Decembar 2024 Issue

VAJIRAO & REDDY IAS

Monthly Magazine

For UPSC | IAS | IPS & State Civil Services Aspirants

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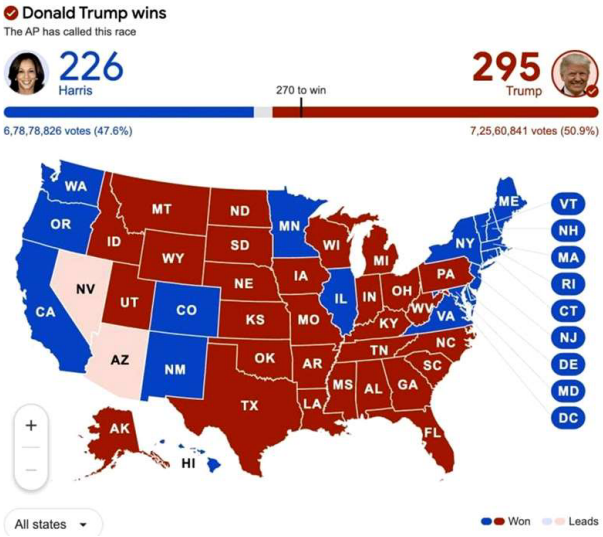
BURNING NEWS

USA PRESIDENTIAL ELECTIONS

- On 6 Nov 2024, Donald Trump won the US elections. The US media hasannounced Trump's win.
- His rival Kamala Harris has secured 226 electoral colleges, while Trump surpassed the 270 - the majority mark.
- He will be the second Republican to get a second term in office in 20 years. George Bush, a Republican, was president from 2001 to 2009.



THE ELECTIONS

- On November 5, 2024,The 2024 United States presidential election was held where U.S. citizens chose between former President Donald Trump (Republican) and Vice President Kamala Harris (Democrat) for the office of the 47th President.
- Unlike the direct election system used in countries like France, the United States elects its president through a more complex, multi-stage process.
- The election process is governed by the U.S. Constitution, which states that the winner is determined not by the popular vote, but by the Electoral College.
  - o The popular vote is the total number of votes cast by people in an election.
  - o In a presidential election in the U.S., it shows how many people voted for each candidate.

IS PRESIDENT OF USA PART OF THE CONGRESS ?

NO

What is Congress?

- Congress is the legislative branch of the U.S. government. It's the part of the government that makes laws.
- Congress is bicameral, meaning it has 2 houses:
  - o The Senate and
  - o The House of Representatives.

WHO IS A SENATOR ?

- A Senator is a member of the Senate, which is the upper house of Congress.
- There are 100 Senators in total from 50 states, with 2 Senators from each state. No matter how big or small the state is, each has equal representation in the Senate.
- Senators serve 6-year terms. Every two years, about one-third of the Senate is up for re- election.

WHO IS A REPRESENTATIVE ? (IN THE HOUSE OF REPRESENTATIVES)

- A Representative is a member of the House of Representatives, which is the lower house of Congress.
- There are 435 Representatives in total. Each state gets a number of Representatives based on its population. States with more people, like California, have more Representatives than smaller states like Wyoming.

- Representatives serve 2-year terms. All 435 seats are up for election every two years.

  There are 535 members in Congress (100 Senators + 435 Representatives).

WHAT IS AN ELECTORAL COLLEGE FOR THE PRESIDENT?

- The Electoral College is a system used in the United States to elect the president and vice president.
- It's not a direct popular vote where the person with the most votes wins.
- Instead, the U.S. uses a group of electors from each state to decide who wins.

HOW DOES IT WORK ?

Electors in Each State:

- Each state has a certain number of electors based on its population.
- Electors are not Senators or Representatives.
- Senators and House Representatives are elected to serve in Congress.
- Electors, on the other hand, are chosen specifically for the purpose of voting in the Electoral College during the presidential election.

HOW ELECTORAL VOTES ARE ASSIGNED?

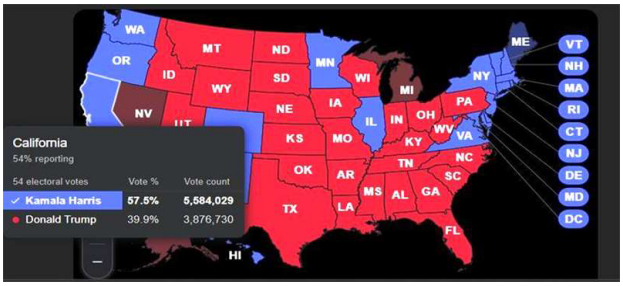
- **How Electoral Votes Are Assigned:**
  - Each state gets electoral votes equal to the total number of Senators plus the number of House Representatives. So, every state gets at least 3 electoral votes (2 Senators + 1 Representative).
  - **For example:**
    - California, the most populous state, has 54 electors (2 Senators) + (52 Representatives) = 54 electoral votes
    - Wyoming, one of the smallest states, has 3 electors (2 Senators + 1 Representative).
- **Formula:**

  Electoral Votes for a State = Number of Senators (always 2) + Number of House Representatives (based on population).

- **Total Electoral Votes:**

  There are 538 total electoral votes (100 Senators + 435 Representatives + 3 votes for Washington D.C.).
  - Washington DC got 3 electoral votes from the 23rd AA in 1961.
- To win the presidency, a candidate needs 270 electoral votes.
- **The Popular Vote:**
  - On Election Day (the first Tuesday after the first Monday in November), voters in each state cast their ballots for a presidential candidate.
  - When voters vote, they are really voting for a slate of electors pledged to that candidate.
  - In 48 states out of 50, the candidate who wins the popular vote receives all of that state's electoral votes.

    The exceptions are Maine and Nebraska, which divide their votes differently based on proportional system.
- If 57% of voters in California vote for Kamala Harris, then all 54 of California's electors (the electoral votes) will be pledged to vote for Kamala Harris in the Electoral College.



- If 56% of voters in Texas vote for Donald Trump, then all 40 of Texas's electors will be pledged to vote for Donald Trump.

ROLE OF ELECTORS AFTER POPULAR VOTE

- **Meeting of the Electors:**
  - After the popular vote, the electors meet in December in their state capitals to cast their votes for president and vice president.
  - Most electors vote based on the results of the popular vote in their state (but they are not legally required to in every state).
- Faithless Electors: If an elector votes for someone other than the candidate they promised to support, they are called a faithless elector.
  - Some states have rules against this, and faithless electors can be replaced.
  - In 2016, there were seven faithless electors, but their votes didn't change the overall result.
- **Counting the Votes:**
  - In January, Congress counts the votes of the electors during a joint session.
  - If a candidate gets 270 electoral votes, they are declared the winner.

WHAT HAPPENS IF THERE IS A TIE ?

A tie in the Electoral College is rare but not impossible. It has occurred twice in U.S. history:

- **1800:** Thomas Jefferson and Aaron Burr had the same number of electoral votes.
- **1824:** Andrew Jackson, John Quincy Adams, and two other candidates had split votes. If there is a tie, or if no candidate receives a majority of electoral votes, the decision is thrown to the U.S. House of Representatives.
- **House of Representatives:** In this case, each state's congressional delegation casts one vote to choose the President. A majority of 26 votes is needed to win.
- The Senate would then select the Vice President, with each Senator casting one vote. A majority of 51 votes is required.

If no winner is chosen by January 20 (Inauguration Day), the Vice President becomes the Acting President until a decision is reached.

CRITICISMS OF THE ELECTORAL COLLEGE

- **Winner-Takes-All System:** In most states, the candidate who wins the popular vote in that state gets all the electors, which can make the system feel unfair, especially if a candidate wins the popular vote nationally but loses the electoral vote.
- **Disproportionate Influence:** Small states like Wyoming have more power per person because they have a minimum of 3 electors, regardless of their small population.
- **Popular Vote *Vs.* Electoral Vote:** In 2000 (George W. Bush vs. Al Gore) and 2016 (Donald Trump vs. Hillary Clinton), the winner of the popular vote did not win the election because the other candidate had more electoral votes. This makes people question whether the system truly reflects the will of the people.

PROBABLE IMPACTS ON INDIA

- **Trade:** India's exports can be dented as tariff wars between India & USA was the hallmark of previous presidency term of Donald Trump.
- **Defence Cooperation:** This can strengthen further with more tech transfers happening to India. Trump is keen on containing China.
- **Immigration:** This can be a challenging domain due to the inward & protectionist tendencies of Donald Trump. Visa delays can be eminent.
- **Cut on outsourcing:** Trump has been vocal about bringing industries back to America (which have been outsourced to developing countries like China & India)
- **Geopolitical Conflicts:**
  - **Russia- Ukraine War:** Can be a decisive moment in the war as Trump talks about stopping funds to Ukraine.
  - **West Asia:** Trump has been very tough on Iran. USA's support to Israel will increase.

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6th AITIGA Joint Committee Meetings

Why in News?

The 6th ASEAN-India Trade in Goods Agreement (AITIGA) Joint Committee and related meetings were recently held in New Delhi. These meetings marked a significant phase in reviewing the AITIGA to strengthen and enhance trade relations between India and the ASEAN nations.

Key Highlights of the 6th AITIGA Joint Committee Meetings

- **Review Demand by India**:
  India raised a demand for a review of the AITIGA, which was originally implemented in 2010, arguing that the agreement had resulted in disproportionate trade benefits for ASEAN countries. While India's exports to ASEAN increased from USD 25.62 billion (FY 2010-11) to USD 41.2 billion (FY 2023-24), imports surged from USD 30.6 billion to USD 79.66 billion in the same period. This has led to a growing trade deficit for India with ASEAN.
- **India's Objectives in the Review**:
  - **Enhanced Market Access**: India seeks greater market access for Indian goods, particularly urging Vietnam and other ASEAN countries to make stronger commitments toward market opening for Indian exports.
  - **Stricter Rules of Origin (ROO)**: One of India's key demands is for stricter ROO provisions to prevent Chinese goods from being routed through ASEAN countries at preferential rates, thus bypassing tariffs.
  - **Advancement in Negotiations**: Initial progress was made towards the initiation of tariff negotiations, a crucial part of the review process to address the concerns raised by India.

Key Statistics & Economic Impact

- **ASEAN's Share in India's Trade**:
  ASEAN countries account for about 11% of India's global trade. The bloc's growing trade relationship with India is significant in the broader context of India's foreign trade.
- **Bilateral Trade Performance**:
  - The bilateral trade between India and ASEAN reached USD 121 billion in FY 2023-24.
  - Between April and October 2024, the trade stood at USD 73 billion, registering a 5.2% growth.
- **India's Trade Deficit with ASEAN**:
  India's trade deficit with ASEAN has widened significantly, from USD 4.98 billion in 2010-11 (the first full year of AITIGA's operation) to USD 38.4 billion in 2023-24. This growing trade imbalance is one of the central issues that India hopes to address through the review of the agreement.

Conclusion :

The 6th AITIGA Joint Committee Meetings have brought to the forefront key issues regarding India's trade balance with ASEAN, particularly the trade deficit and the need for greater market access for Indian goods. India's push for stricter rules of origin and progress towards tariff negotiations are crucial steps in recalibrating the AITIGA to make it more beneficial for Indian exporters while addressing concerns over trade imbalances. These developments underscore the growing importance of India-ASEAN relations and the need for continuous updates to trade agreements to meet evolving economic dynamics.

Design Law Treaty (DLT)

Recently, at the Diplomatic Conference to Conclude and Adopt the Design Law Treaty (DLT) held in Riyadh, Saudi Arabia, member states of the World Intellectual Property Organization (WIPO), including India, adopted the Design Law Treaty. The treaty is a significant step towards harmonizing the protection of industrial designs globally and simplifying the application process for designers seeking intellectual property (IP) protection.

What is the Design Law Treaty (DLT)?

About DLT:

The Design Law Treaty (DLT) is a comprehensive framework designed to streamline the process of

protecting industrial designs worldwide. It aims to create a predictable and accessible system for designers, reducing unnecessary bureaucracy and offering greater ease in securing intellectual property rights. This will help in promoting innovation and protecting creative designs in an increasingly globalized market.

Objectives:

- To create a unified and simplified system for the protection of industrial designs.
- To reduce barriers to obtaining and enforcing design rights.
- To make the design application process more accessible to creators worldwide.

Key Provisions of the Design Law Treaty (DLT)

1. **Streamlining Design Application Procedures**
   - **Clear Guidelines**: The DLT sets uniform, clear guidelines for all design applications, ensuring consistency across member countries.
   - **Flexible Representation**: Designers can use various formats such as drawings, photographs, or videos to represent their designs.
   - **Multiple Designs in One Application**: Designers can file for multiple designs in a single application, preserving the original filing date, even if some designs are not accepted.
2. **Improving the Filing Process**
   - **Filing Date Simplicity**: Applicants can secure an initial filing date by submitting essential parts of their application, with the complete application processed later.
   - **Grace Period**: The treaty allows a six to twelve-month grace period to protect the novelty of designs disclosed publicly before filing.
3. **Post-Registration Procedure and Protection**
   - **Publication Control**: Designers can control the publication of their designs for up to six months post-filing, ensuring confidentiality and protecting competitive advantage.
   - **Relief Measures for Missed Deadlines**: Provisions are made to assist applicants who miss deadlines, preventing the loss of rights.
   - **Clear Post-Grant Transactions**: Post-registration procedures like transfers and licensing are clearly defined to ensure smooth management and enforcement.
4. **Two-Tier Structure**

   The Treaty will consist of articles (main provisions) and rules (detailed regulations for implementation). The Assembly of Contracting Parties can amend these rules as necessary to adapt to changes in design law and technology.

What is an Industrial Design?

Definition:

An industrial design is an original creation that is ornamental in nature and gives a product its distinctive appearance. This appearance can result from the shape, lines, color, texture, or material of the design. It can be three-dimensional (such as the shape of a product) or two-dimensional (such as a surface pattern).

Examples of Application:

Industrial designs are applied to various products, such as:

- Packaging
- Clothing
- Medical equipment
- Handicrafts
- Furniture
- Electronic devices
- Jewelry

Importance:

Designs are critical business assets, enhancing a product's market appeal and giving businesses a competitive edge. They influence consumer choices by making products more attractive and distinctive in the marketplace.

Protection:

Designs are protected under intellectual property laws, but this protection is territorial, meaning it is confined to the country or region in which protection is sought. In India, the Designs Act, 2000 governs the registration and protection of industrial designs.

Industrial Design Protection in India

- Between 2014-2024, design registrations in India tripled, with domestic filings increasing by 120% in the last two years.
- In 2023, design applications in India grew by 25%, indicating a rise in awareness and utilization of design protection.

Designs Act, 2000:

In India, industrial designs are protected under the Designs Act, 2000, which requires designers to register their designs with the Design Registry. The Act provides protection for the appearance of the design but excludes functional aspects.

Key Protection Provisions under the Designs Act, 2000 (India)

1. **Eligibility**:
   - Designs are eligible for protection if they are aesthetic and applied to products, not for their functional aspects.
   - The design must be novel and original.
2. **Requirements for Protection**:
   - **Novelty**: The design must be new and significantly different from existing designs.
   - **Non-Disclosure**: The design should not have been publicly disclosed anywhere before filing.
   - **Non-Functional**: Designs driven by functionality (like utility patents) are not protected.
   - **Morality**: The design should not conflict with public morals or public order.
3. **Duration of Protection**:

   Protection lasts for 10 years under the TRIPS Agreement, with the possibility of a 5-year extension upon renewal.
4. **Infringement and Enforcement**:

   Owners of registered designs can prevent others from making, selling, or importing products that replicate their design.
5. **Excluded Designs from Protection**:

   Certain items are excluded from protection, including stamps, calendars, flags, and layout designs of integrated circuits. Additionally, designs cannot include trademarks or copyrightable works.

Judicial Cases on Industrial Design Protection

1. **Ritika Private Limited *Vs.* Biba Apparels Private Limited (2016)**

   Case Summary: Ritika accused Biba of copying its garment designs. The Delhi High Court ruled that the designs were not registered under the Designs Act, 2000, and therefore could not be protected. This case highlighted the importance of design registration for protection.
2. **Crocs Inc. USA v. Bata India Ltd. (2019)**

   Case Summary: Crocs Inc. filed a design infringement suit against Indian footwear manufacturers. The court ruled that the Crocs design lacked novelty and originality due to prior publication in various media, thus rejecting the infringement claim.

Conclusion :

The Design Law Treaty (DLT) represents a major milestone in the global protection of industrial designs. By simplifying and streamlining the application process, it will provide greater accessibility and predictability for designers worldwide. It also facilitates greater international cooperation and protection, offering designers a better mechanism to safeguard their creative innovations. For India, the adoption of the DLT complements the country's growing IP activity and enhances its position as a leading player in the global intellectual property arena.

Biodiversity Beyond National Jurisdiction (BBNJ) Agreement – Between Hope and Hurdles

India's recent signing of the High Seas Treaty, officially known as the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement, marks a significant milestone in global efforts to protect the oceans. This treaty was signed by India's External Affairs Minister, S. Jaishankar, at the United Nations General Assembly in New York on September 25, 2024. The agreement is considered a key development under the UN Convention on the Law of the Sea (UNCLOS). However, while the goals of the treaty are ambitious, there are substantial challenges related to ratification, geopolitical issues, and implementation.

Main Goals of the BBNJ Agreement:

1. **Protect Marine Life**: Establish Marine Protected Areas (MPAs) to preserve biodiversity.
2. **Fair Sharing of Marine Resources**: Ensure equitable distribution of resources from the high seas.
3. **Environmental Control**: Mitigate the environmental impact of human activities like overfishing, deep-sea mining, and pollution.

Key Challenges Facing the BBNJ Agreement:

1. Ratification Challenges:

- The treaty has been signed by 104 countries, but only 14 have ratified it so far. 60 ratifications are required for the treaty to come into full force.
- **Slow Progress**: The delay is mainly due to geopolitical tensions and economic interests. Disputes over maritime boundaries, particularly in areas like the South China Sea, complicate the establishment of MPAs, slowing down the treaty's progress.

2. Geopolitical Issues:

- **MPAs and National Interests**: Countries, especially in Southeast Asia and the Bay of Bengal, fear that MPAs could restrict their access to important marine resources, threatening their local economies and livelihoods.
- **Regional Conflicts**: Ongoing disputes in regions like the South China Sea could undermine efforts to create universally accepted MPAs, especially when countries with competing territorial claims oppose these measures.

3. Lack of Clear Implementation Guidelines:

- While the treaty outlines broad goals, it lacks specific guidelines on how these goals should be achieved. For example, it mandates Environmental Impact Assessments (EIAs) for activities that might harm the high seas but doesn't clarify how these assessments should be conducted, checked, or enforced.
- The lack of accountability may allow wealthier nations to control the benefits derived from marine resources, potentially excluding poorer nations from the fair distribution of resources.

4. Risk of Conflicting with Other Agreements:

- The BBNJ Agreement may conflict with existing treaties such as the Convention on Biological Diversity (CBD). Overlapping rules could create complexities for countries trying to comply with both sets of regulations, especially for smaller nations.

5. Capacity-Building Gaps:

- The treaty calls for fair partnerships in ocean science but doesn't offer clear commitments to provide technical and financial support to poorer countries. This gap could exacerbate inequalities between developed and developing nations, preventing the latter from fully participating in conservation efforts.

Other Key Issues in the High Seas Treaty:

1. **Focus on High Seas Only**: The treaty focuses mainly on the high seas, but marine ecosystems are interconnected with Exclusive Economic Zones (EEZs), where nations have control over marine resources. Pollution, overfishing, and habitat destruction in EEZs can affect the high seas, making the treaty's conservation goals harder to achieve.
2. **Ongoing Environmental Damage**: The treaty requires EIAs for new activities but doesn't address ongoing environmental damage from practices like oil and gas exploration. Local countries may resist international review of their EIAs, weakening the treaty's effectiveness, especially in areas where local laws conflict with international standards.
3. **Limited Enforcement Mechanisms**: The treaty lacks robust enforcement mechanisms, making it difficult to ensure full compliance. Countries may be hesitant to follow international environmental guidelines, particularly if they believe their national interests are at stake.

Towards Better Ocean Management:

To overcome these challenges, the treaty must address several political and structural issues:

1. **Integrating High-Seas and Coastal Rules**: Marine conservation efforts must include both the

high seas and coastal ecosystems, considering their interconnectedness. A more holistic approach will be needed to protect marine life across all maritime zones.

2. **Incentivizing Cooperation**: Countries, particularly in the Global South, should be incentivized to align their local laws with international standards. Capacity-building programs and financial assistance from wealthier nations can help facilitate this process.
3. **Strengthening Global Commitment**: The international community must reach consensus on key issues like the creation of MPAs and the fair sharing of marine genetic resources. Stronger enforcement mechanisms must be developed to ensure compliance with the treaty's rules.

Benefits for India:

- **Strategic Presence**: Signing the BBNJ Agreement allows India to enhance its strategic presence in areas beyond its Exclusive Economic Zone (EEZ).
- **Shared Monetary Benefits**: India will benefit from the equitable sharing of resources derived from marine genetic materials.
- **Strengthened Conservation**: The treaty supports India's efforts in marine conservation, and promotes collaboration in ocean science.
- **Scientific Opportunities**: India will gain access to global scientific research, marine samples, and technologies for sustainable development.

About UNCLOS:

The United Nations Convention on the Law of the Sea (UNCLOS) is the primary international legal framework governing the world's oceans. Adopted in 1982 and entered into force in 1994, it regulates various aspects of ocean use, including:

- **Environmental Protection**: Safeguarding marine ecosystems.
- **Maritime Boundaries**: Defining the rights and responsibilities of coastal states.
- **Resource Management**: Outlining the use of marine resources in high seas and Exclusive Economic Zones (EEZs).

UNCLOS divides the ocean into different zones, each with specific legal rights for coastal states and the international community:

- **Baseline**: The reference point from which maritime zones are measured.
- **Internal Waters**: Areas under full sovereignty of coastal states.
- **Territorial Sea**: Extends up to 12 nautical miles from the baseline.
- **Exclusive Economic Zone (EEZ)**: Extends up to 200 nautical miles, granting coastal states exclusive rights to exploit marine resources.
- **High Seas**: The areas beyond the EEZ, open for peaceful use by all states.

Conclusion:

The BBNJ Agreement represents a bold step toward global ocean conservation, but its success will depend on overcoming key challenges related to implementation, geopolitical tensions, and enforcement. As marine ecosystems face increasing threats from human activities, the treaty's effectiveness hinges on global cooperation and shared responsibility. For India, the treaty offers valuable opportunities to strengthen marine conservation, advance scientific research, and position the country as a key player in the future of ocean governance.

Indian Chemical Council Wins 2024 OPCW-The Hague Award

Date of Award: November 25, 2024

Awarded by: Organisation for the Prohibition of Chemical Weapons (OPCW)

Location: The Hague, Netherlands

Overview:

The Indian Chemical Council (ICC) has been conferred the 2024 OPCW-The Hague Award, which recognizes outstanding contributions to the goals of the Chemical Weapons Convention (CWC). This is the first time the award has been given to a chemical industry body. The prestigious award was presented during the 29th Session of the Conference of the States Parties (CSP) of the OPCW, held in The Hague, in the presence of delegates from 193 States Parties and global chemical industry experts.

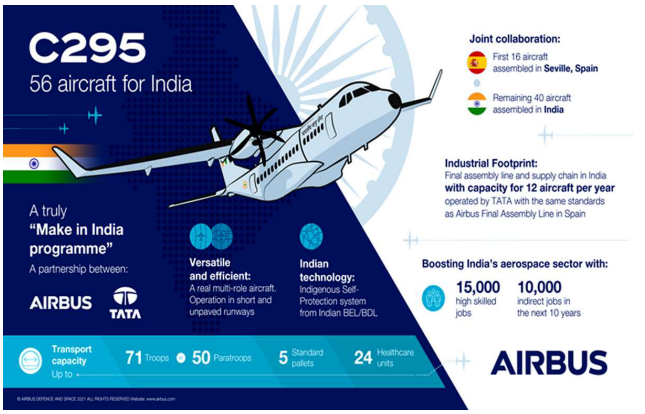
Key Details:

1. **Award Presentation**:
   - The award was presented by Ambassador Fernando Arias, the Director-General of OPCW, and Mr. Jan van Zanen, the Mayor of The Hague.
   - Mr. D. Sothi Selvam, the Director-General of ICC, received the award on behalf of the Indian Chemical Council.
2. **Significance**:
   - The OPCW-The Hague Award was established in 2014 to honor individuals and organizations advancing the Chemical Weapons Convention's (CWC) objectives. In 2013, the OPCW was awarded the Nobel Peace Prize for its role in chemical weapons elimination.
   - ICC's recognition marks a milestone as it is the first time the award has been conferred to a chemical industry body, underscoring the importance of the private sector's role in ensuring chemical safety and security.
3. **Role of ICC**:
   - ICC represents over 80% of India's $220 billion chemical industry.
   - The award recognizes ICC's significant contributions to chemical safety, industry-wide security practices, and CWC compliance in India.
   - Initiatives like the Chemical Weapons Convention Helpdesks and Nicer Globe have advanced industry compliance and improved the safety of chemical transportation across India.
4. **Key Contributions of ICC**:
   - **Promoting Chemical Safety**: ICC has played a vital role in advancing industry compliance with international norms for chemical safety.
   - **Nicer Globe Initiative**: Focused on improving chemical transportation safety in India, the initiative provides real-time monitoring and emergency response mechanisms.
   - **Responsible Care (RC) Programme**: ICC has encouraged chemical manufacturers to adhere to the Security Code under the RC Programme, which enhances industry security and ensures sustainable practices.
   - **E-Filing for Chemical Declarations**: Facilitating the e-filing of chemical declarations to streamline compliance with the CWC.
5. **Chemical Weapons Convention (CWC)**:
   - **Established**: 1997
   - The CWC aims to eliminate chemical weapons worldwide. It currently has 193 States Parties.
   - **OPCW**: The Organisation for the Prohibition of Chemical Weapons (OPCW) is the implementing body for the CWC and works to ensure a chemical weapons-free world.
   - **India's Role**: India is an original signatory of the CWC and has a robust national authority, the National Authority Chemical Weapons Convention (NACWC), responsible for implementing the CWC within India.
6. **India's Commitment**:
   - The award reflects India's ongoing commitment to chemical safety and security, especially within one of the world's largest chemical industries.
   - India's significant role in promoting the goals of the CWC through initiatives by the ICC demonstrates its leadership in responsible industrial stewardship.

Conclusion :

The OPCW-The Hague Award for 2024 is a recognition of the Indian Chemical Council's (ICC) outstanding efforts in advancing chemical safety, security, and compliance with international norms. Through its various initiatives, ICC has not only contributed to enhancing India's chemical industry's safety standards but also supported the global mission of eliminating chemical weapons and ensuring a safer world. This award serves as a model for how industrial bodies can play a pivotal role in the collective responsibility of preventing the misuse of chemical substances.

India-Spain Joint Statement



Why in News?

On 28th Oct 2024, Prime Minister Narendra Modi and Spanish Prime Minister Pedro Sanchez jointly inaugurated a facility in Vadodara for manufacturing the C295 medium-lift tactical transport aircraft, marking a significant step in India's defense manufacturing capabilities.

Key Highlights of the Inauguration

Overview of the Facility:

- **C295 Aircraft Production:** This facility, set up by Tata Advanced Systems Limited (TASL) and Airbus, is India's first private facility dedicated to military aircraft production. The first "Made in India" aircraft will be completed by September 2026.
- **Local Impact:** The project will produce over 18,000 parts locally and is expected to create more than 10,000 jobs across the country.

The C-295's name is a combination of the following:

- **C:** Stands for CASA, the original manufacturer
- **2:** Stands for the number of engines
- **95:** Stands for the payload capacity of 9.5 tonnes

What is C-295 Program :

- In 2021, India's Ministry of Defence signed a ₹ 21,935-crore agreement with Airbus for the procurement of 56 C-295 transport aircraft.
- This procurement is intended to replace the Indian Air Force's aging fleet of Avro-748 planes.
- **Delivery Schedule**:
  - **(a) Fully Assembled Aircraft**: 16 C-295 aircraft will be delivered fully assembled from Spain.
  - **(b) Local Assembly**: The remaining 40 aircraft will be assembled at the new facility in Vadodara.
  - **(c) Timeline**: The first locally produced aircraft is expected to be completed by September 2026, with all 40 units scheduled for delivery by August 2031.

Bilateral Talks and Agreements

- **Strengthened Ties:** PM Modi emphasized that this project signifies a new chapter in India-Spain relations, enhancing cooperation in defense and other sectors.
- **Agreements Signed:** The two leaders finalized agreements on infrastructure, railways, renewable energy, culture, and tourism.

Prime Minister Modi's Remarks

- **Historical Partnership:** PM Modi highlighted the long-standing ties between India and Spain, rooted in shared values like democracy and the rule of law.
- **Project Execution:** He praised the quick turnaround from idea to execution, reflecting a new work culture in India. The facility's foundation was laid in October 2022.

Specific Agreements

- **MoU on Rail Transport:** This agreement aims to boost cooperation in infrastructure planning and operation for both passenger and freight transport.
- **Customs Cooperation:** The customs agreement will facilitate better information exchange to combat customs offenses.

Economic and Commercial Cooperation

- **Trade Relations:** Positive developments in trade and investment noted.
- **Investment in India:** About 230 Spanish companies operate in India, showing support for 'Make in India.'

- **Fast Track Mechanism:** A new mechanism to facilitate mutual investments was established.
- **Joint Commission for Economic Cooperation:** Next meeting of the JCEC to be held in Spain in early 2025.

Broader Context

- **Geopolitical Importance:** Both leaders acknowledged the global context of their cooperation, addressing issues like climate change and poverty, where India and Spain can work together.
- **C295 Aircraft Uses:** The C295 is versatile for roles such as medical evacuations, disaster response, and maritime patrol, enhancing the Indian Air Force's operational capabilities.

Global Issues and Cooperation

- **2026 Celebrations:** Following a recent visit by Spanish Prime Minister Pedro Sánchez—the first by a Spanish PM in 18 years—India and Spain have announced plans to celebrate 2026 as the India-Spain Year of Culture, Tourism, and AI.
- This initiative aims to enhance cultural exchanges and cooperation in artificial intelligence, emphasizing the shared interests of both nations.
- **War in Ukraine:** Both leaders called for a peaceful resolution and adherence to international law.
- **Middle East Stability:** Joint condemnation of violence and calls for humanitarian aid.
- **Climate Change and Renewable Energy:** Commitment to collaborative efforts in addressing climate change.
- **Counter-Terrorism Cooperation:** Strong condemnation of terrorism and a call for global action against terrorist organizations.
- Spain has supported India's bid for permanent membership in a reformed United Nations Security Council.

Historical Ties

- **Establishment of Relations**: India and Spain formalized their diplomatic ties in 1956, laying the groundwork for future cooperation.
- **Cultural and Democratic Values**: Despite limited early interactions, both nations share core values such as democracy, respect for multiculturalism, and a commitment to global peace, which have solidified their relationship over time.
- **High-Level Interactions**: Regular exchanges between leaders have been crucial in strengthening diplomatic and economic ties.

Bilateral Trade

- **Trade Partner Status**: Spain ranks as India's 6th largest trade partner within the European Union.
- **2023 Trade Figures**:
  - **Total Trade Volume**: Approximately $8.25 billion, showing a 4.2% increase from the previous year.
  - **Exports to Spain**: About $6.33 billion, reflecting a growth of 5.2%.
  - **Imports from Spain**: Roughly $1.92 billion, with a modest growth of 1.05%.
- **Key Exports**: Major items exported from India include mineral fuels, chemicals, iron and steel, electrical machinery, and apparel.

Foreign Direct Investment (FDI):

- **Spanish Investment in India**: From April 2000 to December 2023, Spanish FDI in India reached approximately $3.94 billion, making Spain the 16th largest investor in the country. Over 280 Spanish companies operate in sectors like renewable energy and automotive.
- **Indian Investment in Spain**: Indian FDI in Spain is around $900 million, with investments from about 80 Indian companies in IT, pharmaceuticals, and logistics.
- **Economic Cooperation Frameworks:**
  - **Joint Commission on Economic Cooperation (JCEC)**: Established in 1972, with the latest meeting occurring in April 2023, focusing on enhancing economic ties.
  - **CEOs Forum**: Launched in 2015, this platform facilitates discussions between business leaders to boost trade relations.

Strategic Significance and Cooperation

- **Defense Collaboration**: Spain plays an important role in India's defense modernization, contributing expertise in areas like aerospace and naval technology. Spanish companies are involved in key defense projects, enhancing India's military capabilities.
- **Counter-Terrorism Efforts**: Both nations recognize the threat of global terrorism and actively cooperate in intelligence sharing and strategic initiatives to combat it.
- **Sustainable Development**: Spain and India are committed to climate action, working together on sustainable development goals and renewable energy projects, aligning with international agreements like the Paris Agreement.

Common Groupings and Multilateral Cooperation

- **United Nations**: India and Spain collaborate on various global issues, focusing on peace, humanitarian aid, and sustainable development.
- **G20 Membership**: As G20 members, both countries address global economic challenges, advocating for trade reforms and cooperative climate action.
- **International Solar Alliance (ISA)**: Spain's involvement in the ISA supports India's initiative to promote solar energy and sustainable practices globally.

Indian Diaspora in Spain

- **Community Overview**: The Indian diaspora in Spain is approximately 55,000 strong as of 2023, with significant contributions in sectors such as IT, hospitality, retail, and healthcare.

Conclusion

India and Spain are enhancing their partnership across multiple sectors, emphasizing cultural, economic, and security cooperation. The announcement of the India-Spain Year of Culture, Tourism, and AI in 2026 will further deepen these ties, reflecting the shared interests and historical connections that both countries continue to build upon.

Israel's Iron Beam: A "New Era" in Anti-Missile Defence with Lasers

- In November 2024, Israel's Defence Ministry announced a $500 million deal to begin the production of Iron Beam, a laser interception system

  It is designed to target and destroy incoming rockets, missiles, and drones.
- This innovative system will be developed by Rafael Advanced Defence Systems and Elbit Systems
- It is expected to be operational within a year.

What is Iron Beam?

- Iron Beam is Israel's cutting-edge laser defense system, designed to protect the country from a wide range of airborne threats, including missiles, drones, rockets, and mortars.
- The system is set to become operational within a year, according to reports from the Israeli Ministry of Defence.
- It represents a major leap forward in military technology, marking a "new era of warfare" as stated by Israeli officials.

Key Features of Iron Beam

Laser Technology for Missile Defense

- Iron Beam uses high-powered lasers to neutralize incoming projectiles at the speed of light.
- It has the capability to engage threats from hundreds of meters to several kilometers away.
- The system operates with an unlimited magazine, meaning it doesn't require reloading, and boasts almost zero cost per interception, making it highly cost-effective compared to traditional missile defense systems.

Integration with Existing Defense Systems

- The Iron Beam will complement Israel's existing Iron Dome and Arrow 2 & 3 interceptors, which target larger, more advanced threats like ballistic missiles.
- While the Iron Dome is effective against larger projectiles, the Iron Beam will focus on intercepting smaller, faster, and harder-to-detect targets such as drones, rockets, and mortars.

Cost-Efficiency

- Each interceptor missile launched by the Iron Dome can cost around $50,000.
- In contrast, the Iron Beam operates at a fraction of this cost due to its laser-based interception technology.
- This makes the Iron Beam a more affordable and sustainable solution for defending against high-volume, low-cost threats like drones and mortars.

Advantages and Limitations

Advantages:

1. **Cost-Effectiveness**: Iron Beam's laser system offers almost zero cost per interception, which significantly reduces operational costs compared to traditional missile defense systems.
2. **High-Speed Interception**: Being based on lasers, the system can intercept threats at the speed of light, making it highly effective against rapid, incoming projectiles.
3. **Minimal Collateral Damage**: The precision of laser targeting minimizes collateral damage, ensuring that only the intended threats are neutralized.

Limitations:

- The system is less effective in low-visibility conditions, such as bad weather or fog.
- This could limit its operational effectiveness during certain environmental conditions.

The Iron Beam in Context

- Israel is currently engaged in a two-front war against groups such as Hamas in Gaza and Hezbollah in Lebanon, both of which are backed by Iran.
- This has heightened the need for advanced defense systems like the Iron Beam to handle an increased volume of attacks from various missile and drone threats.

Geopolitical Context

- Since October 2023, Israel has been engaged in ongoing conflict with Hamas following a major attack on October 7, which resulted in over 1,200 civilian deaths in Israel.
- In retaliation, Israel's military campaign has led to significant casualties in Gaza, with over 43,000 fatalities as of October 2024, most of whom are civilians, according to local health authorities.
- Tensions with Hezbollah in Lebanon and Iran have added to the volatility of the region, with direct exchanges of fire taking place between Israel and Iran in recent months.

US Military Response

- In light of the ongoing conflict, the United States has adjusted its military presence in the region.
- In addition, Israel recently received a $8.7 billion military aid package from the United States to further strengthen its defense systems as the country faces threats from both Hamas in Gaza and Hezbollah in Lebanon.
- B-52 bombers, fighter jets, refueling aircraft, and Navy destroyers have been deployed to the Middle East to reinforce the U.S. military posture as tensions escalate.

The Future of Anti-Missile Defense

- The Iron Beam marks a technological breakthrough in missile defense, offering a game-changing solution for countries facing threats from low-cost, high-volume missile, rocket, and drone attacks.
- As the system becomes operational, it is expected to enhance Israel's defense capabilities significantly, especially in combination with other advanced systems like the Iron Dome.
- Its successful deployment will likely pave the way for laser-based defense systems to become more common in military arsenals worldwide, marking a significant shift in how countries defend their borders against aerial threats.

