to be financial literacy educators.
- Promotes responsible investing, fraud prevention, digital banking, and saving habits in rural areas.

Phase 1 Achievements

- Over 55,000 beneficiaries reached.
- 60% were female participants from rural communities.

Phase 2 Goals

- Set up 4,000+ financial literacy camps.
- Engage around 40,000 women postal workers.

Institutions Involved

- IEPFA: A statutory body under the Ministry of Corporate Affairs, promotes investor awareness.
- IPPB: A postal bank established in 2018 focused on inclusive, digital-first financial services.

Protection of Women from Domestic Violence Act, 2005

Context:

The Delhi High Court reaffirmed that the Domestic Violence Act is a social justice measure applicable to all women, regardless of religion or social background.

Key Features of the Act:

- Came into effect in 2006.
- Protects women in domestic relationships from physical, emotional, verbal, sexual, and economic abuse.
- Applies to wives, live-in partners, mothers, sisters (including adopted), and daughters.

Salient Provisions:

- **Right to Residence:** Section 17 ensures that the woman cannot be evicted from the shared household.
- **Protection Orders:** Magistrates can restrict abusers from committing further acts of violence.
- **Monetary Relief and Custody:** Victims can get maintenance and temporary custody of children.
- **Time-bound Proceedings:** Court must dispose of cases within 60 days.
- **Multiple Reliefs in One Case:** Civil, criminal, and protective remedies can be combined.

Role of Protection Officers:

- Appointed by governments to help victims with filing complaints, getting legal aid, and accessing shelter or counseling.

Arguments in Favour:

- Provides comprehensive legal protection.
- Recognizes all forms of violence, not just physical.
- Aligns with international obligations like CEDAW.

- Empowers women to seek justice with dignity.

Arguments Against:

- Accused of gender bias – does not include male or transgender victims.
- Cases of misuse and false complaints reported.
- Family disruption and prolonged legal cases create further trauma.
- Structural issues like lack of trained staff and underfunded shelters.

Conclusion:

While the Act is a landmark for gender justice, there is a need for institutional support and safeguards against misuse. A balanced and sensitive approach is essential for effective implementation.

POLITY AND GOVERNANCE

Maharashtra Sets Up Dedicated Cell for Mercy Petitions

Context

The Maharashtra government has set up a dedicated cell under the Additional Secretary (Home) to process mercy petitions of death row convicts. This step came after the Supreme Court directed all states to create such mechanisms to avoid delays. The Court noted that long delays in executing mercy petitions lead to a "dehumanising effect", which may amount to mental cruelty.

This move reflects an administrative shift towards compassion and constitutional morality. It recognizes that justice is not just about punishment but also about protecting human dignity, especially for those awaiting execution amid bureaucratic inaction.

What is a Mercy Petition?

- A mercy petition is a last legal remedy available to convicts. It is especially relevant for those sentenced to death or life imprisonment. The petition is submitted to the President under Article 72 or to the Governor under Article 161.
- The petition does not challenge the court's decision. Instead, it seeks clemency—relief in the form of pardon, commutation, remission, respite, or reprieve. It is based on humanitarian grounds such as mental health, age, rehabilitation potential, or socio-economic background.
- A major concern is the absence of a prescribed timeline. This often causes delays in decision-making, prolonging the uncertainty and psychological trauma faced by the convict.

Constitutional and Legal Framework

The powers to grant mercy are provided in the Indian Constitution.

- **Article 72** empowers the President to grant pardons, reprieves, respites, and remissions. It applies to:
 - Cases under Union law,
 - Court-martial sentences,
 - Death penalty cases.
- **Article 161** empowers the Governor to grant similar relief for offenses under state law. However, the Governor cannot pardon a death sentence or intervene in court-martial cases.

In *Maru Ram v. Union of India (1981)*, the Supreme Court clarified that these powers must be exercised on the advice of the Council of Ministers. The mercy power is not a personal discretion but an executive function.

Moral and Constitutional Justification

- The right to life and personal liberty under Article 21 is fundamental. Even after conviction, the dignity of the individual must be respected. Punishment must be humane and proportionate.
- Mercy petitions serve as a safeguard against irreversible errors in the justice process. They give the executive the moral space to consider non-legal factors like mental illness, post-conviction behavior, and rehabilitation potential.
- International conventions like the Universal Declaration of Human Rights also emphasize the right to life. While India retains capital punishment for the *rarest of rare* cases, mercy petitions allow the state to align with global humanitarian values.

Difference Between President and Governor's Powers

The powers of the President and Governor differ in scope and application:

Aspect	President (Art. 72)	Governor (Art. 161)
1. Jurisdiction	Union laws, court-martial, death sentences	State laws only
2. Court-martial cases	Can grant clemency	No authority
3. Death sentence	Can pardon or commute	Can only commute, not pardon
4. Advice Binding	Council of Ministers at Centre	State Council of Ministers

This shows that while both authorities have clemency powers, the President's jurisdiction is wider and includes more critical cases like court-martial and death sentence pardons.

Need for Dedicated Cells: The Maharashtra Model

Delays in deciding mercy petitions have often been challenged in courts. In *Shatrughan Chauhan v. Union of India (2014)*, the Supreme Court ruled that prolonged delay could itself be a ground for commuting a death sentence.

Maharashtra's dedicated cell is a solution to such administrative paralysis. It aims to streamline the mercy process and enhance accountability. Key functions of the cell include:

- Timely collection of case records and reports.
- Coordination with legal and prison authorities.
- Drafting of notes and recommendations for decision-makers.
- Regular tracking and updating of pending petitions.

This institutional setup can reduce procedural delays and ensure that the executive process matches the gravity of the decision involved.

Conclusion

The power to grant mercy is not a loophole in the justice system. It is a deliberate constitutional safeguard to temper law with humanity. Articles 72 and 161 symbolize the state's responsibility to uphold justice with compassion.

Maharashtra's initiative to set up a dedicated cell reflects progressive governance. It institutionalizes empathy and efficiency in a domain often marred by delay and neglect. Other states must emulate this model to ensure that mercy petitions are decided fairly, promptly, and with full respect to constitutional values.

This reform strengthens the foundation of a humane criminal justice system—one where justice is not just delivered but delivered with dignity.

President's Assent to Waqf (Amendment) Act, 2025

Context

President Droupadi Murmu has signed the Waqf (Amendment) Bill, 2025 into law. This follows its passage by both Houses of Parliament in the same week. The President has also approved the repeal of the *Mussalman Wakf Act* through a separate Repeal Bill, 2025.

What is Waqf?

- Waqf refers to a permanent dedication of property for religious or charitable purposes in Islamic law. Once declared as Waqf, the property is considered to be under divine ownership and cannot be sold or used for personal gain.
- Historically, the Waqf tradition in India goes back to the Delhi Sultanate period. Sultan Muizuddin Sam Ghaor dedicated land for the Jama Masjid of Multan and entrusted its administration to religious authorities.

Objectives of the New Law

The government aims to reform the management of Waqf properties. The law focuses on transparency, judicial clarity, and stronger regulation. It addresses old challenges like excessive litigation, lack of oversight, and delays in property surveys.

Major Provisions

- The law redefines how a Waqf is established. Now, religious use alone is not enough; documented proof will be necessary.
- It improves the registration and survey process by giving responsibilities to district authorities.
- Government oversight has been increased to ensure accountability.
- Non-Muslim individuals and women can now be appointed to Waqf boards and related committees. This is being seen as a step toward inclusivity.

Significance

This law is considered a step forward in updating Waqf governance. It aims to make Waqf property management more structured, fair, and free from misuse.

The government believes these changes will reduce disputes and bring greater efficiency in handling charitable religious assets.

Key Amendments

The act modified several provisions of the Waqf Act, 1995. It aims to streamline property surveys, improve transparency, and address long-standing legal ambiguities.

- **The concept of “Waqf by use” has been removed.** This means that a property used continuously for religious purposes cannot be declared Waqf property without official documents like a *Waqfnama*.
- The responsibility for surveying Waqf properties has been shifted from the Survey Commissioner to the District Collector or other senior officials.
- The Bill proposes that non-Muslims may also be appointed as Chief Executive Officers and members of State Waqf Boards.
- Section 107 of the Waqf Act, 1995 has been deleted. As a result, the Limitation Act, 1963 will now apply to Waqf properties. This could allow adverse possession claims on Waqf lands that have been occupied for more than 12 years.

Why the Amendment?

The government says the changes are needed to fix legal gaps in the existing law. It argues that disputes over Waqf property titles and misuse of land have increased. The Bill also proposes a unified digital registry to track and regulate Waqf assets.

Criticism and Concerns

The amendments have triggered strong opposition. Critics believe that allowing non-Muslims on Waqf Boards and shifting decision-making to District Collectors dilute the rights of the Muslim community. There are concerns that the power to determine Waqf status could now rest with the government instead of the Waqf Tribunal. Critics also argue that applying the Limitation Act may legalize illegal occupation of Waqf land.

Supreme Court affirmed Enforcement Directorate's authority

Context

The Supreme Court affirmed Enforcement Directorate's authority to summon anyone for information, despite ongoing elections.

About Enforcement Directorate

- Formed in 1956 under Department of Economic Affairs.
- Investigates financial crimes under:
 - **PMLA (2002)** – money laundering
 - **FEMA (1999)** – foreign exchange violations
 - **FEOA (2018)** – fugitives and asset seizures

Powers of ED

- Summon for evidence or records.
- Attach, freeze, or confiscate property.
- Conduct raids and interrogations.

Challenges

- Allegations of political misuse.
- Long-drawn investigations due to legal hurdles.

- Poor coordination with other agencies.
- Limited international cooperation on asset recovery.

Way Ahead

- Strengthen ED's capacity and autonomy.
- Legal reforms for quicker case disposal.
- Boost inter-agency and global collaboration.

Tribhuvan Sahkari University

Context

The Lok Sabha recently passed a bill establishing the Tribhuvan Sahkari University in Anand, Gujarat. This initiative honours Tribhuvandas Kishibhai Patel, known as the father of India's cooperative movement.

Contributions

In 1946, he founded the Kaira District Cooperative Milk Producers' Union (KDCMPUL) on the suggestion of Morarji Desai. His partnership with Verghese Kurien led to the creation of Amul, which became the face of the White Revolution. Patel also helped establish institutions like the NDDB, GCMMF, and IRMA.

Legacy

His work laid the foundation for rural self-reliance and cooperative development in India. Recognised with the Ramon Magsaysay Award in 1963 and the Padma Bhushan in 1964, Patel's legacy continues through the institutions he built.

Supreme Court Observations on Disqualification

Context

The Supreme Court has recently addressed the issue of delays in disqualification proceedings involving 10 MLAs from Telangana who shifted allegiance to the ruling party after being elected on a different party ticket.

Legal Framework on Disqualification

- **Article 102** of the Constitution lays down the grounds for disqualification of MPs.
- **Section 8 of the Representation of the People (RP) Act, 1951** specifies offences that result in disqualification upon conviction. These include bribery, corruption, promoting enmity, and heinous crimes like rape.
- A member sentenced to a minimum of two years' imprisonment is liable to be disqualified.
- **Article 103** states that the President decides on disqualification questions, based on the opinion of the Election Commission.

Supreme Court's Stand

- In the Lily Thomas (2013) judgment, the Court struck down Section 8(4) of the RP Act. This section previously allowed convicted MPs/MLAs three months to appeal and avoid immediate disqualification.
- The Court held that candidates and sitting members are equal before the law and must face instant disqualification upon conviction.

- Recently, the Court reiterated that delay by the Speaker in deciding disqualification petitions under the Tenth Schedule (anti-defection law) weakens the law's intent.

Observations on the Speaker's Role

- The Supreme Court highlighted that the Speaker's indecision cannot be allowed to defeat the purpose of the anti-defection law.
- While the Court cannot dictate the outcome, it can order the Speaker to decide within a "reasonable time".
- In previous cases, such as Manipur and Maharashtra, the Court stepped in when the Speaker failed to act promptly.

Understanding the Tenth Schedule

- Introduced in 1985 via the 52nd Amendment.
- Seeks to check political defections by disqualifying elected members who voluntarily give up party membership or defy party directions during voting.
- Originally allowed exceptions:
 - **One-third split** was considered valid, now repealed by the 91st Amendment (2003).
 - **Two-thirds merger** still allowed, if members join another party with two-thirds support.

Conclusion

The Supreme Court's intervention underlines the need for timely adjudication in disqualification matters. Ensuring accountability of legislators who defect is vital to uphold the spirit of democratic stability and the sanctity of the electorate's mandate.

President's Rule in Manipur

Context

Parliament approved the statutory resolution confirming the imposition of President's Rule in Manipur. Under Article 356, the Union government can assume control of state functions if the state fails to act according to constitutional provisions.

Key provisions:

- President's Rule is initially valid for 6 months.
- It can be extended for a maximum of 3 years with conditions under the 44th Amendment Act.
- Article 365 allows imposition if a state fails to follow Union directives.

Important judgments: S. R. Bommai vs Union of India (1994), Buta Singh case (2005). Major commissions like Sarkaria, Punchhi, and Chelliah recommended that Article 356 should be used sparingly and only in genuine constitutional crises.

22nd Amendment to the U.S. Constitution

Context

The 22nd Amendment to the U.S. Constitution was in the spotlight after former U.S. President Donald Trump made remarks on a two-term limit for American Presidents.

22nd Amendment

- The 22nd Amendment to the U.S. Constitution states that no one can be elected more than twice as President. The Amendment was ratified in 1951, after President Franklin D. Roosevelt had been elected four consecutive times, from 1932 to 1944.
- If someone has served as President for more than two years of another's term (for example, a Vice President who became President due to the President's death or resignation), they can only be elected once. Thus, effectively, the maximum U.S. Presidential tenure can be 10 years (two years as a successor plus two full terms).

Voter Verifiable Paper Audit Trail (VVPAT)

Context

Opposition parties in India have demanded 100% counting of VVPAT slips to increase public trust in the use of Electronic Voting Machines (EVMs).

What is VVPAT?

VVPAT stands for Voter Verifiable Paper Audit Trail. It is an independent verification system attached to the EVM. When a vote is cast, the VVPAT prints a slip showing the name and symbol of the selected candidate. The slip is visible to the voter through a transparent window for about 7 seconds and then drops into a sealed box. This allows the voter to confirm that their vote has been recorded correctly.

Why Was VVPAT Introduced?

It was first used in the 2014 Lok Sabha elections to enhance transparency and verifiability in the voting process. It adds a paper trail to electronic voting, which can be cross-verified if needed.

Current Concerns

- Opposition parties believe that counting all VVPAT slips will ensure greater accuracy and build public confidence.
- Currently, slips from only five randomly selected polling booths per Assembly segment are counted.

Significance

VVPAT serves as a vital check-and-balance in India's electoral system. It strengthens the democratic process by providing an additional layer of transparency and trust.

Bharatiya Nyaya Sanhita (BNS): Sections 271 and 272

Context

A First Information Report (FIR) was registered against a restaurant owner in Noida under Section 271 of the Bharatiya Nyaya Sanhita (BNS), drawing attention to the new legal framework replacing the Indian Penal Code (IPC).

Background

The Bharatiya Nyaya Sanhita (BNS), 2023 has replaced the Indian Penal Code (IPC), 1860. Sections 271 and 272 of the BNS correspond to Sections 269 and 270 of the IPC respectively. These sections aim to prevent actions that could result in the spread of life-threatening infectious diseases.

Section 271: Negligent Acts Leading to Spread of Infection

This section deals with acts of negligence that are likely to spread an infection of a disease dangerous to life.

- Punishment: Imprisonment of up to six months, or fine, or both.
- Nature of Offence: Bailable and non-cognizable.

To establish guilt under this section, the following must be proved:

1. The disease in question is dangerous to life.
2. The act was committed with knowledge that it was likely to spread infection.
3. The act was done negligently, without intent.

Section 272: Malignant Acts Leading to Spread of Infection

This section addresses deliberate actions taken with malicious intent to spread a disease that is dangerous to life.

- Punishment: Imprisonment up to six months, or fine, or both.
- Nature of Offence: Bailable and cognizable.

Under this section, the prosecution must prove:

1. The presence of malicious or deliberate intent (mens rea).
2. The disease is hazardous to human life.
3. The act was knowingly committed to cause harm.

Key Features and Differences

- The principal difference between the two sections lies in intent: negligence versus malignancy.
- Both are applicable only to diseases considered dangerous to life.
- These sections were widely invoked during the COVID-19 pandemic under the IPC and now continue with identical wording under BNS.

Legal and Practical Implications

- These provisions are essential in public health emergencies to ensure legal accountability.
- Authorities use them to curb behaviors like violating quarantine rules, running unsanitary businesses, or

hiding infections.

– The burden lies on the prosecution to prove both the existence of a dangerous disease and the accused's knowledge or intent.

Recent Application

The registration of an FIR under Section 271 against a restaurant owner highlights that even in a post-pandemic phase, these legal tools continue to be relevant in cases where public health is endangered through negligence.

Conclusion

Sections 271 and 272 of the Bharatiya Nyaya Sanhita aim to strike a balance between safeguarding public health and ensuring individual accountability. Their effective implementation requires judicial prudence to differentiate between carelessness and criminal intent, thereby upholding public safety without misuse.

Tamil Nadu Sets Up Panel for Enhancing State Autonomy

Context

A three-member committee headed by a former Supreme Court judge has been formed by Tamil Nadu to explore greater autonomy for states within the Indian federal framework.

Key Terms of Reference

- Assess constitutional and legal provisions affecting federal balance
- Suggest ways to reclaim state subjects moved to the Concurrent List
- Examine earlier recommendations like those from the Rajamannar Committee
- Propose governance reforms for efficient Centre-State relations

Federal Features in the Indian Constitution

India operates on a quasi-federal model with a stronger central government. Powers are divided into Union, State, and Concurrent Lists, but financial and structural autonomy is limited.

Major Challenges to Federal Balance

- Excessive Centre control in times of emergency
- Financial dependence of states
- Limited representation in national decisions
- The Centre's power to alter state boundaries

Previous Recommendations for Reform

- **Sarkaria and Punchhi Commissions:** Advocated for stronger Inter-State Councils and transparency in using Article 356
- **NCRWC and NITI Aayog:** Recommended financial devolution and decentralised planning
- **Need for Fiscal Federalism:** Greater share of tax revenues to states and restructured centrally sponsored schemes.

Telangana Implements Sub-Classification Within Scheduled Castes

Context

Telangana has become the first Indian state to implement sub-categorisation of Scheduled Castes (SCs) after the Supreme Court upheld the constitutional validity of such a move. The new law divides SCs into three groups to address internal disparities.

Key Provisions of the Act

The Telangana Scheduled Castes (Rationalisation of Reservations) Act, 2025, divides 59 SC communities into Group I, II, and III.

Group I includes 15 sub-castes, deemed most backward, with 1% reservation.

Group II includes 18 sub-castes with 9% reservation.

Group III includes 26 relatively better-off sub-castes with 5% reservation.

Judicial Background

The move follows the Supreme Court's 2024 judgment in the State of Punjab v. Davinder Singh case. The Court overturned its 2004 EV Chinniah ruling, allowing the state to classify SCs if backed by data and rational criteria.

Constitutional Basis

Articles 15(4) and 16(4) empower the state to make provisions for socially and educationally backward classes.

Article 335 allows for efficiency in administration to be balanced with SC/ST claims.

Article 341 empowers the President to notify Scheduled Castes.

Arguments Supporting Sub-Categorisation

Recognises unequal backwardness within SCs and promotes equitable representation.

Enables better targeting of affirmative action based on empirical data.

Supports the goal of effective inclusion rather than just numerical representation.

Arguments Against

Raises concerns of fragmenting SC communities and weakening political solidarity.

Challenges around defining objective criteria for classification.

Fear that 'creamy layer' concept may dilute protections against historical discrimination.

Way Forward

States can now constitutionally create internal quotas within SC reservations. However, they must ensure the classification is backed by data, follows legal procedures, and addresses the core purpose of social justice.

Program Management Unit Launched

Context

The Ministry of Mines has launched a Program Management Unit (PMU) to enhance the functioning of District Mineral Foundations (DMFs) and better implement the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY).

About DMF

- Established under the MMDR Act, DMFs are non-profit trusts created in mining-affected districts.
- Their goal is to channel funds for the welfare of communities impacted by mining operations.
- Funds come from a share of mining royalties and are not part of the Consolidated Fund of India.

Utilisation under PMKKKY

Seventy percent of DMF funds are earmarked for priority areas such as healthcare, drinking water, education, and welfare of women and children.

Thirty percent may be used for infrastructure like roads and electricity.

Significance

- Strengthens grassroots governance and enables localised development in mining-affected regions.
- Aims to address social, environmental, and economic impacts of mining.

Challenges

- Significant underutilisation of DMF funds across states.
- Lack of annual action plans and local participation.
- Funds often diverted for unrelated infrastructure projects.

Way Forward

Empowering Gram Sabhas, mandating development plans based on local needs, and ensuring third-party audits will enhance transparency and effectiveness.

Declaration of Movable Asset – Supreme Court Judgment

Context:

The Supreme Court of India issued a significant ruling clarifying what types of movable assets election candidates must declare.

Key Observations by the Court:

- Candidates need not declare every item such as clothing, shoes, stationery, and furniture.

- Only those items that constitute **sizable assets** or reflect significantly on a candidate's lifestyle should be disclosed.
- Reinforces that voters do not have an absolute right to a candidate's private life.

Legal Framework:

- **Section 123** of the Representation of the People Act, 1951 defines "corrupt practices."
- **Section 100** allows elections to be declared void if corrupt practices or non-compliance with legal provisions are proven.

Implications of the Judgment:

- Balances the right to information of voters with privacy rights of candidates.
- Prevents misuse of minor non-disclosures as grounds for election invalidation.

Conclusion:

The verdict provides clarity and fairness in electoral disclosures, maintaining transparency while protecting individual dignity.

Jal Jeevan Mission

Context

The Jal Shakti Ministry has sought an additional ₹2.79 lakh crore for the Jal Jeevan Mission.

Overview

- Launched in 2019 to provide tap water to 16 crore rural households.
- Original deadline was 2024; now extended to 2028.

Key Components

- Source sustainability
- Greywater management
- Rainwater harvesting
- Community engagement through IEC and Jan Andolan

SCIENCE AND TECHNOLOGY

Energy Statistics India 2025

Context

The Ministry of Statistics and Programme Implementation (MoSPI) has released its latest annual report, *Energy Statistics India 2025*, through the National Statistics Office (NSO). This publication offers a detailed view of India's evolving energy landscape, highlighting supply, consumption, production, and policy direction.

India's Energy Supply and Demand

India's total energy supply in 2025 has reached 1,800 million tonnes of oil equivalent (MTOE). This reflects a steady annual increase of 4.5% compared to 2024. The demand pattern continues to be shaped by:

- **Industrial use** – 40% of total demand
- **Transport sector** – 25%
- **Household/residential** – 20%

This structure mirrors India's fast-paced economic activity and rising urban electricity needs.

India's Energy Mix (2025)

The composition of energy sources in India shows a strong tilt toward fossil fuels, but renewables are gaining ground.

Source	Share (%)
Coal	48%
Oil	28%
Natural Gas	8%
Renewables	12%
Nuclear	4%

Coal remains dominant, but the growing share of renewables reflects India's gradual shift toward sustainability.

Coal, Oil, and Gas: Reserves and Production

India has a coal reserve base of 320 billion tonnes, mostly concentrated in five states:

- **Odisha** – 25.47%
- **Jharkhand** – 23.58%
- **Chhattisgarh** – 21.23%
- **West Bengal** – 8.72%
- **Madhya Pradesh** – 8.43%

These five states hold nearly 85% of the nation's coal reserves. Annual production stands at 950 million tonnes, fulfilling around 85% of domestic demand. India is the second-largest coal producer globally, after China.

Lignite reserves, at 47.3 billion tonnes, are concentrated in Tamil Nadu (79%), reflecting regional dependence for thermal energy.

Crude Oil Reserves

India's crude oil is mainly located in:

- **Western Offshore** – 32%
- **Assam Region** – 22%

Despite having reserves, India still imports a significant share of its crude requirement due to limited output.

Natural Gas Reserves

Largest reserves are found in:

- **Western Offshore** – 31%
- **Eastern Offshore** – 24%

Gas output supports industries and city gas distribution, but production still lags behind demand.

Renewable Energy Growth in 2025

India has made remarkable progress in renewable energy capacity. The key sources include solar, wind, hydro, and biomass.

Renewable Potential by State

More than 50% of total renewable energy potential is concentrated in four states:

- **Rajasthan** – 20.3%
- **Maharashtra** – 11.8%
- **Gujarat** – 10.5%
- **Karnataka** – 9.8%

Installed Capacity in 2025

Source	Capacity (GW)
Solar	175
Wind	50
Hydro	52
Biomass & Waste	15

The National Solar Mission and Wind Energy Development Programme have been instrumental in achieving these numbers.

Electricity Generation and Use

India's total installed power capacity now stands at 450 GW, an increase from 420 GW in 2024. Annual electricity generation has reached 1,700 TWh, reflecting improved supply reliability.

Per capita electricity consumption has crossed 1,500 kWh per year, driven by urban expansion and increased appliance usage.

Transmission and Efficiency

Transmission losses have declined to 17% in FY 2023–24. In FY 2014–15, these stood at 23%. The improvement is due to smart grid adoption, better load management, and reduced pilferage.

Sustainability and Policy Push

Several government policies are steering India toward an efficient and greener energy future:

- **National Hydrogen Mission:** Promotes green hydrogen use in heavy industries.
- **Perform, Achieve, and Trade (PAT) Scheme:** Encourages industries to reduce specific energy consumption.
- **FAME-III Scheme:** Promotes electric vehicles (EVs) and charging infrastructure.

Carbon Emissions Outlook

India's carbon emissions in 2025 are estimated at 2.9 billion tonnes of CO₂. This marks a 4% decline, thanks to a growing share of renewables.

India remains committed to its net-zero emissions target by 2070, aligned with its NDCs under the Paris Agreement.

Looking Ahead: 2026–2030

By 2030, India aims to:

- Increase the renewable share to 25% of total energy consumption.
- Maintain energy demand growth at 5% annually, driven by the economy.
- Enhance grid modernization and battery storage.

Key Challenges Ahead

Despite progress, India faces critical energy-related challenges:

1. **Fossil Fuel Dependence:** Coal and oil dominate the energy mix.
2. **Import Vulnerability:** Crude oil imports make India vulnerable to global price shocks.
3. **Infrastructure Gaps:** Weak transmission lines and lack of storage hinder renewable expansion.
4. **Technological Limitations:** Integration of renewables needs better forecasting, storage, and automation.

Conclusion

Energy Statistics India 2025 presents a picture of dynamic growth and cautious optimism. India is steadily expanding its energy supply while making room for clean sources. Renewable energy is gaining ground, transmission losses are falling, and consumption is rising in line with development.

However, the journey to a secure, sustainable, and affordable energy future requires deep reforms, technology upgrades, and investment in clean energy ecosystems. Balancing energy demand, climate goals, and economic growth will define India's success in the coming decades.

ICAR-CTCRI Develops Orange-Fleshed Sweet Potato (SP-95/4)

Introduction

The ICAR-Central Tuber Crops Research Institute (ICAR-CTCRI) has developed a new variety of orange-fleshed sweet potato (SP-95/4) to enhance food and nutritional security, particularly in tribal regions of Kerala and other states. The variety has cleared final trials in Odisha, West Bengal, Karnataka, and Kerala.

Nutritional Benefits

The sweet potato variety contains 8 mg of Beta-carotene per 100g, a key nutrient to combat Vitamin A deficiency, which is prevalent among tribal communities. With an average tuber weight of 300 grams and a fusiform shape, it is suitable for processing and mass consumption.

Expansion and Processing Plans

Currently grown on 10–15 acres, the project aims to expand to 100 acres by the end of 2025. There are plans to set up a processing unit using Corporate Social Responsibility (CSR) funds, supporting local farmers with economic and nutritional benefits.

R&D and Trial Success

The SP-95/4 variety has undergone multi-state trials, demonstrating adaptability to varied climatic zones and offering high yield potential. Trials in Attappady confirmed its success in tribal belts.

Initiatives Supporting Cultivation

The project is part of:

- **Rainbow Diet Programme** (launched by CTCRI in 2023)
- **Punarjeevanam Initiative** (jointly led by Kudumbashree and CTCRI from 2024)

These efforts promote biofortified crops and aim to expand cultivation in Attappady to 100 acres.

Public Health Relevance

Inclusion of orange-fleshed sweet potatoes in local diets directly addresses malnutrition and micronutrient deficiencies. It supports government goals of improving tribal health outcomes through sustainable agricultural interventions.

CERN completed a feasibility study on the Future Circular Collider (FCC)

Context

CERN, along with global scientific partners, has completed a major feasibility study on the proposed Future Circular Collider (FCC). This study involved contributions from over a thousand scientists and engineers.

What is the FCC?

The FCC is a proposed particle accelerator that aims to succeed the Large Hadron Collider (LHC). It will be built to explore the most fundamental questions in physics, especially those that remain unresolved even after the discovery of the Higgs boson.

Scale and Design

The FCC will have a massive circumference of 91 kilometres. This is more than three times the length of the LHC. It will be developed in two phases. The first phase will feature an electron-positron collider, expected to become operational by 2046. The second phase will involve a proton-proton collider and is projected to begin by 2070.

Scientific Goals

The collider aims to probe deeper into the origin of mass, the nature of dark matter, and the future of the universe. It will conduct high-energy particle collisions at a scale of 100 trillion electronvolts. This energy level is over seven times higher than what the LHC can currently achieve.

