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PARLIAMENTARY PANEL TO REVIEW MECHANISM TO CURB FAKE NEWS

In News

- The Parliamentary Panel on Communications and Information Technology has called for a **review of mechanisms to curb fake news.**

About

- **Fake news** is either disinformation (deliberately false information meant to harm) or misinformation (false information shared unintentionally).
- Disinformation aims to create confusion and conflict in society.

Status in India

- The **World Economic Forum's Global Risks 2024 report** highlights disinformation as a major short-term risk and identifies India as a leading country in spreading misinformation.
- A study by MIT confirms that **false information spreads faster and wider than the truth.**

Key Drivers

- India, with its vast population and high internet penetration, has become one of the largest consumers and **producers of news and information.**
  - a significant portion of the Indian population depends on social media platforms like Facebook, WhatsApp, Twitter, and YouTube for news updates.
- **Political agendas,** religious misinformation, rumors, and sensationalized claims often find a ready audience, leading to the widespread belief in false narratives.

Impacts

- **Threat to Democracy:** In today's "post-truth" era, emotional appeals often outweigh objective facts, making people vulnerable to misinformation.
  - This can influence public opinion, especially during elections, and even well-informed people may accept false claims.
  - Social media platforms are commonly used to **spread fake news**, sometimes by political parties to incite division.
  - **Hyper-nationalism** has also worsened the spread of misinformation in India.
- **Social Division and Polarization:** Fake news can **polarize public opinion,** spread extremist views, incite violence (such as the attacks in Bengaluru and Muzzaffar Nagar), and lead to harmful health decisions, as seen during the COVID-19 pandemic.

- **Undermines Trust in Media and Institutions:** Persistent exposure to fake news erodes public trust in legitimate media outlets and government institutions, making it challenging to discern reliable information.
- **Economic Consequences:** Misinformation can affect businesses and markets by spreading false claims about products, stocks, or industries, leading to economic losses and damage to reputations.

Challenges in Regulating Fake News

- **Defining Fake News:** Hard to clearly define, risking confusion between misinformation and free expression.
- **Balancing Freedom of Speech:** Regulation must balance with free speech to avoid censorship.
- **Advanced Technology:** Tools like deepfakes make fake news harder to detect.
- **Social Media Accountability**: Platforms lack full accountability for user content.
- **Rapid Spread:** Fake news spreads faster than factual corrections.
- **Low Digital Literacy:** Many people struggle to identify fake news.

Governments Efforts

- The Ministry of Electronics and Information Technology promulgated the **IT (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2023** (2023 Rules), which amended the Information Technology Rules, 2021.
  - The amendment to Rule 3(1)(b)(v) of the IT Rules, 2021 expanded the general term "fake news" to include "government business". Under the Rules, if the FCU comes across or is informed about any posts that are "fake", "false", or contain "misleading" facts pertaining to the business of the government, it would flag it to the social media intermediaries.
  - Recently, the **Bombay High Court** officially struck down the **Centre's Fact Check Unit**, calling amended **IT Rules 'unconstitutional'** underlining the need for frameworks that ensure t**ransparency and avoid potential misuse** of power in **digital governance.**
- **Current Status of Fact Check:** The Press Information Bureau (PIB) still operates a fact-check unit, but it lacks the power to remove content deemed as "fake news".
- **Digital Literacy Campaigns:** Programs like Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) aim to improve digital literacy, especially in rural areas, so citizens can better recognize and avoid fake news.

Suggestions and Way Forward

- Governments should **promote media literacy and critical thinking** in schools, mandating workshops to help students critically evaluate information.
- **Governments, tech platforms, and independent organizations** should collaborate to expand fact-checking networks and integrate real-time verification tools into social media platforms to combat misinformation effectively.
- Social media platforms should take **greater responsibility by using AI** to detect fake news and by labeling misinformation.
- Aristotle's insight into an educated society underscores the **power of critical thinking**: the ability to evaluate ideas without automatically embracing them.

Source: TH

SUPREME COURT SLAMS CENTRE FOR INACTION OVER DIRECTION ON SEX TRAFFICKING

Context

- The Supreme Court criticised the Union government over its failure to establish a dedicated **Organised Crime Investigative Agency (OCIA)** for tackling **sex trafficking** — a promise made to the court in 2015.

