

WEEKLY UPDATES – (11th-17th Feb)

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ENVIRONMENT

Brumation: winter is coming for reptiles

Context: An alligator was seen lying still underwater with only its snout visible. It was undergoing brumation.

During Brumation



- **Slow Down:** Reptiles reduce their activity levels to conserve energy during winter.
- **Reduced Eating and Excretion:** They consume little to no food and excrete less (or not at all) for several weeks.
- **Decreased Movement:** Reptiles become less active and typically seek out the darkest and coldest areas.
- **Hydration:** They may venture outside to drink water in order to stay hydrated.
- **Extended Rest:** While not fully asleep, reptiles remain very still and quiet during brumation.
- **Survival Strategy:** Brumation serves as a survival mechanism during cold periods when food sources are scarce.

What is Brumation?

Brumation is a period of dormancy observed in reptiles. This process bears resemblance to hibernation in mammals. The timing and duration of brumation vary based on factors such as species, age, and gender, with males often emerging from dormancy before females.



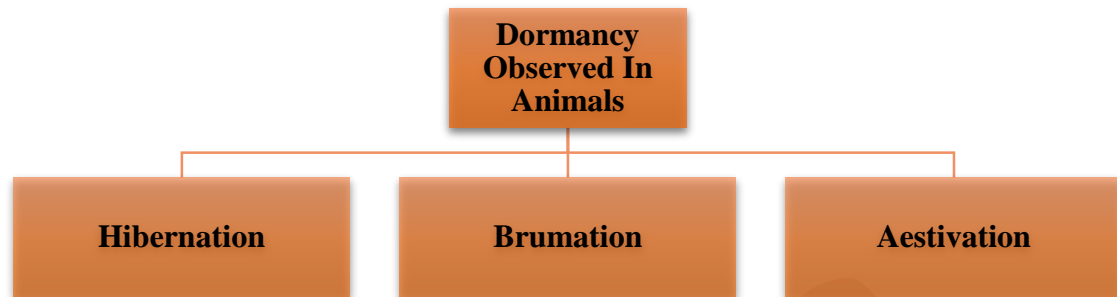
Why Do Reptiles Brumate?

Temperature Regulation

Reptiles enter a state of brumation because they are unable to regulate their body temperature effectively.

Environmental Adaptation

Brumation allows reptiles to endure cold weather and periods of limited food and water availability.



Comparison with Hibernation and Aestivation

- Hibernation is predominantly found in endothermic animals and involves a decrease in metabolic rate, leading to a state of dormancy during colder months.
- On the other hand, brumation is characteristic of ectothermic animals, such as reptiles and amphibians, where metabolic activity slows down but not to the same extent as in hibernation, often triggered by cooler temperatures.
- Aestivation, primarily seen in ectotherms, occurs in response to hot and dry conditions, leading to a reduction in metabolic activity and behavioral changes during the summer season.
- While hibernating animals like bears, bats, and groundhogs remain completely inactive, those undergoing brumation, like snakes and turtles, may display partial activity on warmer days.
- Meanwhile, aestivating creatures like snails and desert tortoises rely on the external environment to regulate their body temperature.
- Despite differences in mechanisms and timing, all three strategies serve to conserve energy and survive challenging environmental conditions.

The patterns of global warming are more important than its levels

Context: A recent study has sparked renewed discussions regarding whether the Earth's surface temperature has surpassed the critical threshold of 1.5 degrees Celsius above pre-industrial levels.

Rising Global Temperature

- Conducted by scientists from Australia and the U.S., the research employed paleo-thermometry to estimate historical temperatures, suggesting that the global average temperature has indeed exceeded the 1.5 degrees Celsius mark.
- However, the study's conclusions are drawn from data collected at a single location, which the researchers then

What is Paleothermometry?

- Paleothermometry, also known as 'paleo proxies,' relies on chemical evidence found in organic materials such as corals, stalactites, and stalagmites to estimate past temperatures.
- Although this method provides valuable insights into historical climate conditions, it offers indirect evidence and does not directly measure temperatures.
- These proxies indicate historical temperature variations by analyzing the relationship between specific chemical compounds in biogenic materials and the local temperatures during their formation.
- By examining the chemical composition of ancient biogenic materials and the decay rate of certain isotopes, scientists can infer past local temperature anomalies.

extrapolated to infer global temperature trends, presenting a notable limitation.

Limitations

However, these findings represent localized temperature changes and cannot precisely determine minor deviations in historical global temperatures compared to instrumental records.

Lack of Explanations for Patterns

- The discourse regarding the crossing of the 1.5 degrees Celsius global warming threshold lacks clear explanations for exceptional warming and its correlation with specific climatic events or disasters.
- There is a significant gap in understanding the patterns associated with surpassing this threshold and global warming in general, essential for managing associated disasters effectively.

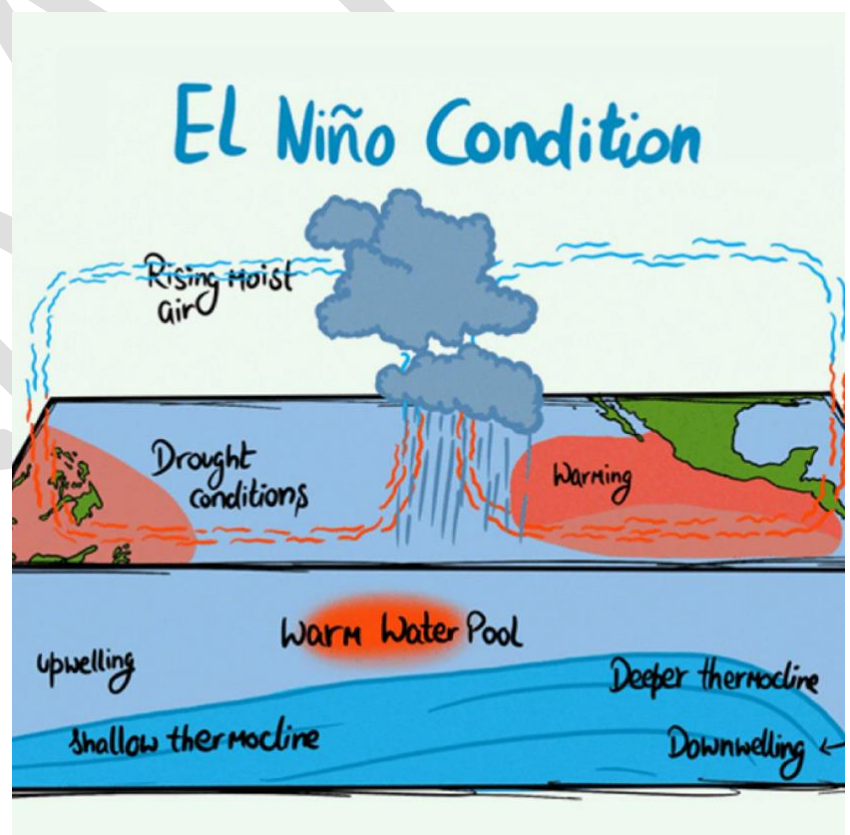
Unexplained Monsoon Dynamics

- The dynamics of the 2023 monsoons, including their amount and distribution, remain unexplained, particularly concerning the interactions between the El Niño phenomenon, its atypical pattern, and global warming.
- Interestingly, the Indian subcontinent experienced noticeable cooling in 2023, adding complexity to the understanding of regional climate trends.