Technological Potential

The project is not just about advancing science. It is also expected to drive innovation in other fields. The FCC could contribute to new technologies in medicine, energy systems like fusion, power transmission, and advanced computing.

Comparison with the LHC

The LHC has been operational since 2008 and led to the discovery of the Higgs boson in 2012. It is set to continue until 2041. The FCC is designed to carry forward this legacy with more powerful capabilities. It will help answer questions the LHC could not fully resolve.

Why This Matters

Understanding particle physics helps us understand how the universe began and how it works. The FCC will offer insights into the smallest building blocks of matter. It will also test the limits of current physical theories and may help develop entirely new frameworks.

Conclusion

The feasibility study marks a big step forward for global science. The FCC promises to be a game-changer in both fundamental research and technology development. As global cooperation grows, the FCC could become the next major tool for scientific exploration after the LHC.

Saturn Gains 128 New Official Moons

Context

Astronomers from Taiwan have discovered 128 new moons around Saturn. This makes Saturn the planet with the most moons in the Solar System. Saturn is the sixth planet from the Sun and the second largest in the Solar System. Its rings are made mostly of ice and rock. Titan, its largest moon, is even bigger than Mercury.

Saturn's New Status

Saturn now has 274 confirmed moons. This is more than all other planets combined. It regains its title as the planet with the most natural satellites, surpassing Jupiter.

How Were They Found?

Some moons were found through space missions like Voyager 1. Others were detected during rare orbital events called "ring-plane crossings." These are times when Saturn's rings appear edge-on, making it easier to spot small moons.

What Are Irregular Moons?

All the newly found moons are irregular. These moons follow tilted, elliptical paths and move in various directions. Scientists believe they were once small bodies captured by Saturn's gravity and later broke into pieces.

Size and Classification

Most of the new moons are just a few kilometers wide. Despite their small size, they meet NASA's criteria for classification as natural moons.

Understanding Saturn's Rings

This discovery helps scientists understand the origin of Saturn's rings. The irregular moons could be remnants of ancient collisions between captured objects. These fragments may have formed the rings we see today.

Moon Naming Process

Currently, the new moons have technical names like "S/2020 S 27." These will be replaced with official names following International Astronomical Union (IAU) guidelines. Saturn's moons are typically named from mythologies, including Greco-Roman and Norse.

Conclusion

This discovery highlights the dynamic and evolving nature of planetary systems. It also shows how much more there is to learn about the Solar System with better technology and deeper observations.

Use of Artificial Intelligence (AI) in Elections

Context

AI is increasingly being used during elections. It is changing how campaigns are run and how voters are engaged.

Use of AI in Elections

- AI helps political parties in targeting voters. It analyses data to understand voter preferences. It identifies key issues and recommends campaign strategies.
- AI tracks online trends and flags misinformation. It is useful in monitoring fake news on social media.

- Voter registration and identification can be improved using AI. It can also enhance accuracy and prevent duplication.
- AI companies have pledged not to misuse the technology during elections. For example, OpenAI is developing tools to detect misleading content.
- India's IT Ministry has asked AI platforms to avoid generating illegal or harmful content.
- The Election Commission is being encouraged to coordinate more with tech companies to control misinformation.
- Companies are also working on tagging AI-generated images to alert users about synthetic content.

What is Election Integrity?

- It means conducting elections in a fair, unbiased, and transparent way. Free and fair elections are a basic constitutional value in India.
- Transparency, right to information, and protection from digital manipulation are its core components.
- The Election Commission of India ensures these values are upheld.

Risks from AI in Elections

- AI can create realistic fake content such as deepfakes. These can mislead voters and distort public opinion.
- Opaque AI models raise concerns about decision-making and accountability.
- There is a risk of AI being used to discourage voting. For instance, fake robocalls might mislead voters.
- The misuse of AI may weaken democratic values. It can influence voters unfairly or spread disinformation.
- Data collected by AI tools may compromise privacy. This creates a need for strong data protection laws.
- Ethical issues also arise, such as AI reinforcing social biases.
- There is concern over how AI companies will be held accountable for harmful content.

Steps by Government and Tech Companies

- The Indian government has issued advisories for AI firms. They must seek permission before offering untested AI tools to Indian users.
- Global tech companies have signed agreements to reduce the misuse of AI during elections.
- They have committed to tools for identifying fake content and awareness campaigns to educate voters.

Conclusion

AI can make elections smarter and more inclusive. But if misused, it may harm democratic values. India needs a clear and strong regulatory framework. The focus must be on fairness, transparency, and safeguarding voter rights.

A growing phenomenon Vibe Coding

Context

In February 2025, OpenAI co-founder Andrej Karpathy introduced a new term that is gaining traction in tech and education circles—"Vibe Coding." This term captures the growing phenomenon of using Large Language Models (LLMs) like ChatGPT, Cursor, or Sonnet to generate software code not through rigorous syntax or deep logic, but through intuition and natural language prompts.

This shift marks a turning point in how programming is perceived. It moves coding from the hands of trained developers into a broader creative domain accessible to non-programmers. While exciting, it raises important questions about the future of software development, its risks, and ethical implications.

What is Vibe Coding?

Vibe Coding refers to an intuitive, conversational approach to programming. The user types a simple prompt describing what they want—such as "create a to-do list app" or "build a chatbot for customer support." The AI then generates the required code, often suggesting improvements or debugging automatically.

This method is prompt-driven, not logic-driven. Users often do not understand the code itself. They rely instead on the model's ability to write and revise programs based on trial, feedback, and iteration. The emphasis is on speed and creativity rather than structure and precision. In short, users are "feeling the vibe" of how an app should behave rather than planning it with formal logic.

Advantages of Vibe Coding

The most striking benefit is accessibility. Individuals with no formal background in computer science—such as artists, students, or entrepreneurs—can now build digital products. This drastically reduces entry barriers for innovation and creativity.

Secondly, Vibe Coding supports rapid prototyping. Users can test multiple ideas in real-time without worrying about syntax or logic errors. This helps generate user-centric designs through quick iterations.

For experienced developers, vibe coding acts as a productivity booster. It simplifies repetitive tasks, helps debug simple issues, and produces boilerplate code, freeing developers to focus on critical logic and design. Additionally, for beginners, vibe coding can be a gateway to learning. It encourages exploration and sparks curiosity. When users see real code generated from their prompts, they may begin to understand programming structures organically over time.

Disadvantages and Limitations

Despite its appeal, vibe coding comes with serious drawbacks. The biggest issue is code quality. AI-generated code often lacks optimization. It may be bloated, inefficient, or redundant. Such code becomes harder to maintain, especially as projects scale.

Another concern is security. Most users accepting AI-generated code lack the expertise to spot vulnerabilities. This can lead to serious flaws, particularly in apps that deal with user data or transactions.

There is also a risk of shallow learning. Vibe coders often use code they don't fully understand. This limits their ability to adapt, troubleshoot, or scale the application. Over time, this fosters a dangerous dependence on AI with little skill development.

A culture of "Accept All"—where users blindly accept AI suggestions—can increase errors and reduce accountability. Furthermore, ethical and legal challenges arise. Code generated by AI could inadvertently plagiarize existing software, creating complications in academic or commercial environments.

Most importantly, vibe coding is not suitable for critical domains like healthcare, finance, or defense. These areas require strict accuracy, compliance, and system reliability, which vibe coding cannot currently ensure.

Is Vibe Coding the Future of Programming?

While vibe coding signals a significant evolution in human-AI interaction, it is unlikely to replace traditional programming in the near future. AI tools lack deep contextual understanding and struggle with long-term code maintainability. They are helpful for small-scale and personal projects but fall short for complex software systems.

At best, vibe coding will complement traditional programming. It will enhance productivity, democratize basic app development, and serve as a learning tool. But for mission-critical software, human expertise, structured logic, and rigorous testing will remain essential.

Conclusion

Vibe coding represents a creative shift in how software is built. It prioritizes intuition over logic, and exploration over structure. While it expands access and encourages experimentation, it also raises valid concerns regarding security, quality, and long-term sustainability.

As AI continues to evolve, a hybrid model may emerge—where human judgment and AI assistance work together in balance. The future of programming is not just about writing code; it is about managing tools that can write code for us—with clarity, control, and accountability.

Havana Syndrome

Context

Recent investigations suggest a link between Havana Syndrome and a Russian military intelligence unit.

What is Havana Syndrome?

Havana Syndrome refers to a set of mysterious health issues. These were first reported by American diplomats in Cuba in 2016. Victims complained of strange sounds, headaches, vision issues, and mental disorientation.

Origin and Symptoms

- The first cases came from the U.S. Embassy in Havana. Affected individuals heard high-pitched noises before falling ill.
- They experienced nausea, dizziness, memory loss, and nosebleeds.
- Later, similar cases were found in China, Germany, and other countries.

Possible Causes

Initially, sonic weapons were suspected. However, research pointed toward exposure to high powered microwaves. These may have harmed the nervous system. Both the U.S. and Russia have explored microwave weapons since the Cold War era.

Affected Regions

- Over 130 suspected cases have emerged globally.
- This includes Russia, China, Austria, Colombia, and India.
- In 2021, a CIA officer in Delhi reported Havana Syndrome symptoms.

Recent Findings

- A year-long global investigation has linked the syndrome to Russia's GRU Unit 29155.
- This unit is also blamed for past poisonings and covert missions.
- The findings suggest the use of directed-energy weapons to harm foreign diplomats.

Russia's Response

Russia has denied the allegations. It claims there is no concrete evidence linking it to the syndrome.

Why It Matters

- The symptoms affect mental and physical health.
- They can impair diplomats, intelligence officials, and security personnel.
- If a state-sponsored attack is confirmed, it raises serious global concerns.

Conclusion

Havana Syndrome highlights the rising threat of invisible weapons. It calls for stronger global rules against the misuse of such technologies. India must stay alert to emerging non-conventional threats to its national security.

Ozone on Jupiter's Moon Callisto

Context

Scientists have found strong evidence of ozone on Jupiter's moon Callisto. This discovery offers new insights into chemical reactions happening on icy bodies in space.

About the Study

The research focused on sulphur dioxide (SO₂)-based ice. Scientists simulated space conditions and exposed this ice to ultraviolet light. This process created a chemical reaction that formed ozone molecules. The ozone was detected through its unique UV absorption patterns.

Why Callisto Matters

- Callisto is the second-largest moon of Jupiter and the third-largest in the Solar System.
- Its surface is mostly made of water ice, rock, sulphur dioxide, and organic material.
- Callisto's surface is stable and heavily cratered, suggesting it has not changed much over time.
- This stability may help preserve potential underground oceans or life-supporting environments.

Importance of the Discovery

Ozone formation implies the presence of oxygen. Oxygen is a key element needed to build complex life molecules like amino acids. This raises new possibilities about habitability beyond Earth. Other icy moons could also have the conditions to support simple life forms.

What is Ozone?

Ozone is made up of three oxygen atoms. On Earth, it exists in the stratosphere and protects life by blocking harmful ultraviolet rays. Without ozone, UV rays could damage DNA and increase the risk of diseases like cancer. It also affects plant growth and harms animals sensitive to radiation.

Conclusion

The finding of ozone on Callisto adds to the growing list of celestial bodies with life-supporting elements. It encourages further exploration of Jupiter's moons. Future missions may uncover whether conditions exist for life beyond Earth.

India plans to begin the domestic production of carbon fibre

Context

India plans to begin the domestic production of carbon fibre to reduce dependency on imports and promote its use in advanced sectors.

What is Carbon Fibre?

- It is made by pyrolyzing carbon-rich materials like polyacrylonitrile (PAN) in an inert environment.
- Characterized by high strength-to-weight ratio, corrosion resistance, and thermal stability.

Applications

- Aerospace
- Automotive and civil engineering
- Sports equipment
- Medical implants
- Defence equipment

Status in India

- India currently imports all of its carbon fibre from countries such as the USA, Japan, France, and Germany.
- Indigenous production aims to boost strategic autonomy and industrial capability.

India is planning to develop its own atomic clocks

Context

India is planning to develop its own atomic clocks, joining an elite group including the US, UK, Japan, and South Korea.

What is an Atomic Clock?

- A highly accurate timekeeping device that measures time by monitoring the vibration of atoms, usually cesium or rubidium.
- **Precision:** Can measure up to billionths of a second.

Working Principle

- Uses a quartz oscillator in combination with atomic resonance.
- Far more stable and accurate than quartz clocks alone.
- Used in satellite navigation, space missions, and scientific research.

Role in Navigation

- Helps measure the distance of spacecraft by timing signal travel.

- Plays a key role in deep space missions and accurate GPS functioning.

India's Initiative

- India's NAVIC navigation system depends on atomic clocks.
- ISRO and National Physical Laboratory (NPL) have partnered to strengthen this capability and reduce reliance on foreign systems.

National Information System for Climate and Environment Studies (NICES) Programme

Context

ISRO has invited researchers to contribute to the National Information System for Climate and Environment Studies (NICES) programme.

About NICES

- Operated by ISRO under the framework of the National Action Plan on Climate Change (NAPCC).
- Initiated in 2012 to monitor climate variability using satellite data.

Objectives

- Generate and share Essential Climate Variables (ECVs) from Earth Observation (EO) satellites.
- Provide data for climate modeling, forecasting, and environmental assessment.

Key Features

- Over 70 geophysical variables made available.
- Covers terrestrial, atmospheric, and oceanic conditions.
- Focus areas include climate services, weather extremes, indicators, and space-based monitoring.

Significance

- Supports data-driven climate policy.
- Enhances scientific research, disaster preparedness, and sustainable development in response to climate change.

Artificial Sun: South Korea's KSTAR Reactor

Context

South Korean scientists have achieved a major breakthrough in nuclear fusion technology. They produced a heat of 100 million degrees Celsius for a record duration of 48 seconds using the Korea Superconducting Tokamak Advanced Research (KSTAR) facility. This experiment was conducted by the Korea Institute of Fusion Energy (KFE).

About the KSTAR Experiment

The KSTAR fusion reactor reached a temperature nearly seven times higher than the Sun's core, which is about 15 million degrees Celsius. It sustained a stable nuclear fusion reaction in a controlled environment, a key requirement for generating clean and limitless energy through fusion.

What Is the Artificial Sun?

The term “artificial sun” refers to experimental nuclear fusion reactors that aim to replicate the Sun’s energy-producing process on Earth.

- These reactors mimic the Sun’s internal nuclear fusion reaction, where hydrogen atoms combine under high temperature and pressure.
- A donut-shaped reactor, called a *tokamak*, is used to confine high-temperature plasma using powerful magnetic fields.
- In KSTAR, the plasma was maintained at 100 million°C, allowing deuterium and tritium nuclei to fuse and release energy.

Understanding Nuclear Fusion

Nuclear fusion is the process in which two light atomic nuclei combine to form a heavier nucleus, releasing enormous energy in the process.

- In the Sun, fusion converts hydrogen into helium.
- On Earth, fusion reactors typically use deuterium (H-2) and tritium (H-3) as fuel.
- When they fuse, they form helium (He-4) and release a high-speed neutron, along with energy.
- The energy comes from the small amount of mass lost during the fusion, which is converted into kinetic energy of the neutron.

Plasma: The Fusion State

Fusion occurs in a special state of matter called plasma, which is a superheated gas made of charged particles — positive ions and free electrons.

- Plasma has unique properties, requiring precise control through magnetic confinement to prevent it from touching the reactor walls.
- Creating and sustaining this state is the greatest challenge in fusion technology.

Significance of Fusion Energy

1. Clean Source of Energy

Fusion does not release carbon dioxide or greenhouse gases. It is a promising solution for sustainable and low-carbon energy production.

2. Extremely Efficient

Fusion energy can produce nearly four times the energy of nuclear fission and millions of times more than fossil fuels like coal or oil.

3. Abundant Fuel Supply

- **Deuterium** can be extracted from seawater.
- **Tritium** can be generated using lithium, which is widely available.
- This makes fusion fuel virtually inexhaustible for millions of years.

4. Safe and Stable

Fusion reactors do not carry the risk of meltdown or explosive chain reactions.

- Fusion reactions are hard to initiate and sustain, adding a safety advantage.
- Fusion does not produce long-lived radioactive waste like fission.

Conclusion

The recent KSTAR achievement brings the world one step closer to realizing practical nuclear fusion. If

successful at a commercial scale, fusion energy could revolutionise global energy systems by providing safe, clean, and limitless power for future generations.

Threats of Fake News and Disinformation

Context

The International Fact-Checking Network (IFCN) raised concerns about misinformation and deepfakes during India's Lok Sabha elections.

Definitions

- ***Fake News***: Fabricated stories with no factual basis.
- ***Misinformation***: False information shared without malicious intent.
- ***Disinformation***: Deliberate spread of falsehoods to mislead.

Impact

- **Democracy**: Can mislead voters, polarize societies, and manipulate election outcomes.
- **Security**: Incites violence and disrupts communal harmony.
- **Trust**: Erodes faith in institutions and the media.
- **Technology**: AI tools like deepfakes make detection harder.

Challenges

- No universal definition of fake news.
- Fear of infringing on press freedom.
- Scale and speed of misinformation spread via social media.
- Difficulty distinguishing satire or opinion from false content.

Legal Tools in India

- **Press Council of India and Indian Broadcast Foundation**: Watchdog roles.
- **IPC Sections 153A, 295, 499, 500**: Prohibit hate speech and defamation.
- **IT Act**: Requires takedown of objectionable content.
- **Contempt of Court Laws**: Cover judicial misinformation.
- **Article 51A (h)**: Promotes scientific temper and rational thinking.

Measures Taken

- **AI-based Detection**: Fact-check bots and image verification tools.
- **Tech Collaboration**: Platforms like Google offer fact-check resources.
- **Government Action**: MyGov helpdesk, PIB Fact Check, and Saathi chatbot.

ZooWIN Platform

Context

India has launched the ZooWIN platform to address the high mortality rates caused by rabies and snakebites. This digital initiative is designed to monitor anti-rabies vaccine and anti-snake venom stocks in real-time, improving emergency health response and availability of lifesaving treatments.

Why ZooWIN Was Needed

Rabies causes around 60,000 deaths globally every year, with India contributing nearly 36% of those cases. Snakebites account for approximately 50,000 deaths annually in India alone. These alarming figures reveal the urgent need for better coordination, monitoring, and accessibility of vaccines and antivenoms, especially in rural and underserved regions.

The programme is being piloted in Delhi, Madhya Pradesh, Assam, Puducherry, and Andhra Pradesh. Health officials have undergone training, and further capacity-building exercises are planned.

How ZooWIN Works

- ZooWIN is modeled on existing digital health platforms like Co-WIN and U-WIN. It uses the infrastructure of the Electronic Vaccine Intelligence Network (eVIN) to track vaccine inventory in real time. The platform allows hospitals and health officials to manage stocks, ensure timely vaccine administration, and improve supply chain efficiency.
- ZooWIN also focuses on spreading awareness and bridging gaps in dog vaccination coverage. It helps citizens find the nearest facility stocked with vaccines.
- Developed by the National Centre for Disease Control (NCDC) and supported by the UNDP, ZooWIN reflects a collaborative push to combat preventable deaths from rabies and snakebites.

20 Years of India's Free Antiretroviral Therapy (ART) Initiative

Context

India recently marked two decades since the launch of its Free Antiretroviral Therapy (ART) programme. Started on April 1, 2004, this initiative was a major step in supporting people living with HIV (PLHIV).

What is ART?

ART refers to the treatment of HIV infection using anti-HIV drugs. It combines several medications to suppress the virus and stop disease progression. The goal is to improve quality of life and reduce transmission.

Why the Initiative Was Needed

In the early 1980s, HIV/AIDS was seen as a death sentence. People faced stigma, fear, and limited access to treatment. Medicines like AZT (zidovudine), the first known antiretroviral, were expensive and out of reach for most. India's ART programme aimed to bridge this gap.

Achievements So Far

By 2023, HIV prevalence in the 15–49 age group dropped to 0.20%. India's total PLHIV count reduced to around 2.4 million, a major decline from earlier figures. New infections have decreased by 48%, better than the global average reduction of 31% (since 2010). India's share of global PLHIV cases has also fallen to 6.3%, down from 10% two decades ago.

Complementary Efforts

Alongside ART, India strengthened support through:

- Free HIV testing and counselling
- Prevention of parent-to-child transmission (PPTCT)
- Introduction of Dolutegravir (DTG) in 2020 – a safer and more effective drug
- Rapid ART initiation policy in 2021 – starting treatment within 7 days of diagnosis, sometimes the same day

Current Phase and Goals

India's fifth phase of the National AIDS Control Programme (NACP) is underway.

Targets for 2025 include:

- 80% reduction in new HIV infections
- 80% decline in AIDS-related deaths
- Elimination of vertical transmission (from mother to child)

Conclusion

India's ART programme stands as a global model of public health commitment. Through sustained government action, scientific advances, and community support, HIV has become a manageable condition rather than a fatal disease.

Kodaikanal Solar Observatory Completed 125 Years

Context

The Kodaikanal Solar Observatory in Tamil Nadu has completed 125 years of solar observation and research.

About the Observatory

It is located in the Palani hills. The Kodaikanal Observatory was established in 1899 as a Solar Physics Observatory. It has been observing and recording images of the Sun daily for over a century, making it one of the longest-running solar observation centres in the world.

Key Scientific Contributions

- In 1868, during a solar eclipse in Guntur, Andhra Pradesh, spectroscopic observations led to the discovery of helium, the second-most abundant element in the universe.
- The observatory has collected a massive archive of full-disc solar images using Ca II K and H-alpha filters.
- It maintains a digital database of over 1.48 lakh images, occupying 10 terabytes of space.

Importance for Solar Physics

The observatory's long-term data has helped scientists study:

- Changes in the Sun's magnetic field,
- Solar cycle variations,
- Effects of solar activity on climate and space weather.

It has also provided insight into the timing of magnetic polarity reversals on the Sun.

Link to the Great Drought

Historical climate data from the observatory connects solar activity to the 1875–77 drought in southern India. This drought caused mass famine in India and globally, affecting over 50 million people.

Why It Matters

Kodaikanal's continuous solar data helps improve our understanding of the Sun's influence on Earth. Its contribution is vital for climate studies, space weather forecasting, and understanding long-term solar trends.

Polio Surveillance Network for Disease Monitoring

Introduction

India's Ministry of Health and Family Welfare is planning to expand the use of its polio surveillance network to monitor other infectious and emerging diseases. This move reflects the country's proactive approach to public health, even after being declared polio-free.

Background of Polio Eradication in India

India reported its last wild polio case in 2011 and was declared polio-free by the WHO in 2014. The success was due to the National Polio Surveillance Project (NPSP), which began in the 1990s. It created a large and effective network of health workers, laboratories, and surveillance systems across the country.

Components of the Polio Surveillance Network

- **Acute Flaccid Paralysis (AFP) Surveillance**
This system monitors children under 15 years for sudden, unexplained paralysis — a symptom of polio. Rapid reporting and investigation have helped prevent any resurgence.
- **Environmental Surveillance**
It tests sewage water for traces of poliovirus. This early detection method helps identify virus circulation even in asymptomatic cases. It remains active despite polio's eradication.

Proposed Expansion to Other Diseases

The government is exploring if the polio network can be used to detect:

- New infectious disease outbreaks
- Public health threats like antimicrobial resistance
- Possibly even non-communicable diseases like diabetes and hypertension (with structural changes)

The National Institute of Health and Family Welfare is conducting a feasibility study.

Challenges Ahead

- The transition must not weaken the current polio surveillance efforts.
- Monitoring non-communicable diseases will require different tools, training, and data frameworks.
- Re-purposing resources must be done without diluting focus or coverage.

Significance

If successful, this integration can provide India with a cost-effective, already-trusted framework for nationwide disease surveillance. It may also serve as a model for other countries aiming to repurpose legacy public health infrastructure.

Report on Fungal Tests & Treatments

Introduction

For the first time, the World Health Organization (WHO) has published two detailed reports exposing the global shortage of effective medicines and diagnostic tools for fungal infections. The situation is especially severe in low- and middle-income countries (LMICs).

Why Fungal Infections Matter

Fungal infections are now a growing public health concern worldwide. Infections like *Candida* are becoming more resistant to antifungal drugs. These infections often target people with weak immune systems, such as:

- HIV patients
- Cancer patients
- Organ transplant recipients

Invasive Fungal Diseases (IFDs) cause over 6.5 million infections and about 3.8 million deaths annually. Even with treatment, mortality rates can exceed 50%.

Current Antifungal Drug Landscape

- **New Drugs in Last 10 Years:**

Only 4 new antifungals have been approved globally (Isavuconazole, Ibrexafungerp, Oteseconazole, Rezafungin).

- **Innovation Crisis:**

- Only three new drug classes have emerged in 30 years.
- Just 9 drugs are currently in trials for high-priority infections.
- Only 3 are in Phase 3, indicating very slow development.
- 22 drugs are in preclinical stages, which often fail.

- **Existing Drug Challenges:**

- Serious side effects
- Limited dose flexibility
- Drug interactions
- Need for long hospital treatment
- Lack of pediatric formulations

Conclusion

WHO's report highlights a critical blind spot in global health systems. Without swift investment in drug development, faster diagnostics, and medical education, fungal infections could become a silent global threat—especially for vulnerable populations in developing nations.

Chandrayaan-3's ChaSTE

Introduction

Chandrayaan-3, India's third lunar mission, created history by successfully landing near the Moon's south pole on 23 August 2023. One of its key instruments, ChaSTE (Chandra's Surface Thermophysical Experiment), has provided valuable insights into the Moon's thermal behavior, especially in the unexplored polar region.

Objectives of ChaSTE

The primary aim of ChaSTE is to measure the vertical temperature profile of the Moon's surface up to 100 mm depth. It also studies thermal conductivity, which is necessary for understanding how heat flows through the lunar soil. These insights are crucial for planning future human and robotic missions.

Design and Functionality

ChaSTE uses ten platinum resistance temperature detectors, placed at different depths along a vertical probe. A ribbon heater near the tip allows it to conduct active experiments. The probe is made of a composite material that reduces external thermal interference and gives it mechanical strength. A rotating mechanism helps it penetrate the lunar soil gradually.

Key Findings

Surface temperatures at the Moon's south pole were recorded at 70°C during the lunar day. At a depth of 80 mm, the temperature dropped to -10°C. This sharp change in temperature reveals a steep thermal gradient, which is different from equatorial lunar regions.

Scientific Implications

The data from ChaSTE has improved our understanding of how solar heat affects the Moon's surface. It also shows that volatile elements like water ice could be preserved in permanently shadowed areas of the lunar poles. These findings are important for setting up future habitats and identifying useful resources.

Operational Timeline

ChaSTE was deployed on 24 August 2023, one day after the Vikram lander touched down. The probe reached a depth of 140 mm in phases. It collected temperature readings every second for one lunar day, which equals about 14 Earth days.

Significance of the Experiment

This was the first time in-situ thermal data was gathered from the Moon's polar region. Previous lunar missions mostly focused on the equator. ChaSTE's results challenge older assumptions and offer new directions for lunar exploration. Its findings could help in identifying more stable underground zones for future missions.

Historical Context

Similar instruments on past missions by ESA and NASA faced challenges in penetrating extraterrestrial surfaces. ChaSTE's success is credited to its innovative rotating design, which proved effective where earlier tools had failed.

Axiom-4 Mission (Ax-4)

Context

Indian astronaut Group Captain Shubhanshu Shukla has been selected to pilot the Axiom-4 (Ax-4) mission to the International Space Station (ISS).

About Axiom Missions

Axiom Space, a private company based in Houston, is organising a series of crewed missions to the ISS.

- **Ax-1:** First all-private space mission to the ISS.
- **Ax-2:** Included the first Saudi female astronaut.
- **Ax-3:** Carried the first astronauts from Turkey and the European Space Agency (ESA) on a commercial mission.
- **Ax-4:** Features a global crew including astronauts from India, Poland, and Hungary.

Crew Members of Ax-4

- Shubhanshu Shukla (India) – Pilot
- Peggy Whitson (USA) – Commander and former NASA astronaut
- Sławosz Uznański-Wiśniewski (Poland)
- Tibor Kapu (Hungary)

The crew will spend 14 days aboard the ISS conducting scientific research.

Role of ISRO

India, through ISRO, will focus on microgravity experiments such as:

- Effects of space on human physiology and cognitive functions
- Muscle degeneration and visual effects from screen use
- Seed germination and plant growth in zero gravity

Importance of the Mission

The mission highlights increasing international cooperation in space research. It provides India with an opportunity to contribute to space medicine, agriculture, and life sciences in space. The collaboration between ISRO, NASA, and ESA reflects the global nature of modern space exploration.

How the venom of Pope's Pit Viper works

Context

A recent scientific study has decoded how the venom of Pope's Pit Viper works. This species is native to northern and northeastern parts of India. The findings can contribute to better understanding venom toxicity and help in the development of more effective antivenoms and pharmaceutical applications.

Why It Matters

- There is currently no species-specific antivenom available for Pope's Pit Viper.
- In India, commercial antivenoms cover only the "Big Four" snakes: Russell's Viper, Saw-scaled Viper, Spectacled Cobra, and Common Krait.

- Victims bitten by pit vipers like Pope's Pit Viper often remain untreated or improperly treated, posing a serious health risk.
- The study can guide the formulation of broad-spectrum or species-targeted antivenoms, improving treatment outcomes in snakebite cases.