Conclusion :

Israel's Iron Beam is set to revolutionize missile defense technology with its use of high-powered lasers. Its operational costs are significantly lower than traditional systems, and it offers unparalleled precision and speed in intercepting smaller projectiles like drones and rockets. As Israel continues to face growing threats from groups like Hamas and Hezbollah, the Iron Beam will serve as a vital addition to the country's multi-layered defense strategy. While challenges exist, particularly in adverse weather conditions, the system represents a new era of cost-effective and efficient warfare.

India's Potential Participation in the China-led RCEP

- **Context:** The CEO of NITI Aayog, B.V.R. Subrahmanyam, recently proposed that India should reconsider its position and join the Regional Comprehensive Economic Partnership (RCEP).
- His remarks mark a significant departure from the Indian government's stance since it opted out of the trade pact in 2019.
- Subrahmanyam also highlighted India's missed opportunities in leveraging the China-plus-one strategy, which could have provided an alternative to China's dominance in global trade.
- His comments coincide with suggestions from the World Bank and an ongoing Economic Survey that advocate for greater integration of India into regional supply chains, including those involving China.

What is the Regional Comprehensive Economic Partnership (RCEP) ?

RCEP is a free trade agreement (FTA) that brings together 16 countries:

- **10 ASEAN members**: Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Singapore, Thailand, the Philippines, Laos, and Vietnam.
- **5 FTA partners**: China, Japan, South Korea, Australia, and New Zealand.

RCEP aims to promote trade in goods and services, facilitate investment, enhance intellectual property rights, and regulate e-commerce, among other areas.

Objective of RCEP:

To create an integrated market with 15 countries, simplifying trade and boosting economic cooperation across the Asia-Pacific region.

India's Position on RCEP: Historical Context

- India had initially engaged in RCEP negotiations for 6 years, but in 2019, it chose to back out of the agreement.
- The decision was largely driven by concerns that joining the RCEP would disproportionately benefit China, further intensifying India's trade deficit with its neighbor, which already stood at $85 billion at the time.
- There were also apprehensions about the free trade agreement with China that would accompany RCEP, potentially leading to unfair competition for Indian industries.

Subrahmanyam's Proposal: Why India Should Join RCEP

1. **Missed Opportunities in the 'China-Plus-One' Strategy**:

   Subrahmanyam, who was formerly India's Commerce Secretary, said that countries like Vietnam, Indonesia, Malaysia, Turkey, and Mexico have capitalized on the China-plus-one strategy, benefiting more than India.
2. This strategy involves shifting some production out of China to other countries, thus diversifying the supply chain.
3. India, he argued, has not leveraged this opportunity to the same extent.

4. **US Tariff Threats and India's Trade Barriers**:

   Subrahmanyam emphasized that India's high tariffs on industrial and agricultural goods have hindered its ability to engage meaningfully in global trade.

5. With the potential return of Donald Trump as US president, India may face greater pressure to reduce tariffs and increase market access to avoid additional tariffs on its exports to the US.

6. **Integration with China's Supply Chains**:

   India's Economic Survey 2024 suggests that India should reconsider joining RCEP to integrate more effectively with China's supply chains.

7. India has bilateral trade worth $118 billion with China, but this trade is heavily skewed in China's favor.

8. Subrahmanyam argued that by engaging with RCEP, India could improve its position and mitigate the risks of being excluded from the evolving global supply chains.

Concerns about China's Dominance in RCEP

1. **Trade Deficits and China's Gains**:

   After RCEP's implementation, several countries have experienced growing **trade deficits** with China. For instance:

   - ASEAN countries' trade deficit with China increased from $81.7 billion in 2020 to $135.6 billion in 2023.
   - Japan's trade deficit with China also rose from $22.5 billion in 2020 to $41.3 billion in 2023.
   - South Korea might even face a trade deficit with China for the first time in 2024.

2. According to the World Bank, these trends suggest that the economic benefits of RCEP are disproportionately skewed in favor of China.

3. This has validated India's concerns about unfair competition under the terms of RCEP.

4. **China's Dominant Role**:

   India's fear of China's dominance in the trade bloc is compounded by an analysis from the Global Trade Research Initiative (GTRI), which shows that after joining RCEP, China has secured the lion's share of trade benefits.

India's Current Trade Agreements and Prospects

1. **Bilateral and Multilateral Agreements**:

   India already has bilateral FTAs with several RCEP countries, except for China. Notably:

   - **Australia** : The Economic Cooperation and Trade Agreement (ECTA) is operational, and a Comprehensive Economic Cooperation Agreement (CECA) is in advanced stages.
   - **New Zealand**: Negotiations for an FTA are ongoing.

2. **Future Prospects**:

   India is working on free trade agreements with the EU, UK, and other regions.

3. However, the need for tariff reductions and market access is critical to integrate into global value chains and capitalize on opportunities within larger trade blocs like RCEP.

Subrahmanyam's Advocacy for CPTPP Membership

- Alongside RCEP, Subrahmanyam also suggested that India should aim to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), which includes Japan, Vietnam, Australia, Canada, Mexico, and several other countries.
- This agreement offers significant trade advantages and integration with the global economy, particularly for the manufacturing sector.
- India has not been part of the CPTPP negotiations.
- However, its membership could provide a more balanced opportunity to engage with the Asia-Pacific region without being unduly influenced by China, given the US's withdrawal from the pact in 2017.

Global and Regional Perspectives on India's Role in RCEP

1. **World Bank's Recommendation**:

   The World Bank has suggested that India reconsider its position on RCEP, citing potential benefits like increased trade, investment, and GDP growth.

2. Despite India's trade deficit with China, RCEP could offer long-term economic integration that might outweigh immediate concerns about unfair trade practices.
3. **Government's Cautious Stance**:

   However, key government officials, including Finance Minister Nirmala Sitharaman, have highlighted the sensitivities surrounding trade relations with neighboring countries, especially China.
4. There is a recognition of the need to balance national interests with the demands of global trade integration.

Conclusion: Should India Join RCE?

India's participation in RCEP is a complex decision that involves weighing the economic benefits of greater trade integration against the risks of increased competition from China. While joining RCEP could potentially unlock new markets and investment opportunities, the trade imbalances with China remain a significant concern.

Impact of Trump's Return to Power on India

- **Context:** The return of Donald Trump to the White House as the 47th President of the United States (Trump 2.0) has raised important questions regarding his policies and their potential impact on the global economy, especially India.
- While the situation is expected to have a positive effect on US equities, experts foresee challenges related to tariffs, visa restrictions, and foreign exchange volatility for India.

Key Policy Changes Under Trump 2.0 and Their Implications for India

1. **US Economic Policies under Trump 2.0**:
   - **Corporate Tax Cuts**: Trump's promise of reducing corporate tax rates from 21% to 15% for domestic manufacturers aims to broaden stock market rallies in the US.
   - **Tariffs and Protectionism**: Trump is expected to pursue a more protectionist stance, including a 20% tariff on all imports and a 200% tariff on cars.
   - These policies, part of his "Make in America" agenda, are aimed at boosting domestic production but could affect India's exports to the US, particularly in sectors like textiles, IT, and manufacturing.
   - **Fiscal Deficits and Inflation Risks**: Trump's policies may exacerbate the US fiscal deficit, which could lead to more hawkish actions by the Federal Reserve (Fed) to counter inflation.
   - The resulting higher interest rates and a firmer USD would have broader global implications, including for India.
2. **Impact of Trump's Policies on Indian Sectors**:
   - **Information Technology (IT)**: The corporate tax cuts in the US are expected to increase IT spending, which would benefit Indian IT companies.
   - **Weaker INR** (Indian Rupee) would also support Indian IT companies' bottom lines by increasing the value of their US-based earnings.
   - However, Indian companies may face challenges if visa restrictions become more stringent, limiting their access to the US labor market.
   - **Pharmaceuticals**: India's pharma sector could benefit from Trump's anti-China policies due to the shifting supply chains and rising demand for Indian-made generic drugs, though Indian exporters must monitor any US regulatory changes like drug price controls.

- The previous administration had introduced measures to cap prices of prescription drugs, which could be revived.
- **Defence**: Trump's focus on increasing US defense spending and strengthening partnerships with countries in the Indo-Pacific region is expected to lead to greater collaboration between India and the US in defense.
- This could create opportunities in the Indian defense sector, promoting defense exports and strategic partnerships.

3. **Trade and Tariff Risks for India**:
   - **Increased Tariffs on China**: If Trump 2.0 escalates the trade war with China, India may face indirect consequences.
   - For instance, if higher tariffs are imposed on Chinese goods, Indian exports to the US, particularly in sectors like textiles, iron & steel, and transport equipment, could face supply chain disruptions.
   - If Chinese manufacturing shifts, India might face more dumping of Chinese goods, which could harm local manufacturing.
   - **Increased Competition in Key Sectors**: The tariff policies might encourage more US companies to re-shore manufacturing, which could indirectly hurt India's exports if the US starts producing more locally or shifts its sourcing to other low-cost regions like Vietnam or Mexico.
   - India's exports of manufactured goods may also be affected by the US-China trade rebalancing.

Broader Economic Implications of Trump 2.0 for India

1. **Monetary Policy: Hawkish Fed and Stronger USD**:
   - With the Federal Reserve (Fed) expected to maintain hawkish policies, interest rates could rise in the US to combat inflationary pressures from Trump's fiscal policies.
     i. Hawkish policies refer to a tough, aggressive approach, usually in economics or foreign affairs.
     ii. In economics, it means focusing on controlling inflation by raising interest rates or tightening the money supply.
   - This could lead to a stronger USD against the INR, potentially resulting in a weaker rupee (UDINR could rise to 84.5), which might increase the cost of imports for India, particularly in sectors reliant on raw materials and capital goods.
   - A stronger USD could make Indian exports more competitive, but the higher cost of borrowing for Indian firms and the capital outflows driven by rising US yields could put pressure on India's foreign exchange reserves.
2. **US-India Relations: Strategic Opportunities and Challenges**:
   - **Security and Defense**: Trump's Indo-Pacific strategy is likely to result in stronger defense and security ties between India and the US, especially in terms of military cooperation, intelligence sharing, and arms deals. India's strategic importance in the region could be enhanced further.
   - **Technology and Supply Chains**: The focus on AI, semiconductors, and electronic manufacturing services (EMS) could provide growth opportunities for India, particularly with its tech sector.
   - India could see increased investments from US firms in tech infrastructure and R&D.
3. **Geopolitical Considerations**:
   - **Anti-China Policies**: Trump's anti-China stance could indirectly benefit India by diverting global supply chains away from China.
   - As China faces more tariffs and restrictions in the US, India could capitalize on China-plus-one sourcing strategies by attracting more manufacturing investments.

- **US-China Trade War**: The escalation of tariffs and trade tensions between the US and China could create volatility in global markets, which could have spillover effects on India.
- However, if India can secure favorable trade terms with the US, it might mitigate some of these risks.

Trump 2.0: A Mixed Bag for India

- **Positive Aspects**:
  - The return of Trump 2.0 could lead to rising US equities, benefiting global risk sentiment, including Indian stock markets.
  - Corporate tax cuts and increased IT spending in the US could boost demand for Indian IT services, pharmaceuticals, and defense products.
  - Strengthening of India-US defense ties could be a positive for India's defense sector.
- **Challenges**:
  - Higher tariffs on Indian exports to the US, particularly in textiles, steel, and transport equipment, could disrupt trade flows and manufacturing in India.
  - Increased US protectionism could impact India's ability to compete in global supply chains and limit market access for Indian goods.
  - Rising interest rates and a stronger USD could make borrowing more expensive for Indian businesses and exacerbate trade imbalances.

Conclusion :

While Trump 2.0 brings some potential benefits for India, particularly in areas like IT, pharmaceuticals, and defense, his protectionist policies could present challenges, especially for Indian exports and trade relations. The stronger US dollar and a more hawkish Fed could put pressure on India's currency and economy, though strategic alignment with the US could provide opportunities in sectors like defense and technology. India's ability to navigate these economic and geopolitical challenges will depend on its adaptability and the strength of its domestic industries in the face of rising global competition.

India and Guyana: A Strategic Partnership Driving Economic Growth and Energy Security

- **Context:** In recent years, Guyana has emerged as a key player in the global energy market, fueled by its offshore oil discoveries, which are reshaping the nation's economy.
- India, with its growing energy needs and expanding geopolitical interests, sees significant potential in deepening its partnership with Guyana, particularly in the areas of energy, infrastructure, agriculture, education, and defence.
- Ahead of Prime Minister Narendra Modi's anticipated visit to Guyana, Dr. Amit Telang, India's High Commissioner to Guyana and neighboring nations, shared insights into the strategic and economic opportunities emerging between the two countries.

Energy Cooperation: Fueling Economic Growth

- **Offshore Oil Discovery**: Guyana's offshore oil boom is transforming its economy, positioning the nation as a future global oil powerhouse.
- India, one of the largest oil consumers in the world, has recognized the potential for collaboration with Guyana in the oil and gas sector.
- As India's energy demands continue to rise, Guyana's growing production capacities offer a mutually beneficial partnership.

- **Initial Trade and Infrastructure Challenges**: In 2021-22, India's oil imports from Guyana reached approximately USD 149 million. However, logistical challenges—such as the need for larger crude carriers and the underdeveloped infrastructure in Guyana—have impacted the volume of imports.
- Despite this, Dr. Telang remains optimistic, noting that upcoming projects, such as new floating production storage and offloading (FPSO) vessels, are expected to boost Guyana's oil production and facilitate more robust energy cooperation with India.
- **Long-Term Engagement**: Indian companies are actively exploring new partnerships with Guyanese firms, focusing on oil exploration, refining, and energy infrastructure development.
- This collaboration reflects India's long-term commitment to strengthening its energy ties with Guyana.

Expanding Economic Cooperation Across Sectors

- **Diverse Economic Interests**: While energy is a focal point, Guyana's broader economic transformation also offers significant opportunities for Indian businesses in sectors like infrastructure, healthcare, education, and hospitality. According to Telang, the 200% increase in economic and commercial inquiries between the two nations highlights the rising interest in expanding trade and investment.
- **Bilateral Trade**: India's bilateral trade with Guyana reached USD 106 million in 2023-24, marking a 60% growth from the previous year.
- Key Indian exports to Guyana include machinery, pharmaceuticals, and vehicle parts, while Guyana exports essential resources such as bauxite ores and iron.
- These growing trade relations lay a solid foundation for future collaborations in infrastructure, education, and healthcare.
- **Opportunities in Healthcare & Education**: India's expertise in infrastructure development, healthcare, and education aligns well with Guyana's modernization goals.
- Indian companies are already engaged in projects that focus on building healthcare infrastructure and providing medical services.
- Additionally, Indian educational institutions are partnering with Guyana's GOAL initiative to offer online courses, with a particular focus on technology, agriculture, and media studies.

Food and Energy Security: Strengthening Cooperation

- **Food Security**: Guyana plays a pivotal role in Caribbean food security as part of the CARICOM (Caribbean Community).
- India has extended its support for Guyana's agricultural sector, including initiatives such as millet cultivation.
- During the International Year of Millets, Prime Minister Modi offered millet seeds to Guyana, resulting in a bumper crop.
- Dr. Telang highlighted this as a significant step toward food security for both nations.
- **Agro-processing and Technology Transfer**: India's expertise in agro-processing and technology transfer is helping Guyana enhance its agricultural productivity.
- Training programs, equipment supply, and the deployment of Indian experts in agriculture are part of ongoing efforts to boost Guyana's agricultural capabilities.
- **Renewable Energy**: Beyond oil, India and Guyana are collaborating on renewable energy projects. Guyana has begun integrating solar energy, biofuels, and other renewable sources into its energy mix.
- India's Solar Home Energy (SHE) project has already made a positive impact on Guyana's indigenous communities, and additional projects, including one at Chedi Jagan International Airport, are in the works to enhance the country's renewable energy capabilities.

Defence and Security: Strengthening Strategic Ties

- **Defence Cooperation**: India and Guyana's defence relations have strengthened through the delivery of two Dornier aircraft to Guyana under a Defence Line of Credit.
- This cooperation extends beyond military equipment to include training and capacity building for Guyanese personnel.
- Indian defense training programs are helping CARICOM member states enhance their capabilities, further solidifying the strategic partnership.
- **Cybersecurity**: India is also providing cybersecurity training for Guyanese and CARICOM officials, focusing on areas critical to both national and regional security.
- This collaboration is part of a broader effort to enhance the Caribbean region's resilience against emerging security threats.

Education and Capacity Building: Empowering Future Generations

- **Educational Exchanges**: Education remains a key pillar of India's partnership with Guyana.
- Through the ITEC Program (Indian Technical and Economic Cooperation), India trains around 100 Guyanese professionals annually in fields such as technology, agriculture, and media.
- These exchanges are crucial for skill development and knowledge transfer, promoting stronger bilateral ties.
- **Scholarships and Online Education**: The Indian Council for Cultural Relations (ICCR) offers scholarships to Guyanese students, enabling them to study across various disciplines in India, including medicine and paramedical fields.
- Moreover, Indian universities like IGNOU and Jain University are collaborating with Guyana's GOAL initiative to provide online education in a range of fields.

Exploring Opportunities in Space and Technology

- **Space Sector Potential**: Although there is currently no active space cooperation between India and Guyana, Dr. Telang expressed interest in exploring space collaborations.
- India's expertise in disaster management, weather forecasting, and early warning systems could be beneficial to Guyana, especially in light of the country's vulnerability to natural disasters.
- **Technology Transfer**: India's space capabilities—particularly in remote sensing and communication technologies—could help Guyana and its CARICOM partners enhance their disaster preparedness and environmental monitoring efforts.

Looking Ahead : A Vision for Deeper Strategic Cooperation

India and Guyana have already established a strong foundation for their partnership, but the potential for future collaboration is vast. As India's engagement with Guyana deepens across multiple sectors—energy, agriculture, defence, education, and infrastructure—the two countries are poised to contribute to each other's economic growth and sustainable development.

- **Future Prospects**: With a focus on sustainable development, shared prosperity, and regional cooperation, the partnership between India and Guyana is poised to strengthen in the coming years.
- According to Dr. Telang, "With the strong foundation we have built, there is immense scope to broaden our cooperation," underscoring the growing alignment between the two nations in their pursuit of mutual growth.

Conclusion:

The partnership between India and Guyana represents a strategic alliance that is already driving growth in critical sectors such as energy, agriculture, and defence. As Guyana's economic transformation accelerates with its oil discoveries, India's involvement in the country's energy, infrastructure, and development projects is set to expand. With education, cybersecurity, and renewable energy also emerging as key areas of collaboration, the future of Indo-Guyanese relations looks bright, offering immense opportunities for both nations.

India in Talks with Gulf, Asia Nations for Cross-Border Power Grid Links Under OSOWOG

1. In November, 2024, India is actively engaged in discussions with several nations, including Oman, UAE, Saudi Arabia, Maldives, and Singapore, to establish cross-border electricity transmission lines as part of the ambitious One Sun One World One Grid (OSOWOG) initiative.
2. This project was 1st proposed by Prime Minister Narendra Modi in 2018 during the inaugural Assembly of the International Solar Alliance (ISA).

Key Facts and Features of OSOWOG

1. **Purpose of OSOWOG**:
   - The OSOWOG initiative aims to create a global interconnected grid that allows countries to transfer renewable energy, particularly solar power, across borders.
   - This grid will help countries to use renewable resources more efficiently, reduce reliance on fossil fuels, and optimize energy distribution across regions.
2. **India-Oman Power Link**:
   - One of the 1st projects under OSOWOG is the interconnection of India's power grid with Oman's grid.
   - This link will help to enhance renewable energy flow between the two countries.
   - A key aspect of this initiative is the creation of a shared network that enables the efficient transfer of renewable energy across regions.
   - Surplus solar or wind energy in one area can be transferred to another region experiencing an energy deficit.
3. **Maximizing Solar Energy with Time-Zone Diversity**:
   - The idea behind OSOWOG is to leverage time-zone diversity—since the sun is always shining somewhere on Earth, different regions can generate solar power at different times of the day.
   - This allows for continuous generation of solar energy, making the system more reliable and reducing the need for large-scale storage solutions.
4. **Renewable Energy Integration**:
   - The initiative aims to integrate solar, wind, and hydro power from different regions, which will help to balance supply and demand peaks and improve grid stability.
   - By connecting renewable energy sources across borders, countries can better manage their electricity needs, especially during peak times, and reduce their reliance on fossil fuels.
5. **Current and Future Electricity Exchanges**:
   - India currently exchanges about 4,100 MW of electricity with neighboring countries, including Nepal, Bangladesh, Bhutan, and Myanmar.
   - This capacity is expected to increase to 7,000 MW by 2026-27 as new interconnections are developed, including the Oman link.
6. **Proposed Projects under OSOWOG**:
   - In addition to the India-Oman link, other planned interconnections include discussions with the UAE, Saudi Arabia, and Singapore.
   - A 1,000-km undersea power cable connecting Gujarat in India with Oman is also being explored.
   - This would create a secure energy exchange route between the two countries.

Core Principles and Benefits of OSOWOG

1. **Global Renewable Energy Generation**:
   - The OSOWOG initiative operates on the principle that "the sun never sets", meaning

solar energy generation can occur around the clock, thanks to the different time zones across the world.
    - By connecting grids globally, this continuous generation of renewable energy can be shared and balanced across regions, making solar power a stable and consistent energy source.
2. **Cost Efficiency**:
    - Cross-border grid connections help reduce investment costs.
    - Countries can share backup resources, lowering the need for extensive reserve capacity and making the system more cost-effective.
    - By creating shared grids, the overall cost of energy infrastructure can be minimized, making the transition to renewable energy more affordable for all participating countries.
3. **Need for Political and Regulatory Support**:
    - For OSOWOG to succeed, strong political support and well-developed regional coordination mechanisms are crucial.

Other Ongoing Developments in Cross-Border Connectivity

Plans for Sri Lanka:

- India is also exploring a cross-border power interconnection with Sri Lanka as part of its broader efforts to enhance regional energy cooperation.
- The OSOWOG grid will help countries to manage their peak power demands with fewer resources and provide a stable, renewable energy supply across the region.

What is One Sun, One World, One Grid (OSOWOG) ?

1. **Launch:** OSOWOG was proposed by Indian Prime Minister Narendra Modi at the 2018 ISA Assembly. It envisions a global interconnected solar grid that shares solar energy across countries, ensuring continuous access to clean energy.
2. **Collaboration:** In COP26 (2021), the Green Grids Initiative (GGI), launched by the UK, merged with OSOWOG into GGI-OSOWOG to promote renewable energy and ensure net-zero emissions by 2030.

Core Objectives

1. **Global Solar Grid:** Link solar power grids across continents to share energy globally, ensuring that wherever the sun is shining, energy is available.
2. **Maximize Renewable Energy:** Shift energy production from fossil fuels to cleaner sources, balancing global energy needs with solar power.
3. **International Cooperation:** promote collaboration to ensure equitable, sustainable energy access for all countries.

Implementation Phases

1. **Phase 1:** Connect India's grid to neighboring regions in South Asia, Middle East, and Southeast Asia.
2. **Phase 2:** Expand the grid to Africa for broader energy sharing.
3. **Phase 3:** Achieve a global interconnected grid by 2050, integrating 2,600 GW of renewable energy.

India's Role

- **Leadership:** India leads the OSOWOG initiative through ISA, aiming for 500 GW of non-fossil fuel electricity by 2030 and Net Zero by 2070.
- **Energy Growth:** India is the 4th largest renewable energy producer globally, with solar power playing a central role.
- **Grid Interconnections:** India has established connections with Nepal, Bangladesh, and Myanmar, and is negotiating with other nations like Sri Lanka, UAE, and Saudi Arabia.

Challenges

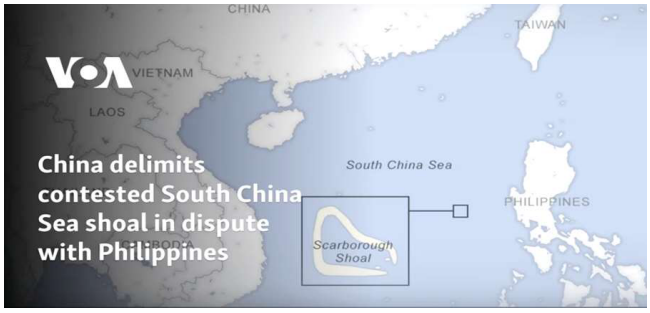
- **Infrastructure:** The need for large-scale grid development, energy storage systems, and battery technologies.
- **Investment:** OSOWOG requires $1 trillion in funding by 2030 for developing countries.
- **Geopolitical Coordination:** Successful implementation requires global cooperation, trade agreements, and regulatory harmonization.

India's Strategic Shift

- **Energy Demand:** India will account for 25% of global energy demand growth by 2040, making solar power crucial for energy security.

- **Air Pollution:** Solar energy helps reduce pollution caused by fossil fuels.
- **Water Crisis:** Solar power is water-efficient, unlike coal-based energy that depletes water resources.

China's Move to Strengthen Territorial Claims over Scarborough Shoal Amid Dispute with Philippines



Why in News?

- China has recently released geographic coordinates marking the baselines around the disputed Scarborough Shoal in the South China Sea, a move likely to escalate tensions between China and the Philippines.
- This action came just two days after Philippine President Ferdinand Marcos Jr. signed two laws demarcating the country's claims in the contested waters.
- Both nations assert sovereignty over the Scarborough Shoal, with China controlling it since 2012 despite an international ruling that invalidated many of China's claims in the South China Sea.

Background : The South China Sea Dispute

1. **The South China Sea**:
   - The South China Sea is a strategically important body of water in Southeast Asia, rich in natural resources, and a critical shipping route connecting Asia with other parts of the world.
   - Several countries, including China, the Philippines, Vietnam, Malaysia, and Brunei, claim various parts of the sea, leading to ongoing territorial and maritime disputes.
2. **The Scarborough Shoal Dispute**:
   - The Scarborough Shoal, located 220 kilometers west of the Philippines' Luzon Island, is at the heart of the ongoing dispute between China and the Philippines.
   - The shoal is an oceanic coral atoll rich in marine life and fisheries, making it an important fishing ground.
   - It also holds potential for underwater natural resources, such as oil and gas reserves.
   - The shoal is submerged at high tide, with only a few rocks above sea level.
   - China refers to the shoal as Huangyan Island, claiming historical rights dating back to the Yuan Dynasty (1200s).
   - However, the Philippines argues that the shoal falls within its 200-nautical mile Exclusive Economic Zone (EEZ), as per the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

China's Recent Move: Baseline Delimitation

1. **Release of Geographic Coordinates**:
   - China's Foreign Ministry stated that its action of releasing coordinates marking baselines around the Scarborough Shoal is in line with international law and Chinese law.
   - The ministry argued that this move is a natural step to strengthen marine management and to defend its territorial sovereignty in the region.
   - The ministry also criticized a recent law passed by the Philippines, the Philippine Maritime Zones Act, calling it a violation of China's sovereignty and maritime rights in the South China Sea.
2. **Legal Justification**:
   - China defends its claims in the South China Sea through a historical argument, referring to ancient records from the Yuan Dynasty and claiming long-standing sovereignty over the region.
   - Additionally, China uses the concept of baselines (straight lines drawn to demarcate a

nation's territorial waters) to lay claim to vast swathes of the South China Sea.

- The release of baselines in the contested waters further intensifies the legal and political struggle over territorial control, particularly as both countries face competing claims over the Scarborough Shoal.

Philippine Response

1. **Maritime Zones Act**:
   - The Philippine Maritime Zones Act defines the country's maritime boundaries, including its Exclusive Economic Zone (EEZ) in the South China Sea, where the Scarborough Shoal lies.
   - The law strengthens the Philippines' position that the shoal is within its sovereign waters.
   - President Ferdinand Marcos Jr. signed the law, asserting the country's sovereignty and reinforcing its claims in the face of China's aggressive stance.
2. **International Arbitration and Previous Ruling**:
   - In 2016, an international arbitration ruling, facilitated by the Permanent Court of Arbitration (PCA) in The Hague, invalidated China's nine-dash line claim that extends nearly all the way to the Philippines' coast. The ruling confirmed that Scarborough Shoal lies within the Philippines' EEZ, under international law.
   - However, China has refused to acknowledge the arbitration ruling, continuing to assert control over the shoal and disregarding the legal findings of the PCA.
3. **Escalating Tensions**:
   - Tensions between the two countries have led to frequent confrontations, including ship collisions and incidents where Chinese coast guard vessels used water cannons to drive away Philippine vessels, particularly Filipino fishermen attempting to access the shoal.
   - These incidents have raised concerns about escalating violence and the potential for military confrontations in a region already fraught with disputes.

Strategic and Economic Importance of Scarborough Shoal

1. **Fishing Grounds**:
   - The Scarborough Shoal is rich in marine life, making it an important fishing ground for both China and the Philippines.
   - However, China's control over the shoal since 2012 has severely restricted access for Filipino fishermen, significantly impacting their livelihoods.
2. **Natural Resources**:
   - The surrounding waters of the Scarborough Shoal are believed to contain valuable marine resources, including oil and natural gas reserves.
   - Control over the shoal is thus strategically important for any future energy exploration and exploitation in the region.
3. **Shipping and Trade Routes**:
   - The South China Sea is one of the world's busiest maritime trade routes.
   - Control over key shipping lanes in this region grants considerable geopolitical leverage.
   - Both China and the Philippines have stakes in ensuring access to these critical waterways for global trade.

International Law : Exclusive Economic Zone (EEZ)

UNCLOS and EEZ:

- The United Nations Convention on the Law of the Sea (UNCLOS), signed in 1982, establishes the concept of the Exclusive Economic Zone (EEZ), which extends 200 nautical miles from a country's coastline.
- Within this zone, the coastal state has the exclusive right to exploit natural resources such as fishing, oil, and gas.
- The Philippines claims the Scarborough Shoal as part of its EEZ, citing proximity to its main island of Luzon.
- The 2016 ruling by the Permanent Court of Arbitration upheld this claim, but China continues to assert its sovereignty over the shoal based on historical grounds.

Conclusion :

The release of baselines by China around the contested Scarborough Shoal further complicates the territorial dispute with the Philippines. Despite the 2016 PCA ruling in favor of the Philippines, China continues to assert its control over the shoal based on historical claims, while the Philippines strengthens its position through domestic legislation. The ongoing confrontation over the shoal and broader South China Sea claims threatens to destabilize the region, with significant implications for international trade, regional security, and international law. The international community must closely monitor developments, as the dispute has the potential to affect broader geopolitical relations in Southeast Asia and beyond.

India-Russia Trade Target of USD 100 Billion : Key Developments and Challenges

Overview :

India and Russia aim to achieve a USD 100 billion trade target well before 2030. This was discussed at the 25th India-Russia Intergovernmental Commission on Trade, Economic, Scientific, Technological, and Cultural Cooperation (IRIGC-TEC) held in New Delhi. The session focused on strengthening bilateral ties and overcoming challenges in trade, connectivity, and strategic cooperation.

Key Highlights from the 25th Session of IRIGC-TEC

1. **Trade Target of USD 100 Billion**:
   - India and Russia are confident of reaching USD 100 billion in annual trade earlier than the 2030 target.
   - Both countries agreed on the need for a more balanced trade relationship and have started efforts to tackle current trade constraints.
2. **Trade Progress and Diversification**:
   - **Payment and Logistics**: Significant progress has been made to resolve challenges related to payments and logistics. 90% of trade between India and Russia is now conducted using local or alternative currencies, minimizing reliance on freely convertible currencies.
   - **Diversifying Trade**: The trade basket is diversifying beyond crude oil. Both countries are focusing on sectors like agriculture, pharmaceuticals, industrial equipment, and technology.
3. **Improving Connectivity and Talent Mobility**:
   - Emphasis was placed on improving connectivity between India and Russia, with key projects like the International North-South Transport Corridor (INSTC), the Chennai-Vladivostok Corridor, and the Northern Sea Route.
   - Both nations are also looking to promote the mobility of talent and skills development, especially for Russia's growing needs in education and workforce collaboration.
4. **Future Steps for Economic Cooperation**:
   - Working groups and sub-groups were set up to finalize the economic cooperation program leading up to 2030.
   - Key agenda items include enhancing market access, and advancing discussions on services, investments, and technology exchange.

India-Russia Trade : Key Data and Facts

1. **Trade Targets**:
   - Initially, India and Russia had set targets of USD 50 billion in investment and USD 30 billion in trade by 2025.
   - In FY 2023-24, bilateral trade reached a record high of USD 65.70 billion. India's exports to Russia were valued at USD 4.26 billion, and imports from Russia at USD 61.44 billion.

2. **Trade Basket**:
    - Imports from Russia include oil, fertilizers, minerals, precious metals, and vegetable oils.
    - Exports to Russia include pharmaceuticals, organic chemicals, electrical machinery, mechanical appliances, and iron & steel.
3. **Major Investments**:
    - Russian investments in India focus on sectors like oil and gas, petrochemicals, banking, railways, and steel.
    - Indian investments in Russia are concentrated in the oil and gas sector and the pharmaceuticals industry.

Key Challenges in India-Russia Trade

1. **Trade Imbalance**:
    - India faces a trade deficit of nearly USD 57 billion with Russia, primarily due to crude oil imports.
    - The trade imbalance is skewed in Russia's favor, with India's exports to Russia remaining lower compared to imports.
2. **Geopolitical Issues**:
    - India's growing ties with the US and the Quad (a group of four major democracies) could limit deeper cooperation with Russia, especially in the context of the Ukraine war.
    - Russia's strengthening relations with China reduce its ability to balance the interests of both India and China, which affects India's leverage in global forums.
3. **Sanctions and Compliance**:
    - Sanctions imposed by the European Union (EU) and Western countries on Russia complicate trade relations with India, with some Indian companies facing sanction risks.
    - India must balance its defense and energy ties with Russia while respecting international sanctions.
4. **Diverse Trade Basket**:
    - Although energy trade (like discounted crude oil) has increased, efforts to expand into sectors such as automotive parts, electronics, and renewables have been slow.
    - Russia's declining international influence also limits its ability to engage with India in new economic areas.
5. **Connectivity Challenges**:
    - Projects like the INSTC and Chennai-Vladivostok Corridor are critical to improving India-Russia trade. However, India's increasing interest in other routes, like the India-Middle East-Europe Corridor, may reduce the strategic importance of the INSTC.

Special Initiatives to Address Trade Challenges

1. **Special Rupee-Vostro Account**:
    - To overcome challenges posed by international sanctions, India introduced a Special Rupee-Vostro Account to facilitate payments in local currencies between Indian and Russian businesses.
2. **Free Trade Agreement (FTA)**:
    - Both countries are working toward a Free Trade Agreement (FTA) with the Eurasian Economic Union (EEU). The agreement would help streamline trade processes and reduce barriers.
    - Ongoing negotiations for a Bilateral Investment Treaty and the launch of an Investment Forum in Moscow are expected to strengthen economic cooperation.
3. **Facilitating Business Ventures**:
    - Russia is showing interest in India's Make in India program, which could lead to joint ventures and more business opportunities between the two countries.
    - The Authorized Economic Operators (AEO) agreement between India and Russia will simplify trade processes, allowing trusted exporters to benefit from smoother customs clearances.
4. **Energy Sector Cooperation**:
    - Both countries are focusing on large-scale energy initiatives, particularly in the nuclear and renewable energy sectors (solar and wind energy).

5. **Russian Business Centre**:
    - A Russian Business Centre has been established in New Delhi to facilitate business interactions, organize regional missions, and offer analytical support for improving bilateral economic ties.

International North-South Transport Corridor (INSTC)

1. **About INSTC**:
    - The INSTC is a 7,200 km multimodal transit route that connects the Indian Ocean and Persian Gulf to the Caspian Sea, extending to northern Europe via St. Petersburg, Russia.
    - It was launched in 2000 under a trilateral agreement between India, Russia, and Iran.
2. **Geopolitical Importance**:
    - The INSTC connects ship, rail, and road routes between India, Iran, Azerbaijan, Russia, Central Asia, and Europe. It has the potential to enhance India's connectivity with Central Asia and the Eurasian region.
3. **Membership:**
    - The member countries of the INSTC include India, Iran, Russia, Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Ukraine, Belarus, Oman, and Syria. Bulgaria has joined as an observer.

Conclusion :

The growing economic partnership between India and Russia presents significant opportunities for both countries, especially in the context of resource exchange and market access. As Russia pivots toward Asia and both nations seek to adapt to a multipolar global order, strengthening their trade, energy, and strategic ties will be essential for their mutual benefit. Overcoming current challenges, such as trade imbalances and geopolitical complexities, will be key to achieving the USD 100 billion trade target well before 2030.

MATES : A New Scheme for Young Indians to Work in Australia

In November 2024, Australia has introduced a new scheme called MATES (Mobility Arrangement for Talented Early-professionals Scheme) that gives young professionals from India the opportunity to work in Australia for a limited time.

What is MATES?

- MATES is a scheme for Indian university graduates and early-career professionals, allowing them to live and work in Australia for up to two years.
- It was created under the Migration and Mobility Partnership Arrangement (MMPA), an agreement signed by Australia and India on May 23, 2023.
- The MMPA aims to encourage two-way migration and mobility between the two countries, while addressing issues like illegal migration.
- MATES will begin in December 2024 and will be available to professionals from India.

Who Can Apply for a MATES Visa ?

To be eligible for the MATES scheme, applicants must meet the following conditions:

- **Age**: Must be 30 years or younger at the time of applying.
- **Education**: Must have graduated within the last **2 years** from a recognized Indian university.

- **Language Skills**: Must have proficient English skills, with a minimum IELTS score of 6 overall and at least 5 in each module.
- **Eligible Degrees**: Must hold a Bachelor's degree or higher in any of the following fields:
  - Renewable Energy
  - Mining
  - Engineering
  - ICT (Information and Communications Technology)
  - AI (Artificial Intelligence)
  - FinTech (Financial Technology)
  - AgriTech (Agricultural Technology)
- **University Eligibility**: Graduates from the top 100 universities in India (according to the National Institutional Ranking Framework (NIRF) 2024) are eligible. In Punjab, eligible universities include Panjab University, Chandigarh University, Thapar Institute of Engineering and Technology, and Lovely Professional University.