El Niño as a Warming Paradigm

El Niño's Influence

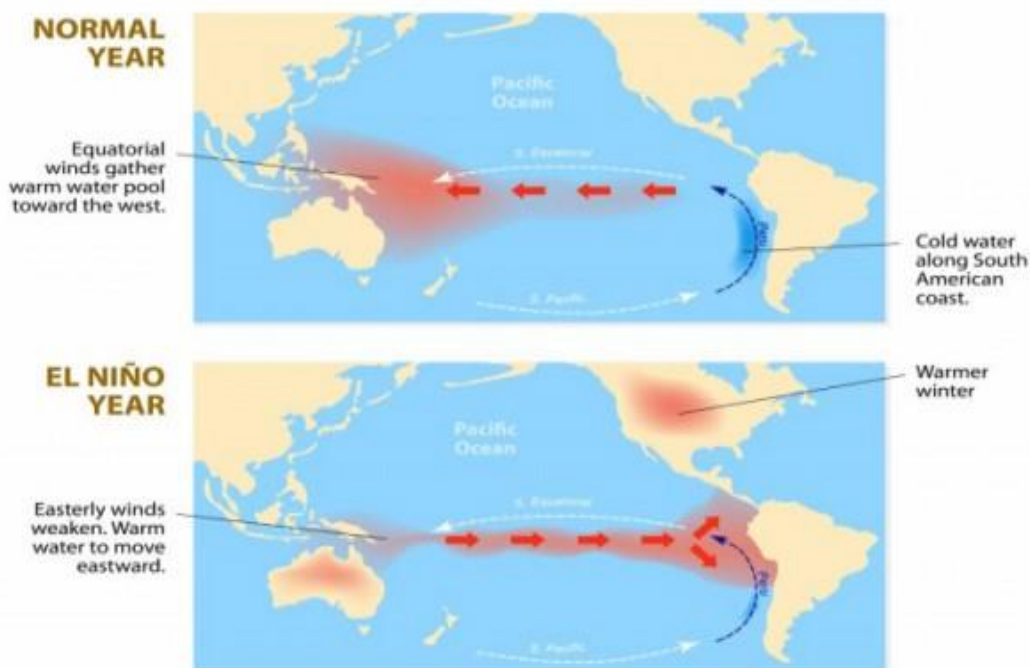
- The tropical Pacific Ocean's cyclic behavior, alternating between absorbing heat during La Niña years and releasing it during El Niño years, leads to temporary global warming effects known as teleconnections.
- These teleconnections highlight the significance of warming patterns, with the location of El Niño warming impacting its effects on the monsoon and other global regions.
- Moreover, El Niño teleconnections themselves influence the warming pattern, contributing to various climatic outcomes, with droughts potentially affecting temperature changes more significantly than floods in some cases.



Impacts of El Niño

- Current heavy rainfall and snowfall in California, attributed to El Niño, are likely intensified by global warming, further influencing local and global temperatures.
- The broader pattern of global warming, driven by human-made greenhouse gases, results in amplified warming in certain regions while reducing warming in others, impacting local and global climates differently.
- The specific effects of local warmings and coolings, along with their magnitudes, determine the combined impact of natural variability and global warming in different areas.

THE EL NIÑO PHENOMENON



ECONOMY

SBI in talks with RBI to lower CRR on green deposits

Context: The State Bank of India (SBI) is currently in discussions with the Reserve Bank of India (RBI) regarding a potential reduction in the cash reserve ratio (CRR) requirement specifically for green deposits. Green deposits, a type of fixed-term investment, are gaining traction among individuals and entities looking to support environmentally friendly initiatives.

Understanding Green Deposits

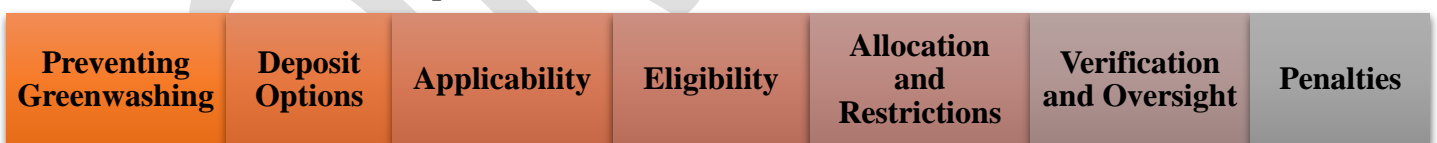
- **Purpose:** Green deposits are tailored investments aimed at backing environmentally sustainable projects.
- **ESG Principles:** These deposits align with Environmental, Social, and Governance (ESG) investing, reflecting the growing trend towards sustainable finance.

- **Utilization of Funds:** Funds from green deposits are directed towards projects promoting renewable energy, clean transportation, pollution control, green infrastructure, and sustainable water management.

Comparison with Normal Deposits

Features	Regular Deposits	Green Deposits
Deployment of Funds	Goes into a common pool	Carved out specifically for green financing
Purpose of Funds	General financing purposes	Channelized towards environmentally sustainable projects
Applicability of Rules	Same rules as regular deposits	Same rules as regular deposits
Maturity Options	Option to redeem or carry forward	Option to redeem or carry forward
Interest Rate Variation	Varies among different lenders	Varies among different lenders
Interest Rates Comparison	Generally similar to regular deposits	Comparable to regular deposits, but some lenders may offer slightly lower rates (e.g., Citibank and HSBC globally)
ESG Mandate Impact on Returns	No impact	Slightly lower returns for investments with Environmental, Social, and Governance (ESG) mandates

RBI Framework for Green Deposits



- **Preventing Greenwashing:** The RBI's framework ensures transparency in environmental claims associated with green deposits.
- **Deposit Options:** Banks offer green deposits in rupees, with choices between cumulative or non-cumulative options.
- **Applicability:** Scheduled commercial banks, small finance banks, NBFCs, and HFCs must comply with this framework.
- **Eligibility:** Both corporate entities and individual customers can invest in green deposits.
- **Allocation and Restrictions:** Funds raised through green deposits are directed towards sectors such as renewable energy, waste management, and afforestation. However, investments in sectors like fossil fuels, nuclear power, or tobacco are prohibited.

- **Verification and Oversight:** Independent Third-Party Verification is conducted annually to assess fund allocation and impact, while lenders are required to review the impact of funds lent for green finance activities annually.
- **Penalties:** Financial institutions face no penalties for underutilization of funds raised through green deposits, offering flexibility.

Conclusion

SBI's proposal to reduce the CRR requirement for green deposits underscores the bank's commitment to promoting environmentally sustainable finance. By incentivizing investments in green initiatives, financial institutions can play a crucial role in addressing environmental challenges while meeting the growing demand for sustainable investment options.

POLITY

SC strikes down electoral bonds scheme, calls it unconstitutional

Context: On February 15, 2024, the Supreme Court delivered a significant judgment declaring the Electoral Bonds Scheme unconstitutional. The unanimous decision addressed various challenges raised against the scheme and ordered immediate actions to be taken.

Reasons for Supreme Court's Decision

- The scheme allowing anonymous political donations was deemed to infringe upon the fundamental right to information under Article 19(1)(a) of the Constitution.
- The court emphasized the role of transparency in fostering participatory democracy and holding the government accountable.

Not Proportionally Justified

- The government's failure to adopt less restrictive methods, such as imposing a cap on anonymous donations, was highlighted.
- The objective of curbing black money was deemed insufficient to justify restrictions on the right to information.

Donor Privacy and Free Elections

- The court distinguished between genuine political support and contributions made with the expectation of influencing policies.

What is the Electoral Bond Scheme?

Electoral bonds are financial instruments similar to promissory notes, purchasable by companies and individuals from the State Bank of India (SBI) and subsequently donated to political parties. These bonds are redeemable only in the designated account of registered political parties. Individuals, either singly or jointly, can purchase these bonds.

Electoral Bond Scheme

- Introduced in 2018, the Electoral Bonds Scheme aimed to enhance transparency in political funding in India.
- It was promoted as an electoral reform to align with the country's move towards a cashless-digital economy.

Amendments Made to the Scheme in 2022

- Introduced an additional 15-day period during general elections to the Legislative Assembly.
- Validity of electoral bonds extended to fifteen calendar days from the date of issue.