Human trafficking in India

- India is a **source as well as a destination** country for human trafficking.
- The main source countries are **Nepal, Bangladesh and Myanmar** from where women and girls are trafficked in the lure of a better life, jobs and good living conditions on this side.
- According to the **Ministry of Home Affairs,** India recorded as many as **10,659 cases** of human trafficking between 2018 and 2022.
  - **Maharashtra** registered the highest number of cases i.e. 1,392 in the past five years, followed by **Telangana (1,301)** and **Andhra Pradesh (987).**

Reasons for Human/Sex Trafficking

- **Poverty:** Individuals and families living in poverty are more susceptible to the false promises of traffickers who offer better opportunities and livelihoods.
- **Lack of Awareness:** Low literacy levels and limited awareness make people, especially in rural areas, more vulnerable to deception and exploitation.

- **Migration:** Unregulated migration, both domestic and international, creates opportunities for traffickers to target individuals who are disconnected from their support networks.
- **Inadequate training of law enforcement agencies**, and corruption exacerbate the challenges of effectively addressing trafficking.

Implications of Sex Trafficking

- **Human Rights Violations:** Victims of sex trafficking suffer severe violations of their fundamental human rights, including freedom, dignity, and bodily autonomy.
- **Perpetuation of Inequality:** Sex trafficking reinforces existing social inequalities, especially against women and marginalized groups, perpetuating cycles of poverty and discrimination.
- **Economic Costs:** Trafficking undermines workforce potential and economic growth.

Constitutional Safeguards in India

- **Article 23:** Prohibits trafficking in human beings and forced labor.
- **Article 21:** Ensures the right to life and personal liberty, which has been interpreted to include the right to live with dignity.
- **Article 39(e):** The state should ensure that the health and strength of workers and children are not abused, and that citizens are not forced to take jobs that are not suitable for their age or strength.

Legal Safeguards in India

- **Protection of Children from Sexual Offences (POCSO) Act, 2012:** Protects children from sexual exploitation and abuse.
- **Juvenile Justice (Care and Protection of Children) Act, 2015:** Provides a framework for the protection, treatment, and rehabilitation of children in need of care and protection.
- **The National Investigation Agency (NIA) Act** was amended in 2019 to enlarge the mandate of the Central agency to include human trafficking.
- **Indian Penal Code (IPC), 1860:** Includes provisions such as Sections 370 and 370A, which criminalize trafficking and exploitation of persons.
- **Trafficking of Persons (Prevention, Protection, and Rehabilitation) Bill:** Although pending, this proposed legislation aims to create a more comprehensive approach to handling trafficking through prevention, protection, and victim rehabilitation.

Way Ahead

- **Economic Empowerment:** Providing sustainable livelihood opportunities and skill development

programs for vulnerable populations reduce the economic pressures that lead to trafficking.

- **Victim Rehabilitation and Support:** Developing comprehensive rehabilitation schemes that provide physical, psychological, and economic support is essential for survivors.

- **International Cooperation:** Strengthening **cross-border partnerships** and **sharing intelligence** can help dismantle trafficking networks that operate transnationally.

Source: TH

DEBATING THE 'HEALTHY LONGEVITY INITIATIVE' REPORT

In Context

- The **World Bank's 2024** report, **Unlocking the Power of Healthy Longevity**, highlights a rapidly **aging population and the rise of NCDs** in **Low- and Middle-Income Countries (LMICs)**.

About

- The report highlights that **addressing NCDs**, such as heart disease, diabetes, and cancer, is essential for **achieving healthy longevity and sustaining human capital** in r**apidly aging populations.**

- And, reduced health funding in India and other LICs/LMICs may **hinder achieving SDG targets**, especially as general government spending rises faster than health allocations.

Key Points of Report

- **Impact of NCDs:** NCDs now account for over 70% of global deaths annually, and this trend is set to continue. By 2050, the total number of deaths is projected to rise from 61 million in 2023 to 92 million, further highlighting the need for urgent interventions.

- **Health Spending: Between 2019 and 2023**, **per capita health spending grew modestly**—0.4% in LICs and 0.9% in LMICs—compared to pre-pandemic growth rates of 4.2% and 2.4%, respectively.