Do You Need an Australian Employer Sponsorship?

- No, applicants do not need an employer sponsorship to apply for the MATES visa.
- The scheme is designed to allow young professionals to find work independently.

Advantages of the MATES Scheme:

- **Work and Live in Australia**: Participants can live and work in Australia for up to two years.
- **No Strict Work Requirement**: While the visa is intended to support professionals in their field of study, there is no strict requirement to work only in the nominated field.
- **Develop Skills and Network**: The scheme is aimed at helping young professionals expand their skills and professional network, especially in sectors like renewable energy, AI, FinTech, and AgriTech.
- **Pilot Programme**: The scheme will start as a **pilot programme** with 3,000 places per year for primary applicants.
- **Dependents Can Join**: Participants can bring their dependents (spouses and children). Dependents will have the right to work in Australia, and their numbers will not count towards the yearly cap.

Duration of Stay:

- Visa holders must make their first entry into Australia within 12 months of receiving the visa.
- Once in Australia, they can stay for up to 24 months from their first entry date.
- The visa allows for multiple entries, meaning they can leave and return to Australia during the two-year period.
- If eligible, participants can apply for an extension or a different visa for temporary or permanent residency after their two years.

How Will the Visa Be Granted ?

- The visa will be granted through a ballot system. This means that applicants will be randomly selected to apply for the visa.
- There is a $25 AUD application fee for the ballot. Once selected, candidates will proceed with the visa application process.

Conclusion :

The MATES scheme is a great opportunity for young Indian professionals to gain valuable international work experience in sectors like engineering, technology, and renewable energy. It provides a chance to live and work in Australia for up to two years without the need for employer sponsorship, helping young professionals develop their skills, network, and grow their careers.

Failed Climate Talks, Middle East Wars : 5 Takeaways From G20 Summit In Brazil

- The G20 Summit in Rio de Janeiro took place with global leaders discussing critical issues such as climate change, ongoing wars in Ukraine, Gaza, and Lebanon, as well as other vital global concerns.
- While the summit highlighted differing views between world powers, it also led to some important outcomes.

Background :

The 2024 G20 Rio de Janeiro summit is the ongoing 19th meeting of Group of Twenty, a Heads of State and Government meeting currently taking place at the Museum of Modern Art in Rio de Janeiro from 18–19 November 2024 with the presence of the leaders of the 19 member countries, plus the African Union and the European Union. It is the first G20 summit to be held in Brazil.

- **Chair**: Luiz Inácio Lula da Silva, President of Brazil.
- **Motto**: Building a Just World and a Sustainable Planet; (Portuguese: Construindo um Mundo Justo e um Planeta Sustentável)

Here are **five key takeaways** from the summit:

1. No Climate Breakthrough

- There were high expectations that the G20 leaders would help to restart the stalled UN climate talks happening in Azerbaijan.
- However, the final declaration was underwhelming.
- In the declaration, the G20 acknowledged the need for climate finance to scale up from billions to trillions of dollars, but it failed to specify who would provide the funds.
- Additionally, the G20 did not reiterate the commitment made at the COP28 climate talks in Dubai last year for a "just, orderly, and equitable transition" away from fossil fuels.
- Mick Sheldrick, co-founder of the Global Citizen campaign, criticized the lack of progress, stating, "They haven't stepped up to the challenge."

2. Ukraine War

- The war in Ukraine was one of the central topics of the summit.
- Just before the summit, the United States had granted Ukraine approval to use long-range American missiles to strike Russian territory, raising tensions.
- In response, Russia warned that it would take action if its territory was hit.
- Chinese President Xi Jinping, along with Brazil, has been pushing for peace talks between Ukraine and Russia.
- He called on the G20 to support efforts to "cool" the war.
- The G20 leaders, in their final statement, welcomed "constructive initiatives" aimed at securing a comprehensive, just, and durable peace in Ukraine.
- While they condemned the "threat or use of force to seek territorial acquisition," they made no direct mention of Russian aggression in their statement, reflecting the differing perspectives within the group.

3. Lebanon, Gaza Ceasefire Calls

Leaders of the G20, representing diverse political views, made calls for comprehensive ceasefires in both Gaza and Lebanon:

- In Gaza, the G20 leaders expressed support for a US-proposed UN resolution calling for a permanent ceasefire in exchange for the release of all hostages held by Hamas.
- In Lebanon, the G20 urged for a ceasefire that would allow civilians to return safely to their homes along the Blue Line, the demarcation between Lebanese and Israeli forces.
- These calls for ceasefire reflected the G20's desire for peace in the Middle East and its commitment to de-escalating conflicts in these regions.

4. Tax the Super-Rich

- A significant outcome of the summit was the endorsement of taxing ultra-wealthy individuals.
- The G20 leaders agreed to work together to ensure that ultra-high-net-worth individuals are effectively taxed across nations.
- This was considered a victory for Brazilian President Luiz Inácio Lula da Silva, who had prioritized the issue.
- However, the declaration stressed that such international cooperation on tax policies should be done "with full respect to tax sovereignty" and should include debates on tax principles and measures to combat tax avoidance. Gabriel Zucman, an economist specializing in inequality, who had been consulted by Brazil for the G20 presidency, hailed the decision as "historic", signaling a strong step toward addressing global wealth inequality.

5. Alliance Against Hunger

- One of the main issues championed by President Lula was the creation of a global alliance against hunger.
- At the summit, 82 countries signed on to the initiative, making it a major success for Brazil's presidency.
- The alliance seeks to unite international efforts in the fight against hunger and secure financing for anti-hunger programs.
- The alliance aims to reduce hunger for half a billion people by the end of the decade and replicate successful programs from different countries.
- Lula, who grew up in poverty, referred to hunger as a "scourge that shames humanity" and expressed the urgency of addressing this issue globally.

Conclusion :

The G20 Summit in Brazil offered a forum for leaders to discuss urgent global challenges. While there was no significant progress on climate change, the summit saw meaningful outcomes in addressing the Ukraine war, Middle East ceasefires, taxing the super-rich, and the fight against hunger. Despite differences among countries, the summit highlighted the need for cooperation to tackle pressing issues that shape the future of the world. Through initiatives like the global alliance against hunger and the endorsement of tax reforms, the G20 leaders showed their commitment to addressing both social and economic inequalities and geopolitical instability.

Furious Row at UN as Russia Blocks Sudan Ceasefire Move

Background:

- In November 2024, There was a major argument at the United Nations (UN) over the ongoing civil war in Sudan.
- Russia has blocked a resolution that would have called for a ceasefire and peace talks in Sudan.
- The draft resolution was supported by the UK and Sierra Leone, aiming to stop the fighting that has been devastating Sudan for over a year and a half.

Key facts about Sudan:

- **Geography:**
  - Located in northeastern Africa.
  - **Bordering Countries:**
    South Sudan, Ethiopia, Eritrea, Egypt, Libya, Chad, and the Central African Republic.
  - **Geographic Features:**
    * Borders the Sahara Desert to the north.
    * Extends southward to the forests of West Africa and the Congo River basin.
    * Significant coastline along the Red Sea, providing access to the Indian Ocean and the Mediterranean Sea via the Suez Canal.
- **Capital:**
  Khartoum, located at the junction of the Blue Nile and White Nile rivers, near the center of the country.
- **Currency:**
  Sudanese pounds (SDG).
- **Colonial History:**
  - **Early Occupation:** Egyptian occupation in the early 19th century.
  - **Joint British-Egyptian Rule (1899–1956):** A British-controlled colony after an agreement in 1899.
  - **Independence:** Gained independence from Anglo-Egyptian co-rule in 1956.
  - **Political Instability:** Dominated by military regimes favoring Islamic-oriented governments since independence.
  - **South Sudan:** Prior to its secession in 2011, Sudan included South Sudan, which was home to many sub-Saharan African ethnic groups.
- **Area and Size:**
  Before South Sudan's secession in 2011, Sudan was the largest African country, comprising over 8% of Africa's land area and nearly 2% of the world's total land area.
- **Landscape:**
  - Predominantly desert and arid grasslands with sparse vegetation.
  - Major landscapes include plains and plateaus covering much of the country.

The Sudan Conflict:

- **Start of the War**: The civil war in Sudan started in **April 2023** and is still going on.
- The fighting is between the Sudanese army and a powerful group called the Rapid Support Forces (RSF).
- **Death and Displacement**: The war has caused tens of thousands of deaths, and more than 11 million people have been forced to leave their homes. Many people are also facing hunger.
- **Humanitarian Crisis**: The war has created one of the worst humanitarian crises in the world. Aid workers say that many people are at serious risk due to the violence, lack of food, and destroyed homes and hospitals.

The UN Security Council Resolution:

- **The Proposal**: The UK, with support from Sierra Leone, proposed a resolution to the UN Security Council asking both the Sudanese army and the RSF to:
  - Stop fighting immediately.
  - Start talks to agree on a ceasefire.
  - Protect civilians, especially in the Darfur region of Sudan, where the RSF has been involved in violent attacks.
- **The Veto**: The resolution was supported by 14 of the 15 members of the Security Council, but Russia used its veto to block the resolution, meaning it could not pass.

Reactions to Russia's Veto:

- **UK's Response**: British Foreign Secretary David Lammy called Russia's veto a "disgrace."
- He said Russia was stopping efforts to end the violence and protect the people of Sudan.
- He angrily asked how many more Sudanese people needed to suffer before Russia took action.
- **US's Response**: The US Ambassador to the UN, Linda Thomas-Greenfield, also criticized Russia for blocking the resolution.
- She said Russia was supporting both sides of the conflict to push its own goals, causing more harm to the people of Sudan.
- **Russia's Justification**: Russia's representative at the UN, Dmitry Polyanskiy, defended the veto.
- He said that the resolution was an attempt by the UK to interfere in Sudan's internal affairs without involving Sudan's government.
- He argued that the resolution ignored Sudan's right to decide for itself.
- Russia had previously supported the RSF, but its position seems to have changed.

Sudan's Response:

- **Sudan's Concerns**: The Sudanese ambassador to the UN, Al-Harith Idriss al-Harith Mohamed, said Sudan was unhappy with the resolution.
- He wanted the resolution to include:
  - A condemnation of the United Arab Emirates (UAE) for allegedly supporting the RSF (the UAE denies this).
  - A statement calling the RSF a terrorist group, because of the violent attacks on civilians.
- **Human Rights Violations**: Both the Sudanese army and RSF have been accused of committing terrible crimes, such as killing civilians, attacking women, and forcing people to leave their homes.

Broader Impact:

- **Africa's Role**: Experts, like Alex de Waal, said Russia's veto is a blow to Africa's efforts to bring peace.
- African diplomats had been working together to help find a solution to the Sudan crisis, but Russia's veto makes it harder to reach an agreement.

Conclusion :

The situation in Sudan is very serious, and the international community is divided on how to help. Russia's veto shows how difficult it is to agree on how to respond when different countries have different interests. The people of Sudan continue to suffer because of the lack of action.

EDITORIALS

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International Issues

France Evaluating India's Pinaka Rocket System for Its Military Needs

Key Developments:

- France is showing significant interest in India's Pinaka Multi-Barrel Rocket Launcher (MBRL) system, developed by India's Defense Research and Development Organisation (DRDO).
- The French Army has already reviewed the Pinaka system, and a French evaluation team is scheduled to visit India soon to assess both the Pinaka launcher and its ammunition.
- This comes after India's presentation of the Pinaka system to the French Army in February 2024, which the French military officials found promising.

Overview of the Pinaka Rocket System:

- **Name Origin**: The Pinaka system is named after Lord Shiva's bow, "Pinaka," symbolizing its power and precision.
- **Capabilities**:
  - **Range**: The basic version of the Pinaka has a range of 75 km, with variants capable of targeting at even greater distances.
- **Variants**:
  - **Mark-I Enhanced**: Range of 45 km (28 miles).
  - **Mark-II ER (Extended Range)**: Range of 90 km.
  - **Salvo Capability**: Can fire 12 High Explosive (HE) rockets in 44 seconds from a single launcher.
- **Mobility**: The Pinaka system is mounted on a Tatra truck, which provides mobility and the ability to be rapidly deployed in various terrains.
- **Notable Service Use**:
  - **Armenia-Azerbaijan War**: The Pinaka system gained international attention when Armenia used it effectively during its conflict with Azerbaijan.
  - **Kargil War (1999)**: The system was first used in combat during the **Kargil War**, where it was instrumental in neutralizing enemy positions on mountain tops.

India's Defense Exports and Global Reach:

- **Export to Armenia**: Armenia became the first international customer for the Pinaka system. India signed a US $250 million contract for the sale of the Pinaka MBRL to Armenia.
- **Growth in Defense Exports**: Under Prime Minister Narendra Modi, India's defense exports have increased threefold since 2014, and the Pinaka system is an example of India's growing presence in the global defense market.

France's Interest in Pinaka and the Evaluation Process:

- **French Army's Interest**: A senior French officer confirmed that **France is considering India's Pinaka** system alongside other options for its military needs.
  - **Evaluation Mission**: A French team will soon visit India to evaluate the Pinaka launcher and its related ammunition as part of a broader review of potential suppliers.
  - The evaluation process is in its early stages, and France is considering 3-4 leading suppliers, with India among them.

French Army's Current Rocket Systems and the Need for Replacement:

- **Current Systems**: The French Army currently uses the M270 Lance-Roquettes Unitaire (LRU) system.

  France operates 13 upgraded M270 systems. However, due to the war in Ukraine, six of these systems have been sent to support Ukraine's defense efforts.

- **Seeking a Replacement**: France is actively looking for new rocket systems to replace the M270, and India's Pinaka MBRL is one of the systems under consideration.

Pinaka's Growing Global Demand:

- **International Sales**: Apart from Armenia, there is increasing global interest in the Pinaka system. The Indian Army currently has four Pinaka regiments in service, with six more regiments on order.
- **Enhanced Range**: Extended-range versions of the Pinaka are being developed, with the potential to increase the system's range up to 120 km and 300 km in the future.

Defense Cooperation Between India and France:

- **Land Defense Cooperation**: While India-France defense cooperation has traditionally been more visible in the Air Force and Navy domains, cooperation in land defense is now strengthening.

o **Exercise Shakti 2024**: The 7th edition of the India-France Army Exercise Shakti took place in Meghalaya in May 2024, with a focus on high-altitude warfare. This exercise marked an important step in deepening land defense ties between the two countries.

Bilateral Defense Projects and Cooperation:

- **Rafale-M Jets**: India and France are in advanced negotiations for the purchase of 26 Rafale-M fighter jets for the Indian Navy.
- **Scorpene-class Submarines**: India is also negotiating with France for the acquisition of three more Scorpene-class submarines for the Indian Navy.
- **Advanced Medium Combat Aircraft (AMCA)**: Discussions are ongoing regarding a joint project to develop a jet engine for India's AMCA program.

Geopolitical and Global Cooperation:

- **UNIFIL Cooperation**: Both India and France contribute to UNIFIL (United Nations Interim Force in Lebanon). India has 903 troops, while France has 665 troops deployed in Lebanon as part of the peacekeeping force.

  Both countries share similar views on international law and peacekeeping efforts, particularly in regions like Lebanon where they work to maintain stability between Lebanon, Hezbollah, and Israel.

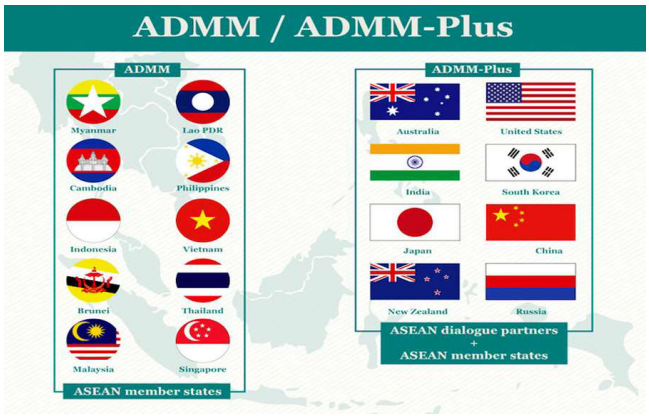
Conclusion :

France's interest in India's Pinaka rocket system marks a significant step in the growing defense ties between the two nations. As India positions itself as a key player in the global defense market, the Pinaka MBRL is gaining international recognition for its effectiveness and reliability. The evaluation process by France and the increasing demand from other countries highlight the global appeal of India's indigenous defense technologies. This cooperation is expected to further strengthen India-France relations, with potential collaborations in various defense sectors, from land systems to air and naval technologies.

11th ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) held in Vientiane, Laos

- In November 2024, Defence Minister Rajnath Singh attended the 11th ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) held in Vientiane, Laos.
- There he met several key counterparts from the Asia-Pacific region, including those from South Korea, Australia, New Zealand, Malaysia, and the US.
- The discussions focused on strengthening defence ties, boosting military cooperation, and deepening industrial collaboration in the region.

What is ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus)



- ADMM-Plus is a platform for ASEAN (Association of Southeast Asian Nations) and its 8 Dialogue Partners:
  - Australia
  - China
  - India
  - Japan
  - New Zealand
  - Republic of Korea
  - Russia
  - United States
- **Purpose:**
  - Strengthen security and defence cooperation.
  - Promote peace, stability, and development in the region.
- **Inaugural Meeting**

  First convened on 12 October 2010 in Ha Noi, Vietnam.
- **Annual Meetings :**

  Since 2017, the ADMM-Plus meets annually to facilitate enhanced dialogue and cooperation among ASEAN and Plus Countries amidst an increasingly challenging regional security environment.

Objectives of ADMM-Plus

1. Capacity Building:

- Help ASEAN member states address shared security challenges.
- Acknowledge the differing capacities of ASEAN members in defence and security matters.

2. Promoting Mutual Trust :

- Promote greater dialogue and transparency between defence establishments.
- Build mutual trust and confidence among the ASEAN members and Plus Countries.

3. Enhancing Regional Peace & Stability:

Promote cooperation in defence and security to tackle transnational security challenges facing the region.

4. Realisation of an ASEAN Security Community :

- Support the vision outlined in the Bali Concord II :
  - Achieve peace, stability, democracy, and prosperity.
  - Ensure that ASEAN member states live in harmony with each other and with the world at large.

5. Supporting the Vientiane Action Programme :

- Facilitate the realisation of ASEAN's peaceful, secure, and prosperous goals.
- Adopt strategies for better external relations with ASEAN's Dialogue Partners.

1. Meeting with South Korean Defence Minister, Kim Yong Hyun

- **Key Points Discussed:**
  - **Co-production & Co-development:** Rajnath Singh highlighted the potential for enhanced defence manufacturing collaboration between India and South Korea, specifically in co-production and co-development.
  - **Defence Corridors:** He invited Korean companies to invest in India's defence corridors, which have significant opportunities for setting up manufacturing units.
  - **Strategic Partnership:** Both countries reaffirmed their Special Strategic Partnership, emphasizing growing bilateral ties and mutual interests in addressing regional security challenges.
  - **Bilateral Defence Cooperation:** The meeting underscored the importance of strong defence relations, especially in light of shared security challenges in the region.
  - Both parties agreed to continue cooperation through established mechanisms like the Defence Policy Dialogue (DPD), with the next round scheduled for December 2024.

2. Meeting with Australian Defence Minister, Pat Conroy

- **Key Points Discussed:**
  - **Partnership in Indian Ocean Region:** Rajnath Singh noted the growing India-Australia partnership, emphasizing shared interests in ensuring stability and security in the Indian Ocean region.
  - **Defence Collaboration:** Both sides agreed to explore deeper defence collaboration, particularly in niche areas, and to exchange an implementing arrangement for air-to-air refuelling.
  - This would improve interoperability between the two countries' air forces.
  - **Strengthening Bilateral Ties:** There was a consensus on taking the bilateral defence relationship to the next level, both in direct bilateral cooperation and in regional contexts.

3. Meeting with New Zealand Defence Minister, Judith Collins

- **Key Points Discussed:**
  - **Cultural and Strategic Ties:** Rajnath Singh emphasized the shared democratic traditions, love for sports (cricket, hockey), and common governance values as the foundation of India-New Zealand defence relations.
  - **Defence Cooperation Agreement (DCA):** Singh requested the early finalization of the Defence Cooperation Agreement (DCA), which is expected to enhance the growing bilateral ties between the two nations.
  - **Shipbuilding Industry:** Both countries agreed to strengthen cooperation in shipbuilding, leveraging India's strong industry in this area to enhance mutual capabilities.

4. Bilateral with Malaysian Defence Minister, Khaled Nordin

- **Key Focus:**
  - Rajnath Singh held discussions with Malaysian Defence Minister Khaled Nordin.
  - The details of the meeting were not elaborated in the statement but were part of the broader diplomatic engagements to strengthen defence relations within the ASEAN framework.

5. Meeting with Defence Minister of Lao PDR, General Chansamone Chanyalath

- **Key Focus:**
  - Rajnath Singh engaged with the Defence Minister of Laos as part of the broader ASEAN Defence Ministers' dialogue, aiming to enhance India's relations with Southeast Asian nations, especially in terms of security cooperation and regional stability.

6. Meeting with US Secretary of Defence, Lloyd J. Austin

- **Key Points Discussed:**
  - **Strengthening India-US Defence Ties:** Rajnath Singh and Lloyd Austin discussed the continued progress in the India-US defence partnership.

    oThe meeting focused on increased cooperation in military operations, information sharing, and defence innovation.
  - **Key Agreements:** Both sides emphasized recent agreements, such as:
    * Security of Supplies Agreement (SOSA) and the Memorandum of Agreement (MOA) signed during Singh's visit to the US in August 2024, aimed at enhancing logistics and defence collaboration.
    * INDUS-X and MALABAR exercises were also highlighted as key initiatives to enhance interoperability between the two nations.
  - **Focus on Indo-Pacific:** Both leaders stressed the importance of maintaining a free and open Indo-Pacific. They supported initiatives like the Maritime Initiative for Training in the Indo-Pacific (MAITRI) and the Quad Indo-Pacific Logistics Network pilot project.
  - **Defence Innovation:** Singh and Austin discussed expanding the collaboration in

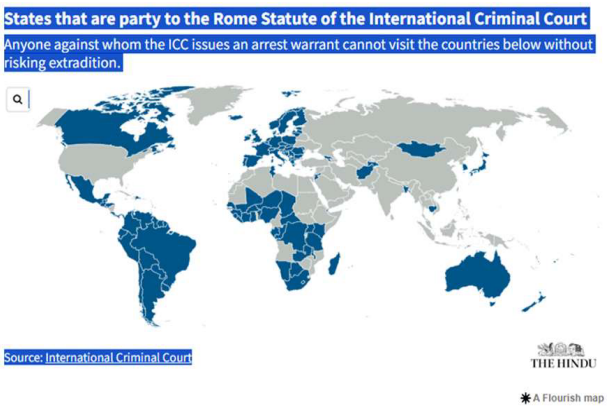
defence innovation, particularly through platforms like the India-US Defence Acceleration Ecosystem, which connects government, businesses, and academic institutions for greater technological collaboration.

Conclusion :

Rajnath Singh's engagements in Laos at the 11th ASEAN Defence Ministers' Meeting-Plus reflect India's active pursuit of strengthening strategic and defence ties across the Asia-Pacific region. Through bilateral discussions with countries like South Korea, Australia, New Zealand, Malaysia, and the US, India is enhancing military collaboration, boosting defence industrial cooperation, and asserting its role in ensuring regional security in the Indo-Pacific. The meetings also emphasize India's growing leadership in shaping a secure, peaceful, and prosperous regional order, particularly through multilateral platforms like ASEAN and the Quad.

ICC Issues Arrest Warrants for Netanyahu, Former Defence Minister, Hamas Leader Mohammed Deif

- On November 21, 2024, the International Criminal Court (ICC) issued arrest warrants for Israeli Prime Minister Benjamin Netanyahu, his former Defence Minister Yoav Gallant, and Hamas leader Mohammed Deif.
- The ICC accused them of war crimes and crimes against humanity related to the ongoing conflict in Gaza.
- The decision follows a series of violent clashes between Israel and Hamas, most notably the October 2023 Hamas attack on Israel that killed hundreds and triggered Israel's large-scale military offensive in Gaza.



Key Points of the ICC Decision

1. **Warrants for Israeli Leaders:**
   - Benjamin Netanyahu and Yoav Gallant are accused of intentionally depriving civilians in Gaza of basic necessities, including food, water, medicine, and fuel.
   - The ICC's three-judge panel found reasonable grounds to believe that both men knowingly and intentionally engaged in actions that led to widespread suffering for Gaza's civilian population.
   - The charges include murder, attacks on civilians, and persecution.
2. **Warrant for Hamas Leader Mohammed Deif:**
   - Mohammed Deif, a senior Hamas military commander, was accused of committing crimes against humanity during the October 2023 attacks.
   - These included murder, extermination, torture, rape, and other forms of sexual violence, as well as war crimes such as taking hostages and attacking civilians.
   - The attacks by Hamas on October 7, 2023, killed around 1,200 Israelis and led to the abduction of 250 people.
3. **Impact of the Warrants:**
   - While the warrants place Netanyahu, Gallant, and Deif as internationally wanted figures, the practical impact is uncertain, as neither Israel nor Hamas are members of the ICC.
   - The United States and Israel, both non-members, have rejected the ICC's authority

and dismissed the warrants as "political" and "anti-Semitic."

- Two of the Hamas leaders named in the request for arrest warrants, Yahya Sinwar and Ismail Haniyeh, were killed during the conflict, and thus the warrants for them were withdrawn.

4. Legal and Political Reactions:

- **Israel's Response**: Israeli officials, including Netanyahu's office, rejected the ICC's decision, calling it "absurd" and "false".
- Israel has long maintained that it has the right to self-defence and would not cooperate with the court's actions.
- **U.S. Support for Israel**: U.S. President Joe Biden expressed strong backing for Israel's right to defend itself, calling the ICC's actions "disgraceful".
- **Hamas Response**: Hamas also condemned the warrants, claiming that they were part of an effort to delegitimize its struggle against Israeli occupation.

5. Challenges in Enforcement:

- The ICC lacks its own police force and relies on cooperation from member states to enforce arrest warrants.
- Since Israel and the U.S. are not members of the court, these warrants may not have immediate practical consequences.
- Netanyahu and Gallant may face challenges when traveling to ICC member states (such as the EU and UK), which are required to detain suspects under arrest warrants.
- However, as demonstrated by Russian President Vladimir Putin's recent travel to Mongolia, which is an ICC member, non-cooperation from certain states could limit the impact of the warrants.

6. The ICC's Jurisdiction:

- While Israel is not a member of the ICC, the court has the authority to prosecute individuals from non-member states if crimes occurred on the territory of a member state or if those crimes were referred to the court by the United Nations Security Council (UNSC).
- Israel's legal arguments against the ICC's jurisdiction, including its claim that the court should allow Israel to investigate alleged war crimes itself, have been dismissed by the ICC.

7. Separate Legal Issues:

- In addition to the ICC case, Israel is also dealing with a separate case at the International Court of Justice (ICJ), where it is accused of genocide by South Africa. Israel denies the accusation, claiming that it is acting in self-defence against Hamas militants.

Conclusion :

The ICC's arrest warrants for Benjamin Netanyahu, Yoav Gallant, and Mohammed Deif represent a significant development in the ongoing Israel-Hamas conflict and the pursuit of accountability for war crimes. While the practical impact of the warrants remains uncertain, the case signals the international community's willingness to address allegations of war crimes and crimes against humanity committed by both state and non-state actors in the conflict. This decision also underscores the growing tension between the ICC and non-member states like Israel, which continues to reject the court's authority.

Prime Minister Narendra Modi's Visit to Guyana and the 2nd India-CARICOM Summit

- On November 20, 2024, Prime Minister Narendra Modi made a historic visit to Guyana, marking the first visit by an Indian Prime Minister to the country in 56 years.
- The last Indian leader to visit was Prime Minister Indira Gandhi in 1968.

Bilateral Talks and Agreements

During his visit, PM Modi held discussions with President Mohamed Irfaan Ali of Guyana, leading to the signing of 10 important agreements between the two nations. These agreements cover a wide range of sectors:

1. **Energy Security**: PM Modi emphasized Guyana's growing role in India's energy security. A long-term blueprint for energy cooperation is set to be developed.
2. **Digital Payments**: One of the key agreements includes the deployment of India's Unified Payments Interface (UPI) in Guyana, which will facilitate seamless digital transactions between the two countries.
3. **Defense Cooperation**: India will continue supporting Guyana's defense sector, offering military training, scholarships, and equipment. Notably, India has already supplied two Dornier aircraft to Guyana this year.
4. **Agriculture and Food Security**: India has contributed to Guyana's food security by providing millet seeds in 2023. Additionally, further cooperation in the agricultural sector is on the agenda.
5. **Healthcare**: India will establish a ***Jan Ausadhi Kendra* in Guyana** to provide affordable medicines and healthcare solutions.

Awards and Honors for PM Modi

In recognition of his contributions, PM Modi received prestigious awards from Guyana and Dominica:

1. **Guyana**: The *Order of Excellence*, conferred by President Irfaan Ali, was awarded to PM Modi for his leadership during the COVID-19 pandemic, global service, and efforts in strengthening bilateral relations.

   PM Modi is only the 4th foreign leader to receive this honor.
2. **Dominica**: The *Dominica Award of Honour* was presented by President Sylvanie Burton, recognizing India's support during the COVID-19 crisis, including the supply of 70,000 AstraZeneca vaccines.

Future Recognition

- PM Modi is set to receive additional honors, with Barbados planning to confer its highest national award on him.
- This would bring his total number of international honors to 19.

Guyana-India Bilateral Relations

India and Guyana share a strong diplomatic history, marked by significant milestones:

- **Diplomatic Missions**: India's diplomatic presence in Guyana began with the establishment of the Indian Commission in Georgetown in May 1965, which was upgraded to a High Commission in 1968.
- **Cultural Diplomacy**: The Swami Vivekananda Cultural Centre (SVCC), established in 1972, has played a key role in fostering cultural ties between India and Guyana.
- **Infrastructure Support:** India has contributed to several major infrastructure projects in Guyana, including the National Cricket Stadium, solar traffic lights, and the Centre of Excellence in Information Technology (CEIT).

About Guyana :

- **Location**: Guyana is located in the northeastern part of South America.
- **Borders**: It is bordered by the Atlantic Ocean to the north, Suriname to the east, Brazil to the south, and Venezuela to the west.
- **Major Rivers**: Some of the country's most significant rivers include the Courantyne, Berbice, Demerara, and Essequibo.

- **Oil Reserves**: Guyana has emerged as a significant player in the global oil market with recent discoveries of over 11.2 billion barrels of oil equivalent, making up about 18% of global oil and gas discoveries.

India-CARICOM Summit in Guyana

- PM Modi attended the 2nd India-CARICOM Summit in Georgetown on November 20, 2024, alongside leaders from the Caribbean Community (CARICOM).
- The summit focused on strengthening ties between India and the Caribbean nations across several key areas.

The summit's discussions were built around the 7 Pillars of India-CARICOM Relations (Acronym: C-A-R-I-C-O-M), which include:

1. **C - Capacity Building**: India will offer 1,000 IT scholarships for CARICOM nations and expand its technology centre in Belize for all CARICOM members.
2. **A - Agriculture and Food Security**: India will share its agricultural technologies, such as the use of drones, and promote millet cultivation to enhance nutrition in CARICOM countries.
3. **R - Renewable Energy and Climate Change**: India invited CARICOM nations to join the International Solar Alliance and pledged support in climate change mitigation, including a $150 million credit line for renewable energy initiatives.
4. **I - Innovation and Technology**: India will share innovations like the UPI and digital payment infrastructure to enhance CARICOM's technological landscape.
5. **C - Cricket and Culture**: PM Modi proposed offering 11 scholarships per CARICOM country for women's cricket coaching to promote empowerment.
6. **O - Ocean Economy**: India will assist CARICOM nations in exploring marine resources, regional connectivity, and maritime security.
7. **M - Medicine and Healthcare**: India reaffirmed its commitment to affordable healthcare through its *Janaushadhi* scheme and continued support in the pharmaceutical sector, including COVID-19 vaccine assistance.

What is CARICOM?

- The Caribbean Community (CARICOM), formed in 1973, is an important regional organization consisting of 21 countries.
- This includes 15 member states and 6 associate members, stretching from the Bahamas in the north to Guyana and Suriname in South America.
- CARICOM represents a diverse population of approximately 16 million people, with a significant portion (60%) of the population under the age of 30.

Key Objectives of CARICOM:

- Economic Integration
- Foreign Policy Coordination
- Human and Social Development
- Security

India's Engagement with CARICOM

- India's relationship with CARICOM is crucial to its Global South Strategy. Strengthening ties with developing nations, particularly in the Caribbean, is a cornerstone of India's foreign policy.
- CARICOM's members, many of whom are also part of the Commonwealth of Nations, offer India a wider platform for global cooperation.
- Shared concerns over issues like climate change, disaster management, and trade form the basis of the India-CARICOM partnership.

Global South Strategy and India's Role

India's outreach to CARICOM nations reflects its broader aim to build stronger alliances within the **Global South**. As a prominent member of this bloc, India seeks to foster mutual development, address shared challenges like climate change, and enhance its influence in global forums such as the United Nations and the World Trade Organization (WTO).

Strengthening ties with CARICOM is an essential part of this strategy.

Conclusion :

PM Modi's visit to Guyana and participation in the 2nd India-CARICOM Summit signifies a major step in deepening India's ties with the Caribbean region. The agreements and initiatives discussed reflect India's commitment to building partnerships that span sectors from energy and technology to agriculture and healthcare, while also fostering mutual collaboration on global challenges such as climate change and sustainable development. Through this engagement, India continues to solidify its position as a key partner in the Global South.

Chennai-Vladivostok Eastern Maritime Corridor Operational

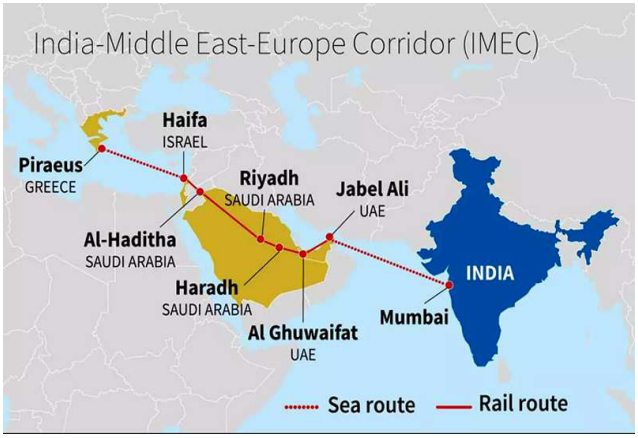
Overview:

- The Chennai-Vladivostok Eastern Maritime Corridor became fully operational by the end of 2023.
- This maritime route facilitates the transportation of goods, such as oil, food, and machinery, between India and Far East Russia.
- The announcement was made by Sarbananda Sonowal, the Minister of Ports, Shipping, and Waterways, on November 18, 2024.

Key Developments:

1. **Time and Distance Reduction**:
   - The **Chenn**ai-Vladivostok Maritime Corridor has reduced the shipping time by 16 days, from 40 days to 24 days.
   - The travel distance has also been reduced by up to 40%, enhancing efficiency in trade between India and Far East Russia.
2. **Ports Involved**:
   - The corridor connects key Indian ports such as Chennai, Paradip, and Vizag along with important ports in the Bay of Bengal.
   - These ports serve as the starting points for goods being shipped to Vladivostok in Russia.
3. **Cargo Flow**:
   - The types of cargo being transported include **crude oil**, **food products**, and **machinery**.
   - This indicates a significant trade between the two regions and is expected to grow in volume.

India-Middle East-Europe Economic Corridor (IMEEC):



1. **Announcement at the G20 Summit**:
   - The IMEEC was announced during the 2023 G20 summit. The corridor aims to connect India with the UAE, Saudi Arabia, Jordan, Israel, and three European countries: Italy, France, and Greece.
   - The corridor is expected to improve trade and connectivity between Asia and Europe.
2. **Distance and Route**:
   - The IMEEC will cover over 4,800 kilometers and will consist of both rail and sea routes.
   - This makes it a significant step toward improving connectivity between these regions.

3. **Collaboration Between India and Greece**:

- India and Greece will collaborate closely to develop the IMEEC, ensuring smoother transportation of goods between Asia and Europe.

India's Maritime Vision 2047:

1. **Ambitious Maritime Goals**:

- India aims to become a top maritime nation by 2047, excelling in key areas such as port operations, cargo handling, ship ownership, shipbuilding, and maritime technology.

2. **Port Capacity**:

- India plans to increase its port capacity to handle 10,000 million metric tonnes of cargo annually by 2047.
- This will position India as a major player in global maritime trade.

3. **Strategic Trade Routes**:

- India will utilize key international trade routes, including the IMEEC and the INSTC (International North-South Transport Corridor), to strengthen its presence in global maritime trade.
- The INSTC is a network of 7,200 kilometers linking India, Iran, Azerbaijan, Russia, and Central Asia to Europe.

4. **Focus on Clean Shipbuilding**:

- India will focus on green shipbuilding, emphasizing the construction of ships powered by clean fuels such as ammonia, hydrogen, and electricity.
- This aligns with India's commitment to sustainability and reducing its carbon footprint in the maritime sector.

Policy and Infrastructure Reforms:

1. **Important Legislative Reforms**:

- India has already passed key laws to improve the maritime sector:
  * **Major Port Authority Act**: This Act decentralizes port governance and aims to enhance port efficiency.
  * **National Waterways Act**: This Act promotes inland water transport to reduce road congestion and improve cargo movement.
  * **Inland Vessel Act**: Aims to improve the use of inland waterways for transportation.
  * **Recycling of Ships Act**: Provides a legal framework to safely recycle old ships and improve environmental standards.
- **Additionally, two more bills are in the pipeline:**
  * **Coastal Shipping Bill**: This will boost coastal shipping by improving the efficiency of domestic maritime transport.
  * **Merchant Shipping Bill**: This will strengthen shipbuilding, ship recycling, and maritime safety.