Eligibility

Only political parties meeting certain criteria, such as securing at least 1% of votes polled in the last General Election, are eligible to receive electoral bonds.

- Unlimited corporate donations were found to undermine the fairness of elections.

Implications and Recommendations

- The SBI was instructed to cease issuing electoral bonds and provide detailed information on past transactions to the Election Commission of India (ECI).
- Electoral bonds within the validity period but not yet encashed by political parties must be returned.

Suggestions for Electoral Funding

- Regulation of donations and expenditure, public funding for parties, and disclosure requirements were proposed.
- Balancing transparency and anonymity in donation reporting was emphasized.
- Establishing a National Election Fund to allocate funds based on electoral performance was suggested.

Conclusion

The Supreme Court's decision to strike down the Electoral Bonds Scheme signifies a crucial step towards ensuring transparency and fairness in India's electoral process. It underscores the need for comprehensive reforms in political funding to safeguard the integrity of elections and promote public trust in democratic institutions.

Rights of Forest-Dwellers in India

Context: Earlier this month, the notification of the Thanthai Periyar Sanctuary in Erode district of Tamil Nadu triggered consternation among forest-dwellers around it. They have expressed fear that this is a prelude to their rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 (FRA) being denied. They have accused the district and State administrations of violating the relevant laws.

Background

- Recently, the notification of the Thanthai Periyar Sanctuary in Erode district, Tamil Nadu, has raised concerns among forest-dwellers in the vicinity.
- These residents fear that their rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA) might be denied.
- They accuse the district and state administrations of violating relevant laws.
- The Thanthai Periyar Sanctuary is situated between the Sathyamangalam Tiger Reserve of Tamil Nadu and the Male Mahadeshwara Wildlife Sanctuary and Cauvery Wildlife Sanctuary of Karnataka.
- Six tribal forest villages, excluded from the sanctuary due to not being revenue villages, lack basic rights and amenities and are confined to a 3.42 sq. km area.

Forest Rights Act, 2006

The Forest Rights Act (FRA), 2006 recognizes the rights of forest-dwelling tribal communities and other traditional forest dwellers to forest resources for various needs such as livelihood, habitation, and socio-cultural purposes.

Objectives include rectifying historical injustices, ensuring land tenure, livelihood, food security, and strengthening forest conservation efforts.

Rights Granted by the Act

Land Rights

Forest dwellers are entitled to land ownership up to 4 hectares per family for cultivated land, with restrictions on transfer.

Use Rights

Rights extend to extracting Minor Forest Produce and grazing areas, excluding timber.

Right to Protect and Conserve

Communities have the right to manage and protect forests, crucial for safeguarding against threats like forest mafias and land grabbers.

Eligibility and Recognition Process

- Scheduled Tribes members primarily dependent on forests for livelihood or residing there for at least three generations can claim rights.
- The recognition process involves Gram Sabha recommendations followed by scrutiny by screening committees at Taluka and District levels, culminating in a decision by the District Level Committee.

Gram Sabha

Consists of all eligible voters at the village level, defined under Article 243(b) of the Indian Constitution.

Rights in Thanthai Periyar Sanctuary

- A recent notification prohibits cattle-grazing in the sanctuary, potentially impacting Bargur cattle's access to traditional grazing areas.
- Despite the FRA recognizing grazing rights, an order from the Madras High Court imposes restrictions on cattle grazing only in national parks, sanctuaries, and tiger reserves, unique to Tamil Nadu.

New changes in the Water Act

Context: The Lok Sabha recently passed the Water (Prevention and Control of Pollution) Amendment Act, 2024. It makes important changes to the Water (Prevention and Control of Pollution) Act, 1974.

About Water (Prevention and Control of Pollution) Act of 1974 and Recent Amendments

- The Water (Prevention and Control of Pollution) Act of 1974 was enacted to address water pollution in India.
- It established the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCB) in September 1974.

- These boards are responsible for monitoring and preventing water contamination from sewage and industrial effluents.
- Industrial units need permission from state boards before establishing factories and must adhere to environmental norms.
- The CPCB collects data on water pollution and sets technical standards, while the SPCB enforces compliance with penalties including fines and imprisonment.
- Amendments to the Act have been made to improve water management and pollution control.
- The central government's legislative power is limited unless requested by two or more states due to water being a state subject.
- Recent amendments apply to certain states and union territories, replacing imprisonment for minor violations with fines.
- The central government gains authority to override SPCBs in specific scenarios and exempt certain industrial plants from SPCB consent requirements.
- Operating an industrial unit without SPCB consent remains a serious offense with potential imprisonment and fines.
- The central government can issue guidelines for SPCB consent procedures and penalties for unauthorized industry operation.
- It also gains authority over selecting SPCB chairpersons and issuing guidelines for consent-related procedures.

About CPCB

- A statutory organization under Mo.E.F.C.C. established in 1974.
- Derives authority from the Water (Prevention and Control of Pollution) Act, 1974.
- Also functions under the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986.
- Coordinates State Pollution Control Boards' activities, provides technical assistance, and resolves disputes.
- Apex pollution control organization in India, advising the central and Union Territory governments.
- Conducts environmental assessments, research, and monitors water and air quality.
- Works with industries and governments on pollution prevention and energy conservation.
- Employs approximately 500 full-time staff, including engineers, scientists, and environmental specialists.

GOVERNANCE

Global meet urges India to augment pulses production to meet nutritional needs

Context: The Global Pulses Conference, an annual gathering of pulse stakeholders, has advised India to increase pulse production to meet nutritional needs.

Key Remarks from Ministers

Ministers Arjun Munda and Piyush Goyal affirmed that the government has implemented measures to boost pulse cultivation, including regular increases in the minimum support price (MSP).

Conference Details

The two-day conference, organized by NAFED and GPC, aims to facilitate knowledge sharing on best practices and technological advancements in pulse cultivation.

Recent Trends in Pulse Production

- India leads globally in pulse production, consumption, and importation.
- Top five pulse-producing states include Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Karnataka.
- Pulse production has surged by 60% over the past decade, reaching 270 lakh tonnes in 2024.
- The partnership between NAFED and GPC seeks to position India as a global leader in pulse production.

Government Initiatives

- The government assures farmers a minimum support price, providing an attractive return on investment.
- MSP rates have seen significant increases, with up to 117% in masoor, 90% in moong, and 75% in chana dal over the past decade.
- India has achieved self-reliance in chickpeas and is nearing self-sufficiency in other pulse crops.
- Efforts are underway to achieve self-sufficiency in pulses by 2027, with a focus on expanding cultivation of tur and black gram.

About the Global Pulses Confederation (GPC)

- GPC is an organization representing the worldwide pulse industry.
- It encompasses various stakeholders, including growers, researchers, traders, and consumers.
- Headquartered in Dubai, GPC is licensed by the Dubai Multi Commodity Centre (DMCC).

The diversity blindspot in health policy

Context: Despite comprising nearly half of India's health workforce, women are significantly underrepresented in leadership positions within the health sector. An analysis of India's National Health Committees between 1943 and 2020 sheds light on the disparities and challenges faced by women in reaching the top of the health pyramid.

Key Highlights

Over-concentration of privileged actors

Lack of women in leadership positions

Gender pay gap and devaluation of women's work

Global trend

- **Over-concentration of privileged actors:** The pyramid's apex is dominated by men, doctors, individuals from Delhi-NCR, and bureaucrats, indicating a lack of diversity and over-representation of the privileged.
- **Lack of women in leadership positions:** Only 11% of women were present in health committees, with 36% of committees having no female representation.
- **Gender pay gap and devaluation of women's work:** Women, who constitute a significant portion of healthcare workers, earn 34% less than men on average and face limited opportunities for career advancement.

- **Global trend:** Similar gender disparities exist globally, with women occupying only a fraction of leadership roles in healthcare despite comprising the majority of the workforce.