  - In India, the share of health in the total budget **dropped below 2% post-pandemic**, reaching **around 1.75–1.85%.**

- **Challenges for India**

  - **Aging Population:** India has around 140 million elderly, with a growth rate three times the overall population, **placing strain on health and social systems.**

  - **Risk Factors**: Tobacco, alcohol, sedentary lifestyles, and poor diets **increase NCD**

risks, especially in rural areas with limited healthcare access.

- **Economic and Social Impact:** Rising NCD rates lead to impoverishment, **reduced investments, and economic slowdown.**

- **Gender and Social Equity:** Women, who often serve as caregivers and experience longer lives with NCDs, **need targeted health protections.**

- **Inconsistencies in Ayushman Bharat**: Designed to provide health insurance to the bottom 40% but **hindered by corruption, low funding, and eligibility challenges.**

- **Higher Out-of-Pocket Medical Expenditure:** India's healthcare costs are often out-of-pocket, with travel costs forming a significant portion, especially for rural populations seeking care.

Government Initiatives

- **National Programme for Health Care of the Elderly (NPHCE):** Provides specialized healthcare services for older adults.

- **National Social Assistance Programme (NSAP):** Offers financial assistance to elderly individuals below the poverty line.

- **Ayushman Bharat:** A health insurance scheme aiming to cover the bottom 40% of households; however, coverage remains limited.

- **Atal Vayo Abhyuday Yojana (AVYAY):** Promotes welfare services for senior citizens.

- **Elderline:** A helpline to assist elderly individuals in accessing necessary services.

Way Forward

- **Life-Course Approach to NCDs:** The report advocates a life-course approach to managing NCDs, emphasizing prevention, early diagnosis, and continuous management across all ages. This approach requires reforms across health, labor, and social protection sectors to support long-term care and reduce NCD burdens.

- **Leveraging Fiscal Tools:** Raising taxes on harmful products such as tobacco and alcohol can reduce health risks and generate funds to improve healthcare services.

- **Expanding Social Security Coverage:** Strengthening Ayushman Bharat to ensure broader coverage for elderly and low-income populations can reduce financial strain from healthcare costs, particularly in rural and underserved areas.

- **Investing in Geriatric Healthcare Infrastructure:** India needs improved healthcare facilities for chronic disease management, particularly in rural regions. Training healthcare workers in geriatric

care and making affordable long-term care options accessible is essential.

- **Addressing Gender and Social Equity:** Targeted health and social protections for women are necessary to address the challenges they face as caregivers and as individuals who experience a greater burden of NCDs in older age.

- **Regulating Healthcare Costs:** The Supreme Court of India has urged the government to regulate prices in private hospitals, which remain high and inaccessible for many. Ensuring consistent enforcement of these regulations is key to reducing out-of-pocket expenses for vulnerable groups.

Source: TH

WORLD INTELLECTUAL PROPERTY REPORT 2024

Context

- India has secured in the top 10 countries for **patents, trademarks, and industrial designs,** according to the World Intellectual Property Organization (WIPO) 2024 report.

Key Highlights

- **Patent Applications:** India recorded a **15.7% growth** in patent applications in 2023, the fastest among the top 20 global IP economies.

- **Industrial Designs:** Applications in industrial designs increased by **36.4%,** showcasing a focus on creative and manufacturing sectors.

- **Trademark Filings:** India ranked **4th globally** in trademark filings, with a 6.1% increase in 2023.

- **Global IP Trends:** Resilience in IP Filings: A total of 3.55 million patent applications were filed globally in 2023, up by 2.7% from 2022.

  - The growth was primarily driven by Asian countries, with India, China, the United States, Japan, and South Korea leading the increase.

What is Intellectual Property?

- Intellectual property (IP) refers to **creations of the mind,** such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

- **IP is protected in law by patents, copyright and trademarks,** which enable people to earn recognition or financial benefit from what they invent or create.

Types of intellectual property

- **Patent:** A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem.

- **Copyright:** It is a legal term used to describe the rights that creators have over their literary and artistic works.

- **Trademark:** It is a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises.

- **Industrial design:** It constitutes the ornamental or aesthetic aspect of an article.

- **Geographical indications and appellations of origin** are signs used on goods that have a specific geographical origin and possess qualities, a reputation or characteristics that are essentially attributable to that place of origin.