2. **Investment in Port Infrastructure**:

- ₹ 80 lakh crore investment has been committed to modernizing India's port infrastructure and expanding its inland waterways. The key infrastructure projects include:
  * **Vizhinjam International Seaport (Kerala)**: A deep-water port designed to handle large ships.
  * **Vadhavan Mega Port (Maharashtra)**: This project will significantly increase India's capacity to handle large volumes of cargo.
  * **Galathea Bay (Nicobar Islands)**: A strategic port development in the Bay of Bengal that will boost connectivity and enhance India's maritime infrastructure.

India's Strategic Maritime Goals:

1. **Shipbuilding Ambition**:

- India aims to become one of the Top 10 shipbuilding nations by 2030 and reach the Top 5 by 2047.
- This ambition supports India's goal of becoming self-reliant in shipbuilding, as part of the Atmanirbhar Bharat vision.

2. **National Maritime Heritage Complex**:

- A National Maritime Heritage Complex is being built in Lothal to promote India's rich maritime history and modern shipbuilding skills.
- The complex will also serve as a center for maritime technology.

3. **Focus on Sustainability**:

- India is working toward green shipbuilding, focusing on ships powered by clean fuels like hydrogen, ammonia, and electricity.
- These efforts align with India's climate goals and sustainability targets.

Improvement in Port Efficiency:

1. **Turnaround Time**:

- India has made significant progress in reducing turnaround times at its ports.
- According to the World Bank's Logistics Performance Index, turnaround time has improved from over 40 hours a decade ago to just 22 hours today, surpassing major maritime nations like Singapore and the United States.

2. **Reforms to Boost Growth**:

- The Coastal Shipping Bill and Merchant Shipping Bill will further enhance the efficiency of coastal shipping and integrate inland waterways into India's maritime transport system.
- The revamped Major Port Authority Act aims to improve port governance, efficiency, and capacity, ensuring that India's ports can handle more cargo.

Challenges and Regional Geopolitical Context:

1. **Geopolitical Challenges**:

- The IMEEC may face challenges due to geopolitical tensions in regions like West Asia, particularly with the ongoing conflicts in Israel, Gaza, and Lebanon.
- These tensions could affect trade routes, although India remains focused on long-term maritime goals.

2. **Priority Maritime Projects**:

- Despite these challenges, projects like the Chennai-Vladivostok Corridor and other maritime initiatives are crucial to India's long-term strategic interests.

Way Forward:

1. **Strengthening India-Greece Ties**:

- The collaboration between India and Greece will be critical for the success of the IMEEC, improving connectivity between Asia and Europe.

2. **Continued Investment in Maritime Infrastructure**:

- India must continue investing in port infrastructure and maritime projects such as Vizhinjam Port, Vadhavan Port, and Galathea Bay to grow its maritime economy and increase global trade.

3. **Focus on Sustainability**:

- India's emphasis on green shipbuilding technologies and the use of clean fuels will not only help achieve climate goals but also enhance India's global maritime reputation.

4. **Maritime Legislative Reforms**:

- Enacting the Coastal Shipping Bill and the Merchant Shipping Bill will be crucial for improving coastal shipping, inland waterways, and shipbuilding in India.

Conclusion :

India's vision for 2047 aims to position the country as a global leader in maritime trade, port operations, shipbuilding, and maritime policies. The operationalization of the Chennai-Vladivostok Eastern Maritime Corridor, the development of the IMEEC, and substantial investments in port infrastructure and clean fuel technologies show India's commitment to realizing this goal. With improvements in port efficiency, legislative reforms, and a strong sustainability agenda, India is well on its way to becoming a top player in global maritime trade.

PM Modi's Visit to Nigeria : First Visit by an Indian PM in 17 years to Strengthen India-Nigeria Ties

Why is this Visit Significant?

- **First Visit in 17 Years**: Prime Minister Narendra Modi's visit to Nigeria is the first visit by an Indian Prime Minister in 17 years.
- This shows the importance of renewing and enhancing India-Nigeria ties, given Nigeria's status as Africa's largest democracy and economy.
- **Part of a Three-Nation Tour**: PM Modi's visit to Nigeria is part of a broader three-nation tour from November 17 to November 21, 2024, which also includes Brazil and Guyana. This tour highlights India's growing global influence and its efforts to strengthen ties with key partners in the Global South.
  - o Prime Minister will make an official visit to Guyana from November 19-21, the first by an Indian Prime Minister since 1968.
  - o In Guyana's Georgetown, Modi is set to attend the 2nd CARICOM-India Summit and hold bilateral meetings with CARICOM member countries.

Key Bilateral Discussions and Agreements

- **India-Nigeria Strategic Partnership**: The discussions between PM Modi and President Bola Ahmed Tinubu focused on strengthening the India-Nigeria Strategic Partnership, which is critical for addressing global and regional challenges in various sectors:

1. **Defense and Security**: The leaders addressed security issues, particularly counter-terrorism, maritime piracy, and separatism.
2. Nigeria faces significant challenges in the Gulf of Guinea, where piracy has been a major concern. Both sides agreed to enhance defense and security cooperation.
3. **Technology and Innovation**: India offered assistance for Nigeria's digital transformation, particularly in Information and Communication Technology (ICT).
4. **Health and Education**: India expressed willingness to support Nigeria in healthcare, including medicine supply and capacity-building for Nigerian healthcare professionals.
5. Both sides also agreed to facilitate student exchanges and academic collaborations.

- **Memoranda of Understanding (MoUs)**: After their discussions, PM Modi and President Tinubu signed three MoUs:

1. **Cultural Exchange**: To promote mutual understanding and strengthen people-to-people ties.
2. **Cooperation in Customs**: To streamline customs procedures, making trade more efficient between the two countries.
3. **Survey Cooperation**: To improve cooperation in surveying and geographical data, assisting in infrastructure development and planning.

- **Humanitarian Aid**: In light of the severe flooding in Nigeria, PM Modi announced that India would send 20 tons of humanitarian aid to assist with flood relief efforts.
- PM Modi also expressed condolences for the loss of life and devastation caused by the floods, underscoring India's solidarity with Nigeria.

Economic Cooperation and Trade

- **Bilateral Trade**: In 2022, the trade between India and Nigeria amounted to USD 15 billion.
- India's key exports to Nigeria include pharmaceuticals, automobiles, machinery, and chemicals, while Nigeria exports oil and gas products to India.
- **Energy Cooperation**: Nigeria, as Africa's largest oil producer, and India, with its substantial energy needs, are natural partners for energy cooperation.

- India has shown interest in investing in Nigeria's oil and gas sectors and has been a key partner in oil exploration in the country.
- **Investment Opportunities**: India is exploring investment opportunities in Nigeria, especially in sectors such as agriculture, manufacturing, and renewable energy. Indian companies are well-positioned to bring technology and investment to these sectors.

Global and Regional Issues Discussed

- **ECOWAS**: PM Modi acknowledged the important role of President Tinubu as Chair of the Economic Community of West African States (ECOWAS).
- He praised Nigeria's contribution to regional stability and cooperation in West Africa.
- **Climate Change and Green Initiatives**: PM Modi invited Nigeria to join India's climate action initiatives, such as the International Solar Alliance (ISA) and the International Big Cat Alliance, which focus on renewable energy and biodiversity conservation.
- **G20 Summit**: The leaders also discussed the significance of the African Union's permanent membership in the G20, a key outcome of India's 2023 G20 presidency. PM Modi emphasized the importance of empowering developing countries in global decision-making forums.

Recognition and Diplomatic Engagement

- **Grand Commander of the Order of the Niger (GCON)**: In recognition of PM Modi's efforts to strengthen bilateral relations, Nigeria conferred its highest national honor, the Grand Commander of the Order of the Niger (GCON), on PM Modi.
- This is the first time the honor has been awarded to a foreign leader since 1969.
- PM Modi dedicated this honor to the 140 crore people of India and the enduring friendship between the two countries.
- **Indian Diaspora in Nigeria**: PM Modi addressed the Indian community in Abuja, emphasizing the shared democratic values between India and Nigeria.
- The Indian diaspora in Nigeria, around 60,000 strong, plays a crucial role in strengthening bilateral ties and fostering people-to-people connections.

India's Development Assistance to Nigeria

- **Concessional Loans:** India has extended a concessional loan worth USD 100 million to Nigeria, aimed at supporting key infrastructure and development projects.
- **Capacity-Building:** India has been providing training programs to Nigerian professionals to help build local capacities, contributing to Nigeria's development in sectors such as healthcare, education, and technology.

The Role of India and Nigeria in the Global South

- **Voice of the Global South:** PM Modi and President Tinubu discussed their shared vision to advocate for the Global South in international forums such as the United Nations and World Trade Organization (WTO). India's leadership in promoting the concerns of developing nations, particularly through initiatives like the Voice of the Global South Summit, received strong support from Nigeria.
- **Common Development Agenda:** Both countries emphasized the need for sustainable development, poverty reduction, and climate change mitigation, with a focus on inclusive and equitable development for the Global South.

PM Modi's Three-Nation Tour : Brazil and Guyana

- **Brazil and G20:** After Nigeria, PM Modi proceeded to Brazil, where he will attend the 19th G20 Leaders' Summit (November 18-19, 2024).
- As a Troika member, India will continue to shape the G20 agenda, focusing on Global South priorities like climate action and financial inclusion.
- **Guyana:** Following Brazil, PM Modi will visit Guyana to strengthen India's diplomatic and economic ties in the Caribbean region.

Historical Background of India-Nigeria Relations

India and Nigeria share a strong and friendly relationship built on respect and cooperation. India, with a population of 1.3 billion people, and Nigeria, with over 190 million people, are large, growing countries with diverse societies. India is the largest democracy in the world, while Nigeria is the largest democracy in Africa, making them natural partners.

- **Shared History:** India's engagement with Nigeria has been shaped by shared historical experiences, particularly both countries' colonial past under the British Empire.
  - Nigeria is regarded as India's "sister continent," with India looking to strengthen its partnership with Africa as a whole.
- They work together to support South-South Cooperation and represent the voice of developing countries in global organizations like the United Nations (UN), G77, and the Non-Aligned Movement (NAM).
- **Diplomatic History:** India opened its Diplomatic House in Lagos in 1958, two years before Nigeria became independent in 1960. Since then, India and Nigeria have maintained regular contacts, and their relationship has grown from friendship to a Strategic Partnership.
- **Indian Community in Nigeria:** There are about 50,000 Indians living in Nigeria, making it the largest Indian community in West Africa. This community plays an important role in strengthening the relationship between the two countries.

Bilateral Visits:

Bilateral visits have been key to improving India-Nigeria relations over time:

1. **Pandit Jawaharlal Nehru's Visit:** India's first Prime Minister, Pandit Nehru, visited Nigeria in September 1962. His meeting with Nigeria's first Prime Minister, Tafawa Balewa, helped build strong ties between the two countries.
2. **Visits from Nigerian Presidents:**

- President Shehu Shagari (1983): Visited India as a chief guest for India's Republic Day celebrations.
- President Olusegun Obasanjo (2000): Also visited India as a chief guest for the 50th Republic Day celebrations.
- President Muhammadu Buhari (2015): Visited India to take part in the Third India-Africa Forum Summit (IAFS-III). This visit helped further strengthen the relationship between the two countries.

3. **Indian Prime Minister Visits:**

- Prime Minister Atal Bihari Vajpayee visited Abuja in December 2003 for the Commonwealth Heads of Government Summit.
- Prime Minister Dr. Manmohan Singh (2007): Visited Nigeria in October 2007, making the relationship between the two countries a Strategic Partnership. The Abuja Declaration for Strategic Partnership was signed, giving new momentum to their ties.

4. **Vice President Visits:**

- Indian Vice President Hamid Ansari visited Nigeria from 26-29 September 2016 and held meetings with Nigerian leaders, including President Buhari and Vice President Yemi Osinbajo. This visit helped deepen cooperation between the two countries.

Key Interactions and Developments

India and Nigeria have continued to strengthen their relationship through regular visits and cooperation:

- **Strategic Partnership:** The signing of the Abuja Declaration for Strategic Partnership in 2007 marked a significant milestone in the relationship. This partnership focused on building strong political, economic, and cultural ties.
- **India-Africa Forum Summit:** Nigerian President Buhari attended the Third India-Africa Forum Summit (IAFS-III) in 2015, highlighting Nigeria's strong commitment to working with India and other African nations.
- **Regular Engagements:** Both countries continue to engage through visits and discussions, helping to improve areas such as trade, investment, and education.

Indian Diaspora in Nigeria

- **Population and Distribution:** The Indian diaspora in Nigeria is sizable, with about 800,000 people of Indian origin, making them the largest racial minority in the country. The majority of the community is Hindu, and they are primarily concentrated in cities such as Lagos, Abuja, Port Harcourt, Onitsha, Ogbomosho, and Ibadan.
- **Economic Contributions:** Indian businesses and the diaspora have significantly contributed to Nigeria's economy, particularly in sectors such as textiles, pharmaceuticals, fishing, and engineering. Indian enterprises have created jobs and investment opportunities, further solidifying the economic relationship between the two nations.

Trade and Economic Cooperation

- **Bilateral Trade:** India is a major trading partner for Nigeria, with bilateral trade reaching $7.89 billion in 2023-24, despite fluctuations in recent years. Nigeria is India's second-largest trading partner in Africa, with trade between the two countries valued at $11.8 billion in 2022-23. India's products account for over 70% of Nigeria's pharmaceutical market.
- **Indian Investments:** Over 200 Indian companies are currently operating in Nigeria, with investments totaling around $27 billion. These investments span various sectors such as pharmaceuticals, power, construction, and manufacturing. Indian companies are also among the largest employers in Nigeria, second only to the federal government.
- **Sectors for Future Cooperation:** Both countries are keen to expand cooperation in sectors like power, transportation, infrastructure, maritime, agro-processing, mining, and textiles. Recent government reforms in Nigeria, including the removal of petrol subsidies and currency decontrol, aim to diversify Nigeria's economy away from oil dependency.
- **India-Nigeria Joint Trade Committee (JTC):** During the second session of the India-Nigeria Joint Trade Committee (JTC) held in Abuja on April 29-30, 2024, both countries agreed to finalize a local currency settlement system agreement to enhance economic cooperation. Key sectors identified for collaboration include crude oil, natural gas, power, pharmaceuticals, UPI, renewable energy, agriculture, food processing, education, transport, railway, aviation, and MSMEs.

Defence and Security Cooperation

India and Nigeria share a strong defence relationship, which includes:

- **Military Training and Support:** India provides training to Nigerian military personnel through the Indian Technical and Economic Cooperation (ITEC) program, offering 150 slots annually for Nigerian defence personnel. India also played a crucial role in establishing the Nigerian Defence Academy and Naval War College.
- **Maritime Security:** India and Nigeria have increased cooperation in maritime security, particularly in the Gulf of Guinea, a region critical for international trade. The Indian Navy Ship (INS) Sumedha visited Lagos in October 2023, where both navies engaged in training, professional interactions, and planning conferences to enhance maritime security and counter piracy.
- **Defence Equipment:** Nigeria is exploring the procurement of helicopters and fighter jets from Indian manufacturers, including Hindustan Aeronautics Limited (HAL), indicating deepening military ties.
- **Space and Cybersecurity Cooperation:** India and Nigeria are collaborating in space and cybersecurity:
  - **Space Cooperation:** An MoU on space cooperation will enhance ties, focusing on remote sensing, mapping, and satellite development. Training programs for Nigeria's National Space Agency are scheduled for January 2025.
  - **Cybersecurity:** An MoU between India's CERT-IN and Nigeria's CERT-NG aims to strengthen cybersecurity cooperation.

Pharmaceutical Cooperation

India is a dominant player in Nigeria's pharmaceutical sector, with Indian pharmaceutical products accounting for over 70% of Nigeria's market. India is regarded as the "Pharmacy of the World" by Nigeria. Key areas of cooperation include:

- **Investments:** Indian investments in Nigeria's pharmaceutical sector exceed $4 billion, with significant initiatives like the Serum Institute of India's partnership with Bio Vaccine Nigeria to produce vaccines locally.
- **Collaboration in APIs and Clinical Trials:** Ongoing discussions are focused on the production of active pharmaceutical ingredients (APIs) and conducting clinical trials in Nigeria to improve healthcare access.
- **Healthcare Schemes:** Nigeria is interested in emulating India's COWIN vaccination platform and the Ayushman Bharat scheme, with Indian support for implementation.

Agricultural Cooperation and Food Security

- **Agriculture's Role in Nigeria:** Agriculture is a cornerstone of Nigeria's economy, employing around 70% of the population and contributing 25.18% to the GDP in 2023. Nigeria has over 70 million hectares of arable land, though only 44% is currently cultivated.
- **Indian Engagement in Agriculture:** Indian companies are already engaged in edible oil plantations and have shown interest in grain farming. Discussions are ongoing for an MoU on agricultural cooperation, including food processing, farm machinery, and irrigation technologies to reduce post-harvest losses.

Education and Skill Development

- **Indian Education in Nigeria:** India is a popular destination for Nigerian students, with over 5,000 Nigerian students currently enrolled in various Indian institutions. Approximately 1,300 student visas are issued annually.
- **Scholarships and Collaborations:** India has extended several scholarships for Nigerian students, promoting cultural exchange and skill development. Furthermore, two universities with Indian collaboration are being established in Nigeria, and negotiations for an educational MoU are ongoing.

Oil and Gas Cooperation

Nigeria is one of the world's largest oil producers, with proven reserves of 37.1 billion barrels of crude oil and 209.5 trillion cubic feet of natural gas. India is a major importer of Nigerian oil, which accounts for a significant portion of its energy needs.

- **Energy Diversification:** India imports 4.6 million barrels of oil per day, and disruptions in oil supply from the Middle East could severely impact India's economy. To mitigate this risk, India is pivoting toward sub-Saharan Africa for a more stable supply of oil and gas resources, particularly from Nigeria.

Strategic Engagement in Africa

1. India's increasing presence in Africa provides an alternative to China's profit-driven and largely state-controlled model and the conditionality-laden approach of the West.
2. India's corporate presence and investments in Africa promote technological advancements, skill development, and efficiency, which could benefit African countries and enhance their economic development.

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Indian Polity & Governance

Press Council of India (PCI)

Overview:

- Recently, the Press Council of India (PCI) issued an advisory to the print media regarding the issue of 'paid news'.

About Press Council of India (PCI):

- **Formation**:
  - Established in 1966 by the Parliament of India, following the recommendations of the First Press Commission, chaired by Justice J.R. Mudholkar.
  - The current functioning of the PCI is governed by the Press Council Act, 1978.
- **Nature**:
  - PCI is a statutory, quasi-judicial body that serves as the watchdog of the press in India.

Composition of PCI:

- The PCI is composed of 29 members:
  - **Chairman**: Nominated by a committee comprising the Chairman of Rajya Sabha, the Speaker of Lok Sabha, and one representative of the Council.
  - **Chairman's Role**: By convention, the Chairman is a retired Supreme Court judge.
  - **Term**: The Chairman and members of the Council serve a term of 3 years.
  - The Council has 28 other members representing different sectors, including journalism, education, and law.

Primary Function:

- The main function of PCI is to check media practices and ensure the freedom of the press is upheld in India.

Other Key Functions:

1. **Maintain Independence**: Ensures that newspapers remain independent of external influences.
2. **Code of Conduct**: Develops and enforces a code of conduct for journalists and newspapers, adhering to high professional standards.
3. **Monitor News Dissemination**: Reviews developments that may restrict the supply and dissemination of news that is of public interest.
4. **Foreign Assistance Review**: Reviews cases where Indian newspapers or news agencies receive assistance from foreign sources, as referred by the Central Government.
5. **Adjudication of Complaints**: The PCI adjudicates complaints made either against the press for violating journalistic ethics or by the press for interference with its freedom.

- **What is a Statutory Body?**

  A statutory body is a non-constitutional body created by Parliament through an act of legislation. It has the authority to make decisions and pass laws on behalf of the state or country. Statutory bodies are authorized to legislate and regulate specific areas as defined by their governing laws.

Conclusion :

The Press Council of India (PCI) plays a crucial role in maintaining ethical standards in Indian journalism and ensuring that the freedom of the press is not compromised. By regulating media practices and addressing violations of press ethics, PCI helps to preserve the integrity of the media industry in India.

Rethinking India's New Population Strategy : A Comprehensive Overview

Why in News?

Recently, the state of Andhra Pradesh reversed its longstanding two-child policy, which had been in place for nearly three decades. Under this policy, individuals with more than two children were barred from contesting local body elections. The reversal of this policy reflects the growing concerns over India's changing demographic trends, including an aging population and declining fertility rate, which could have significant social and economic consequences in the future.

The Need for a New Population Strategy in India

India's population dynamics have been evolving rapidly, prompting the government and policymakers

to reconsider existing strategies. The new population strategy must be aligned with the country's demographic realities and future aspirations for economic growth and social welfare.

1. Declining Total Fertility Rate (TFR)

- TFR is a key indicator of population growth. India's TFR has steadily declined over the past few decades. According to NFHS-5 (2019-21), India's TFR stands at 2.0 children per woman, which is below the replacement level of 2.1. This suggests that India's population growth will slow down in the coming decades, and in some states, it may even start shrinking.
- **Concern**: Some states, like Andhra Pradesh, with a TFR of 1.5, are already well below the replacement level, which could lead to a shrinking workforce and labor shortages in the future. This could significantly impact the economic growth and productivity of the nation.

2. Harnessing Demographic Dividend for Economic Growth

- India has a young population, with approximately 68% of the population in the working-age group (15-64 years) and 26% in the 10-24 age group. This makes India one of the youngest countries in the world, presenting a significant opportunity to capitalize on the demographic dividend.
- To maximize this advantage, India must ensure that its youth is adequately equipped with education, skills training, and access to job creation. A new population policy is necessary to provide the infrastructure and resources for youth empowerment and employability.

3. Aging Population

- As per the India Ageing Report 2023 by the United Nations Population Fund, more than 20% of India's population will be aged 60 or above by the year 2030.
- **Challenges**:
  - Increased healthcare demand, especially for chronic and geriatric care.
  - The need for policies that support elderly care and healthy aging.
  - A shrinking labor force due to a higher number of retirees and fewer young people entering the workforce.

4. Resource Scarcity and Environmental Pressure

- India's rapidly growing population is placing a strain on its natural resources, such as water, land, and energy.
- Cities like Delhi and Bangalore face acute water stress as per capita water availability continues to decline.
- Unplanned urbanization, driven by high population growth, is leading to overburdened infrastructure, increased pollution, and the expansion of slums, further highlighting the need for a population policy that incorporates environmental sustainability and urban planning.

5. Rising Inequality and Low Living Standards

- Rapid population growth in impoverished areas exacerbates economic inequality and strains public resources.
- Many people, especially in rural and marginalized communities, struggle to access healthcare, education, and basic social services. This underscores the importance of a comprehensive population policy that includes social equity and poverty alleviation measures.

India's Historical Population Policies

India has implemented several population control measures since independence. The shift in policy focus has evolved from coercive measures to a more rights-based approach.

1. Post-Independence Family Planning (1952)

- India became the first country in the world to launch a national family planning program in 1952. The primary aim was to reduce birth rates by promoting the use of contraceptives and creating awareness about population control.

2. National Population Policy 1976

- The 1976 National Population Policy linked population control with economic development and included measures such as:

- Increasing the legal marriage age (18 for girls, 21 for boys).
- Expanding access to education and healthcare services.
- Incentivizing **sterilization** as a means of population control.

3. Emergency Period (1975–1977)

- The Emergency Period during the Indira Gandhi government is infamous for forced sterilizations and coercive population control measures. This led to significant public backlash and eroded trust in government-led population control programs.

4. National Population Policy 2000

- The 2000 policy set medium-term and long-term goals for population stabilization, focusing on achieving a replacement-level fertility rate (2.1 TFR) by 2045.
- It aimed to provide universal access to contraceptive methods, reduce maternal and infant mortality, and promote delayed marriage.

5. Current Focus:

- The modern approach to population control focuses on voluntary family planning, improving maternal and child health, and expanding contraceptive access.
- Population stabilization is now integrated with broader national goals such as economic growth, environmental sustainability, and social equity.

State-Level Policies

- Some states, like Uttar Pradesh and Assam, have introduced policies that promote a two-child norm, linking it to government benefits such as employment opportunities, welfare benefits, and electoral eligibility.
- These policies aim to address the rapid population growth in these states, which have a higher TFR compared to others like Tamil Nadu and Andhra Pradesh.

Way Forward: Key Recommendations for India's Population Strategy

Given India's demographic diversity and rapidly changing population dynamics, a one-size-fits-all approach will not work. The country needs a multi-pronged, region-specific strategy that focuses on sustainability, social equity, and economic growth.

1. Focus on Voluntary Family Planning

- India must adopt rights-based family planning policies that empower individuals, especially women, to make informed choices about family size.
- Policies should include laws against sex-selective abortion, promotion of female literacy, and ensuring equal opportunities for women in education, employment, and social security.

2. Region-Specific Approach

- States with high fertility rates (e.g., Uttar Pradesh, Bihar) may require targeted interventions, such as improved access to contraceptives, education, and economic opportunities for women.
- States with low fertility rates (e.g., Tamil Nadu, Andhra Pradesh) need policies that address the challenges of an aging population and a shrinking workforce.

3. Integrating Family Planning into Holistic Development

- Family planning should be part of a broader socio-economic development framework. It should be linked with education, employment generation, and poverty alleviation.
- This will ensure that family planning contributes to sustainable development and social justice.

4. Strengthening Social and Healthcare Systems

- India must increase its investment in healthcare infrastructure and social security systems to address the growing needs of an aging population.
- Measures should include:
  - Expanding **geriatric care** facilities.
  - Promoting the **silver economy** by encouraging businesses and services that cater to older populations.
  - Providing **flexible work arrangements** for older workers to keep them integrated into the labor force.

Conclusion :

India's demographic transition presents both opportunities and challenges. While the demographic dividend offers the potential for significant economic growth, the country also faces challenges like an aging population, labor shortages, and resource stress. A new, comprehensive population strategy that is rights-based, region-specific, and integrated with development goals is essential to ensure India's long-term social and economic sustainability. By prioritizing education, healthcare, and sustainable growth, India can unlock the full potential of its population while addressing the challenges posed by its evolving demographic landscape.

Constitution Day 2024

- On 26th November 2024, Constitution Day (celebrated annually) marks the adoption of India's Constitution in 1949.
- This year, the Prime Minister of India highlighted the Constitution as a living document pivotal for India's socio-economic progress, justice, and democracy, aligning with the 75th anniversary of its adoption.
- Additionally, the Supreme Court of India commemorated the occasion, while also remembering the 26/11 Mumbai Attacks, symbolizing India's resilience.

What is Constitution Day?

- **Purpose**: Constitution Day commemorates the adoption of the Indian Constitution on 26th November 1949.
- It celebrates the democratic principles of justice, liberty, equality, and fraternity laid down in the Constitution.
- The day also honors the Constituent Assembly's vision, and Dr. B.R. Ambedkar's key role as the Chairman of the Drafting Committee, making him the "Father of the Indian Constitution."

Historical Context:

- In 2015, the Ministry of Social Justice and Empowerment declared 26th November as Constitution Day to deepen citizens' engagement with the Constitution.
- Before 2015, 26th November was observed as National Law Day.

Key Highlights of Constitution Day 2024

1. Celebrations in Jammu & Kashmir

o For the first time since 1947, Jammu & Kashmir celebrated Constitution Day, following the abrogation of Article 370 in 2019. This marked a shift towards full integration of the region into India's legal and political framework.

2. Hamara Samvidhan, Hamara Samman Campaign

o Launched on 24th January 2024, this year-long campaign aims to enhance constitutional awareness. It includes workshops, seminars, and regional events, promoting values like justice for all and a new resolve for India's progress. It aligns with India's vision for becoming a developed nation by 2047.

3. Recognition of Women in the Constituent Assembly

o The President of India celebrated the contributions of women like Sarojini Naidu, Vijaya Lakshmi Pandit, Sucheta Kripalani, and lesser-known figures such as Ammu Swaminathan, Annie Mascarene, Dakshayani Velayudhan, and Begum Qudsia Aizaz Rasul in shaping the Constitution.

What Makes the Indian Constitution a "Living Document"?

1. Amendability

o The Indian Constitution can be amended to adapt to changing needs, ensuring its relevance. Article 368 provides a detailed amendment process, though it prohibits altering the basic structure as defined in the Kesavananda Bharati case (1973).

2. Judicial Interpretation

o The Supreme Court plays a vital role in interpreting the Constitution, ensuring it evolves. For example, in the K.S. Puttaswamy case (2017), the Court recognized Right to Privacy as a fundamental right, showcasing the Constitution's flexibility.

3. Federal Structure

o India's federal structure balances power between the central and state governments. Article 246

divides legislative powers between the Union, State, and Concurrent Lists, ensuring effective governance while addressing regional needs.

4. **Responsive to Social Change**

o Provisions such as the 89th Amendment Act (2003) made the National Commission for Scheduled Tribes (NCST) a constitutional body, underscoring the Constitution's role in fostering social justice and protecting marginalized communities.

Key Facts about the Constitution of India

1. **Constituent Assembly**

o The drafting process took nearly 3 years (2 years, 11 months, and 18 days). The Assembly initially had 389 members, which was later reduced to 299 after partition.

2. **Original vs. Current Structure**

o The original Constitution had 395 Articles, divided into 22 Parts and 8 Schedules. Today, it has more than 450 Articles, 25 Parts, and 12 Schedules.

3. **Amendments**

o As of 2024, the Constitution has undergone 106 amendments, reflecting the evolving political and social landscape of India.

4. **Length**

o The Indian Constitution is the longest written constitution globally. Its extensive provisions were essential to address India's vast diversity and complexity.

5. **Global Influence**

o The Constitution draws inspiration from various global sources, including the American, Irish, British, Canadian, and Australian constitutions, and is influenced by the Government of India Act, 1935.

Conclusion :

Constitution Day serves as a reminder of the visionary principles laid down by India's Constituent Assembly. It is a celebration of India's democracy, unity, and diversity. The Indian Constitution has evolved to address contemporary issues, and its continued relevance underscores its status as a living document. Celebrating Constitution Day, especially in the context of its 75th anniversary, is a reminder of the Constitution's enduring role in shaping India's path to a just and inclusive society.

SC Upholds EVM and VVPAT System

Why in News ?

The Supreme Court (SC) recently dismissed a Public Interest Litigation (PIL) that sought the re-introduction of ballot papers instead of Electronic Voting Machines (EVMs) and Voter Verifiable Paper Audit Trail (VVPAT) systems. The SC upheld the integrity of the EVMs, noting that doubts about their reliability arise predominantly after electoral losses. The Court also emphasized the technical safeguards in place that ensure the security and transparency of the voting system.

The Controversy Regarding EVMs

Allegations of EVM Tampering:

- **Political Parties' Claims**: Some political parties have raised concerns about the tampering of EVMs, particularly after electoral defeats. For example, in 2009 and 2019, opposition parties questioned the integrity of EVMs following their electoral losses.
- **2020 Resurgence of Controversy**: Similar claims resurfaced after the 2020 assembly elections in five states.

Election Commission's Defense:

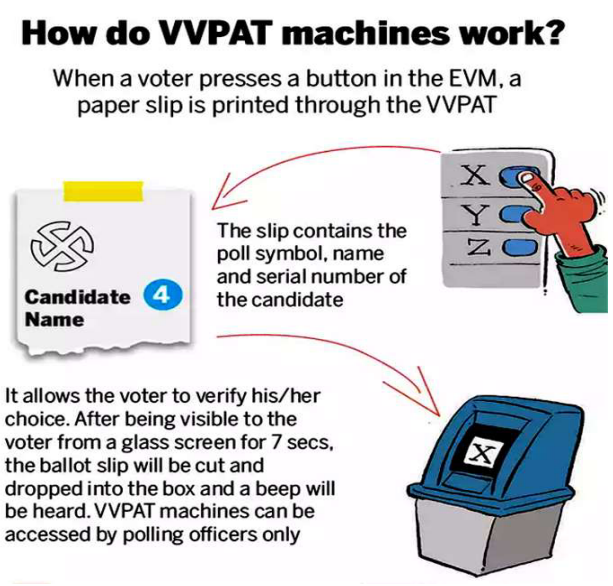
- The **Election Commission (EC)** has consistently defended the **EVMs' reliability**, citing technical studies and expert reviews that assert the machines cannot be tampered with or hacked.
- The **Supreme Court's Ruling**: The SC reaffirmed the technical safeguards, rejecting the PIL for a return to paper ballots, calling it **unsound**.

What are EVMs and VVPATs ?

EVMs (Electronic Voting Machines):

- **Purpose**: EVMs are used to conduct elections for the Parliament, State Legislature, and local bodies such as Panchayats and Municipalities.
- **Components**: EVMs have two key units:
  - **Control Unit**: Managed by the presiding officer.
  - **Ballot Unit**: Used by voters to cast their votes.

VVPAT (Voter Verifiable Paper Audit Trail):



- **Purpose**: VVPAT enables voters to confirm that their vote is recorded as intended.
- **Working**: After a vote is cast, a paper slip with the candidate's name, symbol, and serial number is printed and displayed through a transparent window for 7 seconds before being automatically cut and stored.

Evolution of EVMs in India:

- **1977**: Concept of EVMs conceived.
- **1979**: Prototype developed by Electronics Corporation of India Limited (ECIL), Hyderabad.
- **1982**: First use in Kerala's Parur by-elections (Legality challenged).
- **2004**: EVMs used nationwide in Lok Sabha elections.
- **2013**: **VVPAT** introduced, first used in Nagaland by-election.
- **2019**: First full Lok Sabha election supported by VVPAT.

Safeguards to Ensure EVM Integrity

Technical Safeguards:

- **Microcontroller Security**: One-Time Programmable (OTP) microcontrollers, which cannot be reprogrammed after manufacturing.
- **Tamper Detection**: The Advanced M3 EVMs are designed to disable the machine in case of unauthorized physical access.
- **Stand-Alone Operation**: EVMs are not connected to any wired or wireless networks, preventing remote tampering.
- **Trusted Manufacturers**: EVMs are produced only by Public Sector Undertakings (PSUs) like BEL and ECIL.

Administrative Protocols:

- **First-Level Check (FLC)**: Includes visual inspection and testing by engineers from BEL/ ECIL.
- **Randomized Allocation**: EVMs are randomly assigned to polling stations to avoid manipulation.
- **Mock Polls**: Conducted before elections to ensure accuracy and functionality.
- **Counting Day**: EVMs are placed under CCTV surveillance, with random VVPAT slip cross-verification.
- **Storage and Transportation**: EVMs are stored in strongrooms with CCTV and armed police surveillance. They are transported in GPS-tracked vehicles.

Advantages of EVM-VVPAT Over Ballot Papers

1. **No External Power Requirements**: EVMs operate on batteries, making them functional in remote areas.
2. **Elimination of Invalid Votes**: Unlike paper ballots, EVMs eliminate issues like incorrectly marked or torn ballots.
3. **Prevention of Booth Capturing**: EVMs limit voting speed, preventing rapid fraudulent voting.
4. **Accurate and Fast Counting**: EVMs enable quicker and error-free vote counting compared to manual methods.
5. **Transparency and Voter Verification**: The VVPAT allows voters to verify that their vote was recorded correctly.

Conclusion :

The EVM-VVPAT system has significantly modernized elections in India, offering transparency, accuracy, and efficiency over traditional paper ballots. Despite occasional skepticism, the Election Commission and Supreme Court have consistently upheld the

security and integrity of EVMs, ensuring trust in the democratic process. Stringent technical safeguards and administrative protocols make EVMs a reliable tool for conducting elections in India.

Supreme Court Ruling on Fraudulent Conversions for Reservation Benefits

Why in News?

On 26th November 2024, the Supreme Court of India delivered a significant ruling on the issue of fraudulent conversions aimed at gaining reservation benefits. The Court declared that converting to a religion solely for the purpose of claiming Scheduled Caste (SC) benefits is a fraud on the Constitution. The case arose after the petitioner, C Selvarani, was denied a SC certificate despite claiming that she had converted to Hinduism to avail herself of caste-based reservation benefits.

Key Points of the Judgment:

Background of the Case:

- C Selvarani applied for a government job as an Upper Division Clerk in Puducherry under the SC category.
- She claimed to belong to the Valluvan caste, which is listed as an SC under the Constitution (Pondicherry) Scheduled Castes Order, 1964.
- Selvarani argued that she had converted back to Hinduism and followed Hindu customs to regain her SC status and qualify for reservations.
- Upon investigation, authorities discovered that Selvarani had been baptized as a Christian at birth and had been practicing Christianity throughout her life, with no official evidence or ceremony of reconversion to Hinduism.

Investigations and Evidence:

- Authorities found no proof supporting Selvarani's claim of reconversion to Hinduism.
- Her family's Christian background was confirmed, and there was no official reconversion ceremony, which is required to regain caste status after conversion.
- The Court noted the absence of substantial evidence of any genuine conversion.

Court's Observations:

- The Supreme Court emphasized that conversion to another religion (e.g., Christianity or Islam) leads to the loss of caste identity, and reconversion to Hinduism is necessary to regain it.
- True belief in the religion is necessary for conversion, not just for gaining benefits under the reservation system.
- The Court noted that fraudulent claims for caste-based benefits undermine the purpose of the reservation system, which aims to support socially and economically disadvantaged communities.
- The Court highlighted that such misuse of the reservation system deprives genuine beneficiaries who are actually in need of support.

The Doctrine of Eclipse:

- The Doctrine of Eclipse was invoked by the Court, which states that when a person converts from Hinduism to another religion, their caste status is temporarily suspended.
- The caste status can only be revived when the person genuinely converts back to Hinduism and is accepted by the community.
- However, if someone has been part of another religion for several generations, it may be difficult to restore their original caste identity.