Unique Challenges in Indian Health Policy Approaches

Concentration of medical leadership

- Delhi-NCR dominates, while hilly areas like the North-Eastern states have low representation.

Top-down approach and uniform policies

- Lack of consideration for diverse needs and contexts across different regions of India.

Inadequate representation of directly affected people

- Policies often fail to consider the perspectives of those directly impacted, such as patients and marginalized communities.

Recommendations

Identity-based considerations in decision-making

Instituting dedicated resources for women

Representation of directly affected people

- **Identity-based considerations in decision-making:** Take into account challenges faced by women and marginalized groups in hiring, promotion, and rotating decisions.
- **Instituting dedicated resources for women:** Provide flexible working arrangements and support mechanisms to help women break through glass ceilings.
- **Representation of directly affected people:** Include diverse voices in policy-making processes to ensure policies are responsive to the needs of all stakeholders, particularly those most affected by healthcare decisions.

Way Forward

- **Equitable representation:** Stakeholders from diverse backgrounds should be included in decision-making processes to ensure more inclusive health policies.
- **Addressing gender disparities:** Implement measures such as reserving seats for women and marginalized individuals on health committees.
- **Empowering women in leadership:** Provide resources and support systems to promote the advancement of women in healthcare leadership roles.
- **Incorporating diverse perspectives:** Ensure policies consider the needs and experiences of all stakeholders, including patients and marginalized communities.

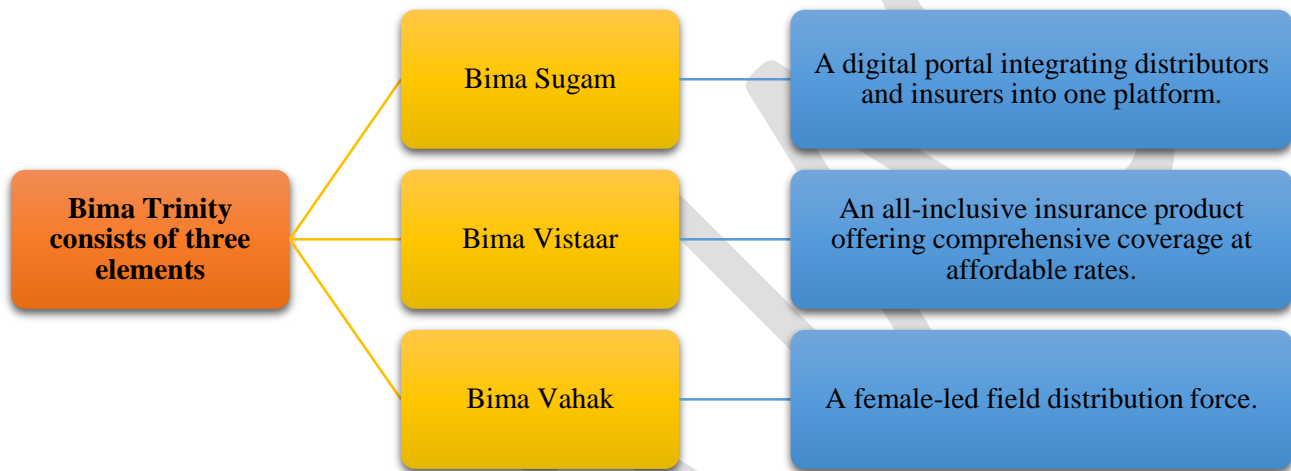
Addressing gender disparities in Indian health leadership requires concerted efforts to promote diversity, equity, and inclusion. By empowering women and incorporating diverse perspectives, India can build a more inclusive and responsive healthcare system for all.

IRDAI issues exposure draft on Bima Sugam e-marketplace for insurance

Context: The Insurance Regulatory and Development Authority (IRDAI) has introduced an exposure draft proposal for an insurance electronic marketplace known as Bima Sugam. Bima Sugam is likened to the UPI moment for insurance and is one part of the Bima trinity.

Bima Trinity

Bima Trinity is a three-pronged strategy by the Indian government to boost insurance penetration. It's an initiative aimed at enhancing the availability, affordability, and accessibility (the three As) of insurance products to a broader population.



Bima Sugam

About	<ul style="list-style-type: none"> • It's an online platform where customers can select a suitable insurance scheme from multiple options provided by various companies. • Bima Sugam caters to all insurance needs, including life, health, and general insurance (such as motor and travel). • This platform facilitates paperless settlement of claims, be it for health coverage or death claims, based on policy numbers.
Steps taken by IRDA	<ul style="list-style-type: none"> • IRDAI has formed a committee to develop the platform. • It plans to solicit proposals soon to appoint a service provider for the platform. • The service providers will be technological partners responsible for creating and operating the platform.
Benefits of Bima Sugam	<ul style="list-style-type: none"> • Single window for policyholders • Empowerment of consumers • Benefits for insurance companies and intermediaries • Universalization and democratization of insurance • Transition from physical to online mode • Aligning with the demat account model
Key highlights of the proposed guidelines	<ul style="list-style-type: none"> • Not-For-Profit Structure • Multi-Stakeholder Ownership • Regulatory Oversight • Risk Management

- Consent-Based Architecture
- Free Services for Consumers

Insurance Regulatory and Development Authority of India (IRDAI)

- IRDAI is a statutory body established under the Insurance Regulatory and Development Authority Act, 1999.
- Its responsibilities include regulating the insurance business, promoting its orderly growth, and safeguarding policyholders' interests.

Granting bail in UAPA cases

Context: The Supreme Court recently denied bail to Gurwinder Singh, an accused in an alleged Khalistan module, who is implicated in a larger conspiracy involving Sikhs for Justice, a pro-Khalistan group banned by the Indian government.

- Although courts have occasionally granted bail under the UAPA, despite its stringent conditions, they have generally interpreted Section 43D (5) to allow bail only in exceptional cases.

Unlawful Activities Prevention Act (UAPA), 1967

About	Enacted in 1967, the UAPA serves as India's primary counter-terrorism law, aimed at outlawing and penalizing unlawful and terrorist activities threatening the nation's integrity and sovereignty.
Key provisions	<ul style="list-style-type: none"> • The UAPA grants extensive powers to the Central Government to designate organizations as terrorist and prescribes penalties for involvement in such activities. • It applies to offenses committed both within and outside India, with both Indian and foreign nationals liable for charges.
Timeline	<ul style="list-style-type: none"> • A charge sheet must be filed within 180 days of arrest, with the investigation completed within 90 days. • Failure to complete the investigation within the stipulated time entitles the accused to default bail.
Special court	The act establishes special courts designated to conduct trials under UAPA.
Sanction to prosecute under UAPA	<ul style="list-style-type: none"> • Section 45(1) mandates prior sanction from the central or state government, or an authorized officer, for any offense under the act. • The sanction must be given within a prescribed time frame after considering the competent authority's report.
2019 Amendment of UAPA	The 2019 amendment broadened the scope of the act, empowering the government to designate individuals as terrorists and requiring NIA approval for property seizure during NIA-led investigations. It also added a treaty to the list of treaties defining terrorist acts.
Section 43D(5) of UAPA	This provision addresses the granting of bail to terror accused, making bail virtually impossible under UAPA.
Supreme Court on Section	<ul style="list-style-type: none"> • In various cases, the Supreme Court has upheld the stringent bail provisions under UAPA, emphasizing acceptance of the state's case without scrutinizing its merits.

**43D(5)
UAPA**

of

- However, recent rulings have recognized the right to speedy trial as a ground for granting bail, and there's ongoing debate regarding the interpretation of the "prima facie true" test for bail under UAPA.

Clause in draft India-EFTA pact may hit drug industry

Context: A provision within a preliminary text of a free trade agreement being discussed between India and the European Free Trade Association (EFTA) could potentially postpone access to affordable generic versions of patented medications in India by at least six years.