About Pope's Pit Viper (*Trimeresurus popeiorum*)

- **Naming:** Named after American herpetologist Clifford H. Pope.
- **Habitat:** Prefers dense tropical and subtropical forests.
- **Distribution:** Found in northeastern Indian states like Arunachal Pradesh, Assam, Nagaland, and Meghalaya, as well as Bhutan, Myanmar, and northern Thailand.

Significance

Understanding the venom composition of under-researched snake species like Pope's Pit Viper is essential for expanding the scope of antivenom development and addressing regional gaps in snakebite treatment in India.

National Centre for Polar and Ocean Research (NCPOR)

Context

The National Centre for Polar and Ocean Research (NCPOR), based in Goa, celebrated its 25th Foundation Day.

About NCPOR

NCPOR is an autonomous research institution under the Ministry of Earth Sciences. It serves as the nodal agency for planning, managing, and conducting India's research activities in the polar and oceanic regions.

Key Functions

- Coordinates and supports India's polar scientific missions in the Arctic, Antarctic, and the Himalayas.
- Conducts oceanographic and atmospheric studies to understand climate change and related phenomena.
- Facilitates capacity building and international collaboration in polar science.

Research Stations Managed by NCPOR

- **Antarctica:** Maitri and Bharati Stations
- **Arctic:** Himadri Station (Ny-Ålesund, Svalbard)
- **Himalayas:** Himansh Station (in Spiti Valley, Himachal Pradesh)
- **Ocean Platform:** Sagar Kanya – a floating oceanographic laboratory used for marine research

Significance

NCPOR plays a strategic role in advancing India's scientific presence in climate-sensitive zones. It contributes to the study of glaciology, oceanography, and atmospheric sciences, aiding national and global efforts in climate monitoring and adaptation.

Shingles Vaccine and Dementia Risk Reduction

Context

A study conducted in Wales indicates that the shingles vaccine may reduce the likelihood of new dementia diagnoses by approximately 20% over seven years.

What is Shingles (Herpes Zoster)?

Shingles is a viral infection caused by the Varicella-Zoster Virus (VZV), the same virus responsible for chickenpox. After an individual recovers from chickenpox, the virus remains dormant in the body and can reactivate years later as shingles, leading to painful rashes and nerve complications.

Dementia Overview

- Dementia encompasses a group of diseases affecting memory, thinking, and daily activities, primarily in older adults. Common forms include Alzheimer's disease, vascular dementia, dementia with Lewy bodies, and frontotemporal dementia.
- Dementia results from diseases that damage brain cells, leading to cognitive decline beyond normal aging. It can also arise from strokes, infections, alcohol abuse, or physical brain injuries. Dementia has multifaceted impacts—physical, psychological, social, and economic—on individuals, caregivers, families, and society at large.

Agni-Prime Ballistic Missile

Context

The Agni-Prime ballistic missile was successfully flight-tested by the Strategic Forces Command (SFC) along with the Defence Research and Development Organisation (DRDO) from Dr. APJ Abdul Kalam Island, off the Odisha coast.

About Agni-Prime

Agni-Prime is the latest and most advanced missile in India's Agni series of nuclear-capable ballistic missiles. It incorporates several next-generation features and represents a significant leap in India's strategic missile technology.

Key Features

- **Type:** Two-stage, surface-to-surface ballistic missile
- **Launch Platform:** Canister-based and road-mobile
- **Fuel:** Solid-fuel propulsion system
- **Range:** Between 1,000 km to 2,000 km
- **Mobility:** It can be transported and launched quickly due to its canisterized design, enhancing operational readiness
- **Guidance System:** Equipped with a dual redundant navigation and guidance system
- **Reentry Vehicle:** Features a maneuverable reentry vehicle (MaRV), enhancing its ability to evade enemy missile defense systems
- **Weight and Size:** Lighter and more compact than earlier versions of the Agni series

Significance

- Enhances India's nuclear deterrence by providing a credible second-strike capability
- Facilitates quicker deployment and better survivability in mobile launch systems
- Increases operational flexibility for the Indian Armed Forces
- Demonstrates indigenous capability in building state-of-the-art missile systems under the Make in India initiative

Strategic Forces Command (SFC)

- Established to manage India's strategic and tactical nuclear arsenal
- Operates under India's Nuclear Command Authority (NCA)
- Ensures the readiness and coordination of India's nuclear forces
- Works closely with DRDO and other defense establishments to operationalize strategic assets

India's Ballistic Missile Development

India has developed several classes of ballistic missiles as part of its Integrated Guided Missile Development Programme (IGMDP):

- **Prithvi series:** Short-range ballistic missiles
- **Agni series:** Medium to intercontinental range ballistic missiles
- Agni-Prime is positioned between Agni-I and Agni-II in terms of range but surpasses them technologically

Conclusion

The successful test of Agni-Prime strengthens India's strategic posture and showcases advancements in missile technology. It reaffirms India's commitment to maintaining credible minimum deterrence while pursuing peaceful and responsible use of defense capabilities.

Project Akashdeep

Context

The Indian Army has initiated the induction of the Akashteer Command and Control System under 'Project Akashdeep' to strengthen its air defence capabilities.

About Akashteer Command and Control System

- Developed by Bharat Electronics Limited (BEL)
- Part of the 'Atmanirbhar Bharat' initiative
- Designed to digitize and automate the entire air defence control and reporting mechanism
- Provides a real-time, integrated view of the battlefield airspace for better coordination and decision-making
- Offers high mobility through vehicle-based control centres capable of functioning in challenging environments
- Facilitates the monitoring of low-level airspace and the management of ground-based air defence weapon systems

Features

- Integrates radar and communication systems from various tiers into a unified network
- Enhances situational awareness by presenting a consolidated air threat picture
- Supports faster and more precise deployment of air defence assets
- Enables secure and reliable communications among different units
- Improves survivability and response time during aerial threats

Project Akashdeep

- It is the Indian Army's automated air defence control and reporting system, similar to the one used by the Indian Air Force
- Aims to modernize the army's ability to monitor, track, and respond to aerial threats
- Digitally transforms traditional air defence systems, enhancing operational efficiency and accuracy
- Ensures real-time threat evaluation, prioritization, and engagement

Strategic Importance

- Strengthens India's air defence posture against low-flying aircraft, UAVs, helicopters, and cruise missiles
- Improves coordination across various air defence units
- Supports network-centric warfare by integrating sensor-to-shooter links
- Enhances India's self-reliance in defense technologies

Conclusion

The induction of Akashteer under Project Akashdeep marks a significant milestone in India's efforts to build a modern, automated, and integrated air defence network. It reflects India's resolve to develop indigenous defence technologies and secure its airspace effectively.

DRDO Tests Laser Weapon System

Context

DRDO successfully tested the Mk-II(A) Laser-Directed Energy Weapon (DEW) system in Andhra Pradesh.

The Mk-II(A) Laser-Directed Energy Weapon (DEW) System

The system was developed by DRDO's Centre for High Energy Systems and Sciences (CHESS), Hyderabad, in collaboration with other DRDO labs, academic institutions, and Indian industries. It is capable of detecting, tracking, and neutralizing drones, enemy sensors, and antennae with high precision using a high-intensity laser beam. The system works at the speed of light, causing minimal collateral damage and reducing dependency on traditional ammunition. The cost of operating this system is extremely low, estimated to be equivalent to a few litres of petrol per use.

Importance

As drone swarms and unmanned aerial systems grow in prominence, laser-DEWs offer a strategic and cost-effective alternative to conventional missile-based defence systems.

India now joins a select group of countries such as the US, China, and Russia with such advanced military technology.

Quantum Cybersecurity Platform Launched

Context

QNu Labs, supported by the Department of Science and Technology, launched Q-Shield, a quantum-safe platform to secure critical infrastructure and data.

About Q-Shield

The platform manages cryptographic security across cloud, on-premises, and hybrid systems. It ensures end-to-end protection for data in transit and at rest using quantum-resistant methods.

Importance of Cryptography and Critical Infrastructure

With rising cyber threats, protecting systems essential for national security, economy, and public safety is vital. Q-Shield enables India to lead in quantum cryptography and digital sovereignty.

World Quantum Day and Mission

- The launch coincided with World Quantum Day, celebrated on April 14.
- The year 2025 has been declared the International Year of Quantum Science and Technology. India's National Quantum Mission, approved in 2023, aims to develop 50–1000 qubit quantum computers in the next eight years.
- Applications include secure communications, drug discovery, and AI.

Conclusion

India's investment in quantum technology through platforms like Q-Shield reflects its ambition to become a global leader in next-generation cybersecurity and computing.

Type 5 Diabetes: Recognised Form of Malnutrition-Linked Diabetes

Context

The International Diabetes Federation has officially classified Type 5 diabetes as a distinct condition.

Type 5 Diabetes

- It is also known as malnutrition-related diabetes. It affects lean, undernourished adolescents and young adults, mostly in low-income countries. It was first identified in Jamaica in 1955 as J-type diabetes, it differs from Type 2 diabetes by being caused by poor pancreatic development due to childhood undernutrition.
- Unlike Type 2 diabetes, insulin resistance is absent, though insulin production is low. Many patients respond well to oral medication and do not require insulin injections. It signifies a crucial health challenge in undernourished populations where metabolic disorders coexist with poverty.

Kavach 5.0 System

Context

The Ministry of Railways plans to implement Kavach 5.0 to modernize Mumbai's suburban rail system.

- Kavach is an indigenously developed Automatic Train Protection (ATP) system. It automatically applies brakes if the loco pilot misses a signal or overspeeds.
- Certified to the highest safety level (SIL-4), Kavach was declared the National ATP system in 2020.
- The latest upgrade, tailored for Mumbai's suburban network, will improve train frequency by 30% and reduce commuter load. Implementation is expected by December 2025.

'Gaurav' (Bomb)

Context

DRDO has successfully conducted trials of the Long-Range Glide Bomb (LRGB) 'Gaurav' from a Su-30 MKI aircraft.

'Gaurav' is a 1,000 kg class precision-guided glide bomb with a strike range between 30 and 150 km. Developed by DRDO, it enhances India's long-range strike capabilities. It uses GPS guidance and is designed for stand-off air-to-ground operations.

PRATUSH Telescope around the moon

Context

India is planning to place a radio telescope named PRATUSH around the moon, marking a significant step in space-based astronomical research.

About PRATUSH

- PRATUSH stands for Probing Reionization of the Universe using Signal from Hydrogen. It is a radio telescope being developed by the Raman Research Institute (RRI) in collaboration with the Indian Space Research Organisation (ISRO).
- The telescope aims to detect weak radio signals from neutral hydrogen during the early universe's reionization era. These signals can provide insights into the formation of the first stars and galaxies.
- Initially, PRATUSH will be placed in Earth's orbit for calibration. It will later be sent to the moon's far side to take advantage of the radio silence—an environment free from Earth-based radio interference.

Coordinated Lunar Time (CLT)

Context

The White House has directed NASA to develop a unified standard of time for the Moon and other celestial bodies, known as Coordinated Lunar Time (CLT), by the end of 2026.

What is Coordinated Lunar Time (CLT)?

Coordinated Lunar Time refers to a standardized timekeeping system specifically designed for operations on the Moon. It aims to provide an accurate and consistent time reference for future lunar missions, scientific research, and commercial activities.

Why is it Needed?

The Moon has a weaker gravitational field compared to Earth, which causes time to pass slightly faster on the lunar surface.

Without a common time standard, coordinating activities, data transfers, and communication among different spacecraft, lunar bases, and Earth-based control centers will become difficult. It is especially critical as NASA plans to establish a permanent lunar base under the Artemis program, and future missions to Mars are also in the pipeline.

Key Features and Benefits

- Synchronizes all lunar missions and instruments.
- Improves coordination between space agencies and private companies.
- Ensures the reliability of scientific experiments, satellite operations, and data exchange.
- Helps manage lunar commerce and logistics operations more efficiently.

Artemis Program Context

Under the Artemis program, NASA aims to land the next humans on the Moon and build a sustainable base by the end of this decade. This base will serve as a stepping stone for deeper space exploration, including human missions to Mars.

Implications of CLT Development

- Sets the stage for international cooperation on lunar governance.
- Facilitates the development of lunar time zones and digital infrastructure.
- May lead to the eventual establishment of time standards for Mars and other celestial bodies.
- Enhances precision in scientific research and inter-agency collaborations.

AI Safety Testing

Context

The United States and the United Kingdom have signed a landmark agreement to collaborate on AI safety testing.

About AI Safety Testing

Artificial Intelligence (AI) is transforming industries across the world, from healthcare and finance to transportation and entertainment. However, as AI systems grow in complexity, ensuring their safe deployment has become a critical challenge.

The Need for Safety Testing

AI systems, especially those based on machine learning, may behave unpredictably in real-world situations that were not covered during training. This can result in a wide range of consequences, from minor

disruptions to severe failures. Rigorous safety testing is crucial to detect and prevent such risks before AI models are deployed at scale.

Current Practices and Challenges

There is no universal standard for AI safety testing. Practices vary across companies and countries, and while some organizations have developed strong protocols, others lack the capacity or frameworks to do so. This results in inconsistent approaches to safety and oversight.

Recent Development

- The US and the UK have entered into a first-of-its-kind agreement on AI safety.
- This cooperation builds on commitments made during the Bletchley Park AI Safety Summit.
- Both nations will share critical technical research and insights on AI safety and security.
- The agreement aims to align strategies on how to test and safely deploy AI systems.

Significance

The collaboration is expected to set a global precedent for responsible AI development and foster trust in AI technologies. It may also lay the groundwork for international standards on AI governance.

India's First Home-Grown CAR-T Cell Therapy for Cancer

Context

India has launched its first indigenously developed CAR-T cell therapy for cancer, named NexCAR19, marking a milestone in gene therapy and cancer treatment.

About the Therapy

NexCAR19 is a gene-based cell therapy specifically designed for treating B-cell cancers such as leukemia and lymphoma. It has been developed through a collaboration between Tata Memorial Hospital and ImmunoACT, a start-up incubated at IIT Bombay.

How CAR-T Cell Therapy Works

CAR-T stands for Chimeric Antigen Receptor T-cell therapy. It involves genetically modifying a patient's own T-cells (a type of immune cell) to recognize and destroy cancer cells.

The therapy primarily targets B-cell lymphomas and B-cell leukemias. These cancers originate from abnormal growth in B-lymphocytes, a type of white blood cell responsible for producing antibodies.

Significance

- NexCAR19 is the first Made-in-India CAR-T therapy to be commercialized.
- It makes such advanced treatments more affordable and accessible compared to imported therapies.
- It demonstrates India's growing capacity in high-end biomedical innovation.

Comparison with Other Therapies

Therapy Type	Description	Examples
Stem Cell Therapy	Uses stem cells to regenerate or repair tissue	Bone marrow transplant
Dendritic Cell Therapy	Uses immune cells to trigger anti-cancer response	Used in prostate cancer
CAR-T Cell Therapy	Reprograms T-cells to target specific cancer antigens	NexCAR19 for B-cell cancers

Types of T-Cells and Their Roles

- **Cytotoxic T-Cells:** Destroy virus-infected and cancerous cells.
- **Helper T-Cells:** Coordinate immune responses.
- **Regulatory T-Cells:** Prevent autoimmune responses.

B-Cells and Their Function

- B-cells produce antibodies to fight infections.
- Two types: plasma cells (actively produce antibodies) and memory cells (store immunity).

Broader Implications

- Personalized medicine takes a step forward in India.
- Opens doors for more innovations in immunotherapy and gene editing.
- Enhances India’s biomedical R&D infrastructure.

Conclusion

The launch of NexCAR19 is a breakthrough in Indian healthcare, providing a cutting-edge, life-saving therapy to patients within national borders. This reflects India's evolving strength in biotechnology and its ability to develop globally competitive medical solutions.

Three-Dimensional Map of the Universe (DESI Project)

Context

A global team of scientists has released the most comprehensive three-dimensional map of the universe, based on the first-year observations from the Dark Energy Spectroscopic Instrument (DESI).

What is DESI?

The Dark Energy Spectroscopic Instrument (DESI) is a unique astronomical tool that enables high-speed, high-accuracy measurement of galaxies.

- DESI is mounted on the Mayall 4-Meter Telescope at the Kitt Peak National Observatory in Arizona, USA.
- It captures light from 5,000 galaxies at once, allowing for rapid and detailed mapping.
- India's Tata Institute of Fundamental Research (TIFR) is a collaborating institution on the project.

Key Findings

- **Distance Measurements:** DESI has measured light from over 6 million galaxies, including ancient galaxies that existed 11 billion years ago.

- 3D Mapping: The instrument has precisely determined the distances between galaxies, creating a 3D map that covers a significant portion of the observable universe.
- This map is the most accurate and expansive of its kind to date.

Scientific Significance

- DESI aims to help scientists understand the nature and behavior of dark energy, the mysterious force responsible for the universe's accelerating expansion.
- The map reveals the distribution and clustering of galaxies, which can shed light on how the universe evolved and where dark energy may be acting more strongly.

Dark Matter and Dark Energy: A Brief Overview

Component	Characteristics
Dark Matter	Interacts via gravity but not via electromagnetic force. Invisible, yet detectable through gravitational effects. Provides structural "glue" for galaxies.
Dark Energy	A repulsive force driving the accelerated expansion of the universe. Comprises 68% of the universe's energy content.
Ordinary Matter	Makes up only ~5% of the universe. This includes stars, planets, and all physical objects visible to us.

Content of the Universe

- Dark Energy: **~68%**
- Dark Matter: **~27%**
- Ordinary Matter: **~5%**

India's Contribution

India's **TIFR** has been part of DESI's international collaboration. Indian scientists have contributed to instrument calibration, data processing, and research design.

Why Is This 3D Map Important?

- **Understanding Cosmic Evolution:** It helps trace how matter in the universe formed clusters and structures over billions of years.
- **Testing Cosmological Models:** The map provides empirical data for refining or challenging existing models of cosmology.
- **Probing Dark Energy:** With better accuracy in measuring galactic distances, scientists can study how dark energy influenced expansion at different times in cosmic history.

Conclusion

The release of DESI's 3D map marks a major advancement in observational cosmology. It not only enhances our understanding of the universe's structure but also brings us closer to decoding the mysteries of dark energy, the most dominant and least understood component of the cosmos.

Project Varsha

Context

India is developing a new naval base under Project Varsha for its nuclear submarine fleet.

Location and Purpose

- Situated at Rambilli, near Visakhapatnam.
- Designed to host nuclear-powered ballistic missile submarines (SSBNs).
- Will have underground tunnels for stealth operations in the Bay of Bengal.

Related Project

Project Seabird: Similar strategic naval base on the western coast in Karwar, Karnataka.

Submarine Expansion

- INS Aridhaman is the third SSBN after INS Arihant and INS Arighaat.
- It will be the largest nuclear submarine in India's fleet with a displacement of 7,000 tonnes.

Mauritius Signed ISA's Country Partnership Framework

Context

Mauritius has signed a Country Partnership Framework with the International Solar Alliance, becoming the first African country and the fourth globally to do so after Bangladesh, Bhutan, and Cuba.

About the Framework

This partnership creates a structured mechanism for cooperation between ISA and Mauritius on solar energy projects that align with national developmental goals. The CPF is a strategic tool developed to promote long-term engagement and solar capacity building.

International Solar Alliance (ISA)

ISA is a treaty-based intergovernmental organization launched in 2015 by India and France at COP21. It aims to encourage solar energy as a sustainable and accessible energy source. Its goal is to mobilize \$1 trillion in investments by 2030. More than 100 countries have joined, with over 90 formally ratifying the treaty. Initially focused on countries between the Tropics of Cancer and Capricorn, the agreement was later amended to include all United Nations member states. The ISA is headquartered in Gurugram, India.

ISRO's 'Zero Orbital Debris' Milestone

Context:

ISRO achieved a rare feat of leaving no orbital debris during the PSLV-C58/XPoSat mission.

About the Mission:

- Launched in Jan 2024.
- After deploying satellites, the rocket stage was converted into POEM-3 (PSLV Orbital Experimental Module).
- Deorbited from 650 km to 350 km for early atmospheric re-entry.

Significance:

- Prevented addition to space debris, mitigating risks from Kessler Syndrome.
- POEM-3 served as a cost-effective platform for space experiments by startups and academic institutions.

What is Space Debris?

- Non-functional, human-made objects in Earth orbit.
- A major threat to satellites and space missions.

International Framework:

- Space Liability Convention 1972: Launching states liable for damage caused by space objects.
- No binding global law yet on controlling space debris re-entry.

Project NETRA:

- ISRO's early warning system for tracking space hazards.
- Enhances India's Space Situational Awareness capabilities.

Kuiper Internet Satellite Launch

- Amazon has launched the first Kuiper internet satellites. Project Kuiper is Amazon's plan to build a satellite internet network. It will compete with Elon Musk's Starlink. Starlink already operates about 8,000 satellites.
- The aim is to provide internet to remote and underserved areas. Kuiper and Starlink use satellites in low Earth orbit. These systems bypass the need for underground cables. Amazon plans to invest up to \$10 billion in Kuiper.

Nuclear, Chemical and Biological Disarmament: India's Stance

India and South Korea recently discussed disarmament issues, focusing on nuclear, chemical, and biological weapons. Disarmament is a long-term global objective aimed at eliminating weapons of mass destruction (WMDs) to ensure peace and security.

What is Disarmament?

- Disarmament involves reducing or eliminating arms—especially WMDs—either through mutual agreement or international treaties.
- It can be partial (reducing stockpiles) or total (complete elimination).

Key Nuclear Disarmament Treaties:

- **NPT (1968):** Prevents the spread of nuclear weapons and promotes peaceful uses of nuclear energy.
- **TPNW (2017):** Bans nuclear weapons completely but lacks support from nuclear-armed states.
- **CTBT (1996):** Prohibits all nuclear explosions, though not yet in force.
- **Outer Space Treaty (1967):** Bans placement of WMDs in space.

Chemical and Biological Disarmament:

- **Chemical Weapons Convention (CWC):** Bans the development and use of chemical weapons. India is a party to this treaty.
- **Biological Weapons Convention (BWC, 1972):** Bans all biological weapons and was the first multilateral disarmament treaty in WMDs.

Arguments Supporting Disarmament:

- Humanitarian need to avoid mass destruction and long-term ecological harm.
- Promotes international security by reducing the chances of conflict escalation.
- Resources used in arms buildup can be redirected toward development.

Arguments Against Disarmament:

- Nations argue that nuclear weapons serve as a deterrent against attacks.
- Verifying disarmament is difficult without strong global institutions.
- Global power imbalances make mutual trust a challenge.

India's Position:

- India supports global disarmament and advocates for total elimination of nuclear weapons.
- It criticizes the NPT as discriminatory and unjust to non-nuclear states.
- India has a declared "No First Use" policy and a credible minimum deterrent approach.
- India's key nuclear events include:
 - **Smiling Buddha (1974):** First nuclear test.
 - **Operation Shakti (1998):** Series of five nuclear tests.

India views disarmament as essential for global peace but believes in maintaining its strategic deterrent until complete and non-discriminatory disarmament is achieved globally.

Chernobyl Disaster

The Chernobyl nuclear disaster remains one of the worst man-made catastrophes in history. It occurred on April 26, 1986, at Reactor 4 of the Chernobyl Nuclear Power Plant in Ukraine, then part of the Soviet Union. The disaster continues to be debated in terms of its causes and consequences.

Key Points:

- Reactor 4 exploded due to a failed safety test and poor reactor design.
- The explosion released 400 times more radiation than the Hiroshima atomic bomb.
- The nearby town of Pripyat was evacuated 36 hours later, and remains uninhabitable.
- Two workers died immediately. Another 28 rescue workers died within three months due to acute radiation sickness.
- Over 2,600 square km remain permanently contaminated.
- In 2005, the UN predicted that about 4,000 more may eventually die due to exposure.
- The IAEA (International Atomic Energy Agency) helped coordinate cleanup and support efforts.
- Lessons from Chernobyl shaped global nuclear safety regulations.

Crystal Maze 2 Missile

The Indian Air Force successfully tested the Crystal Maze 2 missile, enhancing India's air strike capability, especially in challenging environments.

Key Points:

- It is an air-launched ballistic missile with a range of over 250 kilometers.
- It can strike both fixed and movable targets like radars or air defense systems.
- It works effectively in GPS-denied zones, where satellite navigation is blocked.
- Designed for high precision and penetration in heavily defended areas.
- It strengthens India's strategic deterrence and modern warfare abilities.

Marrakesh Agreement

The Marrakesh Agreement marked a turning point in global trade. It laid the foundation for the creation of the World Trade Organization (WTO), replacing the General Agreement on Tariffs and Trade (GATT).

Key Points:

- Signed on April 15, 1994, in Marrakesh, Morocco during the Uruguay Round of negotiations.
- Formally established the WTO, which came into existence on January 1, 1995.
- Created a legal and institutional framework for international trade.
- Aimed to reduce trade barriers and ensure a rules-based global trade order.
- Strengthened dispute resolution mechanisms among member countries.

Microbes Found Beneath Atacama Desert

Scientists have discovered resilient microbial life deep under the Atacama Desert, the driest hot desert on Earth. This discovery has implications for the search for life on Mars.

Key Points:

- Microbes were found between 2 to 4 meters below the surface.
- Dominated by Actinobacteria and Firmicutes, which are salt-tolerant and anaerobic.
- These microbes survive without oxygen and in extreme dryness.
- The Atacama Desert is used as a Mars-analog due to its harsh environment.
- The findings support the possibility of microbial life beneath the Martian surface.

Tardigrades

Context

ISRO will send tardigrades to the International Space Station under the Voyager Tardigrades experiment (Axiom-4 mission).

About Tardigrades

- Also called water bears or moss piglets.
- Microscopic animals (0.3–0.5 mm), discovered in 1773.
- Known for extreme resilience—can survive extreme cold, heat, vacuum, radiation, and dehydration.
- Have eight clawed legs and a segmented body with a protective cuticle.

India's First Satellite Aryabhata Completes 50 Years

Context

The Aryabhata satellite completed 50 years since its launch in 1975.

About Aryabhata

- India's first satellite, named after the ancient mathematician.
- Built by ISRO and launched from the USSR.
- Focus areas: Solar physics, X-ray astronomy, and aeronomy.
- 26-faced polyhedron, 1.4 m in diameter, 360 kg, solar panels on 24 sides.
- India became the 11th country to launch a satellite into orbit.

2D Semiconductors

Context

IISc scientists propose angstrom-scale chips using 2D materials like graphene and transition metal dichalcogenides (TMDs).

What are 2D Semiconductors?

- Ultra-thin materials with high carrier mobility, tunable bandgaps, and large surface area.
- Enable angstrom-scale chips—smaller than current nanometer-scale chips.

India's Effort

- Tata-PSMC's ₹91,000 crore project is India's largest.
- IISc focuses on post-silicon technology to position India as a future leader.

Lucy Mission

Context

NASA's Lucy spacecraft flew by the Donaldjohanson asteroid in the main belt.

About Lucy Mission

- Launched in 2021 to explore 10 asteroids (including Jupiter's Trojans).
- Instruments include L'LORRI, L'Ralph, and L'TES.
- In 2023, Lucy found a moon named Selam around asteroid Dinkinesh.
- Named after the hominin fossil "Lucy" to represent evolutionary research.

Global Clinical Framework for Meningitis

Context

The World Health Organization has released its first global guidelines for the prevention, diagnosis, and treatment of meningitis under its Defeating Meningitis by 2030 Roadmap.

About the Disease

Meningitis is an inflammation of the meninges, the membranes covering the brain and spinal cord. It can be caused by bacteria, viruses, fungi, or even autoimmune reactions. The bacterial forms caused by *Neisseria meningitidis*, *Streptococcus pneumoniae*, and *Haemophilus influenzae* are particularly fatal if untreated. It mainly affects children, adolescents, and immunocompromised individuals.

Prevention and Management

Vaccines exist for meningococcal, pneumococcal, and Hib-related meningitis. Prompt antibiotic treatment is vital in bacterial cases. Public health infrastructure must enhance early detection and vaccination campaigns.

Volcanic Vortex Rings from Mount Etna

Context:

Mount Etna in Italy has been observed emitting rare volcanic vortex rings.

What Are Volcanic Vortex Rings?

- Circular rings of water vapour or gas expelled rapidly from a volcanic vent.
- Similar to smoke rings blown from the mouth.

Scientific Importance:

- Provide clues about volcanic activity and emission patterns.
- Aid in eruption prediction and gas emission studies.

Historical and Global Occurrences:

- First observed in 1724 at Etna and Vesuvius.
- Seen recently at volcanoes in Japan, Iceland, New Zealand, and Alaska.

About Mount Etna:

- Located on Sicily's east coast, Europe's largest and most active volcano.
- Almost constant activity with multiple summit and flank craters.
- UNESCO World Heritage Site since 2013.

Human Papillomavirus (HPV) Testing Kits in India

Context:

India's first HPV testing kits are set for validation across global study centres for mass use in cervical cancer screening.

About HPV:

- A common STI affecting skin, genital area, and throat.
- Most cervical cancers (99%) linked to high-risk HPV types.
- Transmitted via sexual contact.

About Cervical Cancer:

- Second most frequent cancer among Indian women.
- Mostly preventable through vaccination and early screening.

Significance of the Testing Kits:

- First made-in-India HPV detection tool.
- Cheaper alternative for large-scale deployment.
- Once validated, will boost early diagnosis and prevention.

Prevention Measures:

- HPV vaccines.
- Regular screening and treatment of precancerous lesions.

Whooping Cough Outbreak

Context:

Several countries including China, the Netherlands, and the Czech Republic have reported a spike in whooping cough cases.