- **Trade secrets** are IP rights on confidential information which may be sold or licensed.

India's initiative

- **National IPR Policy 2016** encompassing all IPRs into a single vision document setting in place an institutional mechanism for implementation, monitoring and review of IP laws.

  - The policy encourages innovation and creativity by providing stronger protection and incentives for inventors, artists, and creators.

- **Cell for IPR Promotion and Management (CIPAM):** It has been set up to coordinate the implementation of the National IPR Policy.

- **National Intellectual Property Awareness Mission (NIPAM),** a flagship program to impart IP awareness and basic training in educational institutes.

- **Scheme for Facilitating Startups Intellectual Property Protection(SIPP):** it is introduced to foster innovation and entrepreneurship by providing a supportive ecosystem for startups to protect and manage their IP assets.

- **Atal Innovation Mission (AIM):** It was set up by **NITI Aayog in 2016** to promote a culture of innovation and entrepreneurship in India. AIM has created **four programs** to support these functions:

  - Atal Tinkering Labs
  - Atal Incubation Centers
  - Atal New India Challenges and Atal Grand Challenges
  - Mentor India.

Concluding remarks

- India's impressive IP growth, marked by significant advancements in patents, industrial designs, and trademarks, underlines its commitment to fostering innovation and reinforcing its global economic presence.

- This momentum supports India's broader goals of economic expansion and innovation-driven development.

World Intellectual Property Organization (WIPO)

- It is a **self-funding agency of the United Nations,** that serves the world's innovators and creators, ensuring that their ideas travel safely to the market and improve lives everywhere.
- **History:** WIPO was established in **1967** by the **WIPO Convention.**
- **Members:** The organization has **193** member states including both developing and developed nations like India, Italy, Israel, Austria, Bhutan, Brazil, China, Cuba, Egypt, Pakistan, the U.S. and the U.K.
  - India joined WIPO in **1975.**
- **Headquarters:** Geneva, Switzerland.

Source: DD NEWS

'ADAPTIVE DEFENCE' STRATEGY TO BOLSTER INDIA'S DEFENCE

Context

- Recently, the Union Defence Minister, at the inaugural Delhi Defence Dialogue, announced the government's commitment to developing an 'Adaptive Defence' strategy aiming to bolster national security.

Concept of Adaptive Defence

- Adaptive Defence is **not merely a reactive measure** but a **proactive strategy**. It involves **anticipating potential threats** and preparing for them in advance.
- It emphasises situational awareness, flexibility at both strategic and tactical levels, resilience, agility, and the integration of futuristic technologies.

Emerging Threats Ahead of India's Defence

- **Traditional Threats:** India continues to face significant traditional threats, particularly along its borders. The ongoing tensions with neighbouring countries necessitate a robust and vigilant defence posture.
  - The LAC with China and the LoC with Pakistan remain hotspots for potential conflicts.
  - Ensuring the security of these borders requires constant surveillance, advanced weaponry, and well-trained personnel.

- **Unconventional Threats:** India is increasingly dealing with unconventional challenges such as terrorism, cyber-attacks, and hybrid warfare.
  - **Terrorism** remains a persistent threat, with various groups targeting India's sovereignty and stability.
  - **Cybersecurity** is another critical area, as cyber-attacks on critical infrastructure and defence networks can have devastating consequences.
  - **Hybrid warfare**, which combines conventional and unconventional methods, poses a complex challenge that requires innovative and adaptive strategies.

Need for 'Adaptive Defence' in India

- **Diverse Security Threats:** India encounters a wide range of security threats, from **traditional border disputes to unconventional issues** like terrorism, cyber-attacks, and hybrid warfare.
  - These threats are constantly changing, requiring a flexible and dynamic defence strategy.
- **Technological Advancements:** Emerging technologies such as artificial intelligence, drones, and cyber capabilities are reshaping the nature of warfare.
- **Geopolitical Changes:** The global geopolitical landscape is in flux, with shifting alliances and new strategic partnerships.
- **Grey Zone and Hybrid Warfare:** Traditional defence methods are being challenged by grey zone and hybrid warfare tactics, which blend conventional and unconventional methods.