Ruling on Misuse of Reservation:

- The Supreme Court ruled that granting reservation benefits to individuals who falsely claim caste status for personal gain undermines the very purpose of the reservation system.
- Such practices would deprive the true beneficiaries who are meant to be supported by the system.

Final Verdict:

- The Court rejected Selvarani's appeal, agreeing with the Madras High Court and other authorities that her claims were not genuine.
- The ruling set a precedent for stricter checks and investigations into claims for caste-based reservations to ensure that the system is not misused.

Wider Impact of the Ruling:

Dalit Converts to Christianity or Islam:

- The ruling has broader implications for Dalit Hindus who convert to Christianity or Islam.
- The Indian government has already made it clear that Dalits who convert to these religions will not be entitled to SC reservation benefits.
- In 2022, the Union Law Minister clarified that Dalit converts to Christianity or Islam would not be allowed to contest elections in SC reserved constituencies or avail other reservation benefits.

Government's Stand on Caste-Based Reservations:

- The Indian government has set up a committee to examine the status of Dalits who convert to other religions and how they should be treated within the reservation framework.
- The commission, led by Justice K.G. Balakrishnan, is tasked with studying whether Dalit converts should receive SC status or reservation benefits and will submit its final report by October 2025.

Constitutional Context and SC Reservations

Constitutional Provisions for SC Reservation:

- **Article 341**: Empowers the President to notify which castes, communities, or tribes are designated as Scheduled Castes (SCs).
- **Article 16(4)**: Provides the State with the power to make provisions for reservation in government appointments or promotions for backward classes.
- **Article 25**: Guarantees the freedom to practice, propagate, and profess religion, while allowing religious communities to manage their affairs, subject to public order, morality, and health.

SC Reservations and Dalit Converts:

- The Constitution (Scheduled Castes) Order, 1950 states that only those Hindus, Buddhists, and Sikhs can be considered as SCs.
    - Originally, only Hindus were recognized as SCs.
    - The order was amended in 1956 to include Sikhs and again in 1990 to include Buddhists.
- However, Dalits who convert to Christianity or Islam are not entitled to SC status or reservation benefits, even if they were originally Dalits.

Why the Difference ?

- The Indian government argues that Scheduled Tribe (ST) and Other Backward Classes (OBC) status is not affected by religion.
    - People from these communities can still avail benefits even if they convert to another religion.
    - For example, certain Muslim and Christian communities have been included in the OBC list post the Mandal Commission Report.

Larger Constitutional Debate on Extending SC Benefits to Dalit Converts:

- Petitions have been filed asking whether Dalit Christians and Dalit Muslims should be included in the SC category and whether the religion-based distinction in the reservation system should be removed.
- **August 2022**: The Supreme Court sought clarification from the Union Government on this issue.
- The Ministry of Social Justice and Empowerment set up a 3-member commission in October 2022, headed by Justice K.G. Balakrishnan, to study this matter, with a final report due by October 2025.

Views of Previous Panels on the Issue:

1. **Ranganath Misra Commission (2007)**:
   Recommended that SC status should not be tied to religion, allowing Dalits from any religion to claim SC benefits.
2. **Sachar Committee (2005)**:
   Noted that Dalit Muslims and Dalit Christians continue to face social and economic backwardness, but do not receive the same benefits as Hindus, Sikhs, or Buddhists.

Conclusion :

The Supreme Court's ruling highlights the importance of genuine conversions for reservation benefits and addresses the misuse of caste status for personal gain. The decision also sets the stage for

further debates on whether Dalit converts to Christianity or Islam should receive SC status and benefit from the reservation system. The Indian government is expected to take action based on the findings of the 3-member commission on this issue, which will have significant implications for the future of the reservation system in India.

19 Members of Jarawa Tribe Included in Electoral Roll for the First Time

Date of Inclusion: November 2024

Location: Andaman and Nicobar Islands

Overview:

For the first time in India's election history, 19 members of the Jarawa Tribe from the Andaman and Nicobar Islands were included in the electoral roll for the Special Summary Revision-2025. This marks a significant step in the inclusion of indigenous tribes in India's democratic process, ensuring the Jarawas can now participate in national elections. The revision process will continue until November 28, 2024.

Key Details:

1. **Inclusion Process**:
   - The 19 Jarawa tribe members were included under the Systematic Voters' Education and Electoral Participation (SVEEP) programme, which aims to ensure broad participation in elections.
   - The Special Summary Revision is a regular process carried out to update the electoral rolls, and this marks a historic inclusion of members of the Jarawa tribe.
   - The revision took place in the Jirkatang area, the native hamlet of the Jarawa tribe.
2. **Leadership and Oversight**:
   - The inclusion was carried out under the leadership of Keshav Chandra, the Chief Secretary of Andaman and Nicobar Islands, and Arjun Sharma, the District Election Officer of South Andaman.
   - The Sub-Divisional Magistrate (SDM) of South Andaman, Vinayak Chamadia, highlighted the efforts made to include the Jarawas in the election process.
3. **Jarawa Tribe Background**:
   - The Jarawas are a nomadic, hunting and gathering tribe native to the western coast of Middle Andaman and South Andaman Islands.
   - They have had limited contact with the outside world, with the first friendly contact made in 1974. Since then, the Jarawas have become non-hostile to the contact teams that visit them, bringing gifts like coconuts and bananas.
   - The tribe is known for its hunter-gatherer lifestyle and nomadic existence, relying on bows and arrows for hunting wild pigs and lizards. They also fish with bows and arrows and use baskets for catching fish.
   - Unlike other tribes such as the Onges or the Andamanese, the Jarawas do not use dogs for hunting.
   - Jarawa housing consists of temporary huts that they build as they move through their territories. They cross creeks using crude rafts made from local materials.
4. **Jarawa Population**:
   - The current population of the Jarawa tribe is estimated to be around 240, based on the 2001 Census.
   - The tribe is one of the few indigenous groups in the region that has been able to maintain a largely isolated existence despite external pressures.
5. **Efforts for Inclusion**:
   - This move towards including Jarawa members in the electoral process is part of broader efforts to ensure electoral participation among tribal communities.
   - The inclusion of the Jarawas is a major milestone for the Systematic Voters' Education and Electoral Participation (SVEEP) program, which aims to increase voter registration and participation among marginalized communities, particularly in remote or indigenous groups.
6. **Significance**:
   - The inclusion of Jarawa tribe members is a significant development in India's efforts to

integrate its indigenous communities into the democratic framework.

- It highlights the inclusive nature of India's election process and the increasing efforts to engage with tribes that have historically been isolated from mainstream society.

Conclusion :

The inclusion of 19 Jarawa tribe members in the electoral rolls for the first time reflects a positive step towards the inclusion of indigenous communities in India's electoral process. This historic event marks the beginning of greater engagement with the Jarawas, and it could serve as a model for integrating other marginalized and isolated tribal groups into the democratic process in the future.

Centre Launches E-Daakhil Across All States and Union Territories of India

Date of Launch: 22nd November 2024

Location: Ladakh, India

Overview:

The Department of Consumer Affairs, Government of India, has officially launched the E-Daakhil portal across all states and union territories of India. The final launch took place on 22nd November 2024 in Ladakh, marking the platform's nationwide reach. E-Daakhil is an innovative online mechanism designed to streamline the consumer grievance redressal process, enabling consumers to file complaints and track their cases online, ensuring a faster and more efficient resolution system.

Key Details:

1. **E-Daakhil Portal**:

- The E-Daakhil portal was first introduced in September 2020 by the National Consumer Dispute Redressal Commission (NCDRC) as part of the Consumer Protection Act 2019.
- The portal was designed to offer an inexpensive, speedy, and hassle-free mechanism for filing consumer complaints, especially in light of COVID-19 restrictions that made physical access to consumer forums difficult.
- The portal facilitates online filing of complaints, payments, and case tracking, eliminating the need for consumers to travel or be physically present at consumer forums.
- It offers an intuitive and user-friendly interface, making it easy for consumers and advocates to file complaints, track cases, and ensure a transparent process.

2. **Launch in Ladakh**:

- The Lieutenant Governor of Ladakh, Brig. (Dr.) B.D. Mishra (Retd.), officially launched the portal in Ladakh on 22nd November 2024.
- With this, the E-Daakhil platform is now accessible to consumers across all regions of India, from metropolitan cities to remote areas, further empowering consumers and improving the efficiency of the consumer grievance redressal system nationwide.

3. **Impact of E-Daakhil**:

- E-Daakhil has been a game-changer for promoting consumer rights and ensuring timely justice. It is now an accessible platform for consumers to file complaints and track their progress online in the comfort of their homes.
- The portal also facilitates paperless case filing, ensuring a transparent and efficient process.
- Consumers or advocates can easily register on the platform using an OTP (One-Time Password) sent to their registered mobile number or an activation link sent to their email address.

4. **Success Stories**:

- **Sambalpur District Commission**: In January 2024, a case involving a faulty Hero Electric Atria was ruled in favor of the complainant, with compensation of Rs. 25,000 and litigation costs of **Rs. 5,000**.
- **Andaman District Commission**: In September 2022, a complainant who was charged twice for fuel due to a failed UPI transaction was awarded a refund of Rs. 3,980 along with 6% interest and Rs. 10,000 for mental agony.

5. **Key Features**:

- **Paperless Process**: E-Daakhil ensures that all complaints and follow-ups are handled digitally, eliminating the need for physical paperwork.
- **Complaint Tracking**: Consumers can easily track the status of their complaints in real-time through the platform.
- **Nationwide Reach**: With the recent inclusion of Ladakh, the portal is now operational across all 35 states and union territories of India.

6. **Future Plans – E-Jagriti**:

- The Government of India is also working on launching the E-Jagriti portal, which will further streamline the case filing, tracking, and management process.
- **E-Jagriti** will enable seamless communication between consumers, consumer commissions, and other stakeholders, ensuring faster dispute resolution.
- This platform is designed to automate and digitize processes, reducing delays, minimizing paperwork, and ensuring timely disposal of cases, contributing to a more effective and accessible justice system for consumers.

7. **Current Statistics**:

- As of now, over 2,81,024 users have registered on the E-Daakhil portal, and 1,98,725 complaints have been filed.
- Out of these, 38,453 cases have already been disposed of, indicating the growing success and efficiency of the platform.

Conclusion :

The nationwide launch of the E-Daakhil portal represents a significant step towards empowering consumers and enhancing the accessibility of the consumer grievance redressal system in India. The platform is a revolutionary initiative that provides consumers with a simple, transparent, and efficient way to file complaints and track their resolution without the need for physical presence. As the platform continues to expand, and with the upcoming launch of E-Jagriti, it is set to further transform the landscape of consumer rights in India, making justice more accessible and timely for all.

Government Cites 17 Reasons to Deny or Cancel Foreign Fund Registration of NGOs

Context :

- In November 2024, the Ministry of Home Affairs (MHA) issued a notice listing 17 reasons for which the Foreign Contribution (Regulation) Act (FCRA) registration of NGOs (Non-Governmental Organizations) may be denied or canceled.
- These reasons mainly address concerns about national security, social harmony, misuse of foreign funds, and the involvement of NGOs in anti-national activities.
- The list signals a tightening of controls over NGOs receiving foreign donations, showing the government's focus on ensuring that foreign funds are not used in ways that could harm India's sovereignty, security, or public order.

What is the FCRA?

- The Foreign Contribution (Regulation) Act (FCRA) was enacted in 1976 during the Emergency period to regulate the flow of foreign contributions into India.
- Its primary purpose is to ensure that foreign donations to Indian NGOs do not adversely affect national interests, sovereignty, or internal security.

Key Objectives of FCRA:

- To regulate the acceptance and utilization of foreign funds by NGOs.
- To ensure that foreign funds do not negatively impact India's sovereignty, democratic values, or internal security.

Evolution of the FCRA

1. **2010 Amendment:**

- Streamlined regulations for receiving foreign contributions.
- Prohibited the use of foreign donations for activities harmful to national interests.

2. **2020 Amendment:**

- **Aadhaar Mandate:** Required Aadhaar numbers for key functionaries of NGOs.

- **Designated Bank Account:** Foreign funds must be routed through an FCRA-approved account at the State Bank of India.
- **Domestic Transfer Ban:** Prohibited NGOs from transferring foreign funds to other domestic entities.
- **Administrative Expense Limit:** Reduced the cap on administrative expenses from 50% to 20% of foreign funds received.

Who Needs FCRA Registration ?

Any organization, association, or NGO wishing to receive foreign donations must be registered under the FCRA. This includes a variety of NGOs working in social, educational, economic, or religious fields.

- **Validity & Renewal:** FCRA registration is valid for 5 years and can be renewed if the organization complies with FCRA norms.
- **Permissible Uses of Foreign Contributions:** Foreign funds can only be used for activities that serve social, educational, cultural, or economic purposes and contribute positively to the nation.

Monitoring Authority

The Ministry of Home Affairs (MHA) is the regulatory body responsible for ensuring FCRA compliance by NGOs.

Key Developments in FCRA Implementation:

- In 2015, NGOs were required to maintain their bank accounts with core banking facilities for better monitoring.
- In 2023, an amendment mandated that NGOs disclose assets created with foreign funds in their annual returns.

17 Reasons for Denying or Canceling FCRA Registration

The MHA has outlined 17 specific reasons for denying or canceling the FCRA registration of NGOs, focusing on misuse of foreign funds and activities that may pose a threat to national security or social harmony. These include:

1. **Anti-Development Activities:** NGOs found using foreign funds for activities detrimental to India's development will have their registration revoked.
2. **Inciting Malicious Protests:** If funds are used to instigate protests that disrupt public order or destabilize the country.
3. **Religious Conversion Activities:** Involvement in forced or induced religious conversion or proselytizing.
4. **Links with Terrorist or Anti-National Organizations:** Ties with organizations or individuals involved in terrorism or activities against India's sovereignty.
5. **Misuse of Foreign Funds:** Diversion of funds for activities threatening national security or public order.
6. **Personal Gain by Office Bearers:** Use of foreign contributions by office bearers for personal enrichment.
7. **Defunct or Non-Operational NGOs:** If the NGO is found to be inactive or non-operational for a long period.
8. **Failure to Submit Annual Returns:** Non-submission of required annual returns is grounds for cancellation.
9. **Non-Compliance with NGO's Objectives:** If funds are not used for the purpose the NGO originally registered for.
10. **Adverse Field Inquiry Reports:** If investigations suggest that an NGO's activities are harmful to social or religious harmony.
11. **Prosecution Pending:** Criminal investigations or prosecutions against office-bearers or key functionaries.
12. **Lack of Transparency:** Failure to provide necessary documents or explanations when sought by authorities.
13. **Non-Cooperation with Investigations:** Refusal to comply with investigations or government directives.
14. **Failure to Maintain Accountability:** Lack of proper financial records or failure to submit audit reports on foreign funds.
15. **False Representation of Activities:** Misrepresentation of activities or impact to justify foreign funding.

16. **Radical Organization Links:** Associations with radical or extremist groups.
17. **Involvement in Anti-National Activities:** Direct involvement in activities that undermine India's sovereignty or security.

Consequences of FCRA Cancellation

- **Prohibition from Re-Registration:** If an NGO's registration is canceled, it cannot reapply for FCRA registration for three years.
- **Suspension:** The government can suspend an NGO's registration for up to 180 days while investigations are ongoing, and financial assets can be frozen.
- **Legal Recourse:** NGOs can appeal the cancellation of their FCRA registration in the High Court.

Other Important Aspects of FCRA

- **No Foreign Contributions from NRIs:** Contributions from Non-Resident Indians (NRIs) using their personal savings through normal banking channels are not considered foreign contributions.
- **Transparency & Monitoring:** NGOs are required to disclose the full details of foreign donations and how the funds are used to ensure transparency.

Conclusion :

The FCRA is a crucial tool for regulating foreign contributions to NGOs in India, ensuring that these funds are used for social welfare purposes and not for activities that could threaten national security or disrupt social harmony.

Why is Germany Headed for Snap Polls?

Overview:

- On November 6, 2024, Germany's ruling coalition, made up of the Social Democrats (SPD), Greens, and Free Democrats (FDP), fell apart after Chancellor Olaf Scholz fired his Finance Minister, Christian Lindner (FDP).
- After this, a no-confidence vote will take place on December 16, 2024.
- Since Scholz is expected to lose without support from the FDP, snap elections are planned for February 23, 2025, earlier than the original election date in September 2025.

What Caused the Collapse of the Coalition?

Germany's coalition government, formed after the 2021 federal elections, was a three-party alliance:

1. **Social Democratic Party (SPD)** – Center-left.
2. **The Greens** – Left-wing.
3. **Free Democratic Party (FDP)** – Center-right, fiscally conservative.

The current coalition has been struggling due to conflicts over important issues, especially on money matters:

1. **Disagreements Over Money and Spending:**
   - The SPD (Social Democrats) and Greens wanted to increase government spending to help with things like climate change and defense.
   - However, Christian Lindner (FDP) opposed this, pushing for strict rules on borrowing money to keep government debt low.
2. **Tax Cuts and Budget Cuts:**
   - The FDP also wanted tax cuts for the rich and spending cuts in other areas, which the SPD and Greens didn't agree with.
   - These disagreements over money created tension within the coalition.
3. **Big Budget Problems:**
   - The government was already facing a multi-billion euro gap in the national budget, which made the situation even worse.

What is Germany's Debt Brake Rule ?

Germany has a debt brake rule that limits how much money the government can borrow. The

government can only borrow up to 0.35% of GDP (the total value of goods and services in the country). This rule is in the German Constitution and was created to avoid too much borrowing, which could lead to large debts in the future.

- **Exceptions to the Debt Brake**:

  In cases of emergencies, like natural disasters or major crises, the German Parliament (Bundestag) can temporarily suspend the debt brake.

- **For example**, it was used during the COVID-19 pandemic and Ukraine war, which caused an energy crisis in Germany.

The Budget Crisis:

To get around the debt brake rule, the government used some special off-budget funds to finance important projects. These include:

- Climate and transformation fund
- Economic stabilization fund
- Federal armed forces fund

These funds helped pay for things like climate change programs and defense spending. But a court ruling in November 2023 said that it was unconstitutional to move 60 billion euros of unused pandemic debt into one of these funds. This decision created a big budget problem and made the coalition even more unstable.

What Happens Next?

1. **No-Confidence Vote and Snap Elections**:
   - The no-confidence vote will happen on December 16, 2024.
   - Chancellor Olaf Scholz is expected to lose this vote without the support of the FDP, which has left the coalition.
   - As a result, snap elections will be held on February 23, 2025, earlier than the original elections planned for September 2025.
2. **Rising Opposition**:
   - The Christian Democratic Union (CDU) and the Christian Social Union (CSU), which are part of the main opposition, are now leading in the polls.
   - A recent survey shows that the CDU/CSU alliance has 33% of the vote, while the SPD is at only 16%.
3. **The Far-Right Party (AfD)**:
   - The AfD (Alternative for Germany), a far-right party, has also been growing in popularity.
   - It is now at 17% in the polls, higher than the SPD.
   - The AfD recently won a state election in Thuringia, marking its first win since the Nazi era.
   - The AfD has been criticized for having links to neo-Nazi groups and for pushing anti-immigrant policies.
   - There are debates in Germany about whether the AfD should be banned, but no action has been taken so far.

Conclusion :

Germany's ruling coalition has been marked by deep ideological divides and poor governance, especially over fiscal policy, defense spending, and handling the consequences of the Ukraine war. With the snap elections scheduled for February 2025, the political landscape in Germany is expected to shift significantly, with the CDU/CSU alliance and the far-right AfD poised to gain ground. However, the rise of the AfD also raises concerns about the potential for extreme-right politics gaining further traction in the country.

Grievance Redressal Assessment and Index (GRAI) 2023 Launched on 18 November 2024

What is GRAI?

- The Grievance Redressal Assessment and Index (GRAI) is a system designed to measure how well different government ministries and departments handle public complaints and grievances.
- The 2023 GRAI was launched by Dr. Jitendra Singh, India's Union Minister of State for various departments.
- This index aims to help the government understand where they are doing well in resolving complaints and where they need to improve.

Purpose of GRAI:

- The main goal of GRAI is to give a comparative picture of how different ministries and departments handle grievances.

- It is meant to highlight strengths and show areas where improvements are needed in the grievance redressal process.

Structure of GRAI:

- The GRAI 2023 measures the grievance handling system based on four main areas (called "dimensions") and 11 indicators:

1. **Efficiency** - How quickly and effectively grievances are handled.
2. **Feedback** - The quality and usefulness of feedback provided to complainants.
3. **Domain** - The specific areas of grievance handling, such as policy and legal matters.
4. **Organizational Commitment** - The level of commitment by the ministry or department to resolving grievances.

- The 2023 report used data from January to December 2023, collected through CPGRAMS, which is the Centralized Public Grievance Redress and Management System.

Groups Based on Number of Grievances:

- Ministries and departments were divided into three groups based on the number of complaints they received:
- **Top Ministries and Departments:**

Group	Registered GrievanceRange	No. of Ministries/ Departments
A	registered grievances > 10,000	28
B	registered grievances 2,000 to 9,999	33
C	registered grievances < 2,000	28

- Department of Agriculture and Farmers Welfare, O/o the Comptroller & Auditor General of India and Department of Investment & Public Asset Management have topped the rankings in Group A, B and C respectively.
- A detailed list with top three Ministries and Departments in composite and dimension-wise ranking is as follows :

#		Rank 1	Rank 2	Rank 3
Group A: Grievances > 10,000	Composite	Department of Agriculture and Farmers Welfare	Department of Posts	Ministry of Cooperation
	Efficiency	Ministry of Cooperation	Department of Telecommunications	Ministry of Labour and Employment
	Feedback	Department of Agriculture and Farmers Welfare	Central Board of Direct Taxes (Income Tax)	Department of Defence
	Domain	Unique Identification Authority of India	Ministry of Home Affairs	Ministry of Cooperation
	Organizational Commitment	Department of Posts	Department of Telecommunications	Ministry of Corporate Affairs
Group B: Grievances 2,000 - 9,999	Composite	O/o the Comptroller & Auditor General of India	Department of Land Resources	NITI Aayog
	Efficiency	Department of Legal Affairs	Department of Land Resources	NITI Aayog
	Feedback	O/o the Comptroller & Auditor General of India	Department of Expenditure	Department of Financial Services (Pension Reforms)
	Domain	Department of Land Resources	Ministry of Parliamentary Affairs	Ministry of Drinking Water and Sanitation
	Organizational Commitment	Department of Empowerment of Persons with Disabilities	Department of Land Resources	Ministry of Ayush
Group C: Grievances < 2,000	Composite	Department of Investment & Public Asset Management	Ministry of Development of North Eastern Region	Department of Pharmaceuticals
	Efficiency	Department of Investment & Public Asset Management	Ministry of Development of Northeastern Region	Ministry of Mines
	Feedback	Department of Pharmaceuticals	Department of Public Enterprises	Department of Investment & Public Asset Management
	Domain	Ministry of Development of Northeastern Region	Department of Youth Affairs	Department of Bio-Technology
	Organizational Commitment	Department of Official Language	Department of Chemicals and Petrochemicals	Legislative Department

Special Features of the GRAI 2023 Report:

- The report includes a Root-Cause Analysis, which looks at why certain departments are better or worse at resolving grievances.
- It also gives advice for improvement, including using technology like Artificial Intelligence (AI) and Machine Learning (ML) to predict and solve problems before they happen.
- The report suggests better training for grievance officers and more audits to make sure things improve.

CPGRAMS and its Importance:

- CPGRAMS is a key tool that allows people to file complaints online and track their progress.
- It has become an important part of the government's effort to be more transparent and accountable.
- The Commonwealth Secretariat has even recognized CPGRAMS as a best practice for other countries to follow.

Future Recommendations:

The GRAI 2023 report also provides a roadmap for future improvements, including:

- Using advanced technologies (like AI and ML) to improve grievance management.
- Integrating CPGRAMS into more levels of government to improve grievance redressal nationwide.
- Ensuring better reporting of the status of grievances and giving regular updates.

Conclusion :

The Grievance Redressal Assessment and Index (GRAI) 2023 highlights the ongoing improvements in how the government addresses public complaints. With better technology, better training, and a commitment to solving problems, the government aims to improve the overall experience for citizens filing grievances and ensure that their concerns are resolved more efficiently.

Solar Energy Corporation of India (SECI) and the Adani Bribery Allegations

Context:

- The Solar Energy Corporation of India (SECI), a government-owned company, plays a crucial role in India's renewable energy sector.
- Recently, SECI has been linked to bribery accusations involving major energy companies, including Adani Green Energy and Azure Power Global.
- These allegations have raised concerns about corruption and fairness in India's renewable energy industry.

1. SECI's Role in India's Renewable Energy Sector

- **Established in 2011**: SECI was set up as part of India's plan to increase renewable energy use. It is the main agency responsible for solar energy development and helps India meet its renewable energy goals.
- **Impressive Growth**: SECI has grown significantly. From managing just 0.75 GW of renewable energy in 2014-15, it now oversees 65.3 GW, with around 40 GW of that from solar energy. The rest includes 16.3 GW of wind energy and 9 GW from combined solar and wind projects.
- **Influence in the Market**: SECI plays a central role in the renewable energy market by organizing competitive bids, power purchase agreements (PPAs), and power sale agreements (PSAs) with distribution companies (DISCOMs).

2. SECI's Business Model

- **Renewable Energy Trading**: SECI is India's largest agency for trading renewable energy. It buys energy from developers chosen through bidding and sells it to DISCOMs through long-term agreements (PPAs and PSAs).
- **Energy Traded**: Last year, SECI traded about **43,000 million units** of renewable energy, showing its major role in the market.
- **Focus on Solar and Manufacturing**: SECI has also worked to link solar energy generation with solar panel manufacturing in India, awarding projects that combine energy production with the ability to make solar panels and cells locally.

3. Bribery Allegations Involving SECI

- **Background**: SECI is at the center of bribery claims tied to a 2019 project where it awarded 15 GW of renewable energy contracts:
  - 12 GW for solar energy generation
  - 3 GW for solar panel manufacturing
- These projects are said to have been linked to bribery payments to secure agreements with state governments for buying renewable energy.
- The U.S. Department of Justice (DOJ) claims Adani Green Energy and Azure Power Global paid over $250 million in bribes to Indian officials to get these deals approved.

4. Details of the Allegations

- **Adani Green Energy's Role**: Adani Green Energy was given an 8 GW solar project, the largest in the world, worth $6 billion.
- The company was also required to build 2 GW of solar panel manufacturing capacity in India.
- However, SECI struggled to find buyers for the energy, causing delays. Allegations suggest bribes were paid to officials in Andhra Pradesh, Odisha, Chhattisgarh, and Tamil Nadu to speed up the process.
- **Azure Power Global's Role**: Azure Power received a 2 GW solar power project and was required to build 500 MW of solar panel capacity.
- Similar to Adani, Azure had trouble finalizing energy purchase agreements with state DISCOMs, which led to allegations of bribery to get the deals done faster.
- **Personal Allegations Against Gautam Adani**: The U.S. Justice Department also pointed to Gautam Adani, the chairman of the Adani Group, claiming he personally met with Andhra Pradesh officials and offered bribes to help secure these important agreements.
- This has attracted attention because of Adani's high profile in business.

5. SECI's Response to the Allegations

- **Denial of Wrongdoing**: SECI has denied any involvement in the bribery. The company's **Chairman**, **RP Gupta**, said there is no evidence linking SECI to the scandal, and SECI is committed to maintaining transparency and integrity in its work.
- **Ongoing Investigations**: While SECI denies wrongdoing, investigations by the U.S. Justice Department and Indian authorities are still underway. The results of these investigations could have major consequences for SECI, Adani, and other stakeholders in India's renewable energy industry.

6. Impact on India's Renewable Energy Sector

- **Potential Setback**: If the bribery claims are proven true, it could damage the reputation of India's renewable energy sector, which has made significant progress in recent years. It could also reduce investor confidence and make it harder for India to reach its renewable energy goals.
- **Impact on SECI's Role**: As a key player in India's renewable energy market, any damage to SECI's reputation could affect future bidding processes, project approvals, and trust in India's energy transition efforts.
- **More Scrutiny**: The bribery scandal has led to calls for more regulations and transparency in how renewable energy contracts are awarded. There may also be stronger oversight of large projects that combine energy generation with manufacturing to prevent future corruption.

Conclusion :

SECI has played a vital role in helping India achieve its renewable energy goals, especially in solar power. However, the recent bribery allegations involving big companies like Adani Green Energy and Azure Power have put SECI under scrutiny. The outcome of the ongoing investigations will have a big impact on the future of India's renewable energy sector, which is an important part of the country's sustainable development plan.

EDITORIALS

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Indian Polity & Governance

Comptroller and Auditor General of India (CAG)

Why in News?

K Sanjay Murthy has been appointed as the new Comptroller and Auditor General (CAG) of India, succeeding Girish Chandra Murmu.

Key Facts About the Comptroller and Auditor General (CAG)

- **Role and Function**:

  The CAG heads the Indian Audit and Accounts Department (IAAD) and is responsible for ensuring financial accountability and safeguarding the public purse. The CAG's duties extend to auditing accounts related to expenditures from the Consolidated Fund of India and the funds of state governments.

- **Constitutional Foundation**:

  The CAG is a constitutional office created under Article 148 of the Indian Constitution. It is a key pillar of India's democratic framework, alongside other institutions like the Supreme Court, Election Commission, and Union Public Service Commission.

- **Governance Framework**:

  The CAG's duties and powers are governed by the Comptroller and Auditor-General's (Duties, Powers, and Conditions of Service) Act, 1971, with amendments in 1976, 1984, and 1987.

Appointment and Tenure:

- **Appointment**:

  The CAG is appointed by the President of India by a warrant under his hand and seal.

- **Term**:

  The CAG serves a term of six years or until the age of 65, whichever is earlier.

- **Removal**:

  The CAG can be removed only by the President through a process similar to that of removing a Supreme Court judge, requiring a special majority resolution in both Houses of Parliament.

- **Independence**:
  - The CAG enjoys independence in performing its functions. It can only be removed under a constitutional process, not at the President's pleasure.
  - **Salary and Benefits**: The salary of the CAG is equivalent to that of a Supreme Court judge.
  - The administrative expenses of the CAG, including salaries and pensions, are charged to the Consolidated Fund of India and do not require parliamentary approval.

- **Ineligibility for Future Office**:

  The CAG is ineligible for holding any further office under the Government of India or any state after leaving office.

Duties and Powers of the CAG:

- **Auditing Accounts**:

  The CAG audits the accounts of the Union and state governments, including accounts of government corporations, PSUs, and bodies substantially funded by the government.

- **Certifying Tax Proceeds**:

  The CAG certifies the net proceeds of taxes and duties collected by the government and audits transactions related to debt, advances, and suspense accounts.

- **Reporting**:

  The CAG submits its audit reports to the President, who places them before Parliament. These reports are then reviewed by the Public Accounts Committee (PAC) of Parliament.

- **Propriety Audits**:

  In addition to legal and regulatory audits, the CAG conducts propriety audits to assess the wisdom, economy, and faithfulness of government spending, identifying wastefulness and inefficiencies.

International Role:

- **External Auditor**:
  - The CAG serves as the External Auditor for international bodies, such as:
  - International Atomic Energy Agency (IAEA) (2022-2027)
  - Food and Agriculture Organization (FAO) (2020-2025)

Constitutional Provisions Regarding CAG:

Provision	Description
Article 148	Deals with the **appointment**, **oath**, and **conditions of service** of the CAG.
Article 149	Specifies the **duties** and **powers** of the CAG.
Article 150	Prescribes the form in which the accounts of the Union and States must be kept, on the advice of the CAG.
Article 151	Requires CAG's reports on Union accounts to be submitted to the **President** and laid before **Parliament**.
Article 279	Provides that the CAG certifies the calculation of **net proceeds** of taxes, and its certificate is final.
Third Schedule	Prescribes the **oath or affirmation** to be taken by the CAG upon assuming office.

Role of CAG in Strengthening Democracy:

- **Ensuring Accountability**:

  The CAG ensures government accountability in the use of public funds, thereby preventing misuse and promoting responsible governance, which is essential for any democracy.
- **Strengthening Local Governance**:

  The CAG supports Panchayati Raj Institutions (PRIs) and urban local bodies by providing guidance on financial management and capacity building through annual technical inspection reports.
- **Citizen-Centric Approach**:

  The CAG places citizens at the heart of its audit process, ensuring that government programs are implemented efficiently and in alignment with public needs.

Significant Scandals Exposed by CAG:

- **2G Spectrum Allocation Scam**:

  The CAG exposed a loss of ₹ 1.76 lakh crore due to the undervaluation of 2G spectrum licenses.
- **Coal Mine Allocation Scam (Coalgate)**:

  The CAG estimated ₹ 1.85 lakh crore in wrongful gains due to irregular coal block allocations between 2004 and 2009.
- **Fodder Scam (Chaara Ghotala)**:

  The CAG uncovered fraudulent withdrawals worth ₹ 940 crore in Bihar's Animal Husbandry Department (1985-1995).

Criticisms and Challenges:

- **Declining Number of Reports**:

  The number of audit reports tabled by the CAG in Parliament has declined significantly from 53 in 2015 to 18 in 2023, raising concerns over reduced oversight.
- **Post-Facto Audits**:

  The CAG mainly conducts post-facto audits (after expenditure is made), limiting its ability to prevent financial mismanagement before it happens.
- **Limited Role in Pre-Auditing**:

  Unlike other international counterparts, the CAG does not engage in pre-auditing before the issuance of the budget, restricting its proactive role in financial governance.
- **Staffing Issues**:

  The Indian Audit and Accounts Department (IAAD) has seen a reduction in staff, impacting its ability to conduct thorough audits.
- **Delays in Reporting**:

  There are often significant delays in submitting audit reports to Parliament, which hinders timely accountability.

Reforms Needed for CAG:

- **Amendment of CAG Act**:

  The CAG Act should be updated to reflect contemporary governance challenges and improve accountability.
- **Selection Process**:

  A more transparent selection process, involving a collegium comprising the President, Chief Justice of India, Prime Minister, and Leader of Opposition, should be established to ensure impartiality.

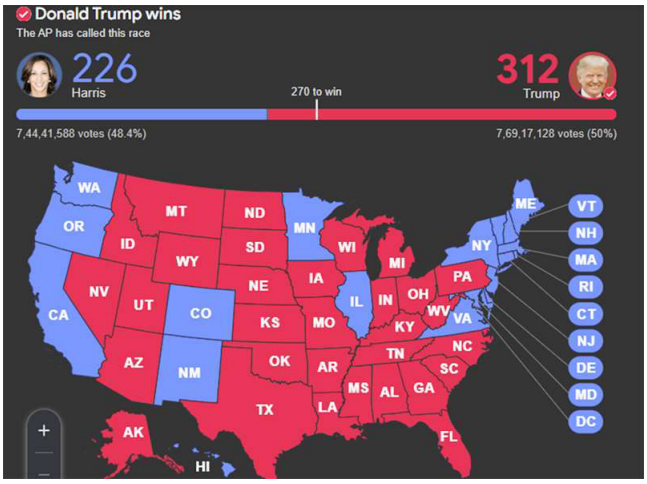
- **Adaptation to Emerging Issues**:
  The CAG should adapt to auditing newer sectors like climate change and technology, ensuring comprehensive oversight.
- **Capacity Building**:
  Enhanced training for CAG staff, particularly in specialized fields such as natural resources and complex economic sectors, is essential to improve the quality of audits.

Conclusion :

The CAG of India plays a pivotal role in ensuring financial integrity and upholding democratic accountability. Despite some challenges, such as staffing shortages and delays in reporting, the CAG continues to be a critical instrument in safeguarding taxpayer money and promoting transparency in governance. Addressing the identified shortcomings and introducing reforms will enhance its effectiveness and relevance in an evolving economic and political landscape.

2024 United States Presidential Election: How Does the U.S. Electoral College Work?

- On 6 Nov 2024, Donald Trump won the US elections. The US media has announced Trump's win.
- His rival Kamala Harris has secured 224 electoral colleges, while Trump has won 270 - the majority mark.
- He will be the second Republican to get a second term in office in 20 years. George Bush, a Republican, was president from 2001 to 2009.



1. On November 5, 2024,The 2024 United States presidential election was held where U.S. citizens chose between former President Donald Trump (Republican) and Vice President Kamala Harris (Democrat) for the office of the 47th President.
2. Unlike the direct election system used in countries like India, the United States elects its president through a more complex, multi-stage process.
3. The election process is governed by the U.S. Constitution, which states that the winner is determined not by the popular vote, but by the Electoral College.
   (a) The popular vote is the total number of votes cast by people in an election.
   (b) In a presidential election in the U.S., it shows how many people voted for each candidate.

What is the Electoral College?

1. The Electoral College is a system used in the United States to elect the president and vice president.
2. It's not a direct popular vote where the person with the most votes wins.
3. Instead, the U.S. uses a group of electors from each state to decide who wins.

First we need to understand the US parliament i.e Congress and its 2 houses

What is Congress ?

- Congress is the legislative branch of the U.S. government. It's the part of the government that makes laws.
- Congress is bicameral, meaning it has 2 houses: the Senate and the House of Representatives.

What is a Senator?

- A Senator is a member of the Senate, which is the upper house of Congress.
- There are 100 Senators in total from 50 states, with 2 Senators from each state. No matter how big or small the state is, each has equal representation in the Senate.
- Senators serve 6-year terms. Every two years, about one-third of the Senate is up for re-election.

What is a Representative (in the House of Representatives) ?

- A Representative is a member of the House of Representatives, which is the lower house of Congress.
- There are 435 Representatives in total. Each state gets a number of Representatives based on its population. States with more people, like California, have more Representatives than smaller states like Wyoming.
- Representatives serve 2-year terms. All 435 seats are up for election every two years.