About Whooping Cough (Pertussis):

- Caused by the bacterium *Bordetella pertussis*.
- Highly contagious respiratory infection.
- Named after the characteristic “whooping” sound during coughing bouts.

Transmission and Symptoms:

- Spread through droplets from coughs and sneezes.
- Begins with cold-like symptoms, low-grade fever.
- Progresses to intense coughing fits followed by vomiting or fatigue.
- Can lead to pneumonia or death, especially in infants.

Vaccination:

- DTaP and Tdap vaccines protect against whooping cough.
- Immunization is the most effective prevention strategy.

Public Health Importance:

- Early detection, vaccination drives, and public awareness are essential to manage resurgence.

ANURAG BACHAN'S

INTERNATIONAL RELATIONS

India-Thailand Strategic Partnership

Context

Prime Minister Narendra Modi visited Thailand to participate in the 6th BIMSTEC Summit held in Bangkok. During the visit, India and Thailand signed a declaration to establish a strategic partnership, reflecting the deepening of bilateral ties.

India-Thailand Strategic Partnership

Historical Background

India and Thailand have shared friendly and cooperative relations for decades. Diplomatic ties were formally established in 1947. In 2022, both countries celebrated 75 years of diplomatic engagement, highlighting their longstanding historical and cultural bonds.

Areas of Cooperation

India and Thailand cooperate in diverse sectors such as trade, investment, defence, maritime security, science and technology, education, tourism, and cultural exchanges. Thailand's 'Act West' policy complements India's 'Act East' policy, enhancing mutual engagement across the Indo-Pacific region. As maritime neighbours, both countries are important stakeholders in regional security and connectivity.

Multilateral Engagement

Thailand is an active partner in regional groupings where India also plays a key role. These include ASEAN, East Asia Summit (EAS), BIMSTEC, Mekong-Ganga Cooperation (MGC), Asia Cooperation Dialogue (ACD), Indian Ocean Rim Association (IORA), and ACMECS. This multilateral participation has helped deepen strategic understanding and cooperation.

Defence Cooperation

Defence ties were institutionalised with the signing of the MoU on Defence Cooperation in 2012. The partnership includes joint maritime patrols, annual staff talks, defence dialogues, military training exchanges, and participation in joint exercises involving other countries.

Economic and Trade Relations

Bilateral trade has shown consistent growth. In 2023-24, Thailand was India's 21st largest trade partner, with trade valued at around USD 14.94 billion. By 2024, India had become Thailand's 11th largest trading partner, with bilateral trade rising to approximately USD 17.5 billion.

Cultural and Tourism Linkages

Cultural ties are nurtured through the Swami Vivekananda Cultural Centre in Bangkok, operational since 2009. A Cultural Exchange Programme (CEP) covering 2022 to 2027 was signed in 2022. In tourism, there are more than 400 weekly flights between 15 Indian cities and Thailand. In 2024, approximately 2.1 million Indians visited Thailand, accounting for 6 percent of all international tourists. India offers 30-day e-tourist visas to Thai nationals, and Thailand has approved a 60-day visa-free entry for Indian citizens.

Educational Cooperation

An MoU on education was signed in 2005. India offers around 75 annual scholarships to Thai students and 1,000 PhD fellowships to ASEAN countries, with 100 slots designated for Thailand.

Indian Community in Thailand

Thailand hosts a sizeable Indian-origin population, estimated between 4 to 5 lakh. This includes more than 25,000 Non-Resident Indians (NRIs), contributing to the socio-economic development and cultural diversity of the country.

Recent Developments

Both countries held comprehensive discussions covering sectors like defence, trade, health, education, and security. Several memoranda of understanding (MoUs) were exchanged during the visit. The announcement of a strategic partnership reflects a renewed commitment to deepen cooperation in all major areas of bilateral and regional interest.

India-Bangladesh Relations

Context

During the recent BIMSTEC Summit in Bangkok, the Prime Ministers of India and Bangladesh held their first high-level discussion following the recent change in leadership in Dhaka.

Historical and Diplomatic Milestones

India and Bangladesh have shared deep-rooted ties since Bangladesh's liberation in 1971. India played a critical role in the creation of Bangladesh and was the first country to officially recognise it.

Key milestones in the bilateral relationship include:

- 1971: Liberation of Bangladesh and India's recognition of the new nation.
- 1972: Indo-Bangladesh Treaty of Friendship, setting the foundation for cooperation.
- 1974: Indira-Mujib Land Boundary Agreement signed.
- 1996: Ganges Water Sharing Treaty signed for 30 years.
- 2010: Joint communiqué on cooperation in trade, security, and connectivity.
- 2015: Implementation of the Land Boundary Agreement, resolving enclave issues.
- 2021: Celebrations marking 50 years of diplomatic ties.
- 2022–2024: Revival of rail and water connectivity.

Political and Strategic Cooperation

India and Bangladesh operate nearly 70 bilateral mechanisms, covering areas such as defence, trade, energy, border management, and river water sharing. India has provided support in infrastructure

development and counter-terrorism cooperation. Defence collaboration includes lines of credit and training support.

Trade and Economic Relations

Bangladesh is India's largest trading partner in South Asia. India is Bangladesh's second-largest trade partner in Asia.

Trade statistics for FY 2023–24:

- Total trade: USD 14.01 billion
- Bangladesh's exports to India: USD 1.97 billion

Key developments include duty-free access for Bangladeshi products under SAFTA, growth of border haats, and investments in transport and logistics.

Connectivity and Infrastructure

Railway Links: Operational routes include Agartala–Akhaura, Haldibari–Chilahati, Petrapole–Benapole, Gede–Darshana, Singhabad–Rohanpur, and Radhikapur–Biroh.

Passenger Trains:

- Maitri Express (Kolkata–Dhaka)
- Bandhan Express (Kolkata–Khulna)
- Mitali Express (New Jalpaiguri–Dhaka)

Port and Inland Waterways:

- Agreement on the use of Chittagong and Mongla Ports was operationalised in 2023.
- Inland Waterway development is progressing under the Protocol on Inland Water Transit and Trade.

Energy Cooperation

Recent developments include the India-Bangladesh Friendship Pipeline (IBFPL) to transport diesel from India to northern Bangladesh. Renewable energy collaboration is also underway, focusing on solar and hydro power.

Cultural and People-to-People Ties

India and Bangladesh share deep linguistic and cultural affinities, especially in West Bengal and Bangladesh.

- Cultural exchanges continue through initiatives like the Maitree Diwas.
- Academic and technical programs offer scholarships and fellowships to Bangladeshi students.
- India offers ITEC and ICCR scholarships, including PhD fellowships for ASEAN countries.

Key Regional Frameworks

Both countries are active members of several regional groups:

- SAARC, BIMSTEC, IORA, BBIN, and SASEC
- Bangladesh is also involved in the BCIM corridor under China's Belt and Road Initiative, although India remains cautious

Major Issues and Challenges

- **Border Security:** The 4,096.7 km-long border is prone to smuggling, trafficking, and illegal migration. Occasional clashes between border forces raise tensions.
- **Teesta River Dispute:** Despite a draft agreement in 2011, India has yet to sign due to internal political opposition. Over 50 other rivers remain unregulated under formal water-sharing arrangements.
- **China's Growing Presence:** Bangladesh's growing economic and defence ties with China are viewed with concern by India, which sees this as strategic encroachment.
- **Migration and Demographics:** Historical migration into Indian states like Assam and West Bengal remains politically sensitive, often linked to debates on NRC and CAA.
- **Minority Rights:** India has expressed concerns regarding the protection of Hindu and other minorities in Bangladesh.
- **Trade Imbalance and Barriers:** Bangladesh has raised concerns over non-tariff barriers and delays in expanding market access to its goods.

Way Forward

- **Strengthening Dialogue:** Regular high-level talks can help resolve outstanding issues and strengthen trust.
- **Border Management:** Implementation of the Coordinated Border Management Plan (CBMP) has improved joint surveillance and cooperation.
- **Inclusivity and Mutual Respect:** Both countries must ensure minority rights and inclusive development, respecting each other's sovereignty.
- **Balanced Partnerships:** Bangladesh is diversifying its partnerships while maintaining strong ties with India. India must continue a supportive, non-interventionist approach.

Conclusion

India and Bangladesh share a deep historical relationship, but current dynamics require a careful balance of cooperation and sensitivity. By resolving legacy issues and expanding collaboration in trade, security, and connectivity, the two countries can build a stable and mutually beneficial partnership.

BIMSTEC Summit 2025

Context

Prime Minister Narendra Modi participated in the 6th BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) Summit, hosted by Thailand. This marked the first in-person BIMSTEC Summit in seven years. The chairmanship was handed over from Thailand to Bangladesh.

Theme and Focus

The theme of the summit was “BIMSTEC: Prosperous, Resilient, and Open”. The discussions centered on fostering shared growth, improving connectivity, and enhancing cooperation amid rising global uncertainties.

India’s Major Proposals and Initiatives

21-Point Action Plan

India introduced a detailed plan to deepen cooperation across diverse sectors. Key highlights include:

Disaster Management

- Establishment of the BIMSTEC Centre of Excellence for Disaster Management in India.
- Hosting of the fourth joint exercise among BIMSTEC disaster response agencies.

Skill Development and Youth Engagement

- Launch of the BODHI initiative (BIMSTEC for Organized Development of Human Resource Infrastructure) to train 300 youth from BIMSTEC countries annually in India.
- India will host a BIMSTEC Athletics Meet this year and the first-ever BIMSTEC Games in 2027.
- Other proposals include a Young Leaders’ Summit, Hackathon, and a Young Professional Visitors Program.

Digital and Health Cooperation

- Proposal for a pilot project on Digital Public Infrastructure.
- Initiative for capacity building in cancer care across BIMSTEC countries.

Economic and Trade Integration

- Establishment of a BIMSTEC Chamber of Commerce and the hosting of a Business Summit.
- Proposal to link India’s Unified Payments Interface (UPI) with payment systems of other BIMSTEC members to ease trade, tourism, and transactions.

Space and Maritime Cooperation

- Plan to build nano-satellites and promote the use of remote sensing data for member countries.
- Proposal for a Sustainable Maritime Transport Centre in India to boost capacity building and cooperation in maritime logistics and innovation.

Key Summit Outcomes

BIMSTEC Bangkok Vision 2030

A long-term roadmap aimed at building a more prosperous, secure, and connected BIMSTEC by 2030. It focuses on trade, transport, and regional resilience.

Rules of Procedure

BIMSTEC formalized a comprehensive rulebook to ensure transparency, consistency, and operational efficiency.

Eminent Persons' Group Report

This report provides strategic recommendations to align BIMSTEC's work with the 2030 vision, including institutional reforms and new sectoral priorities.

Maritime Transport Cooperation Agreement

A major agreement was signed to promote regional maritime connectivity. It aims to reduce shipping costs, enhance trade, and make sea-based transport more efficient between South and Southeast Asia.

About BIMSTEC

BIMSTEC is a regional organization established in 1997 through the Bangkok Declaration. It brings together South and Southeast Asian nations along the Bay of Bengal.

Members

Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand.

Objectives

To promote regional cooperation in trade, connectivity, energy, environment, science, technology, and economic development.

Conclusion

The 6th BIMSTEC Summit reaffirmed the grouping's importance in connecting South and Southeast Asia. India's proposals and leadership reflect its commitment to regional growth, economic integration, and strategic cooperation under its 'Act East' and 'Neighbourhood First' policies.

Ottawa Convention and Recent Withdrawals

Context

Poland, Finland, and all three Baltic countries (Estonia, Latvia, and Lithuania) have announced their intention to withdraw from the Ottawa Convention. It cited heightened security concerns due to the ongoing conflict involving Russia.

About the Ottawa Convention

The Ottawa Convention is officially titled the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction.

- It was adopted during a diplomatic conference in Oslo in 1997 and opened for signature in Ottawa the same year.
- The treaty came into effect on March 1, 1999.
- It prohibits the use, development, storage, and transfer of anti-personnel landmines.
- Countries that withdraw from the treaty regain the legal right to produce and use landmines.

Progress Achieved

- Over 40 million stockpiled landmines have been destroyed under the convention's framework.
- Significant reduction in new landmine use and production worldwide.
- The convention has helped fund mine clearance efforts and support for victims and affected communities.
- Casualties due to landmines have dropped considerably in many post-conflict regions.

Why It Matters

- Anti-personnel landmines disproportionately impact civilians, with over 80% of victims being non-combatants.
- Ukraine was reported to be the most mined country in 2024, with over 1,200 civilian casualties due to landmines.
- The withdrawals by European nations could set a precedent, especially as countries like Lithuania are also reconsidering their stance on other arms control treaties such as the Convention on Cluster Munitions.

150th Assembly of the Inter-Parliamentary Union (IPU)

Context

Lok Sabha Speaker Om Birla led the Indian delegation to the 150th Assembly of the Inter-Parliamentary Union (IPU), held in Tashkent from April 5 to 9, 2025.

Theme of the Assembly

The assembly focuses on "Parliamentary action for social development and justice".

Key issues under discussion include:

- Eradication of poverty
- Promotion of decent employment
- Social inclusion policies
- Enhancing the participation of marginalized groups in decision-making

About the Inter-Parliamentary Union (IPU)

- Founded in 1889, the IPU is a global organization of national parliaments.
- It currently has 181 member parliaments and 15 associate members.
- The IPU works to strengthen democracy, promote peace, support gender equality, and enable sustainable development through dialogue among lawmakers.
- The organization is headquartered in Geneva, Switzerland, with liaison offices in New York and Vienna.
- It is primarily funded by its member countries.

India's Role in the Inter-Parliamentary Union (IPU)

India has been an active member of the IPU and regularly participates in its deliberations. Through such forums, India promotes inclusive governance, democratic values, and multilateral cooperation on global developmental goals.

Reclaiming Katchatheevu Island

Context

The Tamil Nadu Assembly passed a resolution urging the Central Government to reclaim Katchatheevu Island from Sri Lanka, citing impacts on traditional fishing rights.

Location and Characteristics

Katchatheevu is a 285-acre uninhabited island in the Palk Strait, located between Rameswaram in Tamil Nadu and northern Sri Lanka. It contains a Catholic church but lacks drinking water and infrastructure.

Historical Background

The dispute over Katchatheevu began in 1921 and was settled through two agreements signed in 1974 and 1976 between India and Sri Lanka. These agreements ceded Katchatheevu to Sri Lanka while allowing Indian fishermen access for pilgrimage but not fishing.

Geopolitical Implications

India gained diplomatic goodwill with Sri Lanka and secured rights over Wadge Bank. However, Tamil Nadu continues to protest the agreement, citing harassment by the Sri Lankan Navy. The matter remains sub judice in the Supreme Court.

President of Chile's Visit to India

Context

The President of Chile visited India, marking 76 years of diplomatic relations between the two nations. Chile is a narrow country on South America's west coast, featuring the Atacama Desert and Cape Horn. It lies in the Pacific Ring of Fire, making it seismically active. Chile is the world's top copper producer and also rich in lithium and other critical minerals.

Bilateral Engagements

India and Chile launched talks for a Comprehensive Economic Partnership Agreement (CEPA). They agreed to enhance cooperation in critical minerals and Antarctic scientific research. A key partnership was formed between CODELCO and Hindustan Copper Limited.

India and Russia Mark 78 Years of Strategic Partnership

Context

India and Russia commemorated 78 years of diplomatic relations with cultural and political events, reaffirming their historical and evolving strategic partnership.

Historical Timeline

Diplomatic ties began in 1947, followed by the Treaty of Peace, Friendship, and Cooperation in 1971. After the USSR's dissolution, the Treaty of Friendship and Cooperation (1993) and the Strategic Partnership (2000) were signed. The relationship was elevated to a Special and Privileged Strategic Partnership in 2010.

Trade and Defence Ties

Bilateral trade reached over \$60 billion in 2024–25. India imports crude oil, coal, and fertilizers from Russia, while exporting pharmaceuticals, iron and steel, and electronics. Defence collaboration includes the S-400 Triumf system, BrahMos missile, submarines, and AK-203 rifles. The IRIGC-MTC facilitates joint research and procurement.

Multilateral Engagements

India and Russia collaborate in BRICS, SCO, and G20, promoting multipolarity. Russia supports India's permanent membership in the UNSC and its Act Far East policy.

Energy and Nuclear Cooperation

Kudankulam Nuclear Power Plant remains a symbol of civilian nuclear cooperation. Russia became India's fourth-largest trading partner due to discounted oil.

Emerging Domains

Joint projects in AI, cybersecurity, and satellite navigation are expanding. Russia and India are also exploring GLONASS–NavIC integration and space cooperation.

Challenges

- Delays in defence deliveries due to the Ukraine war and Western sanctions.
- Concerns over Russia's closer ties with China.
- Payment issues due to restricted banking channels.
- India's growing ties with the West add complexity.

Conclusion

Despite changing global alignments, India-Russia ties continue to be rooted in trust, mutual interest, and strategic depth. The partnership is expected to remain vital in energy, defence, and technology.

50 years of India-Portugal Diplomatic Ties

Context

India and Portugal commemorated 50 years of diplomatic relations with high-level meetings and symbolic honors.

Highlights

President Droupadi Murmu met with her Portuguese counterpart in Lisbon, marking the first Indian Presidential visit to Portugal since 1998.

She was conferred the 'City Key of Honour' by the Mayor of Lisbon in recognition of the strengthening bilateral ties.

Portugal: A Brief Overview

- Located on the western edge of Europe, sharing borders with Spain and the Atlantic Ocean.
- Lisbon is the capital and largest city.
- Historically significant for its maritime explorations during the 15th–16th centuries, with explorers like Vasco da Gama and Ferdinand Magellan.
- Former colonial power with colonies like Brazil, Angola, Mozambique, and Goa.
- Currently, Portugal is a European Union member state.

Artemis Accords

Context

Bangladesh signed the Artemis Accords, becoming the 54th country to join the initiative.

About the Accords

- Launched in 2020 by the US with eight founding countries.
- Built upon the Outer Space Treaty of 1967.
- A non-binding set of principles for peaceful, transparent, and cooperative civil space exploration.

Key Principles

Peaceful usage, data sharing, protecting heritage sites, space resource utilization, and avoiding space debris

Scope

Covers activities on the Moon, Mars, asteroids, comets, and their orbits and transit routes.

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India-Italy Comprehensive Strategic Partnership

Context

The Deputy Prime Minister of Italy, Antonio Tajani, visited India to strengthen bilateral cooperation, particularly in trade, defence, energy, and innovation.

India-Italy Relations

Historical ties date back to the ancient spice trade and the travels of Marco Polo.

Established diplomatic relations in 1947 and elevated them to a Strategic Partnership in 2023.

Joint Strategic Action Plan 2025–29 was launched to deepen cooperation.

- Italy is India's 4th largest EU trading partner and 17th in FDI inflows.
- INS Sumedha and ITS Morosini conducted a PASSEX in 2023. The Italian Navy participated in MILAN 2024 hosted by India. Italy's exit from China's Belt and Road Initiative in 2023 reflects convergence with India on strategic concerns.
- An estimated 2 lakh Indian-origin people reside in Italy. The Migration and Mobility Partnership Agreement was signed in 2023. Cultural exchanges continue under the Executive Programme on Cultural Cooperation (2023–27).
- Trade barriers and regulatory issues hinder economic growth. Past strains like the Italian marines case and military sales to Pakistan create defence policy friction.

Way Ahead

Joint incubation centres and tech parks in AI, biotech, and space can deepen ties. Improved FDI procedures and policy alignment can boost bilateral trade and innovation. India and Italy are exploring new avenues in fashion, green tech, and food processing.

US-Iran Nuclear Talks

Context

The United States and Iran have resumed negotiations on Iran's nuclear program, potentially reviving diplomatic efforts after years of stagnation.

Background

Iran, although a signatory of the NPT, ceased cooperation with IAEA post-1979.

The 2015 Joint Comprehensive Plan of Action (JCPOA) aimed to limit Iran's nuclear activity in return for sanctions relief. The US withdrew from the deal in 2018 under President Trump, prompting Iran to enrich uranium up to 60%.

Iran's Nuclear Program

Iran claims peaceful use, but enrichment levels and stockpiling raise global concerns. Weapons-grade uranium requires 90% enrichment, and Iran is close to this threshold.

Latest Developments

Faced with military, economic, and political setbacks, Iran has signalled openness to dialogue. The US, under pressure to prevent nuclear escalation, has reopened talks.

Way Forward

Revival of JCPOA needs trust, phased sanctions relief, and full IAEA oversight. Multilateral guarantees and regional dialogue are essential for lasting peace. India, as a neutral and influential actor, can support non-proliferation and peaceful nuclear energy.

Morag Axis Control

Context

Israel announced the completion of a new security corridor known as the Morag axis, expanding its strategic hold within Gaza.

Details

The corridor stretches between Rafah and Khan Yunis, forming a land connection from the Philadelphi Route to Morag.

The objective appears to be the establishment of a broader Israeli-controlled zone, integrating it with existing corridors like the Philadelphi and Netzarim routes.

The Philadelphi Corridor lies along the Gaza-Egypt border and has been under Israeli control since 2024.

Together, these corridors extend Israeli military presence to over half of Gaza's landmass.

DISASTER MANAGEMENT

Nankai Trough Megaquake Warning

Context

Japan has issued warnings over the potential for a megaquake in the Nankai Trough region. The country is on high alert due to the threat of large-scale seismic activity and tsunamis.

What is a Megaquake?

A megaquake is a high-magnitude earthquake (8.0 or above) that can cause massive destruction. The Nankai Trough is a subduction zone stretching along Japan's Pacific coast, where the Philippine Sea Plate is subducting under the Eurasian Plate.

Concerns and History

The Japanese government estimates a 70–80% probability of a magnitude 8–9 quake in the next 30 years. Historical records show such quakes have occurred every 100–150 years. The government fears significant casualties and economic loss if such an event materialises.

Asbestos Hazards

Context

The Global Asbestos Awareness Week (GAAW) is observed during the first week of April each year to highlight the dangers of asbestos exposure.

About Asbestos

Asbestos is a group of six fibrous minerals known for their durability and heat resistance. It was used widely in industries, but its fibres pose serious health risks when inhaled or ingested.

Health Hazards

Exposure to asbestos can cause chronic diseases like Asbestosis and Mesothelioma. The fibres embed in the lungs and tissues, leading to long-term illness. Many countries have banned or strictly regulated its use.

Swell Waves Inundate Kerala's Coastline

Context

Several coastal districts in Kerala recently faced sudden sea flooding. These were caused by a natural phenomenon known as swell waves, locally referred to as Kallakkadal.

What Are Swell Waves?

Swell waves are long, rolling waves formed far out in the ocean. They are created by storms that may occur thousands of kilometers away. Once formed, these waves travel over long distances, even after the storm has ended. Unlike choppy, stormy waves, swell waves are smooth, rhythmic, and regular in appearance.

Kallakkadal: The Local Name

Fishermen in Kerala call these waves Kallakkadal, which means “unexpected sea” in Malayalam. These waves often arrive suddenly and without any local weather disturbance.

They flood the coast, sometimes damaging homes and fishing gear. In 2012, UNESCO officially recognized the term Kallakkadal for scientific usage.

Why It Happens

As the waves move away from the storm zone, they get sorted. The longer waves travel faster and lead the group, while shorter ones follow. This sorting allows waves to retain energy and height for long distances. When they reach the shore, they bring unexpected surges of seawater.

Impacts in Kerala

The latest Kallakkadal event affected both central and southern parts of Kerala. Low-lying areas near the coast experienced waterlogging. It disrupted fishing activities and caused temporary displacement in some areas.

Conclusion

Understanding Kallakkadal is crucial for coastal safety and early warning systems. Fishermen and coastal residents must be informed in advance to prevent damage. Monitoring swell wave patterns will help reduce the impact of such silent sea invasions.

Impact of La Niña on Indian Monsoon and Agriculture

Context

The Asia-Pacific Economic Cooperation (APEC) Climate Center has predicted the return of La Niña, which is expected to influence the Indian monsoon positively.

Monsoon Forecast for India

India is likely to receive above-normal rainfall during the upcoming monsoon. This trend spans eastern Africa, the Arabian Sea, Bay of Bengal, Indonesia, and parts of South Asia.

Ocean-Atmosphere System

Under normal conditions, trade winds push warm Pacific water from South America to Southeast Asia. This causes upwelling of cold water and cloud formation, contributing to the Indian monsoon. El Niño and La Niña events disturb this balance. They typically form between March and June and peak in winter.

El Niño vs. La Niña

- *El Niño*: Warmer Pacific waters, weak trade winds, drought in India, wet in South America and North America.
- *La Niña*: Cooler Pacific waters, strong trade winds, enhanced monsoon rains in India, flooding in parts of Asia and Australia.

La Niña's Effect on Indian Monsoon

La Niña enhances monsoon activity in India, leading to increased rainfall, especially in central and northwestern parts. It counters the droughts often caused by El Niño events.

Benefits for India

- **Water Management**: Higher rainfall improves irrigation and reservoir levels.

- **Agriculture:** Boosts sowing of Kharif crops like paddy and pulses.
- **Food Prices:** Increased yields help stabilize food prices.
- **Hydropower:** Improved reservoir levels enhance power generation capacity.

Seasonal Outlook: IMD Prediction (April–June 2024)

Context

IMD forecasts above-normal temperatures and heatwaves across most of India.

Key Observations

- Higher-than-normal daytime and nighttime temperatures.
- Heatwaves likely in south, central, eastern, and northwest India.
- El Niño weakening; La Niña may develop by monsoon onset.

Concerns

- **Health Risks:** Heatstroke, dehydration.
- **Agriculture:** Crop stress and water shortages.
- **Energy:** Surge in power demand and reduced hydroelectric output.
- **Environment:** Deteriorating air quality and ecosystem imbalances.

Heatwave Criteria (IMD)

- Temperature $\geq 40^{\circ}\text{C}$ in plains or $\geq 30^{\circ}\text{C}$ in hills.
- Departure from normal of $4.5\text{--}6.4^{\circ}\text{C}$.
- Severe heatwave: Temp $> 47^{\circ}\text{C}$.

About IMD

- A wing of the Ministry of Earth Sciences.
- One of six Regional Specialised Meteorological Centres under WMO.
- Provides long-range forecasts and early warnings.

Japan's Megaquake Threat

Context

Japan faces a serious risk of megaquakes, particularly along the Nankai Trough. The government has warned that a future seismic event could cause massive loss of life and economic devastation. This concern intensified after a 7.1 magnitude earthquake in 2024, which injured several people. The urgency to enhance disaster preparedness has become more pressing.

About Nankai Trough

The Nankai Trough is a 900-kilometre-long undersea fault situated off Japan's Pacific coast. It stretches from Shizuoka to Kyushu. The region is located on a tectonic boundary where the Philippine Sea Plate is

subducting beneath the Eurasian Plate. This constant geological activity results in the buildup of stress, which can release suddenly in the form of large earthquakes.

Disaster Relief Funds

Context

The state of Tamil Nadu has filed a suit in the Supreme Court alleging that the Central Government is withholding disaster relief funds after Cyclone Michaung and associated floods severely affected the state in 2023.

About Disaster Relief Funds in India

India has two major funding mechanisms for disaster response and mitigation:

1. State Disaster Response Fund (SDRF)
2. National Disaster Response Fund (NDRF)

Both were established under the Disaster Management Act, 2005, enacted after the devastating Indian Ocean Tsunami of 2004.

State Disaster Response Fund (SDRF)

- SDRF is the primary fund available with state governments to meet the expenses of immediate relief following natural calamities.
- It is contributed to by both the Centre and states in a fixed proportion—75:25 for general states and 90:10 for special category states.
- The fund is managed by the State Executive Committee headed by the Chief Secretary of the state.

National Disaster Response Fund (NDRF)

- NDRF is used when a disaster is severe and goes beyond the coping capacity of the state.
- It is wholly funded by the Central Government.
- It covers calamities of severe nature such as cyclones, droughts, earthquakes, floods, etc.

Process for Availing NDRF Funds

1. The affected state must submit a memorandum seeking central assistance.
2. The Ministry of Home Affairs (MHA) constitutes an Inter-Ministerial Central Team (IMCT) to assess the ground situation.
3. The IMCT submits its report to a sub-committee of the National Executive Committee (NEC) which reviews and finalizes the recommendations.
4. The final decision on fund allocation is made by a High-Level Committee chaired by the Union Home Minister and comprising the Ministers of Agriculture and Finance, and the Vice-Chairperson of NITI Aayog.

Use of NDRF Funds

- The funds are used for providing immediate relief measures such as ex-gratia assistance to affected families, food supply, temporary housing, medical care, and infrastructure restoration.
- It is not meant for compensation of loss to properties or long-term rehabilitation.

Issues and Challenges

- **Delays in Fund Disbursal:** Procedural requirements and central oversight often delay the release of funds.
- **Political Disputes:** There have been instances where states allege discrimination in allocation based on political considerations.
- **Underutilization:** States sometimes underutilize funds due to bureaucratic bottlenecks and lack of preparedness.
- **Transparency and Auditing:** Concerns have been raised regarding the transparent utilization and audit of funds.

Way Forward

- Strengthen federal cooperation and ensure timely disbursement of funds without politicization.
- Establish a robust monitoring and grievance redressal system for fund allocation and usage.
- Encourage states to build local-level resilience and improve disaster preparedness using SDRF proactively.
- Regular training and audits to ensure optimal utilization of allocated funds.

Conclusion

The SDRF and NDRF are critical tools in India's disaster response strategy. Ensuring efficient coordination between the Centre and states, along with timely fund release and proper utilization, is essential to support affected populations and rebuild infrastructure after disasters.