Addressing Diverse Security Challenges Through 'Adaptive Defence' Strategy

- **Cybersecurity:** With the increasing digitization of defence systems, cybersecurity has become paramount.
  - Advanced cybersecurity measures protect critical infrastructure from cyber-attacks, ensuring the integrity and confidentiality of sensitive information.
- **Drones and Unmanned Aerial Vehicles (UAVs):** Drones and UAVs provide real-time surveillance, reconnaissance, and targeted strikes.
  - They enhance situational awareness and allow for rapid response to threats, especially in difficult terrains.
  - India aims to become a **global hub for drone technology,** which will not only boost the economy but also enhance its defence capabilities.

- **Space Technology:** Satellites and space-based systems offer critical capabilities for communication, navigation, and surveillance.
  - These technologies ensure continuous monitoring of borders and strategic areas, providing a significant advantage in defence operations.
- **Advanced Weaponry and Defence Systems:** The integration of advanced weaponry, such as precision-guided munitions and missile defence systems, enhances India's ability to counter diverse threats.
  - The **Defence Research and Development Organisation (DRDO)** is actively working on advanced technologies, including the recent successful test of a **Long Range Land Attack Cruise Missile (LRLACM)** with a range of 1,000 km.
  - These systems improve the effectiveness and efficiency of military operations.
- **Artificial Intelligence (AI) and Machine Learning (ML):** AI and ML are revolutionising defence strategies by enabling predictive analytics, autonomous systems, and enhanced decision-making.
  - These technologies help in identifying potential threats, optimising resource allocation, and improving the accuracy of intelligence assessments.
- **Big Data and Analytics:** Big data analytics enable the processing and analysis of vast amounts of information to identify patterns and trends.
  - This capability is essential for intelligence gathering, threat assessment, and strategic planning.
- **Collaborative International Partnerships:** Technological collaboration with other countries helps in the exchange of knowledge, joint development of defence technologies, and strengthening of strategic alliances.
  - These partnerships enhance India's defence capabilities and readiness.

Conclusion and Way Forward

- The Indian government has already initiated several measures to build a robust and self-reliant defence ecosystem. These include establishing the institution of the **Chief of Defence Staff,** promoting jointness among the three Services, and forging new defence partnerships globally.
- By embracing Adaptive Defence, India aims to ensure that its military and defence mechanisms are continuously evolving to counter emerging threats effectively, securing the nation's future in an increasingly complex global environment.

- The concept of 'Adaptive Defence' is central to navigating the increasingly complex global environment, ensuring that India's military and defence mechanisms are resilient, flexible, and technologically advanced.
  - By continuously evolving and adapting, India can effectively safeguard its sovereignty and secure its future.

Source: PIB

EXPANDING HIMALAYAN GLACIAL LAKES

Context

- As per The Central Water Commission's (CWC) report, **Himalayan glacial lakes are rapidly expanding,** posing an increasing threat to communities and ecosystems.

Major Findings

- The total inventory area of glacial lakes within India increased from 1,962 hectares in 2011 to 2,623 in 2024 i.e. **a 33.7% increase.**
- It also identified **67 lakes in India** that witnessed an **over 40% increase** in surface area, placing them in the high-risk category for potential GLOFs.
- **Ladakh, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh** showed the most notable expansions, signalling a heightened risk of GLOFs.
- Glacial lakes and other water bodies across the Himalayan region saw an overall area increase of **10.81%** in 2024.
- The **transboundary risk** is posed by expanding glacial lakes in neighbouring countries, including **Bhutan, Nepal and China.**
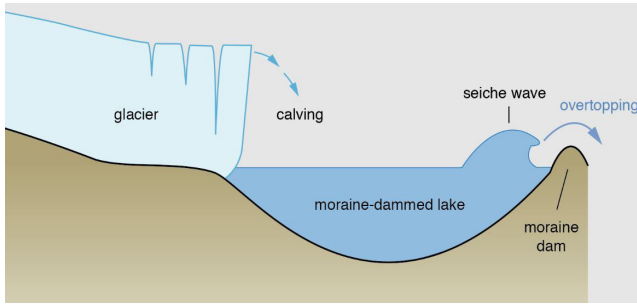
What are Glacial Lakes?

- A glacial lake is a body of water that **originates from a glacier.** It typically forms at the foot of a glacier, but may form on, in, or under it.
- They are divided into two groups:
  - **Ice-contact lakes** which are characterized by the presence of **glacier ice terminating in lake water**.
  - **Distal lakes** that are somewhat distant, but still **influenced by, the presence of glaciers and/or ice sheets.**

What are Glacial Lake Outbursts?