Trade and Economic Partnership Agreement (TEPA)

- Established in 2018, TEPA is geared towards enhancing trade and investment ties between India and EFTA.
- Its objectives encompass reducing tariffs, ensuring equitable market access, and strengthening intellectual property (IP) rights protection.

European Free Trade Association (EFTA)

- EFTA is a regional trade bloc and free trade area consisting of four European countries: Iceland, Liechtenstein, Norway, and Switzerland.
- These nations operate alongside the European Union (EU), participating in the European Single Market and the Schengen Area, but they are not part of the EU Customs Union.
- Formed on May 3, 1960, as an alternative trading bloc for European states that were not part of the European Economic Community (EEC), the EU's precursor.
- The Stockholm Convention of 1960 established EFTA, with seven founding countries (referred to as the "outer seven").
- A revised Vaduz Convention was signed on June 21, 2001, and came into effect on June 1, 2002.
- While EFTA member states retain the autonomy to engage in bilateral trade deals with third countries, they maintain a coordinated trade policy.
- Consequently, EFTA nations have collectively negotiated free trade agreements with the EU and numerous other nations.
- Iceland, Liechtenstein, and Norway are signatories to the Agreement on the European Economic Area (EEA) to access the EU's single market, overseen by the EFTA Surveillance Authority and the EFTA Court.

Navy chief inaugurates new defence systems

Context: Admiral R Hari Kumar, the Navy Chief, inaugurated the Precision Approach Radar (PAR) at INS Utkrosh in the South Andaman Islands during his 3-day visit from 6 to 9 February 2024. The visit aimed to bolster the operational capabilities of the Andaman and Nicobar Command (ANC).

About Precision Approach Radar (PAR)

- Manufactured by a Chennai-based company, PAR facilitates safe aircraft landings in adverse weather conditions like heavy rain and fog.
- It offers precise horizontal and vertical guidance even in low visibility scenarios, aiding pilots in aligning with the runway centerline.

- Positioned near the runway midpoint, PAR operates remotely and assists controllers in providing accurate navigational guidance to pilots.
- Its accuracy allows for lower minimum descent during landings, increasing visibility and safety for pilots.

IUHDSS Launch in Port Blair

- The Integrated Underwater Harbor Defence and Surveillance System (IUHDSS) was inaugurated at Naval Jetty, Port Blair, to bolster the security of Port Blair port.
- IUHDSS is proficient in detecting, identifying, and tracking surface and underwater targets in the vicinity of Naval Dockyards, enhancing port security.

Purpose of Navy Chief's Visit

- Admiral Kumar's visit aimed to evaluate and enhance the operational capabilities of India's sole operational Joint Services Command.
- Discussions during the visit encompassed Andaman and Nicobar Islands' role in military operations, the strategic significance of the Andaman and Nicobar Command, and support for India's 'Act East' policy.

Foundational Stone Laying and Facility Inaugurations

- Admiral Kumar laid the foundation stone for sailors' accommodation at Vijay Baugh and inaugurated various facilities to strengthen ANC capabilities.
- Additionally, he inaugurated Naval Communication Network (NCN) centers at Northern and Southern Islands units of ANC, promoting communication and situational awareness among tri-services.
- 'Saksham' VC Facility Inauguration:
- Kala Hari Kumar inaugurated the 'Saksham' VC facility at Navy Children School, Port Blair, during a special event, primarily for ANC personnel's spouses.
- The facility aims to enhance communication and support jointness among tri-services in ANC operations.

New guidelines released for community radio stations

Context: The Information and Broadcasting Minister released revised policy guidelines for establishing Community Radio Stations (CRSs) in India on World Radio Day (February 13th), aiming to bolster the community radio sector.

- These guidelines were unveiled during the Regional Community Radio Sammelan (South) at Anna University, Chennai, commemorating 20 years of Community Radio in India.

What are Community Radio Stations (CRS)?

- Community Radio is a distinct tier in Radio Broadcasting, separate from Public Service Radio broadcasting and Commercial Radio.
- CRSs are low-power Radio Stations operated by local communities.
- In 2002, the Indian government approved a policy allowing well-established educational institutions to set up CRSs.

- The policy was amended in 2006, enabling community-based organizations like ICAR institutions, Krishi Vigyan Kendras, Registered Societies, Public Charitable Trusts, etc., to establish and operate CRSs, fostering greater community participation in developmental and social issues.

Significance of Community Radio

- CRSs offer a platform for local voices to address issues related to Health, Nutrition, Education, Agriculture, etc.
- Broadcasting in local languages and dialects facilitates instant connection and engagement.
- CRSs promote people's involvement in development programs through a comprehensive approach.
- They preserve local folk music and cultural heritage, reflecting India's linguistic and cultural diversity.
- CRSs serve as instruments for positive social change, empowering communities.

Establishment of CRS in India

- India's first Community Radio began at Anna University, Chennai, on February 1st, 2004.
- Licenses were later extended to well-established educational institutions and expanded to include 'Non-profit' organizations.
- The government facilitated ease of registration by transitioning the application process online.
- The sector has witnessed significant growth, with CRS numbers rising from 140 in 2014 to 481 in 2023, with 155 added in the last two years.
- The target is to establish over 1000 CRSs in India within the next three years.

Revised Policy Guidelines

- The revised guidelines entail an increase in advertising rate to ₹74 per 10 seconds and advertising time to 12 minutes per hour.
- Licensees must form an advisory and content committee with 50% representation for women.
- Eligible organizations operating in multiple districts can establish a maximum of six CRSs in different districts, subject to specific conditions.
- The initial permission period has been extended to 10 years, and the validity of the Letter of Intent is set at one year.
- A three-month buffer is provided for unforeseen circumstances, with fixed timelines for the application process.
- The revised policy aims to stimulate growth in the community radio sector.

Weather Information Network and Data System (WINDS)

Context: The Union Ministry of Agriculture & Farmers Welfare, Government of India, has initiated the Weather Information Network and Data System (WINDS) to produce long-term, hyper-local weather data.

Reasons for Transitioning to Hyperlocal Extreme Weather Forecasting in India

- Weather forecasting is crucial for informed decision-making in disaster management, especially regarding rain, cyclones, heatwaves, and drought.
- The Indian Meteorological Department (IMD) is the primary government agency for meteorology, employing complex techniques to forecast weather patterns.

- Despite improvements, Indian forecasts can still be inaccurate, particularly during winter and summer monsoons, due to the inherently higher variability of tropical weather.

Main Challenges in Indian Weather Forecasting

- Lack of sufficient weather monitoring ground stations, with only around 800 automatic weather stations (AWS) and 37 doppler weather radars (DWR) against the required 3,00,000 and 70 respectively.
- Reliance on outdated prediction technologies, necessitating the development of an integrated system to address data gaps.

Challenges in Predicting Air Pollution and the Way Ahead

- Air pollution, particularly dense fog, poses health risks, necessitating affordable and reliable air quality monitoring systems.
- Indian initiatives such as Make in India and efforts by IITs to establish affordable air quality sensors aim to address this issue.
- An integrated AI/ML-based model incorporating data from new sensors can improve fog prediction, aiding transportation and health-related decision-making.
- About the India Meteorological Department (IMD):
- Established in 1875, IMD is the National Meteorological Service of India under the Ministry of Earth Sciences.
- It provides meteorological observations and forecasts for various sectors and issues warnings for severe weather phenomena.
- Additionally, IMD conducts research in meteorology and allied disciplines.

About the WINDS Portal

- Launched in July 2023 by the Department of Agriculture & Farmers Welfare, it aims to install over 200,000 ground stations to enhance weather data collection.
- The system will generate hyper-local weather data to improve predictions and decision-making, facilitating wider applications in agriculture and other sectors.

Over 3 lakh ASHAs apply for Centre's health cover

Context: The Indian government has decided to expand the coverage of the Ayushman Bharat free public health insurance scheme to include Accredited Social Health Activists (ASHAs), Anganwadi workers, and helpers.