ANURAG BACHAN'S

ECONOMY

RBI completed 90 years

Context

The Reserve Bank of India recently completed 90 years. A special event was held in Mumbai. The Prime Minister and RBI Governor attended the ceremony.

About the RBI

The RBI is India's central bank. It was set up on April 1, 1935. The Reserve Bank of India Act, 1934, provides its legal basis. RBI has been active both before and after independence. It has gained global recognition for its policy and professionalism.

Main Functions of RBI

- **Monetary Policy and Inflation Control:** RBI sets key interest rates to control inflation. The MIBOR (Mumbai Interbank Offer Rate) guides lending rates in the market.
- **Regulation and Supervision:** RBI supervises banks, NBFCs, and other financial institutions. Its oversight maintains stability in the financial system.
- **Foreign Exchange Management:** RBI manages India's foreign reserves. It helps control exchange rate fluctuations and oversees currency markets.
- **Promoting Financial Inclusion:** RBI has worked to bring banking services to the masses. UPI (Unified Payments Interface) is one of its key successes in digital payments.
- **Digital Currency:** RBI has launched the digital rupee. It is a Central Bank Digital Currency (CBDC) for retail and merchant use.

Challenges Faced by RBI

- **Managing Inflation and Growth:** RBI must control inflation while also promoting economic growth. Adjusting the repo rate is a key challenge in this balancing act.
- **Banking Sector Issues:** Non-performing assets (NPAs) continue to be a concern. RBI is working to clean up bad loans in the banking system.
- **Global Uncertainties:** RBI must deal with issues like geopolitical tensions, currency volatility, and global financial instability.
- **Digital Currency Rollout:** Integrating digital currency into the economy brings regulatory and technical hurdles.
- **Impossible Trinity:** This refers to the difficulty of having a stable exchange rate, free capital flow, and independent monetary policy at the same time.

Key RBI Initiatives

- **Liquidity Measures:** RBI reduced the reverse repo rate to 3.75% to release more liquidity. It also provided a ₹50,000 crore refinance facility to boost credit flow.

- **Support to Market Economy:** RBI shifted from resource allocation to enabling market reforms. The adoption of flexible inflation targeting and support for the IBC have improved market discipline.
- **Steps in Union Budgets:** Recent budgets included asset monetisation, privatisation, and better infrastructure financing. These were supported by RBI's credit and inflation policies.
- **Improving Rupee Stability:** RBI raised policy rates and revised inflation targets. Other steps include curbing exports and reducing fuel taxes.

Conclusion and Way Forward

RBI plays a critical role in shaping India's economy. As it completes 90 years, it must remain adaptive and forward-looking. The central bank must deal with evolving payment systems, new risks, and growing public expectations. Its mission remains: ensuring price stability, managing inflation, and supporting inclusive growth.

India's 10-year Bond Yields Declined

Context

India's 10-year benchmark bond yield dropped to 6.49% after the Reserve Bank of India (RBI) announced a bond purchase of ₹80,000 crore in April 2025.

Key Developments

- The yield has declined by 9 basis points (bps) recently and 62 bps since the beginning of FY 2024-25, marking the steepest fall in five years.
- The RBI's intervention via open market operations (OMOs) boosted liquidity in the financial system.
- Improved banking sector liquidity has pushed Treasury bill cut-off rates close to 6.30%, influencing bond demand.

Understanding Bond Yield

- Bond yield is the annual return an investor earns from a bond, shown as a percentage.
- It varies with bond price: when price rises, yield falls, and vice versa.

Types of Bond Yields

- **Current Yield:** Annual interest payment ÷ Current bond price.
- **Yield to Maturity (YTM):** Total expected return if the bond is held till maturity.
- **Yield to Call (YTC):** Expected return if the bond is redeemed before maturity.
- **Yield to Worst (YTW):** Lowest possible yield considering early redemption or default.

Why This Matters

- Falling yields signal easier monetary conditions and improved investor confidence.
- Lower yields reduce borrowing costs for the government.

- They reflect expectations of stable interest rates and controlled inflation in the near future.

Conclusion

The RBI’s liquidity support has improved market sentiment, helping bond yields ease further. Continuous monitoring of inflation and global financial trends will influence bond movements ahead.

Hydroponic Farming

Context

Hydroponic farming is gaining momentum as a sustainable agricultural solution in response to shrinking arable land, water scarcity, and rising urban demand for fresh produce. This modern farming technique offers a promising alternative to traditional agriculture by optimizing resources and producing high yields in controlled environments.

What is Hydroponics?

Hydroponics is a method of growing plants without soil, commonly called soilless farming. In this system, plant roots are immersed in a liquid nutrient solution or supported in moist, inert materials such as Rockwool, Vermiculite, Perlite, or Cocopeat. The nutrient solution contains all essential macro and micronutrients required for plant growth. Depending on the system, roots may either float in a static solution or be continuously bathed by a flowing nutrient stream.

Core Process

Aspect	Description
1. Method	Growing crops without soil using water-based nutrient solution
2. Root Support Medium	Inert media such as Rockwool, Vermiculite, Perlite, Cocopeat
3. Nutrient Delivery	Static solution or continuously circulating liquid with dissolved nutrients
4. Plant Types Supported	Leafy greens (lettuce, spinach), herbs (basil, mint), strawberries, tomatoes

Advantages

Hydroponic systems offer numerous benefits over traditional agriculture:

- They use up to 90% less water, making them ideal for water-stressed regions.
- Crops grow faster and produce higher yields in less time and space.
- Controlled environments reduce pest infestations and disease outbreaks.
- They are highly suitable for vertical farming in urban settings and deserts.

Ideal Areas for Adoption

- Drought-prone and water-scarce regions where water conservation is critical.
- Rocky terrains and regions with poor soil quality unsuitable for traditional farming.
- Urban and peri-urban areas where consumers demand fresh, chemical-free vegetables and herbs.

Challenges

Despite its advantages, hydroponics faces some limitations:

- The initial setup cost for hydroponic systems is high due to equipment and infrastructure.
- Continuous monitoring and nutrient management require technical knowledge.
- The system relies on electricity and precise environmental control, making it sensitive to power outages and system failures.

Way Ahead

To promote hydroponic farming as a viable model:

- Governments and agricultural institutions should provide structured training to farmers.
- Financial incentives, credit access, and startup subsidies can reduce the entry barrier.
- Urban agriculture policies must integrate hydroponics to promote sustainable city farming and ensure food security.

Pradhan Mantri Jan Dhan Yojana Milestones

Context

The Pradhan Mantri Jan Dhan Yojana (PMJDY), launched in 2014, continues to play a pivotal role in deepening financial inclusion in India. As of March 2025, the scheme has crossed a significant milestone of over 55 crore beneficiaries, with a cumulative balance of ₹2.5 lakh crore in Jan Dhan accounts. It reflects the success of efforts to provide banking services to the unbanked population of India.

Inclusive Outreach and Women Participation

Out of the total 55.14 crore account holders, around 67% belong to rural and semi-urban areas, showing its extensive reach beyond cities. Notably, women account for 56% of all Jan Dhan beneficiaries, with over 30.71 crore women owning bank accounts under the scheme. This indicates a remarkable step toward promoting financial empowerment of women and building savings culture in households.

Digital Penetration and Economic Impact

The scheme has enabled wide-scale digital access through the distribution of over 37.77 crore RuPay debit cards. These cards have encouraged digital transactions even in remote areas. The average balance per account stands at ₹4,726, contributing to increased liquidity in the banking system. Moreover, PMJDY has supported Direct Benefit Transfers (DBTs), improved access to insurance, pension, and credit services, and increased the financial inclusion index from 43.4 in 2017 to 64.2 in 2024.

Challenges and Way Forward

Despite these achievements, challenges remain. About 11.3 crore Jan Dhan accounts are dormant. The absence of structured credit scoring and limited private bank involvement have also restricted credit accessibility. The focus now should be on reviving dormant accounts, promoting financial literacy, designing credit-linked products, and enhancing the role of private sector banks to sustain momentum.

NITI-NCAER Portal on State Finances

Context

The Union Finance Minister launched the NITI-NCAER States Economic Forum portal on 1 April 2025. This platform is the result of a joint effort between NITI Aayog and the National Council of Applied Economic Research (NCAER).

Purpose of the Portal

The portal serves as a comprehensive digital archive of state-level data. It focuses on social, economic, and fiscal indicators. The coverage spans over three decades, from 1990-91 to 2022-23.

Its goal is to act as a central hub for research, policymaking, and comparative analysis. It is designed to help understand how Indian states are performing across various sectors.

Main Features of the Portal

The portal is organised into four major components:

1. State Reports

These reports present summaries of macroeconomic and fiscal performance for 28 states.

The data is structured around crucial indicators such as population, economic activity, and revenue patterns.

It offers a state-wise snapshot of the development landscape.

2. Data Repository

This section gives direct access to a vast dataset, divided into five verticals:

- Demography
- Economic Structure
- Fiscal
- Health
- Education

Each vertical helps users explore trends through downloadable and visual data.

3. Fiscal and Economic Dashboard

This dashboard provides interactive graphs and tables.

Users can compare key variables like GDP, fiscal deficit, capital spending, and others across time and states.

It also offers appendices and summary tables for deeper analysis.

4. Research and Commentary

This part contains insights from expert studies on state finances and fiscal policies.

It includes analytical papers, policy briefs, and research notes from both NCAER and other contributors.

Analytical and Strategic Use

- The portal is more than just a data platform. It is intended as a tool for evidence-based policymaking.
- It enables policymakers to benchmark a state's performance against national averages or against other states.
- Researchers can track long-term trends, study fiscal behaviour, and assess the impact of government schemes.
- Students and journalists can also use the platform to understand regional development patterns.

Benefits for Stakeholders

- For policymakers, it supports designing better fiscal policies.
- For researchers, it offers reliable and clean historical data.
- For the public, it promotes transparency by showing how public finances are managed.
- For academia, it provides a rich base for case studies, comparative analyses, and empirical research.

Conclusion

The NITI-NCAER States Economic Forum portal fills a longstanding gap in state-level data access. It helps ensure that policy debates are grounded in real evidence, not assumptions.

By making complex data accessible and visually intuitive, it empowers India's states to compete, cooperate, and correct course where needed. The portal is a step toward more accountable and efficient governance at the state level.

RBI's ₹80,000 Crore Injection in Government Securities

Context

The Reserve Bank of India (RBI) recently announced a plan to purchase government securities (G-Secs) worth ₹80,000 crore. This move comes in response to changing liquidity conditions in the financial system.

Understanding Government Securities

Government securities are financial instruments issued by the Central or State Governments to raise money from the public or institutions. They are a form of borrowed capital and represent a government's debt obligation.

These instruments are tradable in financial markets. They are considered to have negligible default risk, and hence are called gilt-edged securities.

G-Secs come in two major types:

1. Short-Term Instruments

- These include Treasury Bills (T-Bills) with maturities less than one year.
- Common tenures are 91 days, 182 days, and 364 days.
- They are issued at a discount and redeemed at face value.

2. Long-Term Instruments

These are called Dated Securities or Government Bonds, with maturities of more than one year. They offer periodic interest, called coupon payments, and return the principal at maturity.

Who Issues These Securities?

- The Central Government issues both Treasury Bills and Dated Securities.
- State Governments issue only Dated Securities, known as State Development Loans (SDLs).

The RBI acts as the debt manager for both the Centre and the States. It manages issuance, trading, redemption, and interest payments.

Why Did RBI Inject ₹80,000 Crore?

Liquidity refers to the amount of money available in the banking system. When liquidity tightens, it affects the availability of credit and the interest rates in the economy.

To address this, the RBI uses Open Market Operations (OMOs). These are buying or selling of government securities to manage money supply.

In this case, the RBI decided to buy securities, which means it is injecting liquidity into the system. This allows banks to have more funds available for lending, investment, and maintaining economic momentum.

Significance of This Move

- Maintains credit flow to businesses and consumers
- Prevents tightening of interest rates
- Supports economic growth in a controlled inflation environment
- Helps the government manage borrowing costs effectively

Importance of G-Secs in the Economy

- G-Secs serve as a benchmark for interest rates across the economy.
- They are used by banks, insurance firms, pension funds, and even individuals for safe investments.
- These securities are essential for the monetary policy toolkit of the RBI.
- G-Secs are also used to meet Statutory Liquidity Ratio (SLR) requirements by banks.

Conclusion

The RBI's recent purchase of government securities is part of its active liquidity management strategy. It reflects the central bank's balancing role between supporting growth and controlling inflation. Government securities, meanwhile, remain a critical pillar of India's public finance and monetary ecosystem. They ensure stable borrowing for the state and provide a safe investment option for the market.

Purchasing Managers' Index (PMI)

Context

India's manufacturing sector showed strong performance in March 2025, with the Purchasing Managers' Index (PMI) rising to 58.1. This is the highest value in eight months and reflects robust business activity and demand.

Key Highlights

The PMI increased from 56.3 in February to 58.1 in March. The index for new orders rose to 61.5, also marking an eight-month high. This indicates sustained growth in manufacturing supported by domestic and international demand. Employment in the sector also showed moderate improvement due to higher production requirements.

What is PMI?

The Purchasing Managers' Index is a monthly indicator of economic health based on surveys of private sector companies. It reflects business confidence and economic trends in the manufacturing and services sectors. The index is prepared by agencies such as S&P Global and is based on key parameters like new orders, output, employment, suppliers' delivery time, and inventories.

How it is Interpreted

The PMI value ranges between 0 and 100. A value above 50 signals expansion in activity, while a value below 50 reflects contraction. The further the value is from 50, the stronger the rate of change.

Significance

PMI serves as an early indicator of economic trends and is closely monitored by policymakers, investors, and market analysts. It is especially useful for assessing the health of the industrial sector and understanding future GDP trends.

Conclusion

The March 2025 PMI suggests that India's manufacturing sector is gaining momentum. Rising new orders and improved production signal optimism in business confidence and broader economic recovery.

India's External Debt increased

Overview

India's external debt stood at approximately \$718 billion in December 2024. This reflects a 10.7% increase from the previous year's figure of \$648 billion. The primary drivers behind this surge are non-financial corporations borrowing for infrastructure-related investments. While general government debt declined, both short-term and long-term external debt rose.

Debt-to-GDP Ratio

The external debt-to-GDP ratio increased marginally to 19.1%, up from 19% in September 2024. This indicates a relatively stable external borrowing position in proportion to economic output.

Currency Composition

- **US Dollar:** 54.8%
- **Indian Rupee:** 30.6%
- **Japanese Yen:** 6.1%
- **Special Drawing Rights (SDR):** 4.7%
- **Euro:** 3%

This distribution highlights continued dominance of dollar-denominated borrowing, increasing exposure to currency risk.

Short-Term vs Long-Term Debt

- **Long-Term Debt:** Over \$578 billion (marginally increased)
- **Short-Term Debt:** Rose to 19.4% of total debt, up from 18.9%. The rising share of short-term debt signals growing reliance on near-term external financing, which could raise rollover risks.

Valuation Impact

Due to US dollar appreciation, a valuation effect of \$12.7 billion inflated the debt stock. Without this, the real increase in external debt would have been \$17.9 billion, not just \$5.2 billion.

Sectoral Share of Debt

- **Non-financial Corporations:** 36.5%
- **Deposit-taking Corporations:** 27.8%
- **General Government:** 22.1%
- **Other Financial Corporations:** 8.7%

This distribution confirms that the private sector, especially non-financial entities, is leading the borrowing trend.

Debt Service Ratio

Debt servicing accounted for 6.6% of current receipts in December 2024, down from 6.7% in the previous quarter. This reflects moderate repayment pressure and manageable servicing capacity.

Conclusion

India's rising external debt reflects both developmental financing needs and exposure to global financial conditions. While overall indicators remain stable, rising short-term debt and currency vulnerabilities warrant close monitoring.

SCORES 2.0: Strengthening Investor Protection

Context

SEBI has launched SCORES 2.0, the updated version of its online grievance redressal system, to streamline the process for resolving investor complaints in the securities market.

About SCORES

SCORES stands for SEBI Complaints Redress System. It was initially launched in June 2011 to provide a digital interface for investors to file complaints against listed companies and market intermediaries.

What's New in Version 2.0?

The upgraded system brings greater efficiency and transparency.

Key improvements include:

- **Auto-routing** of complaints to the concerned entity
- **Auto-escalation** if complaints are not addressed within the set time
- **Monitoring by Designated Bodies** to ensure accountability
- **Reduced timelines** for quicker resolution

Two-Tier Review Mechanism

SCORES 2.0 introduces a dual-layered review process:

1. **First Review** by the 'Designated Body' if the investor is unsatisfied with the initial response
2. **Second Review** by SEBI itself, if the issue remains unresolved

About SEBI

The Securities and Exchange Board of India is a statutory regulator, set up in 1992. It was established through the SEBI Act, 1992, to protect investors and regulate India's securities market. SEBI also has quasi-legislative, quasi-judicial, and quasi-executive powers.

Powers and Functions

- SEBI drafts regulations, conducts inquiries, and can impose penalties
- After the 2014 amendment, SEBI can also regulate unregistered money pooling schemes over ₹100 crore
- It plays a key role in ensuring market integrity and investor trust

Conclusion

SCORES 2.0 reflects SEBI's effort to strengthen investor confidence through technology. By making grievance redressal more transparent and efficient, SEBI aims to make India's capital markets safer and more inclusive.

Fiscal Health Index (FHI) 2025

Context

NITI Aayog, in partnership with the Press Information Bureau, has released the Fiscal Health Index (FHI) 2025 to assess and compare the financial position of Indian states.

About the Index

The FHI evaluates the fiscal performance of 18 major Indian states. These states together contribute a large share of India's GDP, population, public expenditure, and fiscal resources. The index is based on official data compiled by the Comptroller and Auditor General (CAG) for the financial year 2022–23.

Core Components of FHI

The index is composed of five sub-indices:

1. **Quality of Expenditure** – Measures how states allocate spending between development and non-development purposes.
2. **Revenue Mobilisation** – Assesses own tax and non-tax revenue efforts.
3. **Fiscal Prudence** – Reviews budgetary discipline and the state's ability to contain deficits.
4. **Debt Index** – Examines the state's debt levels relative to GSDP.
5. **Debt Sustainability** – Focuses on the state's capacity to repay debt based on current revenue trends.

Key Findings

- **Top Performers:** Odisha ranked first in overall fiscal health, followed by Chhattisgarh, Goa, Jharkhand, and Gujarat.
- **Spending and Revenue Share:** States account for around 67% of total public expenditure and contribute about 33% of the country's total revenue.
- **Debt Issues:** States like West Bengal and Punjab are facing serious debt challenges with high and rising debt-to-GSDP ratios.

Significance

The FHI helps identify fiscal vulnerabilities and strengths across states. It provides a useful benchmarking tool for policy formulation and financial management. It encourages data-driven discussions among policymakers on fiscal reforms.

Conclusion

The index highlights the importance of prudent fiscal management at the state level. It urges policymakers to strike a balance between developmental needs and financial sustainability.

Sever Damage to Cardamom Plantation in Kerala

Context

Prolonged drought conditions in Kerala have led to severe damage to cardamom plantations, especially in Idukki district, a key cultivation zone for small cardamom in India.

Response by ICAR and KVK Idukki

To support affected farmers, the Krishi Vigyan Kendra (KVK), Idukki, under the Indian Council of Agricultural Research (ICAR), is implementing biological solutions to improve crop resilience and yield.

Key Intervention – PPFM Application

- Pigmented Facultative Methylophilic Bacteria (PPFM) are being used as a foliar spray on cardamom crops.
- These aerobic, Gram-negative bacteria feed on single-carbon compounds like formate, formaldehyde, and methanol.
- PPFM promotes plant growth through nitrogen fixation, phytohormone production, and chlorophyll enhancement.
- Their application has shown improvements in stomatal count, chlorophyll levels, and malic acid, leading to higher photosynthetic activity.

Benefits

- Enhances crop tolerance to drought stress.
- Increases yield and overall plant vitality.
- Offers a sustainable and eco-friendly alternative to chemical inputs.

Cardamom Plantation

- Belongs to the Zingiberaceae (ginger) family.
- Grown as a perennial herb mainly in the Western Ghats of South India.
- Requires humid conditions, rainfall of 1500–2500 mm/year, and temperatures between 15°C to 35°C.
- Prefers deep, well-drained soil rich in organic content.
- Known for its aromatic spice used globally in culinary and medicinal applications.

Current Concerns

- Drought stress has reduced flowering, fruit setting, and yield.
- With Kerala being a major producer, the situation may impact both domestic availability and exports.

Way Forward

- Promote climate-resilient agricultural practices.
- Encourage use of bio-fertilizers and drought-resistant varieties.
- Ensure timely support and compensation for affected farmers.

India's Engagement with NAFTA and US Trade Talks

Context

In an effort to advance a trade agreement with the United States and avoid 26% reciprocal tariffs, India's Ministry of Commerce and Industry has expanded its NAFTA division.

Understanding NAFTA

The North American Free Trade Agreement (NAFTA) was a trilateral trade pact among the United States, Canada, and Mexico, effective from 1994 to 2020. It created one of the world's largest free trade zones, eliminating tariffs and reducing trade barriers to promote economic integration. In 2020, NAFTA was replaced by the United States-Mexico-Canada Agreement (USMCA) with updated provisions on digital trade, labor standards, and environmental regulations.

Challenges in India-US Trade Talks

- **Data Localisation Demands:** The U.S. Trade Representative (USTR) has raised concerns about India's data localisation requirements, which compel banks and payment service providers to store data within India.
- **Intellectual Property (IP) Concerns:** India has been placed on the USTR's Priority Watch List due to the lack of specific trade secret protection laws, lengthy patent approval processes, and inconsistent enforcement of IP laws.
- **Labour and Environmental Standards:** India has yet to conclude a comprehensive trade agreement with any Western country, primarily due to divergent positions on labor rights enforcement mechanisms and environmental sustainability standards demanded by developed countries.

Basel III Endgame

Context

The United States Federal Reserve has announced adjustments to the proposal concerning the Basel III Endgame.

What is the Basel III Endgame?

The Basel III Endgame is part of a series of international banking reforms formulated by the Basel Committee on Banking Supervision, under the Bank for International Settlements. These reforms aim to standardize global banking regulations to prevent financial instability, especially in the wake of the 2007–2009 financial crisis.

The Endgame phase, finalized in 2017, introduces stricter capital requirements, leverage controls, and enhanced liquidity management. It emphasizes the use of standardized risk assessment models and seeks to reduce the over-reliance on internal models used by banks to calculate risk exposure.

Unlocking India's Tool Export Potential

Context

NITI Aayog's recent report outlines a blueprint to transform India's hand and power tools industry into a \$25+ billion export sector by 2035.

Industry Overview

The hand and power tools sector supports vital industries such as construction, electronics, and automotive. Globally valued at \$100 billion in 2022, the market is expected to nearly double by 2035.

India's Current Position

India contributes less than 2% of global exports in both hand and power tools. Punjab and Maharashtra are key exporting states.

Barriers to Growth

- High input and logistic costs
- Limited access to advanced machinery
- Inadequate financing and industrial land
- Supply chain inefficiencies

Proposed Interventions

- **Tool Clusters:** Establish mega tool parks with ready infrastructure
- **Policy Reforms:** Reduce import duties and simplify labor laws
- **Bridge Cost Support:** Provide short-term subsidies if reforms lag
- **Technology Access and Training:** Strengthen R&D and upskill labor

Vision for 2047

Capturing a 25% global share in hand tools and 10% in power tools could generate massive employment and support rural industrialisation.

Time Use Survey 2024: Insights into Daily Life

Context

The Time Use Survey (TUS) 2024 revealed significant data on how people in India allocate their time across various activities.

About the Time Use Survey

Conducted by the National Statistics Office (NSO) under the Ministry of Statistics and Programme Implementation (MoSPI), the first all-India Time Use Survey (TUS) was from January to December 2019, with the second survey for 2024 released in February 2025. It provides data on time spent on paid and unpaid tasks, learning, socializing, leisure, and self-care activities.

Key Findings

- **Work-Related Activities:** Delhi residents spend the most time on work-related activities, averaging 563 minutes daily, surpassing the national average of 440 minutes. Goa follows closely with 536 minutes, showing a notable increase from 2019.
- **Unpaid Domestic Services:** The survey highlights a gender gap, with women dedicating 289 minutes daily compared to men's 88 minutes.
- **Learning Activities:** Slight decline observed, with the national average dropping from 424 minutes in 2019 to 414 minutes in 2024. Andhra Pradesh and Tamil Nadu remain high in learning time.
- **Socializing and Community Participation:** Varying trends across states, with Nagaland reporting increased social engagement.
- **Leisure Activities:** Nationwide rise, with Uttarakhand seeing a notable increase.
- **Self-Care Time:** Including sleep and hygiene, has decreased nationally, with some states like Meghalaya and Jammu & Kashmir showing an increase.

Indian Financial Regulators Need More Autonomy: IMF-World Bank Report

Context

A recent joint assessment by the International Monetary Fund (IMF) and the World Bank has highlighted the need to strengthen the independence and powers of India's financial regulatory bodies. The report recommends legislative reforms to enhance the functional autonomy of institutions like the Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), and the Insurance Regulatory and Development Authority of India (IRDAI).

Overview of Financial Regulators in India

India's financial architecture is governed by a network of regulatory institutions responsible for ensuring stability, transparency, and accountability across the banking, insurance, capital markets, and pension sectors. These institutions are central to enabling trust, investor protection, and economic development.

Major Regulatory Bodies

- **Reserve Bank of India (RBI):** As the central bank, it manages monetary policy and supervises the banking sector, ensuring liquidity, inflation control, and currency stability.
- **Securities and Exchange Board of India (SEBI):** Regulates India's securities market, protects investor interests, and promotes transparency and efficiency in capital markets.
- **Insurance Regulatory and Development Authority of India (IRDAI):** Supervises and regulates India's insurance sector, ensuring fair practices and protection of policyholders.
- **Pension Fund Regulatory and Development Authority (PFRDA):** Oversees pension-related institutions and schemes, especially the National Pension System.
- **Ministry of Corporate Affairs (MCA):** Administers corporate law and governance under the Companies Act, ensuring transparency and accountability in company operations.
- **Ministry of Finance (MoF):** Responsible for fiscal policy, financial institutions, and economic legislation. It also plays a role in overseeing the financial regulatory structure.

Issues Highlighted by the Report

- **Governmental Interference:** The Ministry of Finance currently holds significant influence over the governance structures of regulatory bodies, including power to override supervisory decisions, which undermines the autonomy of institutions like the RBI.
- **Restricted Powers Over State Entities:** Regulators have limited authority over state-owned banks and insurance firms. For example, the RBI cannot independently enforce board restructuring or direct mergers in public sector banks.
- **Governance Shortfalls in Insurance:** IRDAI lacks sufficient enforcement mechanisms against inefficiencies and non-compliance within state-run insurers.

Importance of Independent Regulators

Core Points	Significance
1. Financial stability	Helps regulators take rapid, data-driven decisions during economic crises.
2. Public confidence	Builds trust among investors, depositors, and international markets.
3. Corporate governance	Enables strict compliance with governance norms within financial institutions.
4. Risk management	Aids in early identification of threats to systemic financial stability.
5. Foreign investment	Enhances India's appeal as a stable financial destination for global investors.
6. Response to emerging risks	Facilitates proactive policy to address climate, cyber, and technological risks.

Key Recommendations of the IMF-World Bank Report

- **Institutional Reforms:** The appellate power currently vested with the Ministry of Finance should be transferred to an independent body to reduce executive overreach.
- **Empower IRDAI:** Grant authority to enforce actions against public sector life insurance companies and enhance governance by clearly demarcating the roles of board members and management.
- **Enhance RBI Oversight:** RBI should provide detailed guidance for corporate governance in banks, remove conflict of interest by not appointing its own staff on bank boards, and assert more control over state-run financial institutions.
- **Strengthen PSBs:** Public Sector Banks should improve their capital base to prepare for future financial shocks, ensuring continuity of credit even during crises.
- **Macroprudential Supervision:** SEBI's progress on securities market oversight is commendable, but it should be complemented by greater cybersecurity vigilance and oversight of financial conglomerates.
- **Climate and Systemic Risks:** Regulatory agencies must build frameworks to identify and mitigate risks emerging from climate change and potential mass asset liquidations in debt markets.

Conclusion and Way Forward

The financial sector's stability relies on the strength and independence of its regulatory institutions. The IMF-World Bank assessment underscores that undue political or executive interference reduces regulatory effectiveness and undermines investor confidence. By granting full autonomy to regulatory bodies, improving their governance standards, and strengthening inter-agency coordination, India can build a more resilient and globally competitive financial system.

USA's Reciprocal Tariffs on India and the World

Context

The United States, under former President Donald Trump, introduced a new tariff regime called "Reciprocal Tariffs" on April 2, 2025. The announcement, part of what he referred to as "Liberation Day," aimed to correct perceived trade imbalances. India, along with several other major economies, was affected by these new tariff rates.

Understanding Tariffs and Reciprocity

- A **tariff** is a tax imposed by a government on imported goods to regulate trade, protect domestic industries, and raise revenue.
- A **reciprocal tariff** is a countermeasure in which a country imposes duties equivalent to those levied by a trading partner. It is often used to equalize treatment or retaliate against unfair trade practices.
- A **discounted reciprocal tariff** applies adjusted or reduced tariffs to certain goods to promote mutual trade benefits without full alignment with existing general tariffs.