- As glacial lakes grow larger in size, they become more dangerous because they are mostly dammed by **unstable ice or sediment** composed of **loose rock and debris.**

- In case the **boundary around them breaks,** huge amounts of water rush down the side of the mountains, which cause flooding in the downstream areas called **glacial lake outburst floods or GLOF.**
- In 2013 Uttarakhand's Kedarnath witnessed flash floods along with a GLOF caused by the **Chorabari Tal glacial lake,** killing thousands of people.

Reasons for the Glacial Lake Outbursts

- **Rising Temperatures:** The warming climate is causing glaciers to melt more rapidly in the Himalayas, contributing to the formation of new glacial lakes and the expansion of existing ones.
- **Increased Glacier Instability:** The rapid melting and retreat of glaciers lead to the destabilization of the moraines (ridges of rock and debris) that hold back water.
- **Monsoon Rains:** The Indian monsoon season brings intense rainfall to the Himalayan region, which increases the volume of water flowing into glacial lakes.
- **Earthquakes and Landslides:** The Himalayan region is seismically active, and earthquakes trigger landslides or rockfalls into glacial lakes.
- **Development Projects:** In the Himalayan region, there is increasing pressure to develop infrastructure, increasing the risk of landslides.
- **Lack of Monitoring and Preparedness:** Many of the glacial lakes in India are not regularly monitored, especially those in remote areas.

Consequences of GLOFs in India

- **Flooding:** A GLOF causes severe downstream flooding, wiping out villages, infrastructure, and farmland in affected areas.
- **Erosion and Riverbank Damage:** Sudden floods cause significant erosion of riverbanks, destabilizing land and infrastructure.
- **Loss of Lives and Livelihoods:** Communities living in flood-prone areas are at direct risk, especially those with limited resources to cope with the aftermath of such events.

- **Infrastructure Damage:** Roads, bridges, hydropower plants, and other critical infrastructure is destroyed by the massive surges of water.

Preventive Measures Taken

- **The National Disaster Management Authority (NDMA)** has finalised a list of **189 "high-risk" glacial lakes** for mitigation measures to reduce the risk.
    - Steps include constituting teams to investigate these lakes and attempt lake-lowering measures, which are done to buffer against any overflow.
- **The National Glacial Lake Outburst Floods Risk Mitigation Programme (NGRMP)** aims at detailed technical hazard assessments, installing automated weather and water level monitoring stations (AWWS) and early warning systems (EWS) at the lakes and in downstream areas.
    - So far, 15 expeditions have been conducted including six in Sikkim, six in Ladakh, one in Himachal Pradesh and two in Jammu and Kashmir.

Source: TH

NEWS IN SHORT

RETAIL INFLATION

Context

- According to the National Statistical Office (NSO), the retail inflation rate in India surged to a 14-month high of **6.21%** in October, driven by a notable increase in the prices of essential food items.

What is Retail Inflation?

- Retail inflation refers to the **rate at which the general price level of goods and services bought** by households increases over a specific period.
- In India, retail inflation is measured by the **Consumer Price Index (CPI),** which tracks the changes in the prices of a basket of goods and services typically consumed by urban and rural households.
- Inflation can be caused by an imbalance in supply and demand, disruption in supplies, or expectations of inflation.

Steps Taken

- **Monetary Policy Adjustments:** The RBI may consider tightening monetary policy by raising the repo rate to curb inflationary pressures.

- **Supply Chain Measures:** The government intervenes to streamline supply chains and reduce disruptions.

> **Consumer Price Index (CPI)**
> - CPI is an economic measure that **tracks the average change in the prices** paid by consumers for a basket of goods and services over time.
> - The **CPI in India** is compiled by the **National Statistical Office (NSO)** and is categorized into CPI for **urban** and **rural** areas.
>   - These indices are then combined to calculate the **CPI (Combined)**, which gives a comprehensive overview of inflation for the entire country.

Source: IE

GENETIC CIRCUITS IN BACTERIA

Context

- Researchers from the Saha Institute of Nuclear Physics in India have developed a cell-based biocomputer using genetically modified bacteria.