- The Health Ministry has collected Aadhaar details for over three lakh ASHA workers and 23 lakh Anganwadi personnel from various states.

Key Highlights

- The Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) provides health coverage up to ₹5 lakh annually to impoverished families, recently extended to include healthcare workers as per the Finance Minister's announcement during the interim Union Budget 2024-25.
- The ASHA program, vital for community health, has played a significant role in providing healthcare access, particularly during the COVID-19 pandemic.
- As of December 31, 2023, India had over 13 lakh Anganwadi workers, over 10 lakh helpers, and 9.83 lakh ASHAs, making it the largest community volunteer program worldwide.
- Currently, 55 crore individuals across 12 crore families benefit from AB-PMJAY, with states/UTs expanding coverage at their expense.

- Up to December 20, 2023, approximately 28.45 crore Ayushman cards have been issued, leading to 6.11 crore hospital admissions valued at ₹78,188 crore, including 1.7 crore admissions in 2023 worth over ₹25,000 crore.
- The scheme has achieved gender equity in healthcare access, with women comprising about 49% of Ayushman cardholders and 48% of hospital admissions, across 26,901 empanelled hospitals, including 11,813 private ones.

Accredited Social Health Activists (ASHA)	
About	<ul style="list-style-type: none"> • The ASHA program began in 2005-06 under the National Rural Health Mission, initially targeting rural areas and later extended to urban settings through the National Urban Health Mission in 2013. • It has become the largest community health worker program globally, fostering community participation in health. • As of June 2022, there are over 10.52 lakh ASHAs in all states/UTs (excluding Goa).
Role of ASHA	<ul style="list-style-type: none"> • ASHA serves as a community-level health care facilitator and service provider, raising awareness on health issues. • They deliver crucial services in maternal child health, family planning, and under the National Disease Control Programme. • ASHA workers, predominantly women, serve populations of about 1,000 in rural areas and 2,000 in urban settings, with adjustments made based on local needs.
Selection of ASHA	<ul style="list-style-type: none"> • ASHA must primarily be a woman resident of the village, married/widowed/divorced, aged preferably between 25 to 45 years, and literate. • Preference is given to those with at least a 10th standard qualification if available in sufficient numbers. • ASHA workers are considered honorary/volunteer positions, not government employees.

Ayushman Bharat Approach

- It comprises establishing health and wellness centers for accessible healthcare and implementing the Pradhan Mantri Jan Arogya Yojana (PMJAY) to financially safeguard poor families from health-related expenses.
- PMJAY provides a ₹5 lakh insurance cover per family for secondary and tertiary care, with beneficiaries identified through the latest Socio-Economic Caste Census (SECC) data.
- Beneficiaries can seek treatment in any empanelled hospital, with costs shared between the center and state governments.
- Empanelled hospitals adhere to predefined rates for medical procedures under PMJAY, ensuring affordability and transparency.
- The National Health Agency, established as an autonomous entity, collaborates with state governments for effective PMJAY implementation.

MILITARY EXERCISES

Indian martial arts training for Army post Galwan clash

Context: In response to heightened tensions following the Galwan clash between India and China, the Indian Army has introduced martial arts training alongside regular physical exercises. This initiative aims to enhance the combat skills and physical fitness of troops.

Major Inclusions

Punjab Regiment – Gatka

- The Punjab regiment has incorporated Gatka, a traditional martial art originating from Punjab in the 15th century. Gatka involves stick-fighting techniques using wooden sticks to simulate swords. It has historical significance as it was taught by Sikh gurus.

Gorkha Regiment - Khukuri Dance

- The Gorkha Regiment has integrated the Khukuri Dance into its training regime. This dance, performed exclusively by men, symbolizes victory and is an integral part of Gurkha culture. The Khukuri, a small knife, holds symbolic importance in this dance form.

Madras Regiment Kalaripayattu

- The Madras regiment has embraced Kalaripayattu, an ancient martial art from Kerala. Kalaripayattu emphasizes physical conditioning, weapon training, and indigenous healing techniques. It aims to achieve harmony between mind and body.

Udhampur-based - Krav Maga

- The Udhampur-based regiment has adopted Krav Maga, an Israeli-origin martial art. Krav Maga focuses on practical self-defense techniques, including strikes, kicks, and grappling. It equips soldiers with skills for real-life combat situations.

Exploration of Various Indian Martial Art Forms

Martial Art	State	Description	Famous For
Thang Ta	Manipur	A martial art with two main components: Thang-ta (armed combat) and Sarit Sarak (unarmed fighting).	Known for its use of primary weapons like the thang (sword) and ta (spear).
Lathi Khela	West Bengal	Utilizes lathi (wooden stick) as a weapon, an ancient martial art in Punjab and Bengal.	Practitioners known as lathials.
Gatka	Punjab	Traditional martial art associated with Sikh gurus, emphasizing sword and sticks fighting skills.	Known for incorporating self-defense techniques and controlled combat.
Kalaripayattu	Kerala	Ancient martial art based on knowledge of the human body,	Considered one of the oldest fighting systems and a precursor to Kung-Fu.

Martial Art	State	Description	Famous For
		practiced in Kerala and parts of Tamil Nadu.	
Mallakhamb	Madhya Pradesh	Traditional sport involving gymnastic postures and wrestling grips with a vertical pole, cane, or rope.	Known for its aerial yoga and gymnastic postures on a stationary pole.
Silambam	Tamil Nadu	Weapons-based martial art, incorporating a broad range of weapons and animal motions like snake, tiger, and eagle forms.	Famous for its use of various weapons and animal-inspired movements.
Musti Yuddha	Varanasi	Unarmed combat technique emphasizing punches, kicks, knees, and elbows, originating in Varanasi, Uttar Pradesh.	Known for teaching self-defense without the use of arms and ammunition.
Kathi Samu	Andhra Pradesh	Ancient martial art using various kinds of swords, with stick fights known as 'vairi' as a precursor to real sword fights.	Prominent for its use of different sword techniques and stick fights.
Sqay	Kashmir	Sword-fighting martial art with a curved single-edged sword and a shield.	Known for its use of armed tactics with swords and various unarmed techniques.
Paikha Akhadha	Odisha	Traditional warrior school, used as a peasant militia training school in Odisha.	Known for conventional physical activities and rhythmic gestures with weapons.

The incorporation of diverse martial arts into Indian Army training reflects a strategic approach to enhancing combat skills and physical fitness. By drawing from various Indian and international martial art forms, the Army aims to equip its personnel with a wide range of techniques for effective self-defense and combat operations.

INTERNATIONAL RELATION

India has rejected demand for data exclusivity in drug development in FTA talks'

Context: India has firmly rejected the demand from four European nations in the EFTA bloc for the inclusion of a 'data exclusivity' provision in proposed free trade agreements, citing its commitment to protecting the interests of the domestic generic drugs industry.

About the European Free Trade Association (EFTA) Bloc

The EFTA bloc consists of

- Iceland
- Liechtenstein
- Norway
- Switzerland

Formation

- Established in 1960 by seven European countries as an alternative trade bloc to the EU.

Trade Relations

- Members have free trade agreements among themselves and with other regions.

Activities

- Participate in the European Single Market through the EEA Agreement.

Institutions

- EFTA Court, EFTA Surveillance Authority, EFTA Secretariat.

Relationship with EU

- Not part of the EU, but have close economic ties and trade agreements with EU countries.

Debate over Data Exclusivity

- **Pharmaceutical Sector Implications:** Data exclusivity grants innovator companies exclusive rights over technical data, hindering competitors from obtaining marketing licenses for cheaper versions during the exclusivity period.
- **Influence of Swiss Pharma Firms:** Despite Switzerland advocating for data exclusivity, India maintains its stance against it.