Key Features of the Announcement

- A **baseline 10% tariff** was applied to all imports, with varying rates for different countries.
- **Higher tariffs**, ranging from 10% to 50%, were imposed on countries with large trade surpluses with the US.
- **India faced a 26% tariff**, while China (34%), Taiwan (32%), Japan (24%), and the European Union (20%) were also targeted.
- Key sectors impacted globally included textiles, chemicals, electronics, and machinery.
- The stated intention was to rebalance trade relationships and address concerns like currency manipulation and regulatory barriers.

Impact on India

1. Export Pressure

Indian exporters, especially in sectors such as automobiles, textiles, electronics, and seafood, face cost increases that could reduce their competitiveness in the US market.

2. Potential Response Measures

India may consider revising import duties on specific US products such as gems, jewelry, and auto components to maintain trade balance and encourage bilateral cooperation.

3. Diplomatic Strategy

India continues to stress the importance of long-term trade cooperation and is likely to pursue diplomatic engagement to address the tariff challenges while safeguarding strategic interests.

4. Comparative Position

India's tariff rate (26%) is lower than several regional competitors: Vietnam (46%), Thailand (37%), Bangladesh (37%), Sri Lanka (44%), and Pakistan (30%), which could offer a relative advantage in some sectors.

India–USA Trade Snapshot (2024)

- **Total bilateral trade** in goods: \$129.2 billion
- **US exports to India:** \$41.8 billion
- **US imports from India:** \$87.4 billion
- **US trade deficit with India:** \$45.7 billion

Major Indian Exports to USA

- Diamonds, gold, and precious stones
- Generic pharmaceuticals and active pharmaceutical ingredients
- Garments, cotton fabrics, and home textiles
- Engineering goods like auto parts and tools
- Organic and specialty chemicals
- IT services and software (services trade not reflected in merchandise statistics)

Major US Exports to India

- Crude oil and LNG
- Aircraft and defense-related equipment
- Diagnostic instruments and medical devices
- Semiconductors and electronic components
- Industrial and automation machinery
- Agricultural products like almonds, apples, and soybeans

Sectors in India Affected by Tariffs

- **Electronics:** Over \$14 billion in annual exports could be impacted.
- **Gems and Jewellery:** Nearly \$9 billion worth of exports face higher duties.
- **Pharmaceuticals and Energy:** These sectors remain mostly exempt under the new tariffs, preserving India's advantage in essential goods.
- **Auto parts and aluminium:** Though not directly impacted by the 26% tariff, they remain subject to a pre-existing 25% duty under earlier policies.

Global Impact

- **Increased Tensions:** Countries like China, Vietnam, and EU members, which faced higher tariffs (up to 54%), have criticised the move as unilateral and disruptive to global trade norms.
- **Retaliation Risk:** Some nations have hinted at counter-tariffs, raising the possibility of escalating trade disputes.

- **Economic Volatility:** Global financial markets experienced instability, with disruptions in supply chains and rising costs for industries dependent on international imports.

Conclusion

The US reciprocal tariff strategy signals a shift toward protectionist trade measures and challenges the stability of global trade systems. For India, while the tariffs create near-term difficulties, the relatively moderate rate compared to regional peers offers room for strategic adjustments. Balancing diplomacy with internal policy responses will be key to mitigating long-term impacts.

Undersea Cables and India's Expanding Digital Infrastructure

Context

India is witnessing a major expansion in its digital connectivity with the arrival of new undersea cable systems. The landing of 2Africa Pearls (supported by Meta) and SEA-ME-WE 6 cables at Chennai and Mumbai in 2024 has significantly boosted international bandwidth and strengthened India's position in global internet networks.

What Are Undersea Cables?

Undersea cables are fiber optic networks laid across the ocean floor that enable global internet and communication systems.

- They connect countries by transmitting vast amounts of data between continents.
- These cables are robust, insulated, and designed to withstand deep-sea pressure and conditions.
- Around 90% of global data and 80% of international trade rely on these cables.
- Financial transactions, government communication, and digital services depend heavily on them.

About SEA-ME-WE 6

- A 21,700 km-long submarine cable connecting Singapore to France, passing through Egypt over land.
- The SEA-ME-WE 6 consortium includes members from India, Bangladesh, UAE, France, Malaysia, Indonesia, Egypt, Saudi Arabia, and several other countries.
- It aims to improve connectivity between Southeast Asia, the Middle East, and Western Europe.

India's Submarine Cable Infrastructure

- Mumbai and Chennai are the two key cable landing stations in India.
- A total of 17 international cable systems currently land in India.
- India also maintains domestic undersea cable systems:
 - Chennai–Andaman–Nicobar Islands (CANI)
 - Kochi–Lakshadweep Island cable project

Project Waterworth by Meta

- Meta has launched Project Waterworth, a subsea cable system expected to span 50,000 km, making it the longest subsea cable project globally.
- It connects regions including India, USA, Brazil, and South Africa.
- The initiative is part of Meta's plan to support AI and high-speed internet access worldwide, with multi-billion dollar investment over several years.
- Cables are laid at depths of up to 7,000 meters, with special protection in high-risk zones.

Optical Fiber Basics

- Optical fibers are thin strands of pure glass or plastic that transmit data as light pulses.
- They work on the principle of Total Internal Reflection (TIR).
- Each fiber consists of a core (higher refractive index) and cladding, which reflects light back into the core, allowing long-distance data transfer with minimal signal loss.

Concerns and Challenges

1. Growing Demand and Capacity Pressure

- While current capacity is adequate, rising internet traffic could soon surpass infrastructure limits.

2. Vulnerability to Disruptions

- About 570 undersea cables carry global data.
- A disruption in the Red Sea could impact 25% of India's internet connectivity.
- India lacks its own cable repair ships, leading to delays when breakdowns occur.

3. Regulatory and Deployment Barriers

- Multiple approvals slow cable laying and maintenance.
- Fishing and shipping activities pose risks to cable integrity.

International Cable Protection Committee (ICPC)

- Established in 1958, the ICPC is a global platform for submarine cable stakeholders.
- It works to promote safe and secure deployment, information-sharing, and protection of cable systems worldwide.

Recommendations for India

- Streamline regulatory approvals and reduce red tape in cable projects.
- Recognise undersea cables as critical telecom infrastructure to qualify for incentives.
- Invest in local cable repair ships and maintenance systems.
- Create exclusive submarine cable corridors to avoid accidental damage from fishing and marine operations.

Conclusion

India's digital ambitions depend significantly on robust and secure undersea cable networks. With growing reliance on high-speed internet, cloud computing, and AI, enhancing the resilience, protection, and regulatory framework for undersea cables is vital to support a secure digital future.

Bangladesh Curtails Yarn Imports from India via Land Routes

Context

India's cotton yarn exports have been impacted after Bangladesh imposed restrictions on imports through land ports.

Understanding Cotton Yarn

Cotton yarn is produced from harvested cotton and is known for being breathable, soft, and ideal for clothing and crafts. Types of yarn include carded, combed, and compact, based on their spinning quality and method.

India's Global Position in Cotton Yarn Trade

India ranks among the top global exporters, shipping \$1.6 billion worth of cotton yarn and nearly \$85 million in MMF yarn in 2024. Key markets include Bangladesh, China, the USA, and UAE.

About CITI

The Confederation of Indian Textile Industry (CITI), formerly Indian Cotton Mills' Federation, is a leading national industry body representing the full textile and apparel value chain. It serves as a bridge between government policymaking and industry stakeholders.

Eurasian Economic Union

Context

India and the Eurasian Economic Union (EAEU) have recently initiated talks to formally begin negotiations for a Free Trade Agreement (FTA).

About the Eurasian Economic Union (EAEU)

The Eurasian Economic Union is an economic bloc established in 2015 to promote economic integration among post-Soviet states.

Member Countries

- Armenia
- Belarus
- Kazakhstan
- Kyrgyzstan
- Russia

Objectives of the EAEU

- Facilitate cross-border trade and labor migration
- Eliminate non-tariff trade barriers
- Promote harmonization of economic policies
- Develop a Common External Tariff (CET) and customs code

Economic Significance

- Combined GDP: Over \$1.5 trillion
- Population: Approximately 180 million consumers
- Strategic resource-sharing and energy cooperation

India-EAEU Trade Potential

- An FTA with the EAEU is expected to boost India's trade with Central Asia and Eastern Europe
- The agreement could help India diversify its export markets and strengthen its strategic outreach in the Eurasian region.

Special Assistance to States for Capital Investment Scheme

Context

Union Territories with legislatures—Delhi, Jammu and Kashmir, and Puducherry—have been included in the Special Assistance to States for Capital Investment Scheme.

About the Scheme

The scheme was launched in 2020–21 to provide 50-year interest-free loans to states and UTs for undertaking capital investment projects. It was designed to support states during the economic slowdown caused by the COVID-19 pandemic. The funds support development projects such as roads, flyovers, public buildings, and tourism infrastructure. The scheme has been extended and will continue in 2024–25. It is administered by the Ministry of Finance.

Index of Industrial Production (IIP)

Context

India's Index of Industrial Production recorded a growth of 2.9% in February 2025, the slowest pace in the last six months.

About IIP

The IIP is a statistical measure that tracks changes in the volume of industrial production over a given time period. It is used to gauge industrial sector performance. It covers three broad sectors: mining, manufacturing, and electricity. It also classifies products into use-based categories such as basic goods, capital goods, and intermediate goods. The data is released monthly by the Central Statistical Organisation under the Ministry of Statistics and Programme Implementation. The current base year for calculating the index is 2011–12.

Environment

Gangotri National Park Opens for Tourists

Location and Area

Gangotri National Park is situated in Uttarkashi district, Uttarakhand. It covers around 2,390 square kilometers. The park is part of the upper Himalayan region.

Wildlife in the Park

The park is home to many rare and high-altitude species. Snow leopards are the most well-known among them. Other animals include black bears, brown bears, musk deer, and blue sheep (Bharal). The Himalayan Monal, a colourful bird, is also found here.

Trekking and Access

The Gangotri-Gomukh trek route is still under repair due to landslides and glacier movements. Authorities are working to reopen this route soon for trekkers and pilgrims.

New Trekking Routes

Two new trek routes have been introduced this year. Tourists are likely to receive permission for trekking on these routes between May and October.

Tourism Significance

The park attracts nature lovers, trekkers, and wildlife enthusiasts. With the park now open for the season, tourism is expected to rise in the region.

***** Migration Pattern of Painted Lady Butterflies

Context

Researchers are studying how butterflies migrate over long distances. A recent focus has been on the Painted Lady butterfly, known for its seasonal movements across continents.

The Painted Lady butterfly is found almost everywhere on Earth, except Antarctica and South America. It thrives in various climates, from deserts to meadows. It has strong flying muscles and can fly at high speeds and altitudes. Its conservation status is Least Concern under the IUCN Red List.

Key Findings

Painted Lady butterflies migrate over 15,000 km. This journey spans 8 to 10 generations, with each butterfly living only 2 to 4 weeks. Unlike birds, they do not show genetic separation between short- and long-distance migrants. This suggests that their migration behaviour depends more on the environment than on inherited genetic traits.

The study helps us understand how insects respond to environmental signals. It shows how non-genetic factors influence their long journeys. It also supports conservation efforts by identifying the areas important to butterfly life cycles.

Naini Lake and threat on ecological sustainability

Context

Naini Lake in Uttarakhand has recorded its lowest water level in five years, raising concerns about ecological sustainability.

Geography and Trends

The lake is tectonic in origin and crescent-shaped. Located in the Kumaon region, it is the third-largest lake by surface area in Uttarakhand. It has reached or gone below zero level more than 10 times since 2000, compared to just twice during the 1900s.

Environmental threat

This drop is attributed to climate change, urbanisation, and deforestation. The lake's health is vital for tourism, water supply, and ecological balance in the region. Urgent steps are needed for water conservation and ecosystem protection.

Fluoride Pollution Crisis in Sonbhadra

Context

Groundwater in the Sonbhadra district of Uttar Pradesh has shown dangerously high levels of fluoride contamination—five to six times above the safe limit. This has triggered serious health concerns for local communities.

About Fluoride

Fluoride is a naturally present mineral found in rocks, soil, and groundwater. It is non-biodegradable and also released into the environment through industrial processes like burning of coal and clay bricks. In moderate quantities, fluoride is beneficial. It prevents tooth decay and strengthens bones. However, high levels can be toxic.

Health Effects

When fluoride concentration in drinking water exceeds 1.5 mg/liter (as per WHO guidelines), it leads to:

- **Dental fluorosis:** Yellowing, staining, or pitting of teeth, especially in children.
- **Skeletal fluorosis:** Joint stiffness, pain, and bone deformities in severe cases.
- **Neurological and developmental impacts:** Particularly in growing children.
- **Other impacts:** Risk to livestock, vegetation, and aquatic organisms due to bioaccumulation.

Environmental Impact

High fluoride in groundwater affects agriculture and animal health. It disrupts soil chemistry and poses long-term ecological risks.

Way Forward

- Installation of fluoride-removal filters at household and community levels.
- Identification of safe water sources.
- Long-term policy to monitor and regulate groundwater extraction.
- Public awareness campaigns on health risks and prevention strategies.

Plant Treaty Amendments

Context

The 13th meeting of the Ad Hoc Open-ended Working Group held on April 1, 2025, in Rome. It was to enhance the Functioning of the Multilateral System (MLS) under the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA).

About the Plant Treaty

- It was adopted in 2001. The International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) is also known as the Plant Treaty. It is the only legally binding global agreement focused on plant genetic resources for food and agriculture.
- It aims to ensure:
 - Conservation of plant genetic diversity
 - Sustainable use of these resources
 - Equitable benefit-sharing from their use
- The treaty also upholds Farmers' Rights and acknowledges the vital role of farmers in preserving crop diversity.

The Controversial Amendments

- The current Multilateral System (MLS) under the treaty covers 64 crops and forages (35 food crops and 29 forage species).
- The proposed amendment seeks to expand access to all plant species that offer potential use in food or forage breeding.
- This would remove crop-specific limits and enable unrestricted access to genetic material.

Significance of Farmers' Rights

- Under Article 9, the treaty obligates member nations to uphold Farmers' Rights, including:
 - The right to save, use, exchange, and sell farm-saved seeds
 - The right to participate in decision-making
 - The right to equitable benefit-sharing

- These rights support local conservation efforts and enhance food security, especially for developing countries.

Opposition to the Amendments

- A coalition of 138 civil society organisations, including 23 groups from India, have strongly opposed the changes.
- They claim the amendments:
 - Undermine the original intent of the treaty
 - Erode protections for developing nations and farmers' sovereignty
 - Facilitate corporate control and biopiracy, including digital sequence information misuse
 - Pose a threat to global biodiversity and seed sovereignty

Implications for Biodiversity and Developing Countries

- There are around 350,000 known plant species, with 30,000 considered edible.
- The proposed changes would risk unintentional sharing of rare or unrecorded species.
- Developing countries might be compelled to share genetic resources they haven't documented or aren't aware of.
- The amendments could contradict the Convention on Biological Diversity (CBD), which grants sovereign rights to nations over their biological resources.
- Critics argue that corporate breeders could profit disproportionately, undermining local community rights.

Conclusion

The ongoing discussions at the 13th MLS Working Group meeting may reshape the access and benefit-sharing framework under the Plant Treaty. While global collaboration in agriculture is crucial, the need for equity, protection of biodiversity, and farmers' rights in developing nations must remain central. The outcomes of this meeting could influence global food security, biopiracy regulations, and the future of biodiversity governance.

Green Credit Programme

Context

The government invited individuals and organisations to participate in environmental activities under the Green Credit Programme. Participants can earn tradable credits for their green contributions.

About the Programme

The Green Credit Programme was launched by the Ministry of Environment, Forest and Climate Change. It was officially introduced at COP28 in Dubai on December 1, 2023. It supports Mission LiFE (Lifestyle for Environment), promoting sustainable behaviour.

Objective

The main aim is to reward voluntary efforts that help the environment. These efforts include planting trees, conserving water, managing waste, and reducing air pollution.

How It Works?

Anyone — individuals, companies, or public institutions — can join voluntarily. For every eligible activity, participants receive green credits. For example, one fully grown tree equals one green credit. These credits can be traded on a national platform.

Where Credits Can Be Used

Green credits can be used to meet compensatory afforestation targets. They can also be used by companies under SEBI's Environmental, Social, and Governance (ESG) guidelines.

Eligible Activities

Some approved activities include:

- Tree plantation and eco-restoration
- Rainwater harvesting and soil moisture conservation
- Managing solid waste and reducing emissions

Concerns and Legal Questions

The Ministry of Law and Justice raised questions about the legal basis for trading green credits. The Supreme Court is also reviewing a petition regarding the survival of plantations under the scheme.

Environmental Issues

Experts worry the programme may lead to clearing important scrublands and open forests. Replacing natural forests with plantations might harm biodiversity. Critics say it weakens the “land-for-land” principle used in compensatory afforestation.

Conclusion

While the programme promotes green practices, its design must protect ecological balance. Clear rules and long-term monitoring are essential for its success.

African Giant Pouched Rat

Context

An African giant pouched rat recently set a Guinness World Record by detecting 109 landmines and 15 unexploded ordnance (UXOs) in Cambodia, highlighting its unique role in humanitarian demining efforts.

About the Species

Scientific name: *Cricetomys gambianus* The African giant pouched rat is a large rodent native to sub-Saharan Africa, known for its intelligence and trainability. The species is listed as “Least Concern” by the IUCN Red List due to its wide distribution and stable population.

Physical Features

- Greyish-brown fur
- Large ears
- Distinctive cheek pouches used to store food

Habitat and Diet

- Found in forests, savannas, and farmlands across sub-Saharan Africa
- Omnivorous, feeding on fruits, seeds, insects, and small animals

Unique Abilities

These rats are trained to detect the scent of explosives in landmines and unexploded ordnance.

- Due to their light body weight, they can walk over landmines without triggering them.
- A rat can search an area the size of a tennis court in just 30 minutes, while human-led metal detectors could take up to four days.
- They are also capable of detecting tuberculosis bacteria more rapidly than conventional lab methods using microscopy.

Significance in Demining Operations

- Cambodia remains one of the most landmine-affected countries in the world due to past conflicts.
- The use of trained rats is cost-effective and significantly faster in clearing mine-contaminated zones.
- Although Cambodia had aimed to be mine-free by 2025, the deadline has now been extended to 2030 due to new discoveries and funding gaps.

Conclusion

The African giant pouched rat represents a successful example of how animal intelligence can be harnessed for humanitarian purposes. Its contribution to mine detection and public health services showcases the potential of innovative biological technologies in addressing global challenges.

Agasthyamalai Landscape and Supreme Court Survey Order

Context

The Supreme Court has instructed the Central Empowered Committee (CEC) to conduct a comprehensive survey of the Agasthyamalai landscape. The goal is to identify non-forestry activities and encroachments and restore degraded forest areas.

About the Survey

The court's direction is aimed at protecting sensitive wildlife habitats and ensuring compliance with forest conservation norms.

- The survey will cover areas such as Periyar Tiger Reserve, Srivilliputhur Sanctuary, Meghamalai Sanctuary, and Tirunelveli Sanctuary.
- It will involve comparing current forest cover with historical records to assess the extent of encroachment and forest degradation.

Central Empowered Committee (CEC)

- Formed in 2002 and restructured in 2008 under the Supreme Court's orders in the *T.N. Godavarman Thirumulpad vs. Union of India* case.
- Functions under the Ministry of Environment, Forest and Climate Change (MoEFCC).
- Composed of a member secretary and three expert members appointed by the Centre.
- Provides recommendations to the court on forest-related matters, including diversion and restoration.

Agasthyamalai Biosphere Reserve

- Located in the southern Western Ghats, straddling the Kerala–Tamil Nadu border.
- Recognized by UNESCO in 2016 as part of its World Network of Biosphere Reserves.
- Includes Shendurney, Peppara, Neyyar Sanctuaries and the Kalakad Mundanthurai Tiger Reserve.
- Named after sage Agasthya Muni, with a pilgrimage site on Agasthyamalai peak (1,868 meters).
- Inhabited by about 30,000 Kani tribespeople, whose traditional knowledge of medicinal plants is notable.
- Known for its rich biodiversity, including over 2,000 medicinal plant species used in Ayurveda.

Significance

The ruling reinforces the protection of fragile ecosystems and ensures regulated development in ecologically sensitive regions. The landscape is key for tiger conservation, endemic flora and fauna, and indigenous communities.

Supreme Court Bans Unregulated Soil Extraction

Context

The Supreme Court of India has invalidated a government notification that exempted linear infrastructure projects (like roads and pipelines) from seeking environmental clearance (EC) for soil extraction.

Background

In March 2020, the Union Environment Ministry issued a notification. It exempted the extraction of ordinary earth for linear projects from needing environmental clearance. The National Green Tribunal (NGT) challenged this and asked for a review. The ministry did not respond, and the matter went to the Supreme Court.

Supreme Court's Observations

The Court termed the exemption “blanket” and “arbitrary.” It noted the rule was passed in haste during the COVID-19 lockdown without public consultation. The Court held that the Centre failed to justify the notification as being in public interest.

- The ruling ensures that soil extraction for linear projects will now require EC.
- This step aims to reduce environmental damage and enforce better compliance.

About the National Green Tribunal (NGT)

- Established under the NGT Act, 2010, it is a specialised judicial body for environmental matters.
- It follows principles of natural justice and is not bound by the Civil Procedure Code.
- It has powers to issue binding orders and award compensation.

Why It Matters

This judgment strengthens environmental protection in India. It restores the importance of environmental assessments in large projects and upholds accountability in policymaking.

India Supports 'Baku to Belém Roadmap'

Introduction

At the 11th BRICS Environment Ministers' meeting held in Brazil, India urged BRICS nations to support the mobilisation of \$1.3 trillion annually for climate financing by 2035. This call aligns with the emerging global plan known as the "Baku to Belém Roadmap," aimed at supporting climate action in developing countries through long-term, just, and inclusive financing.

What is the Baku to Belém Roadmap?

The Baku to Belém Roadmap is a climate finance strategy launched in the lead-up to COP29.

- It aims to mobilise \$1.3 trillion per year by 2035 for climate actions in developing countries.
- The name reflects its timeline: starting with COP29 in Baku (Azerbaijan) in 2024 and concluding at COP30 in Belém (Brazil) in 2025.
- It is being shaped by the presidencies of both COP29 and COP30 under the UNFCCC framework.

Roadmap Objectives

- Generate \$300 billion from public sources and scale up to \$1.3 trillion annually by 2035.
- Ensure equitable and just climate transitions for developing nations.
- Address financing hurdles such as high-interest loans and complex regulations.
- Strengthen the role of multilateral development banks (MDBs) in offering concessional finance.
- Promote partnerships between governments and private sectors.

Key Features of the Roadmap

- A balanced structure of grants, concessional loans, and private capital.
- Focus on transparency and regular updates to track progress.
- Prioritises financial tools that do not add to sovereign debt burdens.
- Emphasises data-driven, technical solutions over political disagreements.
- Encourages involvement from BRICS, G77, private investors, and international institutions.

India's Role and Position

India has positioned itself as a key voice for equitable climate finance. During the BRICS meet, it called for:

- Timely and adequate support to fulfil Nationally Determined Contributions (NDCs)
- Respect for common but differentiated responsibilities
- Recognition of the development needs of the Global South

Importance of COP30

COP30, to be held in Brazil in November 2025, will be pivotal for finalising the roadmap.

- It will contribute to the Global Stocktake (GST) to ensure global warming remains below 1.5°C.
- The summit will also focus on climate adaptation, loss and damage financing, and transitioning towards greener economies.

UN Resolution Linking Plastic Pollution to Human Rights

Introduction

On April 4, 2025, the United Nations Human Rights Council passed a historic resolution during its 58th session. The resolution connects plastic pollution and ocean health directly to human rights. It reinforces the global recognition of the right to a clean, healthy, and sustainable environment and marks a shift in the approach to environmental governance.

Context of the Resolution

This decision reflects growing international concern over the harmful effects of plastic pollution on marine ecosystems and human health. The resolution urges the integration of human rights into environmental policymaking and builds on earlier global commitments to environmental protection.

Human Rights and Environmental Protection

For the first time, UN member states have agreed that protecting human rights must be a part of the global response to plastic pollution.

- The resolution links plastic pollution, climate change, and biodiversity loss with the violation of basic human rights.
- It affirms that protecting marine ecosystems is essential not only for nature but also for preserving human dignity, health, and livelihoods.

Connection with Previous UN Decisions

This resolution is a continuation of earlier steps:

- In 2021, the UN Human Rights Council formally recognised the right to a healthy environment.
- In 2022, the UN General Assembly passed a resolution reinforcing this right.
- A report published in December 2024 by the UN Special Rapporteur on Human Rights and the Environment significantly influenced the new resolution. It emphasised the critical role of oceans in sustaining life and protecting the rights of coastal and island communities.

Key Features of the Resolution

The resolution encourages a human rights-based approach to ocean governance that includes:

- Active participation of local communities
- Protection of vulnerable groups affected by environmental harm
- Promoting transparency, accountability, and inclusion in policy decisions
- Coordinated action across the entire plastic life cycle, from production to disposal

Role of Indigenous Knowledge

The resolution recognises the valuable role of Indigenous Peoples and local communities in managing ocean and coastal ecosystems. It advocates for incorporating their traditional knowledge into environmental decision-making processes. This step is seen as essential for developing policies that are both effective and inclusive.

Focus on Plastic Pollution

Plastic pollution, particularly in marine environments, has emerged as a key area of concern. The resolution highlights its damaging effects on marine biodiversity, human health, and the economies of coastal regions. It calls for international cooperation to build climate resilience, especially for communities that are most at risk.

Conclusion

This resolution represents a significant evolution in global environmental governance. By linking ocean protection to human rights, the UN Human Rights Council has broadened the foundation for future action on plastic pollution. It establishes a legal and moral obligation for nations to safeguard both ecosystems and human wellbeing.

Pashmina March and Ladakh's grazing lands

Context

The Ladakh administration imposed Section 144 in Leh, banning public rallies in anticipation of the 'Pashmina March' planned by environmental activist Sonam Wangchuk.

About the March

Wangchuk organized the march to draw attention to threats facing Ladakh's grazing lands, citing the dual pressures from Chinese territorial advances and domestic industrial encroachment. He framed the protest as a non-violent movement inspired by Mahatma Gandhi's Dandi March.

Changthang Plateau

This high-altitude region lies on the Tibetan Plateau, stretching into southeastern Ladakh. Located at around 14,846 feet above sea level, it features giant lakes and unique biodiversity. The Changpa people, a nomadic pastoralist community, inhabit the area and raise Changra goats whose wool yields GI-tagged Ladakh pashmina, a globally prized cashmere variety.

Relocation of Cheetahs Approved to Boost Genetic Diversity

The Cheetah Project Steering Committee has approved the translocation of cheetahs from Kuno National Park to Gandhi Sagar Wildlife Sanctuary to support population viability.

Project Cheetah Background

Started in 2022, the project involved the reintroduction of cheetahs from Namibia and South Africa. Out of the 26 cheetahs introduced, 17 remain in the wild at Kuno and 9 are in enclosures. The aim is to create a metapopulation across a large landscape for genetic exchange and species revival.

About Gandhi Sagar Sanctuary

Located along the Chambal River in Madhya Pradesh, the sanctuary lies within the Khathiar-Gir Dry Deciduous Forests.

The area features historical rock shelters and serves as a suitable habitat for cheetahs due to its topography and prey base.

“Blue Category” Classification For Industries

In News

The Central Pollution Control Board (CPCB) has added a new “Blue Category” in its classification system to recognize environmentally essential industries.

About the Classification

The Blue Category covers sectors like waste-to-energy plants and compressed biogas facilities that have high Pollution Index scores but play key roles in environmental management.

Benefits

Industries in this category will enjoy extended Consent to Operate (CTO) validity—two additional years—as a regulatory incentive.

Pollution Index Classification

- Red: $PI \geq 60$
- Orange: $PI 41-59$
- Green: $PI 21-40$
- White: $PI \leq 20$
- Blue: Essential services with positive environmental externalities

CPCB Overview

CPCB is a statutory body under the Ministry of Environment, Forest and Climate Change. It enforces the Air and Environment Protection Acts and advises on pollution control policies.

Centre for Research on Energy and Clean Air (CREA) Report on Air Pollution

Context

CREA’s recent analysis evaluated the performance of Indian cities under the National Clean Air Programme (NCAP).

Key Findings

- Delhi recorded the highest annual average PM10 level at $206 \mu\text{g}/\text{m}^3$ in FY 2024-25, over three times the national limit.
- Byrnihat and Patna followed in pollution rankings.
- 21 cities, mostly in Uttar Pradesh, showed over 40% improvement.

- Bareilly saw the highest improvement with a 78% drop in PM10 levels.
- Jalgaon recorded the highest increase at 57%.

Challenges

Despite improvements, 91 out of 102 NCAP cities still exceed the national PM10 standard, with limited time left to meet 2025-26 targets.

Nilgiri Tahr Census to be Conducted

Context

Kerala and Tamil Nadu will jointly conduct a Nilgiri Tahr census on the 50th anniversary of Eravikulam National Park.

About Nilgiri Tahr

- Endangered mountain goat endemic to the Western Ghats.
- State animal of Tamil Nadu.
- Found in high-altitude grasslands in Kerala and Tamil Nadu.

Legal and Conservation Status

- Listed as Endangered on the IUCN Red List.
- Protected under Schedule I of the Wildlife (Protection) Act, 1972.

Eravikulam National Park

- First National Park of Kerala (established in 1978).
- Known as the land of Neelakurinji flowers that bloom once every 12 years.

Ozone Pollution

Context

A study by IIT Kharagpur highlights how ozone pollution affects crop yields in India.