Cell-Based Biocomputer

- **Living cells can naturally perform computations** to carry out biological functions. For examples;
  - **Neurons** in the brain communicate to make decisions.
  - **Immune cells** collaborating to respond to threats.
- **Synthetic biology** allows for engineering cells to perform human-designed computations.
- This fusion of biology and computer science has led to living cell-based biocomputers.

Role of Genetic Circuits

- Researchers introduced genetic circuits in bacteria activated by specific chemical inducers.
  - **Escherichia coli (E. coli)** was used as the model organism.
- These engineered bacteria were combined to create a **bacterial computer mimicking artificial neural networks.**
- Each type of engineered bacteria acted as a "bactoneuron" collectively performing complex computations.

Potential Applications

- **Pharmaceutical industry:** Enhances drug design and development.
- **Medical sciences:** Supports personalized medicine for diagnostics and therapies.

- **Biomanufacturing:** Optimizes production processes and develops innovative bio-products.

Source: TH

NISAR

Context

- The NISAR mission is set to be launched early next year from Satish Dhawan Space Centre in Andhra Pradesh, India.

About

- It is jointly developed by NASA and ISRO named'NASA-ISRO **Synthetic Aperture Radar' (NISAR).**
- It will use **radar imaging** to produce a **high-resolution map of the earth's landmasses.**
  - It aims to deepen understanding of dynamic Earth processes, measuring the motion of nearly all of the planet's land and ice-covered surfaces **every 12 days.**
- **Functions:** The satellite will observe movements from earthquakes, ice sheet movements, landslides and volcanic activity, track changes in forests, wetlands and farmland and even check infrastructure stability.
- It is currently expected to be launched onboard an **ISRO GSLV Mk II rocket in 2025.**

Source: DTE

ARTICLE 6.4 OF THE CARBON MARKET

Context

- Experts have raised concerns over the new rules adopted for **Article 6.4** of the carbon market during the **COP29** held in **Baku, Azerbaijan.**

About

- **Article 6.4:** Refers to a provision under the **Paris Agreement** that establishes a UN-regulated system for trading carbon credits, which countries and private companies can use to offset their emissions.
- **Carbon credits**: Countries can transfer carbon credits earned from reducing greenhouse gas emissions to help other countries achieve their targets.

Significance

- **Financial Support**: Provides funding for developing countries.
- **Monitoring and Reliability:** Establishes long-term market standards and transparency in credit use.

Types of Carbon Credit Projects

- **Emission Avoidance Projects:** These involve activities that prevent the release of greenhouse gasses. Examples;
  - **Implementing energy-efficient technologies** like improved cookstoves.
  - **Using renewable energy systems** for lighting and other applications.
- **Emission Removal Projects:** These focus on taking CO_2 out of the atmosphere. Examples;
  - **Planting trees** or restoring forests.
  - **Developing carbon capture** and storage solutions.

Source: DTE

CORPSE FLOWER

In News

- A giant flower named **"Amorphophallus Titanum"** bloomed in Australia.

Corpse Flower (Amorphophallus titanum)

- **About:** It has the largest unbranched inflorescence in the plant kingdom, growing up to 8 feet tall in cultivation and up to 12 feet in the wild.
- **Bloom Cycle**: It blooms for just 2-3 days every two to three years or more, depending on energy accumulation in its underground corm.
- **Odor and Pollination**: It emits a putrid odor, resembling rotting flesh, especially at night.
  - The smell has been compared to dead bodies, sweaty socks, or dead animals.
  - The flower generates heat to spread the smell further, attracting carrion beetles and flies for pollination.
- **Fruiting**: Post-pollination, it produces around 400 reddish-orange fruits, each containing two seeds.
- **Native Habitat**: The plant is native to the tropical rainforests of Sumatra, Indonesia, and was first documented in 1878.
  - **Discovery**: First documented by Italian botanist Odoardo Beccari in 1878.
- **Conservation Status:** Listed as "**Endangered**" by the IUCN, with fewer than 1,000 individuals in the wild.

Source:DTE

COMB JELLY

In News

- Scientists have discovered that the **comb jelly Mnemiopsis leidyi** can reverse its aging process, challenging the usual animal life cycle.