Protection of Generic Industry

Significance of
Generic Industry

Export Growth

Trade and Economic
Partnership
Agreement (TEPA)

Advanced Stage of
Talks



- **Significance of Generic Industry:** India emphasizes the generic drug industry’s significant contribution to exports and the government’s commitment to safeguarding its interests.
- **Export Growth:** India highlights the industry’s growth aligning with export promotion objectives, showcasing its importance to the national economy.
- **Trade and Economic Partnership Agreement (TEPA):** India and EFTA have been negotiating the TEPA since January 2008, covering chapters including intellectual property rights.
- **Advanced Stage of Talks:** Negotiations cover trade in goods, rules of origin, intellectual property rights, and other key areas.

Issue in the India– European Free Trade Agreement (EFTA)

Intellectual Property Rights

- Management of intellectual property rights in the pharmaceutical sector is a major issue in the India-EFTA Free Trade Agreement.
- Discussions on this issue have been ongoing since 2008, with both sides aiming to find a compromise.
- The agreement grapples with patenting, where drug originators are granted exclusive rights for a certain period.
- Governments can enforce ‘compulsory licensing’ to override monopolies in the interest of public health.

	EFTA Overview <ul style="list-style-type: none"> • Inter-Governmental Organization: EFTA promotes and intensifies free trade among member states, serving as an alternative for states not part of the EU. • Trade Dynamics: India’s exports to EFTA countries have shown steady growth, with the trade gap currently favoring the EFTA group.

Data Exclusivity

- A critical point of debate is data exclusivity, which protects clinical trial data for a minimum of six years.
- India has resisted including data exclusivity in the agreement to protect its pharmaceutical industry.

High Cost of Drug Discovery

- Negotiations are influenced by the high cost of drug discovery, which creates a divide between original drug inventors and generic drug manufacturers.
- The expense of developing new drugs contrasts with the lower costs of producing generic versions, highlighting tensions in the global pharmaceutical industry.

India’s Position in the Negotiations

- India opposes data exclusivity to protect its significant pharmaceutical industry and ensure access to affordable medication.
- Balancing drug patents with access to affordable medication is crucial for India.
- India's experience with COVID-19 vaccine development underscores its push for a more flexible intellectual property regime in the Free Trade Agreement.

Trade and Economic Partnership Agreement (TEPA)

Objective	Coverage	Recent Highlights
<ul style="list-style-type: none"> TEPA aims to enhance trade and investment between India and EFTA by eliminating/reducing tariffs and non-tariff barriers. It seeks to ensure fair market access conditions, protect intellectual property rights, and enhance cooperation in various areas. 	<ul style="list-style-type: none"> Comprehensive agreement covering trade in goods, services, investment, intellectual property rights, competition, government procurement, trade facilitation, and dispute settlement. 	<ul style="list-style-type: none"> Acknowledgment of challenges in the global economic and trade environment. Commitment to address bilateral trade and economic partnership issues constructively. India's proposal to include talks on gender equality and women empowerment in TEPA negotiations.

India's Relations with EFTA Countries



- India and Switzerland Relations:** Collaboration in technical and scientific cooperation, skill training, and investment. Switzerland is a significant investor in India.
- India and Norway Relations:** Cooperation in the blue economy, academic collaborations, and investment. More than 100 Norwegian companies operate in India.
- India and Iceland Relations:** Common values of democracy and multilateralism, cooperation in trade, renewable energy, and culture. Support for India's candidature for a permanent seat at the UN Security Council.
- India and Liechtenstein Relations:** Friendly relations with modest bilateral trade and cooperation in economic matters.

Way Forward

- India should invest more in fundamental research and ethical drug trials to secure its pharmaceutical future. The successful development of COVID-19 vaccines in India serves as a model for this approach.
- India's firm stance reflects its commitment to safeguarding the interests of its generic drug industry. As negotiations with EFTA progress, India focuses on promoting fair trade while protecting domestic industries.

PM Modi's visit to the United Arab Emirates

Context: Prime Minister Modi is currently on an official trip to the United Arab Emirates (UAE), marking his seventh visit to the country since 2015 and his third in the last eight months.

India – UAE Bilateral Relationship



Political Relations

- Diplomatic relations between India and the UAE were established in 1972, evolving significantly over time.
- In January 2017, a Comprehensive Strategic Partnership Agreement was signed between India and the UAE.
- High-level visits from both sides have strengthened bilateral relations.
- In February 2019, India was invited as the "Guest of Honour" at the Organisation of Islamic Cooperation's 46th Session in the UAE.
- PM Modi visited the UAE in August 2019, receiving the highest civilian award, the 'Order of Zayed'.
- The Crown Prince of the UAE visited India as the Chief Guest at the Republic Day celebrations in January 2017.
- The foundation stone for the first traditional Hindu Temple in Abu Dhabi was laid in April 2019.
- In February 2022, PM Modi and the Crown Prince held a Virtual Summit, issuing a Joint Vision Statement.

Trade Relations

- India-UAE trade reached USD 85 billion in 2022-23, making the UAE India's third-largest trading partner and second-largest export destination.
- Both countries aim to achieve a trade target of USD 100 billion before the G-20 meeting in Delhi in September 2023.
- The Comprehensive Economic Partnership Agreement (CEPA) between India and the UAE was signed in February 2022.

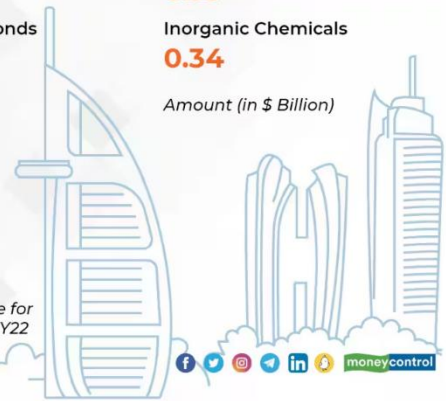
Investment

- UAE emerged as the fourth-largest investor in India in 2022-23, witnessing a three-fold increase in Foreign Direct Investment (FDI).
- NRI remittances from UAE to India amounted to US\$ 17.56 billion in 2018.
- Energy Cooperation:

MAJOR EXPORTS TO UAE

Processed petroleum	3.7	Ocean vessels	1.01
Jewellery	2	Organic Chemicals	0.51
Mobile phones & components	1.5	Cereals (mostly Rice)	0.35
All forms of Diamonds	1.4	Inorganic Chemicals	0.34
Apparel	1.4		
Iron & Steel	1.17		

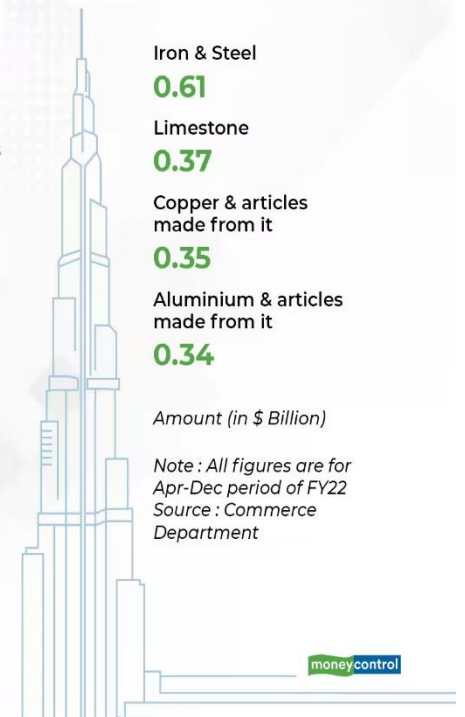
Note : All figures are for Apr-Dec period of FY22
Source : Commerce Department



MAJOR IMPORTS FROM UAE

Petroleum Crude	8.9	Iron & Steel	0.61
Petroleum Gases & gaseous hydrocarbons	3.9	Limestone	0.37
Diamonds of all forms	6.7	Copper & articles made from it	0.35
Gold in all forms	5	Aluminium & articles made from it	0.34
Other petroleum oils	1.1		
Plastic & articles made from it	0.96		

Note : All figures are for Apr-Dec period of FY22
Source : Commerce Department



- Agreements between ADNOC and ISPRL have been signed to establish strategic crude oil reserves in Mangalore and explore storage possibilities in Padur.
- ONGC-led consortium secured a stake in the Lower Zakum Concession.