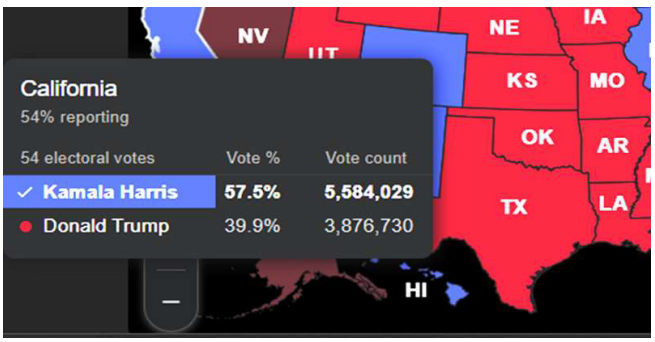
There are 535 members in Congress (100 Senators + 435 Representatives). But when it comes to the Electoral College of the US President election, there are 538 electors in total. The extra 3 electors come from Washington, D.C :

Why Washington, D.C. Gets 3 Electors :

- Washington, D.C. does not have voting Senators or Representatives in Congress, but the 23rd Amendment (passed in 1961) gave D.C. 3 electoral votes in presidential elections.
- These 3 electoral votes are added to the total number of electors in the Electoral College.

How Does It Work?

1. **Electors in Each State**:
   - o Each state has a certain number of electors based on its population.
   - o Electors are not Senators or Representatives.
   - o Senators and House Representatives are elected to serve in Congress.
   - o Electors, on the other hand, are chosen specifically for the purpose of voting in the Electoral College during the presidential election.
2. **How Electoral Votes Are Assigned:**
   - o Each state gets electoral votes equal to the total number of Senators plus the number of House Representatives. So, every state gets at least 3 electoral votes (2 Senators + 1 Representative).
   - o For example:
     - * California, the most populous state, has 54 electors (2 Senators) + (52 Representatives) = 54 electoral votes
     - * Wyoming, one of the smallest states, has 3 electors (2 Senators + 1 Representative).
3. **Formula:**
   - o **Electoral Votes for a State** = Number of Senators (always 2) + Number of House Representatives (based on population).
4. **Total Electoral Votes:**
   - o There are 538 total electoral votes (100 Senators + 435 Representatives + 3 votes for Washington D.C.).
   - o To win the presidency, a candidate needs 270 electoral votes.
5. **The Popular Vote**:
   - o On Election Day (the first Tuesday after the first Monday in November), voters in each state cast their ballots for a presidential candidate.
   - o When voters vote, they are really voting for a slate of electors pledged to that candidate.
   - o In 48 states out of 50, the candidate who wins the popular vote receives all of that state's electoral votes.
     - * The exceptions are Maine and Nebraska, which divide their votes differently based on proportional system.
6. For example, if 57% of voters in California vote for Kamala Harris, then all 54 of California's electors (the electoral votes) will be pledged to vote for Kamala Harris in the Electoral College.



7. If 51% of voters in Texas vote for Donald Trump, then all 40 of Texas's electors will be pledged to vote for Donald Trump.
8. **Faithless Electors:** If an elector votes for someone other than the candidate they promised to support, they are called a faithless elector.
    - Some states have rules against this, and faithless electors can be replaced.
    - In 2016, there were seven faithless electors, but their votes didn't change the overall result.
9. **Meeting of the Electors**:
    - After the popular vote, the electors meet in December in their state capitals to cast their votes for president and vice president.
    - Most electors vote based on the results of the popular vote in their state (but they are not legally required to in every state).
10. **Counting the Votes**:
    - In January, Congress counts the votes of the electors during a joint session.
    - If a candidate gets 270 electoral votes, they are declared the winner.

What Happens if There's a Tie ?

A tie in the Electoral College is rare but not impossible. It has occurred twice in U.S. history:

- **1800**: Thomas Jefferson and Aaron Burr had the same number of electoral votes.
- **1824**: Andrew Jackson, John Quincy Adams, and two other candidates had split votes.

If there is a tie, or if no candidate receives a majority of electoral votes, the decision is thrown to the U.S. House of Representatives.

- **House of Representatives**: In this case, each state's congressional delegation casts one vote to choose the President. A majority of 26 votes is needed to win.
- The Senate would then select the Vice President, with each Senator casting one vote. A majority of 51 votes is required.

If no winner is chosen by January 20 (Inauguration Day), the Vice President becomes the Acting President until a decision is reached.

Why Do They Have the Electoral College?

The Electoral College was created by the U.S. Constitution in 1787. The framers wanted a compromise between electing the president by:

- A direct popular vote (where everyone's vote counts equally) and
- A vote by Congress (which they wanted to avoid to keep the branches of government separate).

The idea was to balance the influence of large states with small states so that the more populous states didn't always dominate the election.

Criticisms of the Electoral College

- **Winner-Takes-All System**: In most states, the candidate who wins the popular vote in that state gets all the electors, which can make the system feel unfair, especially if a candidate wins the popular vote nationally but loses the electoral vote.
- **Disproportionate Influence**: Small states like Wyoming have more power per person because they have a minimum of 3 electors, regardless of their small population.

Why Is It Controversial?

- **Popular Vote *Vs.* Electoral Vote**: In 2000 (George W. Bush vs. Al Gore) and 2016 (Donald Trump vs. Hillary Clinton), the winner of the popular vote did not win the election because the other candidate had more electoral votes. This makes people question whether the system truly reflects the will of the people.
- **Focus on Swing States**: Candidates often focus on a few swing states (states where the election is closely contested) because those are where the electoral votes are up for grabs. States that are seen as "safe" for one party (like California for Democrats or Texas for Republicans) might not get as much attention, even though they have many electors.

What Happens After the Election?

1. **Electoral College Certification**:
    - Once electors have cast their votes, the results are sent to Congress. Congress then meets in early January to count the electoral votes in a joint session.

2. **Inauguration**:

- The newly elected President is sworn into office on January 20, in a ceremony on the steps of the U.S. Capitol. This marks the official start of the new administration.

The election of the President of India differs from the U.S. Electoral College system in several key ways:

Aspect	U.S. Presidential Election	Indian Presidential Election
Electoral System	Uses the Electoral College, where voters cast ballots for electors who then vote for the president.	Uses a parliamentary system where the president is elected by an electoral college composed of elected members of both houses of Parliament and the elected members of the Legislative Assemblies of States and Union territories.
Direct *Vs.* Indirect Election	The president is indirectly elected by electors based on the popular vote in each state.	The president is indirectly elected by the electoral college, but voters do not vote directly for the president.
Role of Political Parties	Candidates typically represent major political parties, and the campaign is driven by party politics and popular vote.	The president is usually from a major political party but is elected by a body that includes representatives from various parties, emphasizing consensus rather than direct popular support.
Majority Requirement	Candidates need a majority of electoral votes (270 out of 538) to win.	The president is elected through a system of proportional representation, where votes are weighted based on the population of states and union territories.
Term and Re-election	The president serves a 4 -year term and can be re-elected for one additional term.	The president serves a 5-year term and can be re-elected for an unlimited number of terms.
Constitutional Role	The U.S. president has significant executive power and is the head of state and government.	The Indian president is primarily a ceremonial figure with limited executive powers, while real executive authority lies with the Prime Minister and the Council of Ministers.

Conclusion :

The Electoral College plays a pivotal role in determining the outcome of U.S. presidential elections. Although candidates compete for votes nationwide, it is the Electoral College votes that ultimately decide who becomes the President and Vice President. Despite its complexities and occasional controversy, particularly when the winner of the popular vote does not win the presidency, the Electoral College remains a key feature of the U.S. electoral system. Understanding this system is essential for comprehending how U.S. elections work and why some states receive more attention during campaigns than others.

Supreme Court Ruling: A Statute Can't Take Away an Institution's 'Minority' Status

- On 8 November 2024, the Supreme Court of India made an important ruling regarding the Aligarh Muslim University (AMU) case.
- The Court overruled its 1967 decision in the Azeez Basha case, which had previously denied AMU the status of a minority institution.
- The new judgment stated that just because an educational institution is created by a law (a statute) does not mean it loses its minority status.
- This ruling is a significant change and will affect how minority educational institutions are treated in India.
- Sir Syed Ahmad Khan established the Muhammadan Anglo-Oriental College in Aligarh, with the aim of providing modern education to Muslims in India, who were perceived to be socially and educationally backward.
- The institution later became the basis for AMU.
- The Aligarh Muslim University Act was passed by the Indian Legislative Council in 1920, formally transforming the MOA College into Aligarh Muslim University (AMU).

Background of the AMU Dispute:

- The legal case began in 2006, when the Allahabad High Court cancelled changes made to the AMU Act (1981), which had restored AMU's minority status.
- The court referred to the 1967 Azeez Basha case, where the Supreme Court had ruled that AMU was not a minority institution because it was set up by a law (the AMU Act of 1920) passed by the Central Government, not by the Muslim community itself.

Key Events in the Legal Journey:

- **1967 (Azeez Basha Case)**: The Supreme Court ruled that AMU was not a minority institution.
- The Court said that because AMU was created by the government through a statute, it could not be considered a Muslim minority institution.
- **1981 Amendment to the AMU Act**: The Act was amended to state that AMU was created to benefit the Muslim community.
- However, the Supreme Court did not change its decision and did not recognize AMU as a minority institution.
- **2005-2006**: AMU began offering reservations (special seats) for Muslim students in its post-graduate medical courses.
- The Allahabad High Court ruled against this, again using the earlier 1967 decision as the basis for its judgment.
- **2019-2024**: The case was sent to a 7-judge bench of the Supreme Court for reconsideration.
- **November 2024**: The Supreme Court ruled that AMU can claim minority status, overturning the earlier decision from 1967.

Centre's Arguments :

The Central Government argued that recognizing AMU as a minority institution could:

- Lead to too many seats being reserved (up to 50%) for Muslim students, which would differ from other national universities.
- Make AMU a special institution, different from other national universities, which could affect its functioning and governance.

AMU's Defense:

AMU's legal team argued that Article 30 of the Indian Constitution protects the rights of minorities to establish and manage educational institutions. They said:

- AMU's exemption from reservations for SC/STs was in line with minority rights, allowing the university to run the institution in a way that best serves the Muslim community's interests.
- This approach was a balance between minority rights and the rights of other groups in society.

The Supreme Court Ruling (November 2024):

In a 4-3 majority decision, the Supreme Court:

- Overruled the 1967 Azeez Basha case and ruled that AMU can claim minority status.
- Stated that just because an institution is created by a law (statute) does not mean it automatically loses its minority status.
- Emphasized that the purpose and community involvement behind the institution's creation are more important than how it was created.

Majority *Vs.* Dissenting Opinion:

- **Majority Opinion**:
  - Chief Justice D.Y. Chandrachud, leading the majority opinion, ruled that statutory creation (i.e., creation by a law) does not remove minority status.
  - The Court said that the important factor is who established the institution and for what purpose.
  - The majority emphasized that minority institutions should be protected under Article 30 and that the legal process used to create the institution does not change its identity.
- **Dissenting Opinion**:
  - Justice Dipankar Datta and other dissenting judges argued that AMU should not be recognized as a minority institution because it was created through a statute.
  - Other dissenting judges also questioned whether the case should have been referred to a larger bench to reconsider the earlier ruling.

Constitutional Provisions Referenced:

- **Article 30**: This article grants minorities the right to establish and manage educational institutions of their choice. It protects these institutions from state interference and ensures that the minority community can control the institution's admissions, management, and rules.
- **Article 15(5)**: Added in 2006, this provision allows minority institutions to not reserve seats for Scheduled Castes (SCs) and Scheduled Tribes (STs), which has been a key issue in the AMU case.
- **Article 30(2)**: Ensures that minority educational institutions are not treated unfairly by the state in terms of funding or regulation.

Key Points of the Court's Judgment:

1. **Minority Status Depends on Purpose, Not Statutory Creation**: The Court ruled that the origin and purpose of an institution are more important than whether it was created by a law. If a minority community established or supported an institution, it should keep its minority status, even if it was created by a law.
2. **State Regulation Cannot Be Discriminatory**: While the state can regulate minority institutions, it cannot treat them unfairly or discriminate against them in terms of funding or regulations. Minority institutions should be treated equally under Article 30.
3. **Minority Rights Include Secular Education**: The ruling clarified that Article 30 is not just about religious education. It also protects the rights of minorities to run institutions offering secular education, ensuring broad academic freedom.
4. **No Difference Between Institutions Set Up Before or After the Constitution**: The Court ruled that minority institutions set up before or after the Indian Constitution (1950) can be recognized as minority institutions under Article 30. It does not matter if the institution was created before India's independence or through a law passed after 1950.

Reference to Previous Case: St Stephen's College (1992)

The Court referred to the 1992 St Stephen's College case. In that case, the Court had upheld St Stephen's College in Delhi as a minority institution, even though it was government-funded, because it was set up by a religious community. This case was used to support the argument that an institution's founding community plays an important role in determining its minority status.

Implications of the Ruling:

For AMU:

- **AMU Can Now Claim Minority Status**: AMU is now officially recognized as a Muslim minority institution. This means AMU can manage the university in a way that benefits the Muslim community.
- The Court's ruling does not specifically require AMU to implement reservations for Muslims, although AMU may choose to do so. The issue of reservations for SCs/STs is left unresolved, and the broader debate between religion-based reservations and caste-based reservations remains open.

For Other Minority Institutions:

- **Impact on Other Minority Institutions**: This ruling affects all minority educational institutions in India. It confirms their right to run institutions based on the interests of the community behind them, regardless of how the institution was created.
- The ruling also clarifies that minority institutions retain their autonomy, even if they receive government funding.

On Reservations:

- The issue of whether AMU must provide reservations for SCs/STs was not directly addressed in the ruling. This leaves the debate open, especially in terms of whether religion-based reservations should be allowed over caste-based reservations.

Legal and Constitutional Significance:

- **Balancing Minority Rights with Social Justice**: The ruling strikes a balance between protecting the rights of minorities to run their institutions and ensuring fairness and social justice through reservations for backward classes.
- **Affirmation of Minority Rights**: The ruling affirms that minority institutions have the right to autonomy and are protected under Article 30 of the Constitution. This strengthens the legal foundation for minority-run educational institutions across India.

Conclusion :

The November 2024 Supreme Court ruling on AMU's minority status is a major development in India's legal framework for minority educational institutions. It confirms that the statutory creation of an institution does not change its minority status. The ruling protects the rights of minority communities to run educational institutions according to their needs, and it highlights important issues regarding admissions, reservations, and autonomy in educational governance. This decision will influence how religious minority institutions are treated in India in the future.

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Indian Society & Social Justice

Ningol Chakkouba Festival

Overview:

The Ningol Chakkouba festival was recently celebrated with great enthusiasm and joy in the state of Manipur.

About Ningol Chakkouba Festival:

- **When is it celebrated?**

  The festival is held every year on the second day of the lunar month Hiyangei in the Meitei calendar.
- **Who celebrates it?**

  Though traditionally celebrated by the Meitei community, other groups also celebrate it now because it highlights the importance of family happiness and reunion to promote peace and harmony in society.
- **Meaning of the festival:**
- Ningol means married woman.
- Chakkouba means invitation for a feast.

  So, the festival is about inviting married women (especially daughters) back to their parents' home for a grand meal and a joyful reunion.
- **How is it celebrated?**

  The main part of the celebration involves married women visiting their maternal (mother's) home for a feast. It is also common for gifts to be exchanged during this time.
- **Special tradition:**

  It's traditional for the son of the family to send a formal invitation to his sister about a week before the festival.
- **Celebration outside Manipur:**

  Ningol Chakkouba is also celebrated in places outside of Manipur, where Manipuri people have settled.

Key Facts about the Meitei Community:

- **Who are they?**

  The Meitei are the largest ethnic group in Manipur.
- **Language:**

  The Meitei language (also called Manipuri) is the official language of Manipur and one of the 22 official languages of India.
- **Where do they live?**

  The Meitei people mostly live in the Imphal Valley of Manipur, but many have also moved to other states like Assam, Tripura, Nagaland, Meghalaya, and Mizoram. There is also a significant Meitei population in Myanmar and Bangladesh.
- **Clans:**

  The Meitei people are divided into clans that do not intermarry.
- **Economy:**

  Their economy is mainly based on rice farming in irrigated fields.

What is Tumaini Festival ?

Overview:

The Tumaini Festival in Malawi brings together refugees and local people through music, art, and crafts. It helps build connections and hope for a better future.

About Tumaini Festival:

- **Founded:** The Tumaini Festival was established in 2014.
- **Location:** It is held every year in the Dzaleka Refugee Camp in Malawi.
- **Unique:** This is the only festival in the world held inside a refugee camp.
- **Organizers:** The festival is managed by the refugees themselves, offering a platform for cultural exchange and community building.
- **Attendees:** Thousands of people from around the world come to enjoy the festival.
- **Activities:** The festival features a mix of music, dance, theater, and visual arts.
- **Award:** It won the Cultures of Resistance Award (CoR Award) in 2024 for its positive impact.
    - The Cultures of Resistance Award was created in 2020 by Iara Lee, a filmmaker and activist. The award honors individuals or groups who creatively work toward positive change in the world.

Key Facts about Malawi:

- **Location:** Malawi is a landlocked country in Southeastern Africa.
- **Size:** It covers an area of 118,484 sq. km.
- **Borders:** It shares borders with Tanzania, Mozambique, and Zambia.
- **Capital:** The capital city is Lilongwe.
- **Languages:** The official languages are English and Chichewa.
- **Currency:** The local currency is the Malawi kwacha (MWK).
- **Geography:** Malawi is known for its highlands and Lake Nyasa (Lake Malawi), one of the deepest lakes in the world, which covers over one-fifth of the country's area.
- **Economy:** Malawi is one of the poorest countries in the world, with most people working in agriculture.

About Dzaleka Refugee Camp:

- **Location:** Dzaleka is the only permanent refugee camp in Malawi.
- **Established:** It was set up in 1994 to help people fleeing wars and violence from Burundi, Rwanda, and the Democratic Republic of Congo (DRC).
- **Current Refugees:** Over the last 30 years, refugees from Somalia, Ethiopia, and other countries have also found safety in the camp.

PM Vishwakarma Scheme

Overview :

The PM Vishwakarma Scheme, launched in 2023, has successfully registered over two million applications. This initiative aims to support artisans and craftspeople by enhancing their skills and providing market linkages, among other benefits.

About PM Vishwakarma Yojana

- **Scheme Type:** Central Sector Scheme
- **Ministry:** Ministry of Micro, Small, and Medium Enterprises (MSME)
- **Duration: 5 years** (FY 2023-24 to FY 2027-28)
- **Target Beneficiaries:** Artisans and craftspeople involved in traditional trades across India, both in rural and urban areas.

Objectives of the Scheme

- **Reviving Traditional Skills:** The scheme aims to strengthen and preserve the Guru-Shishya tradition, a family-based practice where knowledge and skills are passed down through generations of artisans.
- **Productivity Enhancement:** The scheme also seeks to improve the quality of products and services provided by artisans and craftspeople.
- **Market Integration:** Ensuring that the Vishwakarmas (artisans) are integrated into both domestic and global value chains.

Eligibility & Coverage

- The scheme is open to artisans and craftsmen from both rural and urban areas in India.

- It covers 18 traditional crafts, including professions like:
  - Boat Maker
  - Armourer
  - Blacksmith
  - Hammer and Tool Kit Maker, among others.
- **Target Families:**
  - 5 lakh families will be covered in the first year.
  - 30 lakh families will be covered over the 5-year period.

Key Benefits

- **Access to Tooling Facilities:** The scheme provides **improved access** to tooling resources, enhancing productivity and efficiency for MSMEs.
- **Skill Development:** Training programs to ensure artisans meet industry standards and improve their skills.
- **Product & Process Development:** Encouraging the development of new products and improving manufacturing processes to boost competitiveness.
- **Consultancy & Job Work Services:** Tailored consultancy and job work services are provided to meet the specific needs of various industries.

What is a Central Sector Scheme 3?

- Central Sector Schemes are programs that are fully funded by the central government and implemented by central agencies.
- They focus on subjects listed in the Union List (areas where the central government has exclusive legislative power).

Conclusion :

The PM Vishwakarma Scheme is a significant step towards supporting India's artisans and craftspeople, empowering them with the resources, skills, and market linkages they need to thrive. By modernizing traditional industries, the scheme aims to uplift communities and integrate them into larger national and international markets.

Gutti Koya Tribals

Recently, the National Commission for Scheduled Tribes (NCST) has requested the Union Home Ministry and the state governments of Chhattisgarh, Maharashtra, Andhra Pradesh, and Odisha to submit a detailed report on the status of the Gutti Koya tribals.

Key Details about the Gutti Koya Tribe:

1. General Information:

- The Gutti Koya tribe is one of the few multi-racial and multi-lingual tribal communities in India.
- **Population Distribution**: The Koya tribe is primarily concentrated in the states of Telangana, Andhra Pradesh, Chhattisgarh, and Odisha.

2. Language:

- The Koya people speak the Koya language, which is part of the Dravidian language family.
- The Koya language is closely related to Gondi and has been strongly influenced by the Telugu language.

3. Occupation and Lifestyle:

- The Koya tribe practices Podu cultivation, a form of shifting cultivation, which is common among various tribal groups living in forested areas.

  This practice is both an economic survival strategy and a subject of environmental sustainability debates.
- In addition to farming, the Koya people engage in animal husbandry and collect minor forest produce for their livelihood.

4. Festivals:

- The Sammakka Saralamma Jatra, also known as the Medaram Jatara, is the most important festival celebrated by the Koya tribe.
  - It is a tribal festival held every two years during the full moon day of Magha Masam (usually in January or February).
  - This festival takes place in Medaram village, located in Mulug taluk of Warangal district in Telangana.

5. Status in Various States:

- The Koya tribe holds Scheduled Tribe (ST) status in Chhattisgarh.

- However, they have not been granted ST status in other states like Telangana, where many Koyas have migrated to.

Society and Culture:

1. Social Structure:

- The Koya tribe is divided into five sub-divisions, known as Gotrams. Every individual is born into one of these clans and cannot leave or change it.

2. Family Structure:

- The Koya people follow a patrilineal system, where lineage is traced through the father's side.
- The family is referred to as a "Kutum", and the nuclear family is the predominant family structure.

3. Marriage Practices:

- Monogamy is the norm among the Koya tribe, meaning individuals generally have only one spouse at a time.

What is the Sammakka-Saralamma Jatara?

- The Sammakka-Saralamma Jatara, also known as the Medaram Jatara, is a major tribal festival in Telangana, India.
- It is dedicated to honoring the goddesses Sammakka and Saralamma.
- The festival, which takes place every two years, attracts a large number of devotees, especially from the tribal communities, who gather at Medaram village to celebrate the event.
- The festival is considered an important part of the Koya tribe's cultural heritage and is one of the largest tribal festivals in India.

Booker Prize 2024

Overview:

The Booker Prize 2024 for fiction has been awarded to Samantha Harvey, a British writer, for her novel "Orbital". The book is a short, imaginative narrative set aboard the International Space Station (ISS), offering a wonder-filled perspective of life in space.

About the Booker Prize:

- The Booker Prize is the world's leading literary award for a single work of fiction.
- It was founded in 1969 in the UK to reward the best novel written in English.
- Initially, it honored Commonwealth writers, but now it is open to all authors worldwide, regardless of their origin.
- **Objective:** The prize aims to promote excellence in fiction by recognizing the best novel of the year.

Eligibility:

- **Eligibility Criteria:**
  - The prize is open to any novel originally written in English.
  - The novel must be published in the UK or Ireland during the prize year.
  - The book must be an original work, not a translation.
  - Only novels published by registered UK or Irish imprints are eligible. Self-published books are not considered.
- **Prize:**
  - The winner receives a cash award of £50,000.
  - Each of the shortlisted authors is awarded £2,500.

The Booker Prize Foundation:

- The Booker Prize Foundation is a registered charity founded in 2002.
- It has been responsible for administering the Man Booker Prize for Fiction and, since 2005, the Man Booker International Prize.

What is Fiction?

- Fiction refers to literature that is created from the imagination, not based on fact, although it may be inspired by real events or situations.
- **Types of Fiction:**
  - Novel
  - Short Story
  - Novella
- The word fiction comes from the Latin "fictiô", meaning "the act of making, fashioning, or molding".

'Know Your Medicine' App : Strengthening Anti-Doping Efforts in Sports

- In November, 2024, the Union Minister for Youth Affairs & Sports launched a nationwide campaign to enhance the fight against doping in sports.
- The campaign urges athletes, coaches, and the broader sporting community to use the 'Know Your Medicine (KYM)' app, developed by the National Anti-Doping Agency (NADA) India.
- This app aims to provide crucial support in maintaining clean and ethical sports practices by helping athletes check whether their medicines contain banned substances.

About the 'Know Your Medicine' (KYM) App

The KYM app is a key initiative under NADA India's mission to promote anti-doping awareness. The app is designed to help athletes make informed choices about the medicines they use, ensuring they do not unknowingly take substances that are prohibited by global sports organizations. Here are the key features and benefits of the app:

1. **Easy Verification**:

   The app lets users check if a specific medicine or its ingredients contain any substances listed as banned by the **World Anti-Doping Agency (WADA)**, which is responsible for setting the standards for anti-doping rules worldwide.

2. **User-Friendly Search Options**:

   The app provides an **image and audio search** feature, allowing athletes to search for specific medicines or their ingredients. Users can also select their sport category, which makes it easier to find information relevant to their specific needs.

3. **Promoting Fair Sports**:

   By offering a fast and simple way to verify medications, the app helps athletes avoid inadvertent doping violations and ensures they remain in line with the principles of fair play and ethical behavior in sports.

National Anti-Doping Agency (NADA) India

The National Anti-Doping Agency (NADA) was established by the Government of India to be the country's independent body responsible for the fight against doping in sports. Here are the key facts about NADA:

1. **Establishment and Purpose**:

   NADA was set up in November 2005 as a registered society under the Societies Registration Act of 1860. Its primary objective is to ensure that Indian sports remain free from doping, helping athletes compete fairly and maintain integrity in the sporting community.

2. **Key Functions**:

- Implementation of Anti-Doping Code: NADA works to ensure that all sports organizations in India comply with anti-doping standards.
- **Coordinating Doping Tests**: NADA manages a comprehensive testing program in coordination with various stakeholders to detect and deter the use of banned substances.
- **Education and Research**: The agency focuses on promoting anti-doping education and research, helping athletes understand the importance of clean sport.
- **Best Practice Standards**: NADA adopts high standards to continuously improve its anti-doping efforts and to ensure effective implementation of its programs.

3. **Nodal Ministry**:

- NADA operates under the Ministry of Youth Affairs & Sports, which is responsible for the overall development of sports and the welfare of athletes in India.

What is the World Anti-Doping Agency (WADA)?

The World Anti-Doping Agency (WADA) is an international independent organization established in 1999. WADA's role is to lead the global effort against doping in sports, ensuring that athletes everywhere can compete on a level playing field. Here are some key facts about WADA:

1. **International Collaboration**:

   WADA works in partnership with both the global sports community and governments from around the world to fight doping in sports. Its governance and funding come from an equal partnership between sports organizations and national governments.

2. **WADA's Role**:

   WADA is responsible for establishing the **anti-doping code** that all sports organizations must follow. It also maintains a list of banned substances and methods that athletes are prohibited from using.

Conclusion :

The 'Know Your Medicine (KYM)' app is a vital tool in the fight against doping in Indian sports, making it easier for athletes to ensure that the medicines they use do not contain banned substances. This initiative is part of NADA India's broader mission to promote clean sports and raise awareness about the dangers of doping. By using the app, athletes can make more informed decisions, contributing to a fairer and healthier sporting environment.

Sumi Naga Tribe: A Rich Tradition and Cultural Celebrations

- In November, 2024, the Sumi Naga tribe of Nagaland celebrated their traditional Ahuna festival, a post-harvest event marked by unity and gratitude.
- This celebration highlights the cultural practices of the Sumi Naga people, one of the major tribes in the state of Nagaland, located in the northeastern region of India.

About the Sumi Naga Tribe

The Sumi Naga, also known as Sema Naga, is one of the prominent tribes of the Naga people in Nagaland, and their traditions and cultural practices are deeply rooted in their history and way of life. Here are some key facts about the Sumi Naga tribe:

1. **Geographic Distribution**:
   - o The Sumi Naga tribe primarily resides in the central and southern regions of Nagaland.
   - o They are the most widespread tribe among the Naga groups in terms of settlement.
2. **Village Settlement**:
   - o The Sumi people are known for their practice of establishing villages, which is a key feature of their community life.
   - o Unlike other Naga tribes, the Sumi have been particularly focused on the establishment of villages, a practice that continues in recent years.
3. **Historical Practices**:

   Like many other Naga tribes, the Sumi used to practice headhunting before the arrival of Christian missionaries and the conversion of the tribe to Christianity. This was a part of their warrior tradition, which has since been replaced with more peaceful practices.

4. **Language**:

   The Sumi language belongs to the Tibeto-Burman language family, which is common among many tribes in the Naga region.

5. **Major Festivals**:
   - o The Sumi Naga tribe celebrates two main festivals: Tuluni and Ahuna.
   - o **Ahuna**:

     The Ahuna festival is a traditional post-harvest festival celebrated in gratitude for the harvest. It involves thanksgiving for the season's crops and prayers to the spirits for prosperity in the coming year.
   - o **Tuluni**:

     The Tuluni festival is celebrated at the time of the harvest, especially for the arrival of new crops and fruits. It is a time for the community to offer prayers and thanks to God for the abundance of crops from the previous year.

What are the Nagas ?

The Nagas are an indigenous group of people residing in the hilly regions between India and Burma (Myanmar). Here are some key details about the Nagas:

1. **Population**:

   The Naga people are estimated to number about 2.5 million, with around 1.8 million living in

Nagaland, 0.6 million in Manipur, and 0.1 million in Arunachal Pradesh. There are also Naga communities in Burma.

2. **Tribal Groups**:

The Nagas are made up of sixteen main tribal groups, each with its own distinct name, culture, and language. Each tribe has a rich heritage and contributes to the diversity of the Naga people.

3. **Traditional Lifestyle**:

Traditionally, the Naga people lived in hilltop villages and were known for their strong warrior traditions. The villages were often built on hilltops for defense, and the Naga people were involved in frequent armed raids on the plains below.

4. **Cultural and Social Organization**:

The Naga tribes are **tribally organized**, with each tribe having its own customs, rituals, and social structures. They also have a **strong sense of community** and pride in their traditions and heritage.

Conclusion :

The Sumi Naga tribe is a vital part of Nagaland's rich cultural tapestry. Their festivals, such as Ahuna and Tuluni, celebrate the bond between nature and the community. These traditions reflect the Sumi's deep connection to the land and their ancestral practices. By observing these festivals and other cultural aspects, the Sumi Naga tribe continues to maintain its identity while contributing to the larger Naga culture.

What is the World Anti-Doping Agency (WADA) ?

In Nov 2024, India will host a 4-day Global Learning and Development Framework (GLDF) Results Management Training in New Delhi, in collaboration with the World Anti-Doping Agency (WADA).

About the World Anti-Doping Agency (WADA):

1. **Establishment**:

WADA was founded in 1999 as an independent international organization to lead a global effort to eliminate doping in sports.

2. **Mission and Role**:

- WADA's primary mission is to develop, harmonize, and coordinate anti-doping policies and rules across all sports and countries.
- The agency is involved in several key activities, including:
  - Scientific research
  - Education
  - Development of anti-doping capacities
  - Monitoring the World Anti-Doping Code (Code), which unifies anti-doping policies worldwide.

3. **Governance and Funding**:

WADA operates on an equal partnership between the sports movement and governments from around the world. This partnership supports both the governance and funding of the agency.

Formation of WADA:

- **Background**:

In the summer of 1998, events in the world of cycling raised concerns about doping. In response, the International Olympic Committee (IOC) called for a World Conference on Doping.

- **First World Conference**:
  - The First World Conference on Doping in Sport was held in Lausanne, Switzerland, from February 2-4, 1999.
  - The conference led to the Lausanne Declaration on Doping in Sport, which called for the creation of an independent global agency to combat doping.
- **Establishment of WADA**:
  - Following the Lausanne Declaration, WADA was established on November 10, 1999, in Lausanne, Switzerland.
  - WADA's purpose was to promote and coordinate the fight against doping in sport internationally, and it was made operational in time for the 2000 Sydney Olympics.

WADA's Governance Structure:

1. **Foundation Board (42 members)**:

- The Foundation Board is WADA's highest policy-making body.

- It is made up of representatives from:
  - The Olympic Movement (including the IOC, National Olympic Committees, International Sports Federations, and athletes).
  - Governments from all five continents.

2. Executive Committee (16 members):

- The Executive Committee manages and runs WADA's operations and activities, as well as administers its assets.
- The Board delegates the agency's day-to-day management to this committee.

What is Doping ?

- **Definition**:

  Doping refers to the use of artificial or illegal substances to enhance performance in sports.

  Common substances used in doping include :
  - Anabolic steroids
  - Human growth hormones
  - Stimulants
  - Diuretics

  These substances are used to give athletes an unfair advantage over others in competitions, and their use is strictly prohibited in professional sports.

Conclusion:

The World Anti-Doping Agency (WADA) plays a central role in maintaining fairness and integrity in sports by preventing the use of performance-enhancing drugs. Its global efforts are crucial in promoting clean sports and ensuring that athletes compete on equal terms.

State of the World's Children 2024 (SOWC-2024) Report

In November 2024, The UNICEF's State of the World's Children 2024 (SOWC-2024) report highlighted a major global crisis, revealing that nearly half of all children—approximately 1 billion—are living in countries that are highly vulnerable to climate and environmental hazards.

About the State of the World's Children (SOWC) Report:

- **What it is**:

  The SOWC is an annual flagship publication by the United Nations Children's Fund (UNICEF).

  Each year, the report focuses on a key issue affecting children globally, including topics such as:
  - Child labor
  - Conflict and war
  - Urbanization
  - Early childhood development
  - Children with disabilities

  The report provides comprehensive analysis, backed by data and statistics, on global trends impacting children's well-being.

Highlights of SOWC-2024:

- **Launch and Theme**:

  The SOWC-2024 report was launched on 20th November, which is also celebrated as World Children's Day—UNICEF's annual day of action, focusing on the theme "Listen to the Future". This year's report emphasizes the voices of children and young people in shaping the world they want.

- **Three Megatrends Impacting Children by 2050**:

  The report identifies three megatrends that will have a significant impact on children's lives by 2050:
  - Demographic shifts (changes in population patterns).
  - Climate and environmental crises.
  - Frontier technologies (like AI and digital advancements).

- **Projected Global Child Population**:

  The global child population is projected to stabilize at 2.3 billion by 2050.
  - Countries like India, China, Nigeria, and Pakistan are expected to make up more than one-third of the world's child population.
  - India will have the largest share, with an estimated 350 million children, although this is a decline of 106 million compared to the current population.

- **Impact of Climate and Environmental Hazards**:
  - The report warns that nearly 1 billion children globally face extreme vulnerability to climate and environmental risks, including extreme heat, floods, droughts, and air pollution.
  - According to the Children's Climate Risk Index (CCRI), in 2021, India ranked 26th out of 163 countries, with children particularly at risk from these environmental threats.
  - By 2050, the report predicts that children worldwide will experience eight times more exposure to extreme heat waves than in the 2000s.
- **Digital Divide**:

  The digital divide continues to widen:
  - Over 95% of people in high-income countries have access to the internet.
  - In low-income countries, only 26% of people are connected to the internet, highlighting the stark gap in digital access.

What is UNICEF ?

- **Definition**:

  The United Nations International Children's Emergency Fund (UNICEF) was created in 1946, following World War II, with the mission to provide life-saving assistance to children whose futures were at risk, regardless of their country's role in the war.
- **Mandate**:

  UNICEF's main goal is to protect children's rights and improve their well-being, including access to education, healthcare, clean water, and protection from abuse and exploitation.
- **Global Presence**:

  UNICEF operates in over 190 countries and territories, supporting efforts to protect children's rights, especially in the most vulnerable regions.
- **Funding**:

  UNICEF is funded entirely through voluntary contributions from individuals, governments, and partners in the private sector and civil society.

Conclusion :

The SOWC-2024 report underscores the growing challenges children face, especially due to climate change, digital inequality, and demographic shifts. It serves as a call for global action to protect children's future and ensure their well-being in the face of these evolving threats.

Ustad Bismillah Khan Yuva Puraskar

Overview:

The Union Minister of Culture and Tourism will confer the prestigious Ustad Bismillah Khan Yuva Puraskar for the years 2022 and 2023 to 82 young artists during a special ceremony at the Dr. Ambedkar International Centre, Janpath, New Delhi.

About Ustad Bismillah Khan Yuva Puraskar

- **Established**:

  The Ustad Bismillah Khan Yuva Puraskar was instituted in 2006 by the Sangeet Natak Akademi in honor of the legendary Bharat Ratna Ustad Bismillah Khan.
- **Purpose**:

  It aims to recognize and encourage young performing artists under the age of 40 who excel in the fields of music, dance, drama, folk & tribal arts, and puppetry.
- **Award Details**:

  The Yuva Puraskar is presented annually and includes:
  - A cash prize of ₹ 25,000.
  - A plaque.
  - An angavastram (a traditional cloth).
- **Significance**:

  The award was established to motivate and inspire young artists to continue their work in India's rich cultural heritage. It serves as an important platform for recognizing emerging talent in the performing arts.

Who was Ustad Bismillah Khan?

- **A Legendary Musician**:

  Ustad Bismillah Khan was a renowned Shehnai virtuoso and one of India's most respected musicians.

- **Historical Significance**:
  - He famously played at the first Republic Day celebration in 1950, marking an iconic moment in Indian history.
  - He was the first Indian to be invited to perform at the prestigious Lincoln Centre Hall in New York, USA.

What is Sangeet Natak Akademi?

- **Establishment**:

  The Sangeet Natak Akademi was established in 1953 by a resolution from the Ministry of Education. It was founded with P.V. Rajamannar as its first Chairman.
- **Mandate**:

  The Akademi's primary mission is to preserve and promote India's vast intangible cultural heritage, particularly in the forms of music, dance, and drama.
- **Role**:

  The Sangeet Natak Akademi serves as a leading institution for the recognition of artists and the development of performing arts across the country.

Conclusion:

The Ustad Bismillah Khan Yuva Puraskar continues to serve as an important national recognition for young, talented artists, fostering a new generation of performers in India. The award not only honors the memory of the legendary Ustad Bismillah Khan but also provides a significant platform for emerging artists across various cultural forms.

Femicides in 2023 : Global Estimates of Intimate Partner/Family Member Femicides

- On 25th November, the International Day for the Elimination of Violence Against Women, the UN Women and the United Nations Office on Drugs and Crime (UNODC) released the Femicides in 2023: Global Estimates of Intimate Partner/ Family Member Femicides report.
- This report sheds light on the alarming crisis of femicide—the intentional killing of women and girls based on gender.
- The data highlights how intimate partner and family member violence is a leading cause of death for women globally.

What is Femicide?

Femicide is the intentional killing of women and girls, driven by gender-related motives such as discrimination, unequal power relations, gender stereotypes, and harmful social norms. It is distinct from general homicide, where the killing is not necessarily motivated by gender.

Key Findings of the Report

1. **Global Scenario**:
   - In 2023, 85,000 women and girls were intentionally killed worldwide.
   - Of these, 60% (approximately 51,100) were killed by intimate partners or family members.
   - On average, 140 women and girls per day were victims of intimate partner or family member femicides.
2. **Regional Disparities**:
   - Africa reported the highest number of femicide victims, with 21,700 women killed, and the highest rate of femicide at 2.9 per 100,000.
   - The Americas and Oceania followed with femicide rates of 1.6 and 1.5 per 100,000, respectively.
   - Asia and Europe had significantly lower rates, at 0.8 and 0.6 per 100,000.
3. **Non-Domestic Femicide**:
   - Non-domestic femicides (those occurring outside intimate or family settings) are increasingly being recognized:

     5% of femicides in France (2019–2022) and 9% in South Africa (2020–2021) occurred outside the home.
4. **Male Homicide Victims**:
   - 80% of all homicide victims globally in 2023 were men, but women were disproportionately affected by intimate partner violence.
   - 60% of women killed in 2023 were victims of intimate partner or family member violence.

5. **Preventability of Femicide**:

- Many women killed by intimate partners had previously reported violence. For example:

  22-37% of women in France (2019–2022) and similar trends in South Africa (2020–2021) had reported prior violence.

6. **Data Availability**:

- Data on femicides has been inconsistent, with only half the number of countries reporting in 2023 compared to 2020.
- Only a few countries collect data on non-domestic femicides using the UNODC-UN Women framework.

Forms of Violence Against Women

1. **Domestic Violence**:

- Involves harm inflicted by a current or former partner or family member, including physical, sexual, or emotional abuse.
- Examples include coercion, psychological abuse, and controlling behaviors.

2. **Sexual Violence**:

- Involves unwanted sexual acts, such as rape, sexual harassment, and forced prostitution.
- In India, over 31,000 rape cases were reported in 2022 (approximately 87 cases per day).

3. **Psychological Abuse**:

   Includes intimidation, humiliation, and emotional manipulation such as isolating menstruating women or female infanticide.

4. **Cultural Abuse**:

   Encompasses harmful social practices like female genital mutilation, honor-based violence, and child marriage.

5. **Technology-Facilitated Violence**:

   Involves online harassment, cyberbullying, and distributing morphed images or videos.

Gender Violence in India : Key Facts

1. **Increase in Crimes Against Women**:

- The National Crime Records Bureau (NCRB) 2022 data shows a 4% rise in crimes against women compared to 2021.
- Over 4.45 lakh cases of crimes against women were registered, with nearly 51 FIRs every hour.

2. **High Rape Cases**:

- Over 31,000 rapes were reported in 2022, with a peak of 39,000 in 2016.
- In 2018, one rape was reported every 15 minutes across India.

International Day for the Elimination of Violence Against Women

- **Date**: 25th November.
- **Purpose**: To raise awareness about violence against women and girls (VAWG).
- **History**: The date honors the Mirabal Sisters of the Dominican Republic, who were assassinated on this day in 1960 by the regime of Rafael Trujillo for their resistance against his dictatorship.

UN Women and UNODC: Roles and Mandates

1. **UN Women**:

- Established in 2010, it works to address global gender inequality, promote women's empowerment, and eliminate discrimination against women and girls.
- Key Goals: Gender equality, empowerment of women, and promoting women's rights in areas such as development, peace, and security.

2. **UNODC**:

   Founded in 1997, UNODC tackles issues related to illicit drugs, international crime, and terrorism. It also works to combat gender-based violence and trafficking.

Key Laws for Women's Safety in India

1. Immoral Traffic (Prevention) Act, 1956
2. Indecent Representation of Women Act, 1986
3. Protection of Women from Domestic Violence Act, 2005
4. Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
5. Protection of Children from Sexual Offences (POCSO) Act, 2012

Preventing Femicide: Recommendations from the Report

1. **Address Root Causes**:

   Focus on challenging gender-based violence at all levels—individual, interpersonal, community, and societal.

2. **Educational Initiatives**:

   Integrate curricula that promote gender equality, healthy relationships, and challenge harmful societal roles and norms.

3. **Legal Measures**:

- Classify femicide as a distinct criminal offense, as seen in countries like Latin America.
- Establish dedicated units in police and judiciary to handle gender-based violence.

4. **Risk Reduction**:

- Train police and authorities to identify high-risk situations and ensure timely interventions to prevent femicides.
- Enforce restraining orders and limit firearm access to perpetrators of intimate partner violence.

5. **Awareness Movements**:

- Campaigns like #MeToo and Ni Una Menos (Not One Less) bring global attention to the issue of gender-based violence.

6. **Data Collection**:

- Governments should produce annual reports on femicide trends and establish femicide observatories to track and analyze data.

Conclusion :

The Femicides in 2023 report highlights the global crisis of gender-based violence and femicide. It calls for a multifaceted approach to tackle femicide, focusing on prevention through root cause analysis, strengthening legal frameworks, and raising public awareness. Effective prevention requires collective action at individual, societal, and institutional levels. Addressing this crisis is crucial for protecting women's rights and fostering a more equitable and safe world for women and girls globally.

Rengma Naga Tribe

Overview:

The Rengma Naga Tribe recently celebrated the Ngada Festival-cum-Mini Hornbill Festival at the Tseminyu RSA ground in Nagaland. This two-day event showcased the tribe's vibrant cultural heritage, emphasizing their agricultural roots and rich traditions.

About the Rengma Naga Tribe:

- **Ethnic Group**: The Rengma Naga belong to the Tibeto-Burman language family and are part of the larger Naga ethnic community.
- **Geographic Distribution**:
  - The Rengma Naga tribe inhabits the Northeast Indian states of Nagaland and Assam.
  - **Population**: According to the 2011 Census of India, the Rengma Naga population in Nagaland stands at 62,951, and in Assam, it is approximately 22,000.
- **Self-Identification**: The Rengma Naga call themselves **"Njong"** or **"Injang"**.
- **Racial and Historical Background**:

  The tribe belongs to the Mongoloid racial stock and is believed to have migrated from Southeast Asia, traveling across the Yunnan Mountain ranges and settling in the upper Burma region.

History and Culture:

- **Slavery**: The Rengma Naga tribe historically practiced slavery, with slaves known by the names menugetenyu and it sakesa. However, by the time the British arrived in the region, slavery had declined, and no Rengma Naga was enslaved during that period.

Economy:

- **Agriculture**:
  - The Rengma Naga are primarily agriculturists.
  - They practice Jhum cultivation (shifting cultivation) and wet cultivation for growing paddy, which is a staple crop.
  - Additionally, they cultivate seasonal crops and fruits for consumption and trade.

Religion:

- **Traditional Beliefs**: Initially, the Rengma Naga worshipped supernatural beings and followed animistic practices.
- **Christianity**: Today, most members of the Rengma Naga tribe have converted to Christianity.

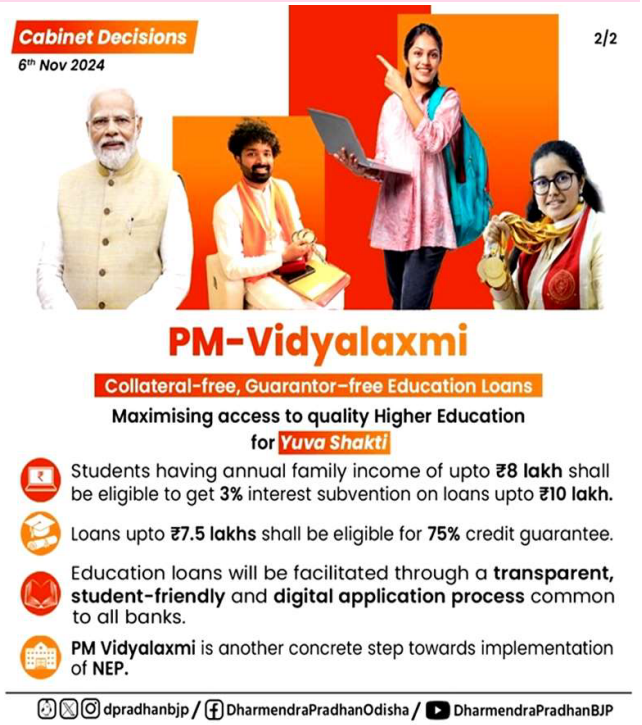
Festivals:

- **Ngada Festival**:
  - The Ngada Festival is the most significant festival for the Rengma Naga tribe, celebrating their agricultural practices, harvests, and cultural traditions.
  - Other seasonal festivals are also celebrated, typically related to the agricultural cycle.

What is Jhum Cultivation?

Jhum cultivation is a traditional agricultural practice, primarily found in the northeastern states of India and Southeast Asia. Also known as shifting cultivation or slash-and-burn agriculture, it involves clearing forest areas by cutting and burning the vegetation. This creates space for planting crops for a limited time, after which the land is abandoned and a new plot is cleared for farming. The practice is typically carried out in areas with poor soil fertility that can only support crops for short periods.

PM-Vidyalaxmi Scheme



Why in News ?

- Recently, The Union Cabinet, chaired by Prime Minister Narendra Modi, has approved the PM-Vidyalaxmi scheme, which aims to provide financial support to meritorious students to pursue higher education without financial constraints.
- This scheme is a part of the government's broader effort to maximize access to quality higher education for Indian youth.
- The initiative is aligned with the National Education Policy (NEP) 2020, which advocates for providing financial assistance to deserving students.
- The scheme will focus on providing collateral-free loans, interest subventions, and credit guarantees for education loans, enabling meritorious students to study in the country's top educational institutions.

Key Features of the PM-Vidyalaxmi Scheme

1. Target Group and Eligibility:

- **Meritorious Students:** Any student admitted to one of the top 860 quality higher educational institutions (QHEIs) in India, as determined by the National Institutional Ranking Framework (NIRF), is eligible for the scheme.
- The scheme covers both government and private institutions ranked in the top 100 in the NIRF, as well as government institutions ranked between 101-200.
- **Annual Family Income:**
  - Students with a family income of up to ₹ 8 lakhs will benefit from 3% interest subvention.
  - Students with a family income of up to ₹ 4.5 lakhs will be eligible for full interest subvention under the Central Sector Interest Subsidy (CSIS).

2. Loan Amount and Financial Support:

- **Loan Coverage:** The scheme provides education loans to cover the full cost of tuition fees and other related expenses (e.g., accommodation, books).
- **Collateral-Free Loans:** Loans will be offered without collateral or guarantor requirements, making it accessible to a larger number of students.

- **Loan Amount Limit:** Students can apply for loans up to ₹ 10 lakh (for both domestic and overseas education).
- For loans up to **₹ 7.5 lakh**, the government will provide a 75% credit guarantee to banks to reduce the risk of default.

3. Interest Subvention:

- **3% Interest Subvention:** Students with an annual family income of up to ₹ 8 lakh, not eligible for other government subsidies, will receive 3% interest subvention on loans up to ₹ 10 lakh during the moratorium period.
- **Full Interest Subvention for Low-Income Students:** Students with an income of up to ₹ 4.5 lakh annually, pursuing technical and professional courses, will receive full interest subvention under the existing Central Sector Interest Subsidy (CSIS) scheme.
- **Coverage:** The scheme will benefit 1 lakh students every year with the interest subvention, with an expected 7 lakh students to benefit by the end of the scheme (2024-2030).

4. Application Process:

- **Unified Digital Portal:** The entire process will be streamlined and digital, with a dedicated online portal—PM-Vidyalaxmi. Students can apply for loans and interest subventions directly through this portal, which will be transparent, student-friendly, and inter-operable with all banks.
- **Simplified Application:** The application process will be simple, and E-vouchers and Central Bank Digital Currency (CBDC) wallets will be used for the payment of interest subvention, ensuring a seamless experience.

5. Additional Support Mechanisms:

- **Loan Disbursement and Coverage:** The scheme will cover educational loans for students enrolled in quality higher educational institutions. The scope of the scheme includes technical, professional, and general education courses.
- **State and Central Government Institutions:** All central government institutions, as well as top-ranked state institutions, are eligible under the scheme.

Budget and Financial Outlay

- A total outlay of ₹ 3,600 crore has been allocated for the period from 2024-25 to 2030-31 to support the implementation of the scheme.
- This funding will provide financial assistance to around 7 lakh students, supporting both the loan disbursement and interest subvention components.

How Will PM-Vidyalaxmi Complement Other Schemes?

The PM-Vidyalaxmi scheme builds on existing education financing mechanisms and further strengthens the government's commitment to providing access to education through financial inclusion. Specifically, it will work in conjunction with:

1. **Central Sector Interest Subsidy (CSIS):**

   Under this existing scheme, students from families with an income of up to ₹ 4.5 lakh who are pursuing technical and professional courses from approved institutions get full interest subvention during the moratorium period.

2. **Credit Guarantee Fund Scheme for Education Loans (CGFSEL):**

   The 75% credit guarantee under PM-Vidyalaxmi will reduce the risk for financial institutions and banks, encouraging them to offer loans to students without collateral.

Together, these schemes will ensure that all deserving students, particularly those from economically weaker sections, have access to quality higher education without the barrier of financial constraints.

Significance of the PM-Vidyalaxmi Scheme

1. **Promoting Financial Inclusion in Education:**

- By offering collateral-free loans and interest subvention schemes, the PM-Vidyalaxmi initiative significantly reduces the financial burden on students and their families, making higher education more accessible, particularly for those from low- and middle-income backgrounds.

2. **Boosting Higher Education Enrollment:**

- The scheme targets more than 22 lakh students annually, covering students across diverse fields and institutions. This will help increase access to quality education and create a more skilled workforce in India.

3. **Digital and Transparent Application System:**

- The digital nature of the scheme ensures greater transparency, reduces delays, and simplifies the loan application process for students, enhancing their overall experience.

4. **Alignment with National Education Policy (NEP) 2020:**

- PM-Vidyalaxmi directly contributes to the NEP 2020 vision of increasing access to higher education for all deserving students by ensuring that financial limitations do not hinder their academic aspirations.

5. **Support for Merit-Based Admissions:**

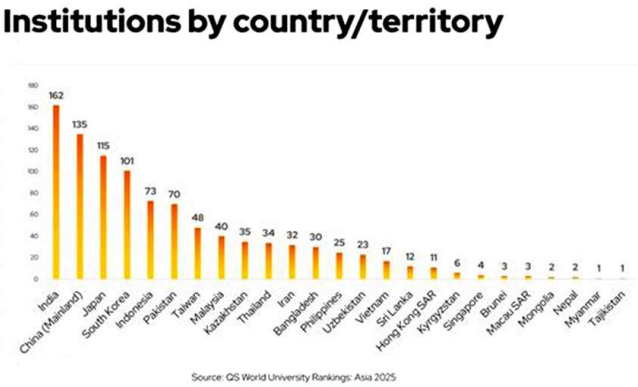
- The scheme encourages merit-based admissions in the country's top educational institutions, making it a progressive step towards supporting excellence and skill development in higher education.

Conclusion :

The PM-Vidyalaxmi scheme is a transformative initiative by the government that ensures no student is deprived of quality higher education due to financial limitations. By providing collateral-free loans, interest subvention, and a digital application process, the scheme promises to create a more inclusive educational environment. Coupled with other schemes like the CSIS and CGFSEL, it strengthens the government's commitment to ensuring that financial barriers do not prevent talented students from accessing higher education in India's best institutions. This initiative will play a crucial role in realizing the goals of the National Education Policy 2020 and enhancing India's human capital.

India Shines in QS World University Rankings: Asia 2025

- In November 2024, India has once again shown its strength in higher education with impressive results in the QS World University Rankings: Asia 2025.
- The latest rankings highlight the growing competition among universities in Asia and reflect India's increasing influence in the global education landscape.
- This year's rankings show India's commitment to academic excellence, research, and international collaboration.



Key Highlights of India's Performance in QS World University Rankings: Asia 2025

1. **India's Top Performers**:

- o India has 7 institutions in the top 100 of the QS Asia Rankings 2025, a testament to the country's growing prominence in higher education.
- o 2 Indian institutions are ranked in the top 50, with Indian Institute of Technology Delhi (IITD) leading the pack at 44th place.

2. **Improvement of Indian Universities**:

- o The University of Petroleum and Energy Studies (UPES) saw the largest improvement among Indian universities, jumping 70 spots to 148th.
- o This boost was driven by improvements in key metrics like International Research Network, Citations per Paper, and Papers per Faculty.

3. **Top 50 Universities**:

- o IIT Delhi (44th) and IIT Bombay (48th) are India's two institutions in the top 50.

- IIT Delhi's rise from 46th last year reflects an impressive employer reputation score of 99%, one of the highest in Asia.
- IIT Bombay ranked 48th with strong scores in employer reputation (99.5%) and academic reputation (96.6%).

4. Top 100 Universities:

- India has 5 institutions in the top 100:
  - IIT Madras (56th)
  - IIT Kharagpur (60th)
  - Indian Institute of Science (IISc) (62nd)
  - IIT Kanpur (67th)
  - University of Delhi (81st), which improved from 94th last year.
- The University of Delhi showed notable improvement, achieving a high score of 96.4% in the International Research Network.

5. Top 150 Universities:

India's higher education strength extends beyond the top 100, with institutions such as IIT Guwahati, IIT Roorkee, Jawaharlal Nehru University, Chandigarh University (120th), UPES (148th), and Vellore Institute of Technology (150th), reflecting the depth of quality education in India.

6. Impressive Research Output:

Anna University achieved a perfect score of 100 in the Papers Per Faculty indicator, emphasizing its high research output and strong academic performance.

7. High-Caliber Faculty:

India's commitment to top-tier teaching is evident as 15 universities scored above 99% in the staff with PhD indicator, showing that India's institutions have highly qualified faculty.

8. Top Faculty-Student Ratio:

North Eastern Hill University and University of Agricultural Sciences, Bangalore achieved a perfect score of 100 in the faculty-student ratio, demonstrating strong academic credibility and effective teaching practices.

India's Growth in Global Education

- Over the last decade, India has made significant progress in the QS World University Rankings.
- In 2025, India has 46 institutions in the rankings, compared to just 11 in 2015, showing a 318% increase in the number of Indian universities listed.
- This growth places India among the top contenders in higher education, particularly within Southern Asia.
- India's 2 institutions in the top 50 and 7 in the top 100 highlight the country's commitment to building world-class universities and enhancing its global competitiveness in education.

Conclusion :

India's performance in the QS World University Rankings: Asia 2025 showcases the country's continued rise as a leading force in higher education in Asia and globally. With seven institutions in the top 100, including two in the top 50, India has demonstrated its growing influence and capability in academic excellence and research.

SVASTIK Initiative

Overview:

- The SVASTIK (Scientifically Validated Traditional Knowledge) initiative was highlighted by the Director of the CSIR-National Institute of Science Communication and Policy Research (NIScPR) at the International Conference on Communication and Dissemination of Traditional Knowledge (CDTK-2024).
- The initiative is aimed at preserving, validating, and promoting India's rich heritage of traditional knowledge through scientific methods.

Key Details of the SVASTIK Initiative:

1. Objective of SVASTIK:

- **Scientific Validation of Tradition**: SVASTIK seeks to scientifically validate and verify Indian traditional knowledge practices, ensuring that they are not only preserved but also understood in a modern scientific context.
- **Promote Scientific Temperament**: By encouraging scientific verification of traditional practices, the initiative aims to cultivate a rational and scientific mindset in the general public.
- **Boost Public Faith**: By demonstrating the validity and relevance of traditional knowledge through scientific methods, the initiative seeks to instill greater public trust and respect for India's cultural heritage.

2. Collaboration and Participation:

- Various research organizations, higher education institutions, experts, and NGOs are collaborating under the SVASTIK initiative to document and share scientifically validated stories and knowledge related to traditional practices.
- These stakeholders help in compiling, validating, and disseminating traditional knowledge.

3. Dissemination of Knowledge:

- SVASTIK uses modern communication tools such as social media to reach a broader audience.
- It has already published content in 17 Indian languages to ensure accessibility across diverse linguistic groups.
- SVASTIK Publications: Two key publications have been released, which provide scientifically validated stories related to traditional knowledge.
- These publications aim to inspire young students to explore science and connect it with their heritage.

4. Goals of the Initiative:

- **Preserve and Perpetuate Traditional Practices**: The initiative focuses on keeping traditional knowledge alive and relevant in today's rapidly changing world.
- **Promote Scientific Temperament**: By emphasizing scientific validation, SVASTIK hopes to engage more people in understanding and exploring traditional practices from a scientific perspective.

What is CSIR (Council of Scientific & Industrial Research)?

- **India's Leading R&D Organization**: CSIR is a publicly funded organization dedicated to the advancement of natural sciences and engineering, with the goal of applying this knowledge for the benefit of society.
- **Organizational Structure**:
  - **President**: The Prime Minister of India (Ex-officio).
  - **Vice President**: The Union Minister of Science and Technology (Ex-officio).
  - **Governing Body**: Headed by the Director-General, with other ex-officio members including the finance secretary.
- **Presence**: CSIR operates through a vast network of 37 national laboratories, 39 outreach centers, 1 Innovation Complex, and three units spread across India.
- **Headquarters**: Located in New Delhi, CSIR plays a key role in India's scientific and technological advancements.

Traditional Medicine:

- **Definition**: Traditional medicine refers to a wide range of health practices, knowledge, and beliefs that use plant-based, animal-based, and mineral-based treatments, spiritual therapies, manual techniques, and exercises.

- **Application**:
  - These practices can be used either individually or in combination to treat or prevent illnesses, as well as maintain well-being.
  - Traditional medicine often includes practices passed down through generations and is deeply rooted in cultural and spiritual contexts.

Conclusion :

The SVASTIK initiative is a crucial step in recognizing and preserving India's rich heritage of traditional knowledge while simultaneously validating it through scientific scrutiny. It has the potential to transform how people perceive and engage with traditional practices, encouraging a more informed and scientifically engaged society.

EDITORIALS

Crus of The Hindu & Indian Express

Indian Society & Social Justice

Prevention of Child Marriages and the "Bal Vivah Mukt Bharat" Campaign

On 27th November 2024, Smt. Annapurna Devi, the Union Minister for Women and Child Development, launched the "Bal Vivah Mukt Bharat" (Child Marriage Free India) campaign in New Delhi.

Key Features of the Campaign:

- **Child Marriage Free Bharat Portal:**

  The campaign introduced an online portal where people can report child marriage cases, file complaints, and get information on the Child Marriage Prohibition Act.
- **Goal for 2029:**
  - The campaign aims to reduce child marriages to below 5% by 2029.
  - This is part of India's plan to become a developed nation by 2047.
- **Launch During the 16 Days of Activism Against Gender-Based Violence:**

  The campaign was launched during the 16 Days of Activism Against Gender-Based Violence, which runs from 25th November to 10th December each year.

1. Prevalence and Impact of Child Marriages in India:

- **Statistics**: Despite many efforts to prevent it, 1 in 5 girls in India still get married before the age of 18.
- Human Rights Violation: Child marriage is a serious violation of human rights and is illegal in India under the Prohibition of Child Marriage Act (2006).
- **Effects on Girls**:
  - **Stops education**: Girls who marry young are often forced to drop out of school.
  - **Harms health**: Early marriage leads to **health problems**, including complications during pregnancy.
  - **Limits future opportunities**: It reduces the chances of girls having better careers or becoming financially independent.
  - **Increases poverty**: Child marriage is linked to higher levels of **poverty** and **gender inequality**.

2. Bal Vivah Mukt Bharat Abhiyan (Campaign) Focus Areas:

- **Target States and Districts**:
  - The campaign will focus on seven states with high child marriage rates: West Bengal, Bihar, Jharkhand, Rajasthan, Tripura, Assam, and Andhra Pradesh.
  - It will also target 300 districts where child marriage rates are higher than the national average.

Main Goal:

The goal is to bring the child marriage rate down to below 5% by 2029, with help from local communities, schools, and legal systems.

Key Features of the Campaign:

- **Child Marriage Free Bharat Portal**:

  This online platform will help people report child marriages, raise awareness, and track the progress of efforts to end child marriage.

- **Collaboration**:

  The campaign calls for help from government agencies, NGOs, community leaders, and youth groups to work together to end child marriages.

3. Legal and Policy Support

Laws:

- **Prohibition of Child Marriage Act, 2006**:
  - This law plays an important role in stopping child marriages.
  - However, the government believes that awareness and education are just as important as enforcing the law.

Government Schemes:

- **Beti Bachao Beti Padhao**:

  This program promotes education and gender equality for girls.
- **Samagra Shiksha**:

  Focuses on providing quality education to all children, including girls.
- **Sukanya Samriddhi Yojana**:

  A savings scheme to ensure financial security for girls.
- **National Education Policy (NEP), 2020**:

  Aims to provide equal educational opportunities to all children, including girls, with special scholarships for disadvantaged groups.

Cultural Norms and Patriarchy:

- The government recognizes that traditional beliefs and societal attitudes play a big role in child marriage.
- Programs like Nari Adalats (women's courts) and gender-sensitive communication guides are designed to change these attitudes and protect girls.

4. Global Context

- **India's Role in South Asia**:
  - India has made a major contribution to the decline in child marriages in South Asia.
  - According to the United Nations, India has helped lead the decline in child marriages in this region.
- **International Collaboration**:

  The Bal Vivah Mukt Bharat campaign encourages partnerships with other countries to end child marriages around the world.

5. Vision for a Developed India by 2047

- **Involving Women and Girls in Nation-Building**:

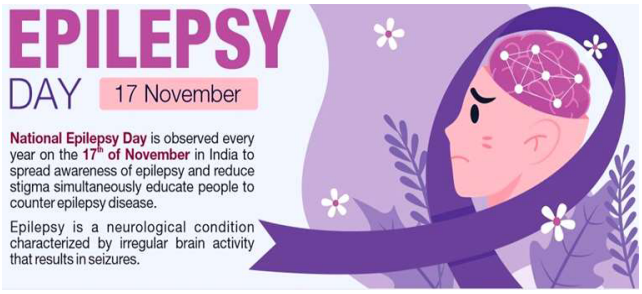
  The government's vision for 2047 is to make India a developed country, with full participation from women and girls.
- **Ending Child Marriages is Key**:
  - Ending child marriages is essential for this vision.
  - By stopping child marriages, girls will be able to get an education, find jobs, and become financially independent, helping them contribute to the economy.
- **Empowering Girls**:

  The government is working to empower girls through education, healthcare, and financial independence, so they can become strong and independent citizens.
- **Role of Society**:
  - Minister Annapurna Devi has called on citizens to take responsibility for preventing child marriages in their own communities.
  - She stressed that no child marriage should happen anywhere in India.

Conclusion :

The Bal Vivah Mukt Bharat campaign is an important step toward eliminating child marriages in India. By combining legal measures, awareness programs, and the support of the community, India hopes to end child marriages and give every girl a chance to succeed in life. Ending child marriages is critical for building a fair and equal society, and helping India become a developed nation by 2047.

National Epilepsy Day 2024 : History, Seizure Types, Symptoms & Prevention Tips



- National Epilepsy Day is observed every year in India on November 17.
- The day is dedicated to raising awareness about epilepsy, its symptoms, and the challenges faced by those affected by the disease.
- It also emphasizes the importance of early diagnosis and treatment.
- Epilepsy is a chronic neurological disorder that affects millions of people worldwide.
- The day aims to support individuals living with epilepsy and educate others on how to assist someone who may experience a seizure.

History of National Epilepsy Day:

National Epilepsy Day was established to highlight the difficulties faced by people suffering from epilepsy. The day gained significance in India thanks to the efforts of health organizations such as the Epilepsy Foundation and other advocacy groups.

- **Initiation**: The day was initiated by the Epilepsy Foundation of India, which was founded by Dr. Nirmal Surya in Mumbai in 2009.
- **Global Impact**: According to the World Health Organization (WHO), nearly 50 million people around the world suffer from epilepsy, with India contributing to 10-20 percent of that global total.

Common Signs and Symptoms of Epilepsy:

Epilepsy is primarily marked by seizures that affect brain function. The most common symptoms include:

- **Loss of Awareness**: A person may experience a temporary loss of awareness, leading to a blank stare, confusion, or unresponsiveness.
- **Uncontrollable Movements**: The person may experience jerking or muscle contractions that cannot be controlled.
- **Cognitive Disruptions**: These can include slowed thinking, confusion, or difficulty concentrating.
- **Sensory Disturbances**: Some may experience altered sensory perceptions, such as dizziness, nausea, or feeling a sense of fear.
- **Psychic Symptoms**: In some cases, individuals might feel intense emotions such as overwhelming fear, or experience hallucinations.

Types of Epileptic Seizures:

Epileptic seizures can be categorized into two primary types: Focal Onset Seizures and Generalized Onset Seizures.

1. Focal Onset Seizures:

These seizures start in one specific area of the brain. There are two types:

- **Focal Onset Aware Seizure**: The person remains conscious but may experience involuntary movements or sensations.
- **Focal Onset Impaired Awareness Seizure**: The person may lose consciousness or awareness during the seizure.

2. Generalized Onset Seizures:

These seizures involve both sides of the brain and can be further divided into six types:

- **Absence Seizures**: A brief period of staring or unresponsiveness.
- **Atonic Seizures**: A sudden loss of muscle strength, leading to a person collapsing or falling.
- **Tonic Seizures**: Muscle stiffening that can cause the person to fall or be unable to move.
- **Clonic Seizures**: Repetitive jerking movements.
- **Tonic-clonic Seizures**: A combination of stiffening and jerking movements, often called a "grand mal" seizure.
- **Myoclonic Seizures**: Sudden, brief jerks or twitches, often affecting the arms or legs.

Prevention Tips for Epilepsy:

While epilepsy cannot always be prevented, there are several ways to manage the condition and reduce the likelihood of seizures:

1. **Take Medicines on Time**:
   - Medication is crucial in managing epilepsy.
   - People with epilepsy should take their prescribed medication on time and follow their doctor's advice.
   - Regular visits to a neurologist are important to help control seizures.
2. **Get Enough Sleep**:
   - Sleep deprivation can trigger seizures.
   - It is important to maintain a regular sleep schedule and get sufficient rest to minimize the risk of seizures.
3. **Avoid Caffeine**:
   - Caffeine can act as a trigger for some people with epilepsy.
   - Foods and drinks like coffee, energy drinks, and soda contain caffeine, and these should be limited or avoided.
4. **Stay Hydrated**:
   - Dehydration can lead to various health issues, including seizures.
   - It is important for individuals with epilepsy to drink plenty of water throughout the day.
5. **Avoid Flickering Lights**:
   - Certain types of flashing or flickering lights can trigger seizures, especially in children.
   - Individuals with epilepsy should avoid exposure to flashing lights from television screens, computer monitors, or mobile phones.

Conclusion:

National Epilepsy Day is a day to raise awareness about epilepsy and support individuals who suffer from this chronic neurological condition. By understanding the symptoms, types of seizures, and prevention tips, we can contribute to a society that is more empathetic and supportive of people with epilepsy. Early diagnosis, medication, and lifestyle changes play a critical role in managing the disease effectively and improving the quality of life for those affected.

Toto Tribe and Particularly Vulnerable Tribal Groups (PVTGs)

- The Toto tribe is an indigenous community that is primarily found in the village of Totopara, located in Alipurduar district of West Bengal, India.
- The tribe has been facing significant challenges in preserving its unique culture, language, and way of life due to its small population size and external pressures.

Geographical Location and Habitat:

- **Totopara Village**: The Toto tribe is concentrated in Totopara village, situated in the Alipurduar district of West Bengal, near the Bhutanese border.
- **Jaldapara Wildlife Sanctuary**: Totopara is located within the periphery of the Jaldapara Wildlife Sanctuary, which is known for its rich biodiversity.
- **Torsa River**: The village is situated on the banks of the Torsa River, which flows between India and Bhutan, providing the community an ecologically rich environment.

Ethnic and Anthropological Background:

- **Tibetan-Mongoloid Ethnicity**: The Toto tribe belongs to the Tibetan-Mongoloid ethnic group, which ties them to the broader Himalayan cultural and ethnic traditions.
- **Population and Endangerment**: With just over 1,600 members, the Toto tribe is considered one of the most endangered tribes in the world.
- This small population has made the tribe vulnerable to extinction, with many members struggling to preserve their traditional way of life.

Tribal Classification:

- **Particularly Vulnerable Tribal Group (PVTG)**: The Toto tribe is classified as a Particularly Vulnerable Tribal Group (PVTG). T
- his classification recognizes their vulnerable status due to their small population size, cultural practices, and economic dependency on traditional activities.

Cultural and Social Structure:

1. **Endogamous and Exogamous Clans**: The Toto tribe is structured around 13 exogamous clans, meaning that individuals are encouraged to marry outside their clan.
2. However, they practice endogamy, meaning marriages within the broader tribe are common.
3. **Monogamy and Anti-Dowry**: The Toto people follow a unique practice of having only one wife and do not engage in dowry practices, setting them apart from many neighboring tribal communities.
4. **Housing**: The traditional housing of the Toto people consists of elevated bamboo huts with thatched roofs, adapted to their environment and lifestyle.

Language:

- **Toto Language**: The language spoken by the Toto people is a Sino-Tibetan language, which is written in the Bengali script.
- This language is integral to their identity but is at risk of disappearing as fewer younger members speak it.

Beliefs and Religion:

- **Hinduism and Nature Worship**: The Toto people consider themselves Hindus and also worship nature.
- They have unique religious practices that integrate animism and nature worship, reflecting their deep connection to the natural world around them.

Economy and Occupation:

- **Traditional Occupation**: Historically, the Toto tribe was involved in food gathering and practiced a slash-and-burn style of cultivation.
- This method of farming was sustainable for their small community, but it posed challenges as the population grew and external factors changed the landscape.
- **Porter Services**: The Toto people historically earned money by acting as porters, carrying oranges from Bhutanese orchards to Totopara, which is a significant part of their economy.
- **Agriculture and Diversification**: Over time, the community has shifted to more settled agriculture, growing crops for sustenance and trade.
- The economic practices of the Toto people have diversified, but they still maintain traditional ways of living.

Challenges and Survival:

- **Risk of Extinction**: Due to their small population, isolation, and loss of cultural identity, the **Toto tribe** is at risk of disappearing. The tribe has been actively involved in efforts to preserve their culture, language, and way of life, but the odds remain stacked against them.
- **External Pressures**: The tribe faces challenges from both external development pressures (such as encroachment and modern agriculture) and internal challenges, including a declining birth rate and the younger generation moving away for better opportunities.

About Particularly Vulnerable Tribal Groups (PVTGs): Progress and Welfare of Tribal Population

- India is home to over 705 tribal communities, including 75 Particularly Vulnerable Tribal Groups (PVTGs).
- These communities are predominantly found in forests, hilly, mountainous, and remote areas, facing challenges related to physical and digital connectivity.
- Since Independence, the government has implemented several strategies to promote the welfare and development of tribal populations.

Tribal Development Programs:

- **Tribal Sub-Plan (TSP)**: Launched in 1974-75, this initiative, now known as the Scheduled Tribe Component (STC) and Development Action Plan for Scheduled Tribes (DAPST), ensures that all ministries/departments of the government work in tandem to formulate schemes aimed at the welfare of the Scheduled Tribes.

Budget Allocations:

- In the last decade, the budget for tribal development under DAPST has increased 5-fold. The allocation rose from Rs 24,598 crore in 2013-14 to Rs 1,19,509 crore in 2023-24, with 42 ministries involved in funding various welfare schemes.
- A dedicated monitoring portal, stcmis.gov.in, tracks the utilization of funds across sectors.

Key Government Schemes and Initiatives:

- **Pradhan Mantri Adi Adarsh Gram Yojana**: Launched to improve infrastructure in tribal villages by integrating DAPST funds.
- The aim is to uplift the living standards of tribal communities through better access to resources and amenities.
- **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyaan (PM-JANMAN)**: Launched on 15th November 2023, with a Rs 24,104 crore budget, the scheme focuses on 75 PVTG communities (11 lakh families) in 18 states and 1 UT.
- The initiative involves relaxing norms for road construction, setting up Anganwadis, providing electricity, and ensuring water supply.

Infrastructure Relaxations:

- Road construction, Anganwadi centers, and health facilities in tribal areas have relaxed norms under the Pradhan Mantri Gram Sadak Yojana (PMGSY) and Jal Jeevan Mission to improve accessibility and essential services in tribal regions.
- Special provisions have also been made for solar power to provide electricity to un-electrified households in remote tribal areas.