About Comb Jellies

- Comb jellies are also known as ctenophores, comb jellies are **gelatinous marine invertebrates** with distinctive rows of cilia for swimming.
- Comb jellies, among the oldest animal species (around 700 million years old), share their time-reversal ability with the immortal jellyfish Turritopsis dohrnii.
- They are **bioluminescent and lack stinging cells**, capturing prey with sticky cells called **colloblasts.**
- **Habitat** : These fascinating creatures inhabit oceans worldwide, from shallow coastal waters to deep seas.
- **Recent study :** Under extreme stress, adult comb jellies regress to a larval form.
  - This finding opens new possibilities for studying age-reversal mechanisms, life cycle plasticity, and animal development, with potential implications for understanding human aging.

Source : TOI

INDIA'S FOSSIL FUEL CO2 EMISSIONS SET TO RISE

Context

- According to a Global Carbon Project study, India's carbon dioxide (CO2) emissions from burning fossil fuels are expected to **rise 4.6% in 2024, the highest among major economies.**

Major Findings

- Globally, fossil-based CO2 emissions are set to see a **rise of 0.8% from 2023.**
  - At this rate there was a **50% chance** that global warming **will exceed 1.5°C consistently in about six years.**
- **India's carbon emissions** are projected to rise with an increase in emissions from coal (4.5%), oil (3.6%), natural gas (11.8%) and cement (4%).
- **China's emissions** are projected to rise by **0.2%** while that of the **United States and the European Union** by 0.6% and 3.8%, respectively.
- **India's contribution to global CO2 emissions** stands at **8%** while China, the US and EU contribute 32%, 13% and 7%, respectively.
- **Land and ocean carbon sinks** continued to absorb around **half of the total carbon emissions,** despite being negatively affected by climate change.

Source: IE

LONG RANGE LAND ATTACK CRUISE MISSILE (LRLACM)

Context

- Defence Research and Development Organisation (DRDO) conducted the maiden flight-test of Long Range Land Attack Cruise Missile (LRLACM).

About LRLACM

- **Range:** 1,000 km
- **Performance:** It is a new variant of the **Nirbhay LRLACM**.
  - Equipped with advanced avionics and software for reliability and efficiency.
  - It is designed to launch from ground using mobile articulated launcher and also from frontline ships using universal vertical launch module system.
- **Developed by:** Aeronautical Development Establishment, Bengaluru collaboration with other DRDO laboratories.
- **Approval:** LRLACM is a **Defence Acquisition Council**-approved, Acceptance of Necessity-sanctioned, Mission Mode Project.
- **Significance:** Once inducted, the LRLACM, similar to the U.S. **Tomahawk cruise missile**, will give Indian armed forces a long range standoff capability to strike targets on land.

Nirbhay Missile

- **About:** India's first indigenously developed long-range subsonic cruise missile.
- **Range and Speed:** Capable of striking targets up to 1,000 kilometers away.
  - Subsonic speed, flying at around Mach 0.7 to Mach 0.9.
- **Guidance and Navigation:** Equipped with Inertial Navigation System (INS), Global Positioning System (GPS), and Geographic Information System (GIS) for accuracy.

- **Terrain Hugging Capability:** Nirbhay has a terrain-hugging capability, which allows it to fly at low altitudes, making it difficult to detect by radar.

Source: TH

FIRST ALL-WOMEN BATTALION OF CISF

Context

- The Home Ministry has approved the establishment of the **first all-women battalion** of The Central Industrial Security Force (CISF).

About

- Presently, there are **7% women personnel** in the CISF, which has a total strength of 1.77 lakh personnel.
- The training program is being tailored to develop an elite force, capable of handling high-level security tasks such as VIP protection and safeguarding major facilities.

About CISF

- It is an armed force established under the **Central Industrial Security Force Act, 1968.**
- The force is led by a **Director General (DG)** and operates under the Ministry of Home Affairs of India.
- CISF is providing security to the strategic establishment, including the Department of Space, the Department of Atomic Energy, the Airports, the Delhi Metro, the ports, the historical monuments and the basic areas of Indian economy such as petroleum and natural gas, electricity, coal, steel and mining.
  - It also provides counter-terrorism security to various sensitive facilities, as well as private sector operations.
- Presently, CISF is also providing security to the protected persons classified as Z Plus, Z, X, Y.

Source: TH

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