What is Ozone Pollution?

- Tropospheric ozone forms from a reaction between nitrogen oxides (NO_x) and volatile organic compounds (VOCs) under sunlight.
- Acts as a greenhouse gas and air pollutant.

Impact on Agriculture

- Reduces photosynthesis by entering through plant stomata.
- Leads to oxidative stress and crop damage.

Findings

- Wheat yields may decline by 20%.
- Rice and maize could drop by 7%.
- Indo-Gangetic Plain and central India experience ozone levels up to six times above safe limits.

Relevance

Ozone pollution hampers progress towards the UN Sustainable Development Goals on poverty and hunger.

India and Denmark Deepen Cooperation Under Green Strategic Partnership

Context

India and Denmark reaffirmed their commitment to strengthen ties through their Green Strategic Partnership during discussions between Prime Minister Modi and Prime Minister Mette Frederiksen.

Evolution of Bilateral Relations

Diplomatic relations between both countries were established in 1949. The Green Strategic Partnership was formalised in 2020, focusing on climate, energy, and sustainable development.

Institutional Mechanisms and Trade

- Bilateral forums like the Joint Commission Meeting and Foreign Office Consultations promote regular engagement.
- In 2023, bilateral trade reached USD 5.3 billion, though this marked a decline from 2022. India exports textiles, vehicles, and leather goods; Denmark exports machinery, pharmaceuticals, and chemicals.

Both countries reviewed progress on the Green Strategic Partnership, with Denmark increasing Investments in India's green transition. They also exchanged views on global issues and multilateral cooperation.

Sea Lions and Algal Bloom

Context

An algal bloom off the California coast has led to aggressive behavior in sea lions due to neurotoxin exposure.

About Sea Lions

Sea lions are marine mammals known for their bark-like vocalizations, social behavior, and agility on land due to their rotating hind flippers. They form large social groups called herds or rafts.

Reason for Aggression

The recent aggression is linked to domoic acid, a neurotoxin produced by the algae *Pseudo-nitzschia*. The toxin affects brain function, causing confusion, muscle spasms, and erratic behavior in sea lions.

Causes of Bloom

The bloom is intensified by:

- **Upwelling:** Nutrient-rich waters brought to the surface by wind.
- **Climate Change:** Warmer seas aid algal growth.
- **Pollution:** Agricultural runoff increases nutrient levels in oceans.

Financing for Sustainable Development Report 2024

Context:

The UN released the 2024 edition of the 'Financing for Sustainable Development Report,' warning of a deepening crisis that threatens SDG achievement by 2030.

Key Highlights:

- A massive financing gap of USD 4.2 trillion annually (up from USD 2.5 trillion pre-COVID).
- 600 million people may remain in extreme poverty post-2030.
- Developing nations face debt distress and high borrowing costs.
- Global growth slowdown and weak policy incentives are worsening the situation.

Suggestions:

- Close financing, policy, and trust gaps.
- Urgent public-private investment push.
- Reform outdated 1944 Bretton Woods structures.
- Strengthen multilateral development banks and social safety nets.

Conclusion:

The report stresses urgent action to reset global financial systems and rescue the SDGs.

Malabar Grey Hornbill (*Ocyeros griseus*)

Context

Researchers in Kerala won the Future Conservationist Award for a conservation project focused on the Malabar Grey Hornbill.

About

This hornbill species is endemic to the Western Ghats. It is distinguished by its grey body and lack of a casque. It is a frugivore and plays a key role in seed dispersal. It is listed as Vulnerable in the IUCN Red List and protected under Schedule I of the Wildlife Protection Act, 1972. It inhabits evergreen forests and plantations in states like Kerala, Tamil Nadu, and Karnataka.

Self-Bred Coral Reef

A significant milestone in coral conservation was achieved when self-bred corals were successfully placed into Europe's largest artificial reef at Burgers' Zoo in the Netherlands.

Key Points:

- Part of the World Coral Conservatory project to conserve coral biodiversity.
- Corals are invertebrate marine animals that secrete calcium carbonate skeletons.
- They live in colonies and form massive reef structures.
- Coral reefs support about 25% of marine life and over a billion people globally.
- They are sensitive to climate change, ocean acidification, and pollution.

UNDP's Climate Promise

The UNDP launched the Climate Promise 2025, reaffirming its commitment to supporting countries in climate action through national pledges.

Key Points:

- Helps countries prepare and implement their Nationally Determined Contributions (NDCs).
- Focuses on reducing emissions, building climate resilience, and sustainable development.
- It is the world's largest global support for climate pledges under the Paris Agreement.
- Supports over 120 countries with technical assistance in five key areas.
- Aims for net-zero emissions and alignment with the 1.5°C global warming target.

INTERNAL SECURITY

Cyber Slavery and India's Response

Context

India's Ministry of External Affairs (MEA) recently rescued several Indian nationals from Cambodia. They had been victims of a growing global crime known as cyber slavery.

What is Cyber Slavery?

Cyber slavery refers to the exploitation of individuals through digital platforms. Victims are often coerced or tricked into working against their will, typically under the control of organized criminal networks. They are forced to carry out online scams, data fraud, or tech-based criminal work for the benefit of these syndicates.

Nature of the Crime

This form of slavery is a modern variant of human trafficking, with a technological twist. Victims may be promised jobs abroad and then trapped, having their passports taken and being forced into illegal online activities. This includes love scams, crypto fraud, extortion schemes, and more, often targeting people in other countries.

India's Intervention

The Ministry of External Affairs acted after receiving alerts about Indians stuck in Cambodia, working under duress. It coordinated with the Indian Embassy and Cambodian authorities to facilitate rescue and repatriation.

Why It Matters

Cyber slavery is an emerging global concern, involving human rights abuse and cross-border cybercrime. India's proactive measures show the need for diplomatic vigilance and stronger legal safeguards for citizens working abroad.

Way Forward

- Strengthen bilateral agreements with countries prone to such crimes
- Increase awareness campaigns for job-seekers going abroad
- Enhance monitoring of online job rackets and recruitment agencies

Operation Chakra V of CBI

Context

Under Operation Chakra V, the CBI arrested four people in connection with cyber fraud involving fake “digital arrests.”

About Operation Chakra

Launched in 2022 by the CBI with INTERPOL support, it targets global cybercrime networks involved in impersonation, phishing, and financial scams. The criminals exploit cross-border vulnerabilities to deceive victims.

Digital Arrest Scam

Fraudsters impersonate law enforcement and accuse individuals of crimes like money laundering or tax evasion to extort money. Operation Chakra aims to coordinate international policing to prevent such scams.

Vibrant Villages Programme-II (VVP-II)

Context

The Union Cabinet has approved the second phase of the Vibrant Villages Programme to accelerate development in strategically important border villages and enhance national security.

About the Scheme

Vibrant Villages Programme-II is a Central Sector Scheme, fully funded by the Union Government.

- Timeline: Till financial year 2028–29
- Focus: Holistic development of select border villages located in strategically sensitive areas

States and Union Territories Covered

The scheme will be implemented in border villages located in: Arunachal Pradesh, Assam, Bihar, Gujarat, Jammu & Kashmir, Ladakh, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tripura, Uttarakhand, Uttar Pradesh, and West Bengal.

Objectives

- Improve living standards and livelihood opportunities in border areas
- Promote secure, prosperous, and resilient border zones
- Strengthen integration of border communities with the rest of the country
- Encourage local residents to act as support systems for border guarding forces by serving as the "eyes and ears" of the state

Key Features of VVP-II

- Infrastructure development at the individual village or cluster level

- Support for local value chains through cooperatives and self-help groups
- Promotion of border-specific outreach programmes
- Establishment of SMART classes to improve educational access
- Tourism development focusing on local culture and nature-based circuits
- Initiatives to ensure sustainable and diverse livelihood opportunities

Significance

Together with Phase-I, VVP-II represents a long-term strategy to strengthen border security through inclusive rural development. It seeks to counter outmigration from remote border regions, reduce vulnerability to cross-border threats, and promote the active participation of locals in national security efforts.

Abusive practices in Shrimp Production in India

Context

India has dismissed allegations made by a U.S.-based human rights group regarding abusive practices in shrimp hatcheries.

About the Industry

India is one of the top global exporters of shrimp, with exports valued at \$5.6 billion out of a total seafood export value of \$8.09 billion in 2022-23. The U.S. is the largest market for Indian shrimp, accounting for 40% of exports.

- Andhra Pradesh is the largest producer, with nearly one lakh shrimp farms
- India leads the market ahead of major exporters like Thailand, Vietnam, China, and Ecuador
- Shrimp farming is a significant employment source and contributes to foreign exchange

Response to Allegations

India has reaffirmed its commitment to sustainable aquaculture practices and compliance with international standards of labor and environmental responsibility.

Online Gaming Under the PMLA

Context

The central government plans to designate online real-money gaming platforms as "reporting entities" under the Prevention of Money Laundering Act (PMLA), 2002.

About

As reporting entities, these gaming platforms will be required to report client and transaction data to the Financial Intelligence Unit-India. In 2023, a 28% GST was imposed on total deposits in real-money games.

Gaming Industry Highlights

India's gaming sector earned nearly \$2.7 billion in 2024. However, the sector is vulnerable to money laundering, tax evasion, and illegal betting due to the real-money component and lack of robust oversight.

IMPORTANT DAYS IN NEWS

Utkala Dibasa or Odisha Day celebrated

Context

Utkala Dibasa, also known as Odisha Day, was recently celebrated to commemorate the formation of the state of Odisha.

About the Day

- Celebrated every year on April 1 to mark the formation of Odisha as a separate province in 1936.
- Odisha was earlier part of the Bengal Presidency under British India.
- After prolonged public demand and mobilization, the state was carved out on linguistic lines.
- Sir John Hubbak became the first governor of the province.

Historical Background

- The region was known as Kalinga, which was invaded by Emperor Ashoka in 261 BCE.
- The last independent Hindu ruler was Mukunda Deb.
- The territory later fell under British rule and was divided administratively.
- In 2011, the state's official name was changed from Orissa to Odisha through the 113rd Constitutional Amendment.

World Health Day 2025

World Health Day is observed annually on 7 April to draw attention to pressing global health challenges and to encourage collective action toward improving public health outcomes.

The theme for this year is "Healthy Beginnings, Hopeful Futures."

Background

The first World Health Day was commemorated in 1950 following its conception at the inaugural World Health Assembly held in 1948 in Geneva, Switzerland. The day is led by the World Health Organization (WHO) and aims to unite global efforts to tackle health priorities through awareness and policy engagement.

World Homoeopathy Day

Context

India hosted the largest symposium on homoeopathy in Gandhinagar, Gujarat, on World Homoeopathy Day 2025.

Background

Observed on April 10 to mark the birth anniversary of Dr. Samuel Hahnemann, the founder of homoeopathy.

Homoeopathy: Overview

- Founded in Germany in the late 18th century.
- Based on the principle of "like cures like" (Similia Similibus Curentur).
- Uses minute doses of natural substances to stimulate the body's healing process.

Legal and Institutional Framework in India

- Governed by the National Commission for Homoeopathy Act, 2020.
- Recognized under the National Health Policy (2017) and regulated by the Ministry of AYUSH.

Key Institutions

- National Commission for Homoeopathy (NCH): Regulates homoeopathic education and practice.
- Central Council for Research in Homoeopathy (CCRH): Leads scientific validation and operates 35+ research centers.
- Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H): Maintains medicine quality standards.

Navkar Mahamantra Divas

Context

Prime Minister Narendra Modi inaugurated and participated in the Navkar Mahamantra Divas.

About

During the celebration, the Prime Minister proposed nine resolutions inspired by the Navkar Mantra. These resolutions are aimed at encouraging a balanced and value-based lifestyle. The nine resolutions include saving water, planting a tree in one's mother's name, promoting cleanliness, promoting local products, encouraging citizens to experience the country through 'Desh Darshan', adopting natural farming, maintaining a healthy lifestyle, doing yoga and sports, and helping the poor.

Vishwa Navkar Mahamantra Divas

This day is observed every year on April 9 to promote peace, non-violence, and spiritual harmony by chanting the Navkar Mantra collectively. This is the most important prayer in Jainism, offering reverence to five supreme spiritual beings: Arihants, Siddhas, Acharyas, Upadhyayas, and all Sadhus. The celebration involves large-scale chanting sessions both physically and virtually.

BR Ambedkar Jayanti

Context

India celebrated Ambedkar Jayanti on 14 April to honour the legacy of Dr. Bhimrao Ramji Ambedkar. He was a leader in the fight against caste discrimination and the principal architect of the Indian Constitution.

Early Life and Education

- Born on April 14, 1891, in Mhow, Madhya Pradesh, into a Mahar Dalit family.
- Studied at Bombay University, Columbia University, and the London School of Economics.
- His academic work included studies on Indian finance and monetary systems.

Role in Constitution Making

- Appointed Chairman of the Drafting Committee of the Constituent Assembly.

- Emphasised equality, liberty, fraternity, and the right to constitutional remedies (Article 32), which he called the "heart and soul" of the Constitution.
- Resigned in 1951 over disagreements on key policy issues including the Hindu Code Bill.

World Malaria Day 2025

World Malaria Day is observed annually on April 25. The 2025 theme is "Malaria ends with us: Reinvest, Reimagine, Reignite." It is an initiative of the World Health Organization to raise awareness and accelerate global efforts toward malaria elimination.

Malaria is a mosquito-borne disease caused by Plasmodium parasites. It spreads primarily through bites from infected female Anopheles mosquitoes. It can also spread via blood transfusions or shared needles.

Five types of Plasmodium parasites infect humans—*P. falciparum* (most deadly and common in Africa), *P. vivax* (dominant in Asia and Latin America), and others include *P. malariae*, *P. ovale*, and *P. knowlesi*.

Symptoms include fever, chills, fatigue, and headache. Timely diagnosis and treatment are critical to prevent complications and death. Efforts are ongoing to distribute mosquito nets, promote vector control, and develop vaccines.

DEFENCE EXERCISES

Multinational Air Exercise INIOCHOS-25 in Greece

Context

The Indian Air Force (IAF) took part in the multinational air exercise INIOCHOS-25, held in Greece from April 1 to April 11, 2025. The 12-day exercise was hosted by the Hellenic Air Force at Andravida Air Base in the Elis region.

About the Exercise

- INIOCHOS is a biennial multinational air combat exercise aimed at improving cooperation, tactical coordination, and interoperability among participating air forces. The 2025 edition saw participation from 15 countries, involving complex, real-time air and surface combat simulations to mirror modern warfare conditions.
- The Indian Air Force (IAF) participated in missions involving combined air operations, complex tactical scenarios, and multinational coordination. The exercise served as a platform to refine air combat tactics, train in joint operational planning, and exchange best practices with global air forces.

Significance

The exercise strengthened India's defence cooperation and diplomatic engagements in the Mediterranean region. It enhanced the IAF's combat readiness and exposure to multilateral joint operations. It also contributed to operational learning, interoperability, and shared defence capabilities among partner nations.

India-U.S. HADR Exercise Tiger Triumph 2025

Context

The fourth edition of the tri-service Humanitarian Assistance and Disaster Relief (HADR) exercise, *Tiger Triumph*, was conducted between India and the United States from 1st to 13th April 2025. It aimed to enhance operational coordination during disaster response missions.

Objective

The primary objective was to improve interoperability and develop Standard Operating Procedures (SOPs) for HADR operations. A Combined Coordination Centre (CCC) was established to facilitate joint planning, execution, and communication between both forces.

Key Activities

- During the *Harbour Phase* in Visakhapatnam, the two forces engaged in flag parades, expert exchanges, and joint training. The *Sea Phase* off Kakinada involved maritime, amphibious, and relief operations coordinated through a joint command centre. A joint medical camp was also set up by India's RAMT and the U.S. Navy medical team.
- The exercise reflected the shared humanitarian vision and strategic alignment of India and the U.S. in Indo-Pacific security and disaster response.

Exercise INDRA 2025

India and Russia successfully concluded the 14th edition of the INDRA naval exercise. This bilateral exercise enhances interoperability in maritime operations and reinforces joint commitment toward regional maritime security. The exercise, which began in 2003, included anti-submarine warfare, gunnery drills, and coordinated maritime patrols.

Exercise Africa India Key Maritime Engagement (AIKEYME)

Context

The first edition of the large-scale multilateral naval exercise Africa India Key Maritime Engagement (AIKEYME) is being held from 13 to 18 April 2025.

Africa India Key Maritime Engagement (AIKEYME)

AIKEYME, which means 'Unity' in Sanskrit, involves participation from India and Tanzania as co-hosts, along with naval forces from Comoros, Djibouti, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, and South Africa. It aligns with India's vision of Mutual and Holistic Advancement for Security and Growth Across Regions (MAHASAGAR).

Importance

The exercise aims to strengthen regional maritime security cooperation and improve interoperability among the participating navies. It addresses shared challenges such as piracy, maritime terrorism, illegal fishing, and disaster response. The initiative reflects India's expanding defence and diplomatic outreach to Africa.

AWARDS

Breakthrough Prize 2025

Context

The Breakthrough Prize 2025 honored scientists across Life Sciences, Mathematics, and Fundamental Physics.

About

Established in 2013 by tech pioneers including Mark Zuckerberg and Sergey Brin, the Breakthrough Prize is considered the “Oscars of Science”. Each award carries a prize of \$3 million.

Latest Winners

- **Fundamental Physics:** Awarded to 13,508 CERN physicists involved in Higgs boson research.
- **Life Sciences:** Recognized innovations in weight-loss drugs, multiple sclerosis treatment, and gene-editing.
- **Mathematics:** Dennis Gaitsgory was awarded for his work on the Langlands Program, a deep connection between number theory and geometry.

IMPORTANT PERSONALITIES

Chettur Sankaran Nair

Context

Prime Minister Narendra Modi paid tribute to Chettur Sankaran Nair for his principled stand against British atrocities during colonial rule, particularly after the Jallianwala Bagh massacre.

Life and Contributions

Chettur Sankaran Nair was a jurist, social reformer, and nationalist. In 1897, he became the youngest President of the Indian National Congress at its Amaravathi Session. By 1908, he was appointed as a permanent judge in the Madras High Court. He served as Education Minister and the only Indian member of the Viceroy’s Executive Council during the time of the Jallianwala Bagh massacre. He resigned in protest, demonstrating rare courage at the highest levels of British administration.

Confronting Colonial Injustice

- Nair accused Michael O’Dwyer of complicity in the massacre.
- O’Dwyer sued him for defamation in a British court in 1924.
- The trial lasted over five weeks, making it the longest civil case of the time.
- Though fined £500, Nair refused to apologise, exposing the racial bias in colonial justice systems and inspiring nationalist sentiment.

Demise of Former ISRO Chairman Dr. K. Kasturirangan

Context:

Dr. K. Kasturirangan, a pioneer of India’s space program and former ISRO chairman, passed away.

Contributions:

- Served as ISRO chairman (1994–2003).
- Led development of IRS and INSAT satellites.
- Oversaw progress of PSLV and GSLV launch vehicles.
- Headed key national committees like NEP drafting and Western Ghats ecology.
- Was a Rajya Sabha member and Planning Commission associate.
- Honored with Padma Shri, Padma Bhushan, and Padma Vibhushan.

PLACES IN THE NEWS

Gaza Strip

Context

Recent reports confirm that Israel has gained control of more than half of the Gaza Strip amid its renewed military campaign against Hamas.

About

The Gaza Strip is a narrow piece of land located on the eastern coast of the Mediterranean Sea, bordered by Israel on the north and east, and Egypt on the southwest. It spans approximately 365 square kilometers. Historically, the area has been a flashpoint for conflict, particularly between Israel and Hamas. Multiple wars, including those in 2008, 2012, 2014, and more recently in 2023–24, have devastated the region. Gaza suffers from severe humanitarian crises due to longstanding blockades, conflict-induced infrastructure damage, and limited access to basic necessities like water, electricity, and healthcare.

Romania

What is the context

A research centre in Romania has developed the world's most powerful laser.

About Romania

Romania is located in the geographic center of Europe. It is bordered by several countries and a sea, including:

- Ukraine to the north
- Moldova and the Black Sea to the east
- Bulgaria to the south
- Serbia to the southwest
- Hungary to the west

Geographical Features

- Romania has diverse and complex relief.
- Approximately 31% of the country is covered by mountains, 36% by hills and tablelands, and 33% by plains.
- The Plateau of Transylvania lies in the center, surrounded by the Carpathian mountain chains.

- The highest elevation is the Moldoveanu Peak.
- The Danube River flows through Romanian territory and forms part of its southern border.

Scientific Achievement

The development of the world's most powerful laser highlights Romania's growing role in global scientific and technological research, especially in the field of high-intensity physics.

Strategic Importance

Due to its location and EU membership, Romania plays a vital role in Europe's geopolitics and security frameworks. Its position on the Black Sea also gives it maritime strategic value.

Saudi Arabia

Context

The world's first 3D-printed mosque has been built in Saudi Arabia.

Geographical Location and Borders

Saudi Arabia is the largest country in the Arabian Peninsula and is situated in the southwest corner of Asia.

- West: Bordered by the Red Sea
- South: Shares borders with Yemen and Oman
- East: Bordered by the Arabian Gulf, United Arab Emirates (UAE), and Qatar
- North: Shares borders with Jordan, Iraq, and Kuwait

Riyadh is the capital city of Saudi Arabia.

Economic Profile

Saudi Arabia's economy is dominated by petroleum and its related industries. It is one of the world's largest oil producers and exporters. The country is pursuing diversification under the Vision 2030 initiative, which includes investments in non-oil sectors, tourism, infrastructure, and technology.

Cultural and Religious Significance

Saudi Arabia is the birthplace of Islam and home to the two holiest cities in Islam—Mecca and Medina. Every year, millions of Muslims visit the country for Hajj and Umrah pilgrimages.

Technological Development

The construction of the world's first 3D-printed mosque reflects Saudi Arabia's push towards technological innovation in construction and its broader strategy of modernization.

Germany Legalised Recreational Cannabis

Context

Germany has formally legalised the recreational use of cannabis, becoming one of the few European countries to do so.

About Cannabis

Cannabis includes the dried flowers, leaves, stems, and seeds of the Cannabis sativa and Cannabis indica plants. Its psychoactive effects are primarily due to the chemical compound tetrahydrocannabinol (THC), a cannabinoid. Cannabis is commonly referred to as marijuana, especially in North and South American contexts.

Cultivation and Usage

Cannabis is cultivated in various regions worldwide, including the United States, Mexico, Canada, South America, the Caribbean, and parts of Asia. Beyond its recreational use, cannabis is also utilized for medicinal purposes in several jurisdictions, where it is prescribed to manage pain, nausea, and certain neurological disorders.

Post Offices in Antarctica

Context

The Bharati Branch Post Office was recently inaugurated at India's Bharati Station in Antarctica by the Chief Postmaster General of the Maharashtra Circle, marking a notable milestone with the introduction of a new PIN code: MH-1718.

Historical Background

India established its first Antarctic post office at Dakshin Gangotri in 1984, shortly after the country's inaugural Antarctic expedition. However, this station was later decommissioned after being submerged by ice in the late 1980s. In 1990, another post office was opened at Maitri station, India's second research base in Antarctica.

Current Indian Post Offices in Antarctica

India currently operates two Antarctic post offices—Maitri and Bharati—separated by roughly 3,000 km. Both fall under the jurisdiction of the Goa Postal Division. Letters destined for Antarctica are routed through the National Centre for Polar and Ocean Research (NCPOR) in Goa.

India's Engagement with Antarctica

India's involvement in Antarctica dates back to 1981 with the launch of the Indian Antarctic Programme under the Ministry of Earth Sciences. The country's research presence began with Dakshin Gangotri (1983), followed by Maitri (1989), and Bharati (2012). India is also a signatory to the Antarctic Treaty, which governs international cooperation on the continent.

Indian Antarctic Bill 2022

The bill aims to provide a domestic legal framework for India's activities in Antarctica. It seeks to establish the Indian Antarctic Authority under the Ministry of Earth Sciences to regulate scientific, environmental, and logistic operations, ensuring compliance with global environmental standards.

Heard and McDonald Islands

Context

As part of the U.S. “Liberation Day Tariffs” policy under former President Donald Trump, a baseline 10% tariff was imposed on all trade partners, including the remote and uninhabited Heard and McDonald Islands.

About the Islands

Heard and McDonald Islands are Australian external territories located in the sub-Antarctic Indian Ocean, about 1,700 km from Antarctica and 4,100 km southwest of mainland Australia.

Volcanic Activity

These islands are home to the only active sub-Antarctic volcanoes, including Big Ben on Heard Island and a volcano on McDonald Island. The region is geologically significant due to continuous volcanic activity and glacial interactions.

Geological Importance

The islands are considered valuable for research in:

- Plate tectonics and ocean basin formation
- Climate change through the study of glaciers
- Volcanic and geomorphological processes in isolated ecosystems

Unique Ecosystem

The islands are free from introduced species, making them one of the few pristine natural ecosystems left on Earth. They support large populations of seals, penguins, petrels, albatrosses, and other marine wildlife.

Wildlife Highlights

- Home to the Heard Island cormorant and endemic subspecies of sheathbill
- Important breeding ground for several species of seabirds and marine mammals

Protection and Recognition

- Listed as a UNESCO World Heritage Site
- Protected under Australia’s Environment Protection and Biodiversity Conservation Act, 1999
- Any unauthorized activity is subject to strict legal penalties

Significance

Despite being uninhabited, the islands are critical for global ecological and scientific research, and they serve as benchmarks for environmental monitoring and climate impact studies.

Democratic Republic of the Congo (DRC)

Context

The United Nations has condemned the large-scale sexual violence and rape of children in the eastern region of the Democratic Republic of the Congo during early 2025.

About

The Democratic Republic of the Congo is located in Central Africa and is the second-largest country in the

continent by area. Its capital is Kinshasa, situated on the Congo River, which is among Africa's most populated urban centers. It shares borders with Angola, Burundi, the Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia. The country is rich in resources, including copper, cobalt, hydroelectric potential, fertile land, diverse wildlife, and the world's second-largest rainforest.

Miscellaneous

Panama Canal

Context

Panama has reaffirmed its sovereignty over the Panama Canal, despite strong rhetoric from the United States, and both nations have signed new agreements for enhanced military training cooperation.

About

The Panama Canal is an artificial waterway linking the Atlantic Ocean to the Pacific Ocean. It is vital to international maritime trade, accounting for nearly 6% of global sea trade.

History

Constructed by the United States and opened in 1914, the canal was under U.S. control until December 31, 1999. The handover to Panama took place under the Torrijos-Carter Treaties. The U.S. retains the right to ensure canal neutrality and emergency access for military needs.

Asian Development Outlook (ADO), 2024

Context:

The Asian Development Bank (ADB) released the Asian Development Outlook 2024, offering economic projections and regional analysis.

Key Global and Regional Findings:

- Asia's GDP grew by 5.0% in 2023; projected to grow by 4.9% in both 2024 and 2025.
- Tourism rebounded to 73% of pre-pandemic levels.
- Inflation is expected to ease to 3.2% in 2024 and 3.0% in 2025.

Risks Identified:

- Geopolitical tensions, conflicts in the Middle East, extreme weather.
- Volatility in U.S. interest rates and China's property sector instability.

India-Specific Highlights:

- ADB revised India's GDP forecast to 7% for FY 2023-24.
- Persistent food inflation to ease to 5.7%.
- Growth driven by investment demand and rural consumption recovery.
- FDI inflows subdued in short-term, expected to improve post-2025.

Trade Strategy for India:

- Aim to reach \$2 trillion exports by 2030.
- Focus on integration into global value chains (GVCs).
- Promote FDI, improve logistics and tariff structures.

About ADB:

- Established: 1966 | Headquarters: Manila, Philippines
- Members: 68
- Focus: Inclusive growth, sustainability, and regional integration

Sustainable Hydrogel to Remove Microplastics

Context:

IISc researchers have developed a novel hydrogel to remove and degrade microplastics in water.

About the Innovation:

- Composed of chitosan, polyvinyl alcohol, and polyaniline forming a three-layer polymer network.
- Embedded with Cu-substituted polyoxometalate (Cu-POM) nanoclusters.
- Uses UV light to degrade contaminants.

Effectiveness:

- Removed ~95% of two different microplastic types at pH 6.5.
- Environmentally safe, efficient, and affordable.

What are Microplastics?

- Tiny plastic particles (<5 mm).
- Found in oceans, soil, food, and even drinking water.
- Pose threats to marine life and human health.

Significance:

- Offers scalable and sustainable technology for water purification.
- Supports India's commitment to clean water and circular economy.

Alfalfa Hay

Context

The delay in India's approval for the import of genetically modified (GM) alfalfa hay from the United States has become a major point of contention in ongoing Indo-US trade negotiations.

Current Status

Although India's Genetic Engineering Appraisal Committee (GEAC) has cleared the import, final approval from the Ministry of Agriculture is still awaited.

About Alfalfa Hay

- Known as the 'Queen of Forages', alfalfa is a highly nutritious crop rich in protein, calcium, and essential vitamins.
- It is extensively used in livestock feed, especially for dairy cattle and horses.
- Alfalfa is a perennial legume that enhances soil fertility through nitrogen fixation, reducing the need for synthetic fertilizers.
- Its deep root system makes it drought-resistant and helps extract nutrients from deeper layers of soil.

Environmental Relevance

The crop improves soil health and contributes to sustainable farming practices.

However, concerns regarding genetically modified variants include biodiversity impact and food safety.