Educational Initiatives:

- **Scholarship Schemes**: The Ministry of Tribal Affairs implements 5 scholarship schemes benefiting over 35 lakh students annually, with an increased budget of ₹ 2500 crore in 2023-24.
- The integration of State and Tribal portals with DBT (Direct Benefit Transfer) has streamlined the scholarship distribution process.
- **Establishment of EMRS (Eklavya Model Residential Schools)**: A new Central Sector Scheme aims to establish 440 new schools in tribal blocks by 2026. These schools will offer education on par with Navodaya Vidyalayas. Over 728 schools (including 288 already sanctioned) will be established, with a significant budget for infrastructure development, including sports centers and teacher recruitment.

Livelihood and Economic Empowerment:

- **Pradhan Mantri Janjatiya Vikas Mission (PMJVM)**: Focuses on livelihood-driven development through the creation of Van Dhan Vikas Kendras and Van Dhan Producer Enterprises, which link tribal communities to market linkages for Minor Forest Produce (MFP). ₹ 1612 crore has been allocated to this mission for 5 years.
- **Van Dhan Karyakram**: Started in 2019, this program has sanctioned over 3800 Dhan Vikas Kendras covering 10 lakh people across 28 states and UTs. 87 MFPs have been added to the list of products eligible for Minimum Support Price (MSP), benefiting tribal communities engaged in forest produce collection.

Health and Nutrition:

- **Sickle Cell Disease Mission**: Aiming for the eradication of sickle cell disease by 2047, the government has initiated a mission to test 7 crore people and implement treatment and preventive measures.
- **Mobile Medical Units and PVTG Hostels**: Under PM-JANMAN, provisions have been made for mobile medical units, multipurpose centers, and PVTG hostels to improve health and nutrition in tribal areas.

Technological Integration:

- **Monitoring and Performance**: The Ministry has developed a Performance Dashboard to monitor the progress of various schemes, ensuring that funds are utilized effectively for the holistic development of tribal populations.

The Global TB Report 2024 by WHO : Acknowledging India's Progress in Tackling Tuberculosis

- The World Health Organization (WHO) released its Global Tuberculosis (TB) Report 2024 on October 29, 2024.
- The report has highlighted India's remarkable progress in fighting Tuberculosis (TB), particularly in closing the gap of missed TB cases since 2015.
- The efforts made by India have been acknowledged globally, as the country has made significant steps in improving TB diagnosis, treatment coverage, and reducing both the incidence and mortality of TB.

India's Progress in TB Management

Improved Treatment Coverage

- In 2023, India reported an estimated 27 lakh TB cases.
- Of these, 25.1 lakh people were diagnosed and began treatment.
- This has helped increase India's treatment coverage to 89% in 2023, up from 72% in 2015.
- India's progress in case detection and treatment coverage has been one of the fastest globally, bridging the gap of missed TB cases and significantly improving outcomes for TB patients.

Decline in TB Incidence

- India achieved a 17.7% decline in TB incidence, from 237 per lakh population in 2015 to 195 per lakh in 2023.
- This is more than **double the global decline** of **8.3%** over the same period.

Reduction in TB Mortality

- India's efforts have resulted in a 21.4% reduction in TB-related deaths, from 28 per lakh population in 2015 to 22 per lakh in 2023.
- This is consistent with the country's sustained efforts to improve TB care and treatment across the country.

Key Contributions to TB Control in India

1. **Increased Funding and Government Support**

o The Indian government has increased the budget for TB control from Rs. 640 crores in 2015 to Rs. 3,400 crores in 2022-23, representing a 5.3-fold increase in funding.

o This financial boost has helped strengthen the National TB Elimination Programme (NTEP), which now benefits from sustained domestic financing.

2. **Enhanced Diagnostic and Treatment Infrastructure**

o India has scaled up its diagnostic capabilities, including the use of molecular diagnostic tools and AI-enabled portable chest X-ray machines.

o India now has the world's largest TB laboratory network, with over 7,767 rapid molecular testing facilities and 87 culture and drug susceptibility testing labs.

3. **Private Sector Participation**

o The private sector contributed to 32.9% of the total TB cases reported in 2023, reflecting the growing involvement of private healthcare providers in TB care.

o Despite this, India has maintained a high treatment success rate of 87.6% in 2024 (January-September).

New Initiatives to Combat TB

Ni-Kshay Poshan Yojana (NPY) Enhancement

- In October 2024, the government announced an increase in the Ni-Kshay Poshan Yojana (NPY) support for TB patients, raising the amount from Rs. 500 per month per patient to Rs. 1,000 per month for the entire duration of treatment.
- The NPY has already disbursed Rs. 3,202 crores to 1.13 crore beneficiaries through Direct Benefit Transfer.

- The increased financial support will benefit 25 lakh TB patients annually and introduce Energy Dense Nutritional Supplementation (EDNS) for around 12 lakh undernourished TB patients.

Ni-Kshay Mitra and Nutritional Support

- The government expanded **nutritional support** under the Ni-Kshay Mitra initiative, which now provides food baskets to household contacts of TB patients.
- This aims to improve the immunity of family members and reduce the economic burden on TB patients.

New TB Treatment Regimen for MDR-TB

- In September 2024, the Ministry of Health & Family Welfare approved the introduction of a novel regimen for Multi-Drug-Resistant Tuberculosis (MDR-TB) called BPaLM.
- This treatment is shorter and more effective compared to older regimens, significantly improving the chances of recovery for MDR-TB patients.

Key TB Statistics in India (2024)

1. Notification and Treatment Success

- o As of September 2024, India has notified 19.88 lakh TB cases, a 4.2% increase from 19.08 lakh cases in the same period in 2023.
- o The private sector contributed to 7.22 lakh notifications, an increase from 6.99 lakh in 2023.
- o India has achieved a treatment success rate of 87.6% in 2024, reflecting the effectiveness of its TB care program.

2. Pradhan Mantri TB Mukt Bharat Abhiyan (PMTBMBA)

- o 54,448 new Ni-Kshay Mitras have been registered under the PMTBMBA as of October 2024, and 8.3 lakh food baskets have been distributed to support TB patients.
- o TB Preventive Treatment (TPT) has been administered to 12.23 lakh beneficiaries in the first three quarters of 2024.

3. Adult BCG Vaccination Study

- o In January 2024, India started an adult BCG vaccination study in collaboration with the Indian Council of Medical Research (ICMR).
- o By October 2024, over 81.4 lakh doses of the BCG vaccine had been administered in 14 states/UTs as part of a trial to explore broader TB prevention strategies.

Conclusion: India's Shift in TB Care :

India's efforts in tackling Tuberculosis have been recognized globally in the WHO Global TB Report 2024. The country has made significant progress in diagnosis, treatment coverage, and reducing TB incidence and mortality. With enhanced funding, innovative treatment options, and greater involvement of the private sector, India is making remarkable strides toward its goal of eliminating TB.

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Economic

State of the Rural Economy of India

India's rural economy, which continues to be a major contributor to the nation's overall economic structure, faces significant challenges such as poverty, unemployment, agrarian distress, and lack of industrialisation. These issues can be addressed through targeted efforts, such as rural industrialisation, promotion of women-owned non-agricultural enterprises, and strengthening infrastructure and entrepreneurial opportunities in rural areas. These measures can contribute to inclusive growth, generating employment and boosting GDP.

What is the State of India's Rural Economy?

1. Rural Demographics:

As per Census 2011, 68.85% of India's population resides in rural areas, and this proportion is expected to remain above 50% even by 2045, underscoring the importance of rural India to the nation's socio-economic structure.

2. **Living Conditions**:

- 39% of rural households live in one-room accommodations, with only 53.2% having access to electricity, compared to 92.7% in urban areas.
- 86% of rural households still rely on firewood for cooking, and only 30.8% have access to tap water, highlighting severe gaps in basic infrastructure and living conditions.

3. **Rural Poverty**:

- Rural poverty was 41.8% in 2004–05, declining to about 25% in 2011–12. However, 6 states still had poverty ratios exceeding 35%.
- Rural Monthly Per Capita Consumption Expenditure (MPCE) remains significantly lower than urban areas, reflecting a high level of poverty and limited purchasing power.

4. **Employment**:

- The PLFS 2023-24 report shows that 53.5% of rural employment is in self-employment, and 25.6% in casual labour.
- About 58.4% of rural workers are engaged in agriculture, which provides seasonal employment.
- Salaried jobs in rural areas comprise only 12% of the workforce, and these are often without contracts, paid leave, or job security.
- According to the India Employment Report 2024, unemployment among educated youth in rural areas has nearly doubled from 35.2% in 2000 to 65.7% in 2022, with women facing higher unemployment (76.7%) than men (62.2%).
- From 2017-18 to 2023-24, India created 150 million jobs, with rural women accounting for 54% of this growth, especially in agriculture.

5. **Agricultural Distress**:

- Small and marginal farmers, who represent 86% of the farming population, own only 43% of agricultural land, while large farmers manage 53%.
- Agricultural labourers face challenges such as seasonal work, low wages, and lack of social security.

What Steps Have Been Taken to Promote Rural Economy in India?

1. **Infrastructure Development**:

- **Pradhan Mantri Gram Sadak Yojana (PMGSY)**: Aims to improve rural road connectivity.
- **BharatNet Project**: Focuses on expanding broadband connectivity in rural areas.
- **Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)**: Electrified over 18,000 villages, boosting rural economic activities.

2. **Support for MSMEs**:

- **MUDRA (Micro Units Development & Refinance Agency Ltd)**: Provides financial support to small enterprises.
- **Credit Guarantee Scheme for MSMEs (CGTMSE)**: Offers credit guarantees to promote growth.
- **SFURTI (Scheme of Fund for Regeneration of Traditional Industries)**: Supports traditional rural industries.

3. **Promoting Rural Entrepreneurship and Employment**:

- **Start-up India Initiative** and **Stand-Up India Scheme**: Encourage rural entrepreneurship.
- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)**: Focuses on skill development for rural youth.
- **National Rural Livelihood Mission (NRLM)**: Strengthens rural livelihoods.

4. **Strengthening Rural-Urban Linkages**:

- **Shyama Prasad Mukherji Rurban Mission (SPMRM)**: Develops rural areas into urban-like hubs.
- **eNAM (National Agriculture Market)**: Promotes online trading of agricultural commodities.

5. **Policy Frameworks for Rural Manufacturing**:

One District One Product (ODOP): Encourages manufacturing and entrepreneurship in each district, focusing on locally produced goods.

What are the Challenges to Rural Economy in India?

1. **Stagnation of the Manufacturing Sector**:
   India's manufacturing sector contributes only 15% to the GDP in 2023, down from 16.1% in 2014-15. This stagnation is partly due to inadequate infrastructure and a slow transition from agriculture to manufacturing.
2. **Spatial Planning Challenge**:
   Over 40% of India's workforce is still engaged in agriculture, compared to 20% in China and 2% in the US. The shift to manufacturing has been slow and uneven, hindering the growth of rural economies.
3. **Infrastructural Issues**:
   Although rural manufacturing is expanding, the lack of infrastructure in rural areas hinders growth. The de-urbanisation of manufacturing has led to the movement of production facilities to rural areas, but the absence of robust infrastructure limits progress.
4. **Investment Challenges**:
   Private investment in rural manufacturing is limited due to issues such as poor infrastructure, unreliable land records, and distorted capital markets, which hinder the entry of efficient businesses.
5. **Unequal Regional Development**:
   Rural and small-town areas are emerging as significant growth engines, but the uneven regional development poses a challenge for balanced economic growth. The majority of the population still resides in rural and small-town areas, making them critical to India's future growth.

What Measures Can Be Taken to Boost Rural Economic Growth in India?

1. **Infrastructure Investments**:
   Investing in rural infrastructure, including roads, electricity, and telecommunications, is essential to create a favorable environment for manufacturing growth and economic development.
2. **Promoting MSMEs**:
   Policies should focus on empowering MSMEs, especially those addressing rural demands. Providing easier access to credit, land, and skill development programs will boost entrepreneurship and generate employment in rural areas.
3. **Developing Small Towns as Industrial Hubs**:
   A policy shift toward developing small towns as industrial hubs will balance regional development and reduce urban-rural disparities.
4. **Focus on Skill Development**:
   Skill development programs should align with industry needs, particularly for non-agricultural sectors. This will prepare the rural workforce for opportunities created by rural industrialisation.
5. **Promoting Women-Owned Non-Agricultural Enterprises**:

- Women-owned non-agricultural enterprises play a vital role in enhancing economic growth, diversifying incomes, and promoting financial inclusion. Over half of the new jobs created by 2030 should be for women to sustain an 8% GDP growth rate.
- Formalising these enterprises, and offering targeted business support and financial services such as priority sector lending, is crucial for promoting women's economic empowerment.

6. **Enhancing Digital Infrastructure**:
   Expanding digital infrastructure in rural areas, including internet access and mobile connectivity, will support women's participation in non-agricultural sectors. Access to fintech solutions will also improve financial inclusion and facilitate business management.

Conclusion :

The rural economy of India is a crucial pillar of the nation's growth but faces significant challenges in terms of poverty, unemployment, and agrarian distress. However, by focusing on rural industrialisation, entrepreneurship, particularly women-owned non-agricultural enterprises, and infrastructure development, India can unlock the full potential of its rural areas. Policy interventions, investment in rural infrastructure, and skill development programs are essential for building a more resilient and inclusive rural economy, ultimately contributing to sustained economic growth and poverty reduction.

Rising Inflation in India

Why in News?

In October 2024, India's Consumer Price Index (CPI) rose to 6.2%, while the Consumer Food Price Index (CFPI), which tracks food inflation, surged to 10.87%. These figures marked the highest inflation rate since August 2023, surpassing the Reserve Bank of India's (RBI) upper tolerance limit of 6%. Despite global inflation easing, India is experiencing persistent inflationary pressures, causing experts to reassess growth and interest rate forecasts.

Key Factors Contributing to High Inflation in India

1. **High Food Inflation:**
   - Food Inflation hit a 15-month high, with an increase of 10.8%.
   - Vegetables saw a 42% rise, reaching a 57-month high.
   - Fruit prices increased by 8.4%, and pulses by 7.4%.
   - The surge in food prices is a significant contributor to the overall inflationary trend.
2. **Core Inflation Uptrend:**
   - Core inflation (excluding food and fuel) is also rising, signaling persistent inflationary pressure beyond food.
   - This includes price increases in household services and other non-food goods, reflecting a broad-based cost increase in everyday living.
3. **Global Price Volatility:**
   - Global edible oil prices have surged due to supply disruptions and other international market factors.
   - As a major importer of edible oils, India faces higher domestic prices, which directly impact food inflation.
4. **Extreme Weather Events:**

   Heatwaves and extreme weather conditions have negatively impacted agricultural yields, leading to supply shortages and pushing food prices higher.

Implications of High Retail Inflation on RBI's Monetary Policy

1. **Delay in Interest Rate Cuts:**
   - The RBI's target inflation rate is 4%, with a tolerance band of 2% to 6%.
   - With inflation exceeding the upper tolerance limit, interest rate cuts are unlikely in the short term.
   - Experts predict that the RBI might only consider rate cuts in 2025, assuming a sustained decline in inflation.
2. **Continued Focus on Inflation Control:**
   - The RBI remains focused on controlling inflation to ensure price stability. Persistent inflation can undermine economic growth and reduce purchasing power.
   - While the RBI initially projected inflation to moderate to 4.8% in Q3 and 4.2% in Q4 of FY 2024-25, these forecasts now seem less likely.
3. **RBI's Policy Dilemma:**
   - The RBI faces a tough choice: curb inflation without stifling economic growth.
   - The inflationary pressures primarily come from rising food prices and supply chain disruptions, which complicates policy decisions.
   - The central bank may adopt a cautious approach, waiting for inflation to decline before considering interest rate cuts.
4. **Potential Risks of Unchecked Inflation:**
   - If inflation continues unchecked, it could undermine real economic growth, particularly affecting sectors like manufacturing and exports.
   - Rising input costs could reduce consumer demand, negatively impacting corporate earnings and slowing down **economic expansion**.
   - The Monetary Policy Framework Agreement (MPFA) between the RBI and the Government of India requires the RBI to report to the government if inflation stays outside the 2% to 6% range for three consecutive quarters.

What is the Consumer Price Index (CPI)?

- **Definition**: The Consumer Price Index (CPI) tracks changes in the retail prices of a basket of

goods and services commonly purchased by households for daily consumption.

- **Purpose**: It is a key indicator of inflation, used by the government and central banks for inflation targeting and monitoring price stability.
- The base year for CPI calculations is 2012.
- The CPI helps understand the cost of living, purchasing power, and the expensiveness of everyday goods and services.

What is the Consumer Food Price Index (CFPI)?

- **Definition**: The Consumer Food Price Index (CFPI) measures the change in prices of food items in a consumer's basket. Unlike the CPI, it focuses exclusively on food inflation.
- **Tracking**: It monitors the price changes of essential food items such as cereals, vegetables, fruits, dairy, meat, and other staples.
- **Release**: CFPI data is released by the Central Statistical Office (CSO) under MoSPI. It is available for rural, urban, and combined areas.

Conclusion :

The current rise in inflation in India presents both challenges and opportunities for policymakers. With food inflation reaching alarming levels and core inflation showing signs of persistence, the RBI's ability to manage inflation while ensuring sustainable economic growth will be tested. Given the multiple global and domestic factors at play, the government's and central bank's policy responses will be crucial in navigating the economic landscape over the coming months.

India's Transition Towards Workforce Formalisation

Why in News ?

India's economy is undergoing a significant transition towards workforce formalisation, shifting from informal employment to more structured, secure, and legally recognised jobs. This transition is aimed at improving job security, social benefits, and economic stability for millions of workers. By integrating a larger portion of the workforce into social security systems, the move fosters greater economic stability and a secure future for employees. The Employee's Provident Fund Organisation (EPFO) plays a key role in this process, expanding the coverage of social security benefits.

What is Workforce Formalisation?

- **Definition**: Workforce formalisation refers to the process of moving jobs from the informal sector (which includes small, unregistered businesses and daily wage workers) into the formal sector, where workers have contracts, job security, and access to benefits like social security, healthcare, and insurance.
- **Features of Formalisation**:
  - **Legal Compliance**: Businesses in the formal sector operate under clear legal frameworks, ensuring they comply with labour laws and regulations.
  - **Tax Revenue**: Formalisation boosts tax revenues by expanding the tax base, leading to better funding for public services and infrastructure.
  - **Employee Benefits**: Workers in the formal sector have access to social security, pensions, healthcare, and retirement benefits.
  - **Access to Financial Services**: Formal businesses find it easier to access bank credit and financial services, fostering growth.
  - **Economic Growth**: Formalisation encourages entrepreneurship, enhances competitiveness, and drives overall economic growth.

Significance of Workforce Formalisation for the Indian Economy

1. **Widespread Informal Employment**:
   - Approximately 85% of India's workforce is part of the informal sector, lacking protection under formal labour laws and social security systems.
   - Formalisation ensures better access to social security, healthcare, and pensions, providing greater economic security and reducing vulnerability to shocks.
2. **Accurate Data Collection**:

   With a formalised workforce, better data can be collected on employment trends, aiding in policy-making and economic planning.

3. **Increased Tax Revenue**:

As more workers are brought into the formal sector, it expands the tax base, providing the government with resources for public services and infrastructure projects.

4. **Reduction in Black Money**:

Formalisation enhances transparency, making illicit activities such as money laundering more difficult.

5. **Digital Inclusion**:

The transition towards formalisation encourages the adoption of digital tools and technologies, improving efficiency and transparency.

6. **Attracting Investment**:

A formal workforce provides businesses with a stable and predictable environment, attracting both domestic and foreign investments.

EPFO and its Role in Workforce Formalisation

1. **About EPFO**:

- The Employee's Provident Fund Organisation (EPFO) is one of the world's largest social security organisations, providing a variety of benefits to workers in India.
- It was established under the Employees' Provident Funds & Miscellaneous Provisions Act, 1952.
- EPFO manages over 29.88 crore accounts, reflecting the scale of its operations and the vast number of transactions it processes.
- The EPFO operates under the Ministry of Labour & Employment, Government of India.

2. **Benefits of EPFO**:

- EPFO provides long-term financial security through retirement funds.
- Benefits include Employees' Deposit Linked Insurance (EDLI), Employees' Pension Scheme (EPS), and partial withdrawals for emergencies, education, or home purchases.

3. **Role in Formalisation**:

- Over 6.91 crore new members joined EPFO from 2017 to 2024, with a record 1.38 crore new members joining in the fiscal year 2022-23.
- In July 2024, nearly 20 lakh new members were added, showing consistent growth in formal employment registrations.
- A significant portion of new EPFO members are youth and first-time job seekers, with a notable rise in female workers joining, indicating a shift towards a more inclusive workforce.
- The increase in EPFO registrations is a clear indication of the growth in formal jobs, allowing more workers to benefit from job security, retirement savings, and insurance.

Challenges in Workforce Formalisation in India

1. **Cost of Formalisation**:

- Many Micro, Small, and Medium Enterprises (MSMEs) and small businesses find formalising their workforce costly and complex, as 80-90% of India's workforce is in the informal sector.
- Simplifying compliance and reducing the financial burden of formalisation are crucial to overcoming this challenge.

2. **Seasonal Workforce**:

Migrant and seasonal workers in industries like agriculture and construction often lack formal contracts due to frequent relocations and lack of documentation, making formalisation difficult.

3. **Resistance to Change**:

Informal sector workers are often reluctant to formalise, preferring the flexibility of informal jobs and lacking awareness of the benefits of formalisation.

4. **Digital Divide**:

Limited access to digital tools and infrastructure, especially in rural areas, hinders the adoption of formal employment despite technological advances such as Aadhaar and Unified Payments Interface (UPI).

5. **Skill Gaps**:

Informal workers often lack the skills required for formal jobs, and there is a shortage of accessible skill development programs to help these workers transition to the formal sector.

6. **Gender Inequality**:

Women face additional barriers to formal employment, including socio-cultural constraints, lack of childcare services, and gender bias in the workplace.

India's Initiatives Related to Workforce Formalisation

1. **e-Shram Portal**:

This platform aims to register informal sector workers, providing them with a unique identification number to access social security and welfare schemes.

2. **Udyam Portal**:

The Udyam Portal simplifies the process of registering MSMEs and provides them access to financial support and incentives, encouraging formalisation.

3. **Pradhan Mantri Shram Yogi Maan-dhan Yojana**:

This scheme aims to provide a monthly pension to workers in the unorganised sector, ensuring social security benefits for informal workers.

4. **Labour Reforms**:

Recent labour codes, including the Social Security Code (2020), Industrial Relations Code (2020), and Occupational Safety, Health and Working Conditions Code (2020), aim to simplify and modernise India's labour laws, making it easier for businesses to hire formally and improving working conditions.

5. **GST and Digital Payment Systems**:

- GST (2017) and digitalisation encourage businesses to operate transparently, contributing to the formal economy and reducing informality.
- Digital payment systems have also facilitated greater financial inclusion and formalisation.

Way Forward

1. **Incentivise Formalisation**:

Policies should focus on reducing the cost of formalisation and providing incentives for businesses to transition to the formal sector.

2. **Improve Financial Inclusion**:

Expanding access to banking services through initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY) and promoting digital payment systems can help integrate more businesses into the formal economy.

3. **Education and Skill Development**:

Expanding access to quality education and vocational training, particularly under the Skill India Mission, will equip workers with the necessary skills for formal jobs.

4. **Promote MSMEs**:

Strengthening MSMEs by providing funds and support to enhance their competitiveness will help boost formalisation and create more job opportunities.

5. **Targeted Schemes for Tribal Workers**:

Implement targeted schemes to formalise tribal workers, ensuring they are covered under social security schemes such as Pradhan Mantri Jeevan Jyoti Bima Yojana and Pradhan Mantri Suraksha Bima Yojana.

Conclusion :

India's journey toward workforce formalisation is a crucial step in strengthening the economy and ensuring social security for all workers. The growing number of EPFO registrations highlights the success of this transition, offering a secure future for millions of workers, particularly in uncertain times like the COVID-19 pandemic. The formalisation process will continue to drive economic growth, inclusion, and stability, paving the way for a more organised and resilient economy.

Agricultural Policy Monitoring and Evaluation 2024

Why in News?

The Organisation for Economic Co-operation and Development (OECD), in its Agricultural Policy Monitoring and Evaluation 2024 report, highlighted a significant concern: India implicitly taxed its farmers USD 120 billion in 2023, the highest among 54 countries. This result stems from government policies

such as export bans and duties, which are designed to keep food prices low for consumers but end up imposing substantial costs on the agricultural sector, leading to a decrease in farmers' income.

Key Highlights of the OECD's Report

1. **Financial Support to Agriculture**:
   - Total global agricultural support averaged USD 842 billion per year from 2021 to 2023. Although support decreased in 2022 and 2023 compared to the 2021 peak, it remained significantly higher than pre-pandemic levels.
   - Market Price Support (MPS), a key component of agricultural subsidies, dropped by USD 28 billion from 2021 to 2023 but still accounted for a large portion of total agricultural support.
2. **Agricultural Support in India**:
   - In 2023, India's export restrictions on essential commodities like rice, sugar, onions, and de-oiled rice bran resulted in negative MPS, causing a USD 110 billion loss. This means farmers received much less for their produce than they would have in an open market environment, leading to a significant income reduction.
   - India had the highest negative price support globally, followed by Vietnam and Argentina, accounting for 62.5% of the global negative price support in 2023. This is an increase from 61% in 2000-02 to 75% in 2021-23.
3. **Global Agricultural Challenges**:
   - Ongoing global conflicts, such as Russia's war against Ukraine, have disrupted agricultural markets, affecting trade and supply chains.
   - The increasing frequency of extreme weather events poses a growing threat to agricultural productivity.
   - Despite government efforts, agricultural productivity growth has slowed, threatening the ability to meet rising global food demands sustainably.
   - The introduction of Environmental Public Goods Payments (EPGP) to support sustainable farming practices is still very small, making up only 0.3% of total agricultural support.
4. **OECD Recommendations**:
   - Governments should set measurable goals for sustainable productivity and invest in monitoring systems like Total Factor Productivity (TFP) and Agri-environmental Indicators (AEIs).
   - TFP measures how efficiently agricultural inputs are turned into outputs, a crucial indicator of sustainable agriculture.
   - AEIs help assess environmental impacts from agriculture and gauge farming practices that support sustainability.

About the Organisation for Economic Co-operation and Development (OECD)

- The OECD, founded in 1961, is an international organisation of 38 democratic countries committed to fostering market economies. It is headquartered in Paris, France.
- Its mission is to promote prosperity, equality, opportunity, and well-being through economic reports, data analysis, and forecasts.
- India has been an OECD Key Partner since 2007, alongside countries like Brazil, China, Indonesia, and South Africa, though it is not a member.
- The OECD is well-known for its Global Agricultural Policy Reviews, and for maintaining a blacklist of non-cooperative tax havens.

How Do Indian Agricultural Policies Negatively Impact Farmers?

1. **Negative Market Price Support (MPS)**:
   - India's agricultural policies have led to negative market price support for farmers. Between 2014-2016, the Producer Support Estimate (PSE) was around -6.2%, driven by negative MPS (-13.1%).
   - PSE measures the value of transfers from consumers and the government to farmers. A negative PSE indicates that policies are hurting rather than helping the agricultural sector.
2. **Export Restrictions and Bans**:

   Export bans and quotas on essential commodities such as rice and sugar limit farmers' access to international markets, driving down domestic prices and decreasing their income.

3. **Regulatory Constraints**:

The Essential Commodities Act, 1955 and Agricultural Produce Market Committee (APMC) Act, 2003 impose price controls and trade restrictions that often result in lower farm gate prices, especially when these prices are set below international market levels.

4. **Low Minimum Support Prices (MSP)**:

The MSP, which is meant to protect farmers, has often been set below international prices, leading farmers to receive lower prices for their crops than they would in an open market.

5. **Inefficiencies in Marketing**:

Poor infrastructure and high transaction costs in India's agricultural markets reduce the prices farmers receive for their produce. These inefficiencies lead to price suppression and hinder farmers' profitability.

6. **Inefficient Resource Allocation**:

Short-term relief from subsidies on fertilizers, irrigation, and electricity fails to address long-term challenges like climate change, market access, and declining agricultural research, which ultimately prevent sustainable growth for farmers.

India's Initiatives Related to Agriculture

1. **National Mission on Sustainable Agriculture**:

Focused on promoting sustainable farming practices, improving productivity, and enhancing income for farmers.

2. **Paramparagat Krishi Vikas Yojana (PKVY)**:

A scheme to promote organic farming and encourage traditional agricultural practices.

3. **Sub-mission on Agroforestry (SMAF)**:

Aimed at promoting agroforestry for better land use and increasing the income of farmers.

4. **Rashtriya Krishi Vikas Yojana (RKVY)**:

A program designed to increase agricultural productivity by providing financial assistance to states and union territories.

5. **AgriStack**:

A digital initiative to create a comprehensive data-driven ecosystem for agriculture, improving market access and transparency.

6. **Digital Agriculture Mission**:

Focuses on the integration of digital tools and technology in agriculture for better efficiency and productivity.

7. **Unified Farmer Service Platform (UFSP)**:

A digital platform aimed at providing a one-stop solution for farmers to access various services, including subsidies, weather forecasts, and market information.

8. **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**:

Focuses on promoting organic farming in the North Eastern states to improve the income of farmers.

Way Forward : Policy Recommendations

1. **Reform Export Policies**:

- Gradually ease export bans and quotas on agricultural products, and invest in infrastructure like cold storage, transportation, and processing to reduce supply chain inefficiencies.
- Align Minimum Support Prices (MSP) with international market prices to ensure farmers receive fair compensation for their produce.

2. **Shift in Budgetary Priorities**:

Redirect resources towards building resilience, sustainability, and infrastructure to reduce the dependence on short-term subsidies and improve long-term farm profitability.

3. **Better Market Functioning**:

Strengthen the integration between state and central policies to reduce fragmentation, promote better coordination, and address sector-specific challenges more effectively.

4. **Promote Digital Platforms**:

Encourage direct marketing and e-commerce platforms like National Agriculture Market (e-NAM) to connect farmers directly with consumers, cutting out middlemen and improving farm gate prices.

Conclusion :

India's agricultural policies have placed a significant burden on its farmers, leading to income losses and market inefficiencies. The OECD report highlights the negative impact of India's market price support system and suggests that the country needs to reform its agricultural policies to ensure fair prices for farmers while balancing the interests of consumers. Initiatives like AgriStack, Digital Agriculture Mission, and various sustainability-focused schemes can pave the way for a more resilient and productive agricultural sector in India.

Upgrading Wind Energy Generation

Why in News?

In August 2024, the Tamil Nadu government introduced the "Repowering, Refurbishment, and Life Extension Policy" aimed at upgrading older wind turbines to enhance energy efficiency. However, wind energy producers have opposed this policy, leading to a stay order from the Madras High Court.

What is the Tamil Nadu Repowering, Refurbishment & Life Extension Policy for Wind Power Projects, 2024?

1. **Context**:

   Many of the windmills in Tamil Nadu are over 20 years old and are in need of upgrades to enhance their energy efficiency.

2. **Policy Focus**:

- **Life Extension**: Extending the operational life of windmills older than 20 years.
- **Repowering**: Replacing old wind turbines with new, more efficient machines.
- **Refurbishment**: Upgrading or repairing older turbines to improve performance.

3. **Capacity Overview**:

   Approximately 300 MW of the 9,000 MW wind energy capacity in Tamil Nadu is over 20 years old and is eligible for upgrades.

4. **Reason for Opposition**:

   Cost Concerns: Wind energy producers will have to pay Rs 30 lakhs per MW every five years for life extension. For repowering, a one-time payment of Rs 30 lakhs per MW is required to replace old machines.

5. **National Policy**:

   The Ministry of New & Renewable Energy (MNRE) has also come up with the National Repowering & Life Extension Policy for Wind Power Projects-2023, which applies to turbines that are older than 15 years or have a rated capacity of less than 2 MW.

Key Facts About Wind Energy in India

1. **Wind Energy Potential**:

- India's wind energy potential is 1,163.86 GW at 150 metres above ground level and 695.51 GW at a 120-metre turbine height.
- Currently, only about 6.5% of India's wind potential is being utilized at the national level, with Tamil Nadu using nearly 15%.

2. **Wind Power Ranking**:

   India is ranked 4th globally for wind power capacity and 4th in renewable energy installed capacity as of 2024.

3. **Cost Competitiveness**:

   Wind power generation is expected to become cost-competitive compared to thermal power by 2025-30.

4. **Maintenance Aspects**:

- **Repowering**: Replacing turbines older than 15 years or under 2 MW capacity with newer, more efficient machines.
- **Refurbishing**: Upgrading turbines by improving their height, changing blades, or installing higher-capacity gearboxes.
- **Life Extension**: Implementing safety measures to extend the lifespan of older turbines.

5. **Windy States**:

- Major wind energy states include Gujarat, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, and Andhra Pradesh, which together contribute 93.37% of India's installed wind energy capacity.
- Tamil Nadu has the second-largest installed capacity of 10,603.5 MW after Gujarat.

Challenges in Repowering and Refurbishing Wind Turbines

1. **Land Requirements**:
   New turbines, especially those with higher capacities (2 MW and 2.5 MW), require more land (3.5 to 5 acres) compared to older, smaller turbines, leading to land acquisition challenges.
2. **Displacement**:
   Over the decades, habitats have developed between wind sites, and repowering projects can lead to displacement and rehabilitation challenges for local populations.
3. **Technology Evolution**:
   Upgrading turbines, blades, and gearboxes requires significant investment, time, and technical expertise to keep up with technological advances.
4. **Banking Issues**:
   Wind turbines installed after 2018 in Tamil Nadu do not have banking facilities, meaning that repowered turbines are treated as new installations, affecting their financial viability as generators cannot bank the energy they generate.

India's Renewable Energy Target

India's renewable energy commitments, presented at COP-26, are part of the Panchamrit (Five Nectar Elements) under its climate action plan:

1. 500 GW Non-fossil Energy capacity by 2030.
2. 50% of energy requirements from renewable sources by 2030.
3. Reduction of total projected carbon emissions by one billion tonnes by 2030.
4. Reduction of carbon intensity of the economy by 45% by 2030, relative to 2005 levels.
5. Net-zero emissions by 2070.

Major Government Initiatives Related to Renewable Energy Transition

1. **Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA)**: Aimed at ensuring electricity access to all households in India.
2. **Green Energy Corridor (GEC)**: A project to strengthen transmission networks for renewable energy.
3. **National Smart Grid Mission (NSGM)** and **Smart Meter National Programme**: Focused on enhancing grid **efficiency** and the integration of renewable energy sources.
4. **Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME)**: A scheme to promote the adoption of electric vehicles and the development of electric mobility infrastructure.
5. **Production Linked Incentive (PLI) Scheme**: Encourages the domestic manufacturing of solar panels, batteries, and other renewable energy components.
6. **Surya Ghar Muft Bijli Yojana**: A program for solar power adoption at the household level, particularly for rural areas.

Way Forward

1. **Improved Tariff Mechanism**:
   Introducing competitive renewable energy tariffs will stabilize pricing and reduce the financial risks for project developers.
2. **Strict Project Completion Deadlines**:
   Ensuring adherence to project deadlines will improve the efficiency of wind energy projects and enhance their **credibility**.
3. **Integration with Solar Energy**:
   India must focus on improving the solar-wind grid integration, as wind generation is often available when solar generation is low (e.g., at night).
4. **Transmission Infrastructure**:
   Investing in advanced energy storage systems and upgrading transmission infrastructure will maximize the efficiency of wind energy and enable better grid integration.
5. **Long-Term Power Purchase Agreements (PPAs)**:
   Securing long-term PPAs with distribution companies (discoms) will ensure a stable revenue stream and encourage greater investment in wind energy.

6. **Technology Upgradation**:

Innovations such as larger turbines, offshore wind technology, and hybrid systems can further boost India's wind energy capacity and meet renewable energy goals more effectively.

Conclusion :

Wind energy plays a crucial role in India's renewable energy transition, and the Repowering, Refurbishment, and Life Extension Policy is a step toward improving the efficiency and sustainability of older wind power assets. However, challenges like land acquisition, displacement, and technological upgrades need to be addressed to make these projects financially viable. With a focus on cost-competitive tariffs, integration with solar power, and innovative technologies, India can accelerate its path toward achieving its ambitious renewable energy targets and contributing to global climate action.

Development Economics

Why in News?

The October 2024 edition of the IMF World Economic Outlook (WEO) report has sparked significant discussions regarding the need to reevaluate development economics to align more closely with political and economic realities. The report advocates for an integrated approach to tackle global economic challenges, emphasizing how economic policies and political realities must work together for effective governance.

What is Development Economics?

Development Economics is a branch of economics that studies how economies can achieve sustained economic growth, poverty reduction, and improve the standard of living for their populations. It specifically focuses on challenges faced by developing countries and explores strategies to foster long-term economic development.

Key Focus Areas:

1. **Economic Growth**: It examines how economies grow and diversify, looking at factors like investment, technology, human capital, infrastructure, and institutional reforms that drive long-term development.
2. **Poverty Reduction**: Focuses on strategies to reduce poverty, such as wealth redistribution, social welfare programs, and inclusive policies to enhance living standards.
3. **Inequality**: Analyzes income and wealth disparities, both within and between countries, and explores policies to address inequality and its impacts on social cohesion and economic stability.
4. **Sustainable Development**: Integrates environmental sustainability with economic growth, addressing issues like climate change and resource depletion while fostering growth.
5. **Globalization and Trade**: Studies the impact of global markets, international trade, and foreign direct investment (FDI) on developing countries, with attention to trade imbalances and market access.
6. **Institutional Development**: Highlights the role of strong institutions (legal systems, governance, public administration) in driving economic progress.

Theoretical Approaches:

- **Neoclassical Theory**: Advocates for free markets, private property rights, and minimal government intervention.
- **Structuralist Theory**: Argues for state-led development to address issues like poor infrastructure and lack of industrialization.
- **Capability Approach** (Amartya Sen): Shifts focus from GDP to human well-being, stressing the importance of expanding individual freedoms and choices.
- **Institutional Economics**: Emphasizes the role of governance and institutional quality in shaping development outcomes