Highlights of PM Modi's Visit to UAE

- PM Modi met UAE's President Sheikh Mohamed bin Zayed Al Nahyan, signing eight pacts to enhance cooperation.
- Key pacts include the Bilateral Investment Treaty, MoU on energy cooperation, and agreements on regional connectivity, digital infrastructure, and heritage preservation.
- PM Modi addressed the Indian community in the UAE at 'AHLAN MODI' and inaugurated the first Hindu stone temple in Abu Dhabi, depicting universal values and stories of harmony from various cultures.

SCIENCE & TECHNOLOGY

CSIR NAL flies test-drone that can double up as 'pseudo satellite'

Context: National Aerospace Laboratories (NAL) recently conducted successful tests on a solar-powered High Altitude Pseudo Satellite (HAPS), a UAV.

About HAPS

- NAL conducted successful tests on an unmanned aerial vehicle known as High Altitude Pseudo Satellite (HAPS) in Challakere, Karnataka, earlier this month.
- The system measures 5 meters in length, has an 11-meter wingspan, and weighs 23 kg. It ascended to approximately 3 km and remained in position for around eight hours.
- NAL has planned a series of tests expected to result in a full-scale craft, with a wingspan of 30m (similar to a Boeing 737), by 2027, capable of reaching 23 km altitude and remaining airborne for at least 90 days.
- The institute aims to design and manufacture various components of the HAPS, including propellers, battery management systems, carbon-composite airframes, flight-control systems, and high-powered electric motors capable of withstanding extreme temperatures.
- In an unrelated project, a Bengaluru-based private company recently conducted the first test flight of a solar-powered, long-endurance drone, which flew for 21 hours.

Benefits/Advantages of HAPS

- These solar-powered vehicles bridge the gap between UAVs flying at lower altitudes and conventional satellites in space.
- HAPS have diverse applications, including telecommunications, emergency/public safety communications, intelligent transportation systems, maritime surveillance, environmental monitoring, and land border control.
- Compared to ground-based communication networks, HAPS can cover larger areas with less interference and facilitate data transfer between satellites and ground-based telecom networks.
- HAPS are more cost-effective and easier to launch compared to conventional satellites.



Significance w.r.t. India

- Hindustan Aeronautics Limited (HAL) announced in 2022 its collaboration with a startup to develop a high altitude pseudo satellite, recognizing the need for innovative solutions to safeguard India's extensive land borders and coastline.
- HAPS, hovering at the edge of the Earth's atmosphere, can enhance border patrolling, track movements in enemy territory or deep seas, and provide round-the-clock surveillance, navigation, and missile detection.
- Equipped with advanced cameras and sensors, HAPS platforms contribute significantly to border security, similar to efforts by China's AVIC in developing surveillance-oriented HAPS platforms.
- NAL, India's sole government aerospace R&D lab established in 1959, focuses on high-tech aerospace disciplines and has made substantial contributions to global aerospace programs over five decades, supporting national strategic objectives.

Earth-wide telescope confirms black hole's shadow is 'real'

Context: Scientists have unveiled new details of a colossal black hole 53 million lightyears away first photographed by the earth-wide Event Horizon Telescope (EHT) in 2017. The feat provided the first visual evidence that black holes exist, confirming a fundamental prediction of general relativity.

Imaging the Black Hole	
Advancements in Black Hole Imaging	<ul style="list-style-type: none"> • Scientists have made significant strides in understanding black holes, notably one located 53 million light-years away, initially imaged in 2017 by the Event Horizon Telescope (EHT). • This groundbreaking imaging marked the first visual confirmation of black holes' existence, aligning with a fundamental aspect of general relativity.
Detailed Analysis of Black Hole's Image	<ul style="list-style-type: none"> • Recent enhancements in EHT capabilities have enabled finer observations near the black hole's event horizon, revealing a distinct ring formation around it. • Initial observations identified the black hole's "shadow," shaped by gravitational effects, validating its mass, size, and shape against predictions from general relativity. • Latest findings, from improved telescope resolution and coverage, reaffirm the dimensions and characteristics of the black hole's shadow, enhancing our understanding of these enigmatic cosmic entities.

Event Horizon Telescope (EHT)

The EHT comprises a global network of 8 radio telescopes, utilizing very-long baseline interferometry, including telescopes such as the Atacama Large Millimetre/sub-millimetre Array and the South Pole Telescope.

- Data synchronization among these telescopes, employing highly accurate clocks, enables the study of celestial objects.
- The addition of the Greenland Telescope has notably enhanced resolution in the north-south direction.

Enhancements and Discoveries

- Efforts to improve EHT capabilities involved increased data recording rates, enhanced spatial information capture, and the incorporation of the Greenland Telescope.
- Notable discoveries include a bright, asymmetric ring of light detected in 2017, aligning with characteristics of a supermassive black hole.

Piecing the Data Together

- In a recent campaign, EHT collected data over six days in April 2018, involving nine stations and four frequencies.
- General relativistic magnetohydrodynamic simulations were employed to model the M87 black hole, considering its gravitational influence as per Einstein's theory.

Gravitational Lensing

- Recent EHT findings confirmed an asymmetric ring structure around the black hole, indicating consistent gravitational lensing effects.
- Observations from 2017 and 2018 demonstrated the ring's stable diameter, showcasing the consistent bending of light by the black hole's gravity.

Significance of EHT Observations

- Observations revealed a brighter southwest portion of the ring, attributed to the black hole's rotation.
- These findings align with expectations for a rotating black hole, with implications for understanding its dynamics.
- Changes in the orientation of the black hole's accretion disk and emitted jet suggest complex interactions influenced by the black hole's spin.
- EHT's efforts consistently validate ring formation and black hole traits, showcasing advancements in observational techniques.
- Future plans include a "movie project" in 2026 to observe changes in the black hole's brightness, offering further insights into its dynamics.

Untapped potential of stem cells in menstrual blood

Context: About 20 years ago, biologist Caroline Gargett identified two cell types in the endometrium through intensive microscopy, suspected to be adult stem cells due to their regenerative properties. These cells, termed endometrial stromal mesenchymal stem cells, opened new avenues for tissue repair and disease treatment research.

Blood Cells in Menstrual Blood

Endometrial stem cells can be obtained non-invasively from menstrual blood, termed menstrual blood-derived stem cells. The discovery of menstrual stem cells was first made from menstrual blood in 2007. These cells offer various advantages, being easily obtainable from women and potentially usable in treatments without risk of tissue rejection.

Endometrium

The endometrium lines the uterus, consisting of a basal layer and an upper functional layer that sheds during menstruation. Throughout the menstrual cycle, the endometrium thickens to support a fertilized egg, then regresses as the upper layer sheds.

Key Role

- The endometrium plays a crucial role in repairing and regenerating the upper tissue layer shed during menstruation, vital for pregnancy by supporting embryo development.
- Endometrial stem cells contribute to this regrowth and may also influence infertility.

Embryonic vs. Adult Stem Cells

- Stem cells are derived from embryos or adult tissues.
- Embryonic stem cells are pluripotent but ethically controversial due to embryo destruction during retrieval.
- Adult stem cells, like those in bone marrow, are less controversial but have limited capabilities and may require invasive collection procedures.

Stem Cells

- Stem cells possess the unique ability to differentiate into specialized cell types in the body and replace damaged or lost cells.
- They are capable of self-renewal, unspecialized, and can give rise to specialized cell types.