Other Food Safety Issues in Indo-US Trade Talks

- **Ready-to-Drink (RTD) Alcoholic Beverages:** India is considering increasing the permissible alcohol content for RTD beverages from 8% to 10–15%, as requested by the United States Trade Representative (USTR).
- **Whiskey Import Standards:** The US has demanded clear protections for products like Bourbon and Tennessee Whiskey. While India's FSSAI allows their import, further regulatory clarification is under discussion.

Conclusion

The approval of GM alfalfa hay has broader implications for India's trade policy, agricultural sustainability, and food safety regulations. Balancing trade interests and public health concerns remains a critical challenge.

High Temperatures and Mango Production

- India faced record temperatures in 2024. The year was the hottest since 1901. This heat has affected mango yields. High temperatures cause early ripening and fruit drop. It also leads to disorders like spongy tissue in Alphonso mangoes.
- India remains the world's largest mango producer. Uttar Pradesh is the top state, followed by Andhra Pradesh and Bihar. In 2024–25, productivity is estimated at 9.4 MT/Ha. This is higher than China and Thailand.
- Mangoes grow best in temperatures between 24–30°C. They can tolerate up to 48°C for short periods. Rainfall around 890–1,015 mm is ideal. The soil should be deep, loamy, and well-drained, with pH 5.5–7.5.

First Aquaculture Insurance Scheme

- The first aquaculture insurance scheme has been launched in India. It is under the PM Matsya Kisan Samridhi Sah-Yojana. This is a sub-scheme of the PM Matsya Sampada Yojana. It offers financial protection to small fish farmers.

- There are two types of coverage. Basic insurance covers natural calamities. Comprehensive insurance also covers diseases. Each policy covers one crop cycle. It supports risk mitigation in the fisheries sector.
- The government also launched the 5th Marine Fisheries Census. It uses a mobile app for real-time data. The census covers 1.2 million households across 3,500 villages. ₹255 crore worth of projects have been announced for seven coastal states and UTs.

ASEAN Future Forum

The ASEAN Future Forum was held to foster dialogue on building a more people-centered and fast-growing ASEAN community.

Key Points:

- Hosted by Vietnam with participation from ASEAN Secretary-General and member nations.
- Discussed regional cooperation, inclusive growth, and sustainable development.
- Included voices from governments, business, academia, and civil society.
- Emphasized long-term vision for ASEAN's future amid global uncertainty.
- ASEAN was founded in 1967 and now has 10 member states.

National Zero Measles-Rubella Elimination Campaign 2025–26

Context:

The Union Minister of Health and Family Welfare launched the National Zero Measles-Rubella Elimination campaign 2025–26, aiming to eliminate both diseases across India.

About Measles:

- Measles is a highly contagious viral disease, mainly affecting children.
- Spread through droplets from the nose, mouth, or throat of infected individuals.
- Symptoms appear after 10–12 days: high fever, runny nose, red eyes, and white spots in the mouth.

About Rubella:

- Also known as German measles, it is a mild illness but dangerous during pregnancy.
- Symptoms: low-grade fever, rash on face, and sore throat.
- Can cause severe birth defects if contracted during early pregnancy.

Indian Scenario:

- India aims for 95%+ vaccination coverage with two MR vaccine doses in every district.
- In 2024, measles cases declined by 73% and rubella by 17% compared to 2023.

- The U-WIN digital platform has been launched for registration, appointment, and vaccination certification.

Viksit Vibrant Villages Program

Context:

Registration began for the Viksit Vibrant Villages Program through the MY Bharat Portal to empower remote border villages.

Overview:

- Implemented in Leh-Ladakh, Himachal Pradesh, and Uttarakhand from 15–30 May 2025.
- Jointly conducted by the Ministry of Youth Affairs and Sports and the Ministry of Home Affairs, with ITBP support.

Key Features:

- 500 MY Bharat youth volunteers will be mobilized to work in 100 border villages.
- Activities include cultural promotion, education, skill-building, health awareness, and environmental practices.
- Aims to reframe border villages as 'first villages' in India's Viksit Bharat vision by 2047.

Line of Control (LoC)

Context:

Fresh small arms firing was reported along the LoC in Jammu and Kashmir, including Kupwara.

About LoC:

- Demarcates India's J&K and Ladakh from Pakistan-Occupied Kashmir.
- Evolved from the 1949 Ceasefire Line after the first India-Pakistan war.
- Became formalized as the LoC after the 1972 Simla Agreement.
- Not an international boundary but a de facto military control line.

India's First Wolf Sanctuary – Mahuadanr

Context:

A study examined tribal knowledge and wolf denning in Mahuadanr Wolf Sanctuary, Jharkhand.

About the Sanctuary:

- Established in 1976 within Palamau Tiger Reserve.
- India's only designated wolf sanctuary for the Indian grey wolf.
- Located in grassland and forest regions of Jharkhand.

Species Profile – Grey Wolf:

- Found across Eurasia and North America; Indian subspecies lives in arid zones.
- Indian wolf listed in Schedule I of Wildlife Protection Act, 1972.
- IUCN status: Least Concern globally, but protected in India.
- CITES Appendix I (Indian populations), Appendix II (others).

Musk Deer

Context:

India currently lacks even foundational breeding stock for the endangered musk deer.

About the Species:

- Nocturnal, solitary, high-altitude herbivores.
- Found in Himalayan states like J&K, Uttarakhand, Sikkim, and Arunachal Pradesh.
- Kashmir musk deer is India's primary species; also state animal of Uttarakhand.

Threats & Conservation:

- Threatened by poaching for musk glands used in perfumes and medicine.
- Endangered status under IUCN.
- Protected under Schedule I of the Wildlife Protection Act.

KG Suresh Appointed Director of India Habitat Centre (IHC)

Context:

Prof. KG Suresh appointed Director of IHC, a premier institution for habitat-related policy and research.

About IHC:

- Established in 1993 to foster interdisciplinary engagement in habitat and environment.
- Designed by architect Joseph Allen Stein.
- Objectives include awareness on pollution, sustainable design, training, and national-international collaboration.

National Zero Measles-Rubella Elimination Campaign 2025-26

The Ministry of Health and Family Welfare has launched the National Zero Measles-Rubella Elimination Campaign 2025-26. The campaign aims to eliminate two major viral diseases—measles and rubella—by ensuring widespread immunization.

Measles is a highly contagious disease that mostly affects children. It spreads through droplets from the nose or mouth of infected persons. The symptoms include high fever, runny nose, red eyes, and white spots inside the mouth, appearing 10-12 days after infection.

Rubella, or German measles, is a mild viral illness, but it becomes dangerous during pregnancy. Its symptoms include low-grade fever, rash starting on the face, and sore throat.

India is targeting over 95% vaccination coverage in every district using two doses of the Measles-Rubella (MR) vaccine. In 2024, the country witnessed a 73% decline in measles cases and a 17% decline in rubella cases compared to 2023. The U-WIN digital platform has been introduced to facilitate online registration, appointments, and digital vaccination certificates.

India's First Wolf Sanctuary – Mahuadanr

The Mahuadanr Wolf Sanctuary in Jharkhand was established in 1976 inside the Palamau Tiger Reserve to protect the endangered Indian gray wolf. It is the only dedicated wolf sanctuary in India and features grasslands, forests, and hills that support a wide range of wildlife.

The Indian gray wolf is a subspecies found in semi-arid and scrub regions across India, including Odisha, Bihar, and West Bengal. It is listed under Schedule I of the Wildlife Protection Act and CITES Appendix I for South Asian populations. Its global status under the IUCN is "Least Concern," but it faces local threats due to habitat loss and conflict.

Musk Deer Conservation Challenges

India initiated musk deer breeding programs in 1965, but currently lacks a viable founder stock. Musk deer are nocturnal, solitary animals found in the Himalayan region, especially in J&K, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.

The Kashmir musk deer is the most common species in India. Males have a gland that produces musk used in perfumes and traditional medicine, making them targets for poaching. The species is listed as 'Endangered' by the IUCN and enjoys the highest protection under India's Wildlife Protection Act.

KG Suresh Appointed Director of India Habitat Centre

Professor KG Suresh has been appointed the new Director of the India Habitat Centre (IHC). The IHC was established in 1993 to serve as a hub for environment, habitat, and urban planning-related research and policy development.

Designed by architect Joseph Allen Stein, the IHC promotes education, documentation, and public awareness related to sustainable habitat and environmental practices. It also supports national and international collaborations on issues like pollution control, water and waste management, and energy conservation.

Vaikom Satyagraha (1924)

- The centenary of the Vaikom Satyagraha was commemorated in 2024. This significant event in the Indian social reform movement was a non-violent protest against untouchability and caste-based restrictions in the princely state of Travancore (present-day Kerala).
- The protest began in the town of Vaikom where Dalits and other lower-caste individuals were prohibited from walking on roads around the Vaikom Shiva Temple. The movement was led by T.K. Madhavan, K. Kelappan, and supported by leaders such as Periyar E.V. Ramasamy. Mahatma Gandhi also endorsed the protest, though he did not participate initially.
- Satyagrahis engaged in peaceful demonstrations demanding equal access to public roads for all castes. Despite initial resistance and arrests, the movement succeeded in securing the right for Dalits to walk on roads near the temple. This marked a milestone in the struggle against untouchability and laid the foundation for later social justice movements across India.

ASI Documents Rock, Temple Inscriptions in Pudukkottai

Context

The Archaeological Survey of India's Epigraphy Division has recorded inscriptions from Malayadipatti and Ponnamaravathi using the estampage method.

Malayadipatti

- Near Kudambeeswarar Temple.
- 16th-century inscription documenting land division between Sundara Chozhapuram and Sevvalur for pond excavation.
- Another inscription near a spring mentions King Raja Rajan Sundarapandyan and Udaiyan Perumal's role in waterbody creation.

Ponnamaravathi

- 8th regnal year of Maravarman Kulasekara Pandiyan.
- Mentions Chozheeswarar Udaiya Nayanar Temple in Uzhavalai Nadu.
- Records a donation of 40 panam for lighting five lamps.
- Older inscriptions date back to the 6th regnal year of Raja Raja III.

Importance

The inscriptions highlight historical practices in regional governance, temple patronage, and community-based water management in Tamil Nadu.

SAARC Visa Exemption Scheme (SVES)

- Recently, India announced that nationals from Pakistan would not be allowed to travel under the SAARC Visa Exemption Scheme (SVES), which was launched in 1992.
- The SVES allows certain categories of dignitaries and officials from SAARC countries to travel without visas within the region using special SAARC visa stickers. These stickers, issued by the member states, are usually valid for a year and exempt holders from police reporting or form-filling procedures upon entry into another SAARC country.
- The move by India comes amid strained bilateral relations with Pakistan, affecting regional cooperation under the SAARC framework.
- SAARC was established in 1985 with eight member countries: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

Supreme Court to Examine Concerns on POCSO Clause

The Supreme Court of India is set to evaluate whether Section 19 of the POCSO Act unintentionally criminalizes consensual sexual activities among adolescents and threatens young girls' access to healthcare.

The Protection of Children from Sexual Offences (POCSO) Act, 2012, protects individuals under 18 from sexual offences. It mandates the reporting of any sexual activity involving minors, regardless of consent, under Section 19.

The Act was amended in 2019 to introduce stricter punishments, including the death penalty for aggravated offences. Under POCSO Rules 2020, Rule 9 allows Special Courts to provide interim compensation to victims for relief or rehabilitation.

The current concern revolves around whether the legal framework respects adolescents' privacy, bodily autonomy, and access to safe healthcare in cases of consensual relationships.

Tax Collected at Source (TCS) on Luxury Goods

The government has imposed a 1% TCS on luxury goods priced above ₹10 lakh, such as handbags, sportswear, and watches. TCS is a tax collected by the seller at the time of sale and is governed under Section 206C of the Income Tax Act, 1961.

TCS is not an additional tax but is adjusted against the buyer's final tax liability when they file their income tax return. If the TCS exceeds liability, a refund can be claimed.

As per Budget 2025 provisions, TCS on general goods sales is being phased out, but it remains applicable for foreign remittances. The threshold for foreign remittances attracting TCS has been increased from ₹7 lakh to ₹10 lakh.

The aim is to improve tax transparency and widen the tax base, particularly by monitoring high-value transactions.

Call for Ban on Chlorpyrifos Pesticide

Health experts in India have called for an urgent ban on chlorpyrifos, a pesticide known to cause brain damage, especially in children. Despite its toxicity, it is still used on various crops in India and poses risks to farmers, ecosystems, and consumers.

Chlorpyrifos is classified by WHO as a 'moderately hazardous' pesticide and has been banned in more than 40 countries. The upcoming BRS COP 2025 in Geneva under the Stockholm Convention may consider further regulation.

The Stockholm Convention seeks to eliminate persistent organic pollutants, while the Rotterdam Convention promotes prior informed consent for trade in hazardous chemicals. India ratified both treaties in 2006, and they are legally binding.

Palmyra - Ancient City in Syria

- Palmyra, a UNESCO World Heritage site, lies in central Syria and has been a center of cultural and trade activity since Neolithic times. Its strategic location on the Silk Road made it a crucial link between Rome and Asia.
- Integrated into the Roman Empire in the 1st century AD, Palmyra became known for its architectural marvels and Greco-Roman influences. However, it suffered extensive damage during the Syrian civil war starting in 2011.
- The city's monuments, including temples, colonnades, and tombs, were destroyed during armed conflicts. Restoration and archaeological preservation efforts are ongoing to reclaim its cultural heritage.

Davis Strait

Context

A hidden landmass has been discovered beneath the icy waters of the Davis Strait.

About

- Scientists from the UK and Sweden discovered the Davis Strait proto-microcontinent.
- It is an ancient fragment of continental crust that measures around 12 to 15 miles (19–24 km).
- This microcontinent lies submerged under western Greenland's offshore waters and is believed to have never fully separated during the breakup of Greenland and North America.

Davis Strait

- Davis Strait separates Canada's Baffin Island from Greenland.
- It connects the Labrador Sea (Atlantic Ocean) in the south with Baffin Bay to the north.
- Straits are narrow water passages connecting two larger water bodies, often formed through tectonic shifts.

5 Years of SVAMITVA Scheme

Context

SVAMITVA Scheme completed 5 years since its launch in 2020.

About the Scheme

- Launched on April 24, 2020, on National Panchayati Raj Day.
- It is a Central Sector Scheme under the Ministry of Panchayati Raj.
- It uses drone technology to map village areas and provide legal ownership of property.
- Implemented by the Survey of India, with NICS I as the technology partner.

Poshan Tracker Application

Context

The PoshanTracker Application won the PM's Award for Excellence in Public Administration 2024 under the Innovation category.

About

- A mobile-based platform for real-time monitoring of nutrition delivery by Anganwadi Workers (AWWs).
- Captures beneficiary data and service delivery information across all Anganwadi Centres (AWCs).
- Aims to ensure targeted policy-making and better implementation of ICDS services.

Nano-sulphur for Mustard Yield

Context

TERI developed nano-sulphur that boosts mustard yield by 30-40%.

Significance

- A green bio-product using plant-promoting bacteria.
- Reduces dependence on traditional sulphur fertilizers by up to 50%.
- Increases farmer income by ₹12,000 per acre.
- Cost-effective: ₹450 for 500 ml of nano-sulphur vs ₹900–1,800 for traditional forms.

Sulphur Role

- Essential for protein formation and oil content in crops like mustard.
- Enhances quality and flavor in several crops like onions and garlic.

Galaxy NGC 1052-DF2

Context

Astronomers at the Indian Institute of Astrophysics found the galaxy NGC 1052-DF2 lacks significant dark matter.

About

- It is an ultra-diffuse galaxy with very few stars and about 1/400th of expected dark matter.
- Its total mass is around 340 million solar masses.
- New models suggest that traditional "cuspy" dark matter halo models do not explain its mass distribution.

Schemes for Sportspersons in India

Context

The Government of India has increased investments and support for athletes across their career span.

Key Schemes

- **Khelo India Programme (2016–17):** Grassroots development and national sports culture.
- **RESET (2024):** For athlete re-skilling and post-retirement support.
- **National Welfare Fund:** One-time grants, pension, and medical aid.
- **NSDF:** Bridges infrastructure and support gaps via public-private funding.
- **ANSF:** Financial aid to federations for international training/events.
- **Scheme for Disabled Athletes:** Inclusive support at grassroots level.
- **Pension Scheme:** Lifelong financial support for meritorious sportspersons.
- **National Sports Awards:** Recognizes and motivates sporting excellence.

Arsenic Pollution

Context

A new study in *The Lancet Planetary Health* links climate change to rising arsenic levels in rice, increasing health risks in Asia by 2050.

What is Arsenic?

Arsenic is a naturally occurring trace element, usually found with sulfur and metals in various minerals. Its inorganic form is highly toxic.

Health Effects

- Long-term exposure can cause cancer, cardiovascular disease, skin lesions, and diabetes.
- Exposure during pregnancy and childhood affects cognitive development.
- In Taiwan, arsenic causes “Blackfoot disease,” leading to gangrene due to blood vessel damage.

Permissible Limits

- WHO guideline for arsenic in drinking water: 0.01 mg/l (10 µg/l).
- In India: 0.05 mg/l (50 µg/l), in absence of an alternative source.

Arsenic in India

- First detected in 1980 in West Bengal.
- Major contamination in Ganga-Brahmaputra alluvial plains.

Government Response

- *National Rural Drinking Water Programme (NRDWP)*: Focus on treatment and alternate supply.
- *IIT-Madras* developed *AMRIT* tech for arsenic and metal removal from water.

International Telecommunication Union (ITU)

Context

India nominated Ms. M. Revathi for Director of ITU’s Radiocommunication Bureau.

About ITU

- Specialized UN agency for digital and telecommunication technologies.
- Established in 1865, headquartered in Geneva.
- Three main sectors: ITU-T (Standardization), ITU-D (Development), ITU-R (Radiocommunication).

Radiocommunication Bureau

- Manages global radio-frequency spectrum and satellite orbits.
- Ensures safe and interference-free use of technologies like 5G, GPS, broadcasting, and space communications.

NEERI to Study Impact on Taj Mahal

Context

Supreme Court directs NEERI to study glass industry's impact on the Taj Mahal.

About NEERI

- Established in 1958 in Nagpur.
- Renamed in 1974 under CSIR.
- Specializes in environmental science, sanitation, air and water pollution solutions.

Taj Mahal

- Built in 1632 by Shah Jahan in Agra.
- UNESCO World Heritage Site since 1983.
- Symbol of Mughal architecture and global tourism landmark.

Undertrial Period Cannot Be Counted for Remission

Context

Kerala High Court ruled that time spent in custody as an undertrial cannot be counted for sentence remission.

Key Legal Understanding

- Remission is granted after conviction, reducing sentence duration without altering its nature.
- Governed by Section 432 of CrPC (now Section 475 of BNSS), and Articles 72 and 161 of the Constitution.
- Pre-conviction detention is handled under Section 428 of CrPC (now Section 468 of BNSS), as a separate provision.

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Climate Change Impact on Women and Children

Context

The Union Ministry of Women and Child Development (WCD) has released a report titled “How Does Climate Change Impact Women and Children Across Agroecological Zones”. The report emphasizes that women and children are disproportionately affected by climate-related disasters and that gender-disaggregated data is vital for creating targeted and effective response strategies.

Agro-Ecological Zones in India

- India has 20 distinct agro-ecological zones, each with unique climatic and geographical features.
- The impact of climate change varies across these zones, affecting local populations differently.
- Some states like Jharkhand, Gujarat, Maharashtra, and Andhra Pradesh include five different agro-ecosystems within their boundaries.
- Some ecosystems, like the North Eastern Hills (region 17) and Western Coastal Plains (region 19), span multiple states, necessitating inter-state coordination for climate adaptation.

Impact of Climate Change on Women

- **Increased Heatwaves:** Heatwave frequency has risen by 30 times as of 2022, posing serious health threats. Vulnerable groups include elderly women, pregnant women, children, and low-income outdoor workers.
- **Indoor Exposure Risks:** In Puducherry, elderly women spend more time indoors without air conditioning, raising exposure to the urban heat island effect.
- **Occupational Health:** In West Bengal, female brickfield workers experienced reduced productivity and higher cardiac strain due to extreme temperatures.
- **Increased Gender-Based Violence:** Climate disasters lead to higher risks of physical, sexual, and domestic violence, particularly among socio-economically disadvantaged women and girls.
- **Maternal Health Threats:** Evidence from China and the US links heatwaves to pregnancy complications like pre-eclampsia and bleeding.
- **Child Marriage:** In Bangladesh, climate stress and heatwaves have led to increased instances of early marriage, used as a coping strategy by impoverished families.
- **Health Burdens:** Women face increased exposure to osteoporosis, respiratory illnesses, cardiovascular conditions, and complications in pregnancy due to air pollution.
- **Floods:** Pose mobility challenges for older women and financial-caregiving pressure on younger women.
- **Droughts:** Lead to greater workloads for water collection and farming, contributing to malnutrition, fatigue, and higher intimate partner violence.
- **Livelihood Risks:** Women involved in agriculture, coastal work, and forest-based occupations bear the brunt of climate variability.
- **Policy Gaps:** Climate action plans rarely account for gendered impacts, leaving women more vulnerable.

Impact of Climate Change on Children

- **High Mortality Risk:** Women and children are 14 times more likely to die in climate disasters (UNDP).
- **Physiological Vulnerability:** Children under five have lower immunity and are highly dependent on adult caregivers, making them especially prone to illness or death during heatwaves, floods, or storms.
- **Disruption of Services:** Disasters displace children, cutting them off from healthcare, schooling, and nutrition.
- Between 2000–2016, over 17,671 child deaths occurred in India due to natural disasters.
- **Waterborne Disease:** Floods often cause diarrhea outbreaks, with dirty water leading to severe dehydration. Diarrhea causes about 300,000 child deaths annually in India.

Air Pollution and Child Health

- **Infant Deaths:** In 2020, 116,000 infants in India died due to air pollution (State of Global Air Report).
- **Developmental Issues:** Exposure to PM 2.5 and pollutants causes infant mortality, stunted growth, and cognitive decline.
- **Prenatal Exposure:** Polluted air during pregnancy harms fetal development, impacting long-term health.

Nutrition and Climate Change

- **Malnutrition Risk:** Rising temperatures and erratic weather may reverse nutritional gains, particularly among pregnant women and children.
- **Fetal Programming:** According to David Barker's Fetal Origins Hypothesis, poor maternal nutrition permanently affects a child's health, increasing risk for non-communicable diseases later in life.

Conclusion

The WCD report underlines that climate change is not gender-neutral. It reinforces the need for climate policies and disaster management plans that are sensitive to the unique vulnerabilities of women and children. The integration of gender-disaggregated climate data, community-based adaptation strategies, and social protection mechanisms is essential to make climate resilience inclusive and effective.

India is Getting More Remittances from Advanced Economies

Context

According to the Reserve Bank of India's latest Remittance Survey, there has been a notable shift in India's remittance landscape, with advanced economies overtaking Gulf countries as the primary source of remittance inflows.

India's Remittance Growth

India's remittance receipts have more than doubled over the past decade, increasing from USD 55.6 billion in 2010–11 to USD 118.7 billion in 2023–24. The country continues to be the world's top recipient of remittances.

Changing Source Composition

Rising Share from Advanced Economies (AEs)

- The United States and United Kingdom now contribute nearly 40% of total remittances, up from 26% in 2016–17.
- The US became the largest contributor in FY21 and accounted for nearly 28% of India's remittance inflows in FY24.
- Singapore's share also rose to 6.6%, its highest level yet.
- Other contributing AEs include Canada and Australia.

Declining Share from Gulf Countries (GCC)

- Traditional Gulf contributors like the UAE, Saudi Arabia, and Kuwait have seen declining shares.
- The UAE's share dropped from 26.9% in 2016–17 to 19.2% in 2023–24.
- The overall contribution from GCC nations has reduced due to economic slowdowns and nationalisation policies like "Saudisation," which favour domestic employment over foreign workers.

State-wise Distribution

- Half of India's remittances are received by Maharashtra, Kerala, and Tamil Nadu.
- Other states such as Haryana, Gujarat, and Punjab receive under 5% each.

Remittance Size Distribution

- Remittances exceeding ₹5 lakh made up 28.6% of total inflows.
- Smaller transfers, ₹16,500 or less, accounted for 40.6% of all remittances.

Reasons Behind the Shift

Decline in GCC Remittances

- Job losses, salary cuts, and the Covid-19 pandemic reduced disposable income.
- Nationalisation efforts in Gulf countries have restricted employment opportunities for foreign workers.

Rise in AE Remittances

- Skilled Indian professionals in STEM, healthcare, and finance sectors have migrated to AEs.
- Higher minimum wages and better purchasing power in countries like the US translate into larger remittances.
- Indian students abroad also contribute by remitting for education loans or family support.

Possible Future Trends

- Immigration restrictions in AEs due to rising right-wing politics could limit long-term residency opportunities.
- As a result, migrants may prefer to remit more back to India instead of investing in host countries.
- India is expected to remain a major global labour supplier until 2048 due to its large and growing working-age population.

Policy Recommendations

- India should focus on aligning its workforce skills with international standards to ensure better employability abroad.
- Protect low-skilled workers from workplace exploitation and underemployment.
- Bilateral and multilateral migration agreements can improve job access and ensure legal protections for Indian workers.
- Streamlined engagement with destination countries can sustain the remittance flow while promoting worker welfare.

Understanding Remittances

- Remittances are financial transfers sent by individuals, usually migrants, to their home country.
- These funds are vital for supporting household incomes, boosting local economies, and balancing current account deficits.
- Transfers are typically made via banks, money transfer services, or digital payment platforms

Brain-computer interfaces (BCIs)

Context

A neurotechnology company led by Elon Musk, Neuralink has announced that it will begin human trials of its revolutionary 'Blindsight' brain chip by the end of 2025. The chip is designed to restore vision in individuals who are completely blind, bypassing damaged eyes and optic nerves.

This development is a major milestone in the field of brain-computer interfaces (BCIs). If successful, it could redefine the possibilities of assistive neuroscience.

What is Blindsight?

Blindsight is a vision-restoration device that does not depend on the eyes. It operates directly through the visual cortex, the part of the brain responsible for processing visual information.

The device uses a microelectrode array that is surgically implanted into the brain. A camera feed captures images, which are then processed and transmitted as electrical signals to the brain's visual center.

In simple terms, it creates the perception of sight by stimulating neurons, even if the person has no functioning eyes or optic nerves. It offers hope to patients with total blindness, including those with irreversible retinal damage.

Understanding Brain-Computer Interfaces (BCIs)

A Brain-Computer Interface (BCI) is a system that links the human brain directly to an external device. It captures signals from the brain, decodes them, and uses them to perform tasks—without the need for muscles or nerves.

The core process of a BCI involves four stages:

- Signal acquisition from the brain
- Signal processing and analysis
- Translation into commands
- Execution by an external device

BCIs can restore lost functions, such as movement or vision, and also augment mental abilities in some settings.

Types of BCIs

BCIs vary based on how closely they interact with the brain:

Type	Description
1. Invasive	Electrodes are implanted inside brain tissue. High accuracy, but involves surgery.
2. Non-invasive	Sensors are placed on the scalp (e.g., EEG). Safer, but signals are less precise.
3. Partially invasive	Electrodes are placed under the skull but not in the brain. Balanced trade-off.

Neuralink's Blindsight is an invasive BCI, as it requires direct implantation into the brain's cortex.

Applications of BCIs

BCIs are being developed across several domains. Their usage ranges from medical recovery to advanced research and intelligent devices.

Sector	Major Applications
1. Medical & Rehab	Assistive tools for paralysis, ALS, spinal injuries; communication aids
2. Mental Health	Neurofeedback for PTSD, ADHD; cognitive enhancement
3. Education	Monitoring attention span; adaptive learning based on brain activity
4. Military & Defense	Controlling drones or machinery using thought; soldier stress monitoring
5. Smart Homes & IoT	Controlling devices with brain signals—lights, locks, systems
6. Neuroscience Research	Mapping brain functions; studying cognition and neural disorders

The possibilities are wide-ranging. Yet, the challenges remain equally significant.

Challenges of Brain-Computer Interfaces

While BCIs offer hope, they also pose technical, ethical, and regulatory concerns.

- **Invasive BCIs** may cause tissue damage or infection. Surgical risks are real.
- **Non-invasive BCIs** suffer from signal noise and lower accuracy.
- **Brain data privacy** is a growing concern. Personal thoughts could be misused if not protected.
- **Long-term stability** of implants is still under testing.

- **Ethical risks** in cognitive enhancement or military applications are under global scrutiny.
- **Regulation** remains weak. Legal frameworks are yet to catch up with BCI innovation.

These limitations make human trials like Neuralink's highly sensitive and closely watched.

Why Neuralink's Trial Matters

The Blindsight chip is not just about restoring vision. It represents the first concrete step towards brain-based sensory substitution at scale. Neuralink's approach combines robotic precision in surgery, high-bandwidth signal processing, and AI-driven decoding.

This trial, if successful, may open doors to future BCIs that can:

- Replace damaged senses
- Restore movement in paralyzed individuals
- Enable communication for those with locked-in syndrome
- Enhance cognition in controlled medical settings

More importantly, it will test the safety and ethical boundaries of implanting technology directly into the brain for therapeutic use.

Conclusion

- Neuralink's Blindsight project marks a new era in human-machine integration. It brings together neuroscience, robotics, artificial intelligence, and medicine to create technology that can repair or replace lost functions.
- However, this frontier is not without risks. Ethical questions around consent, brain privacy, and augmentation will intensify as trials progress.
- India and other countries must start developing legal frameworks and ethical codes for BCI research and deployment. The future of brain tech is near—and governance must be ready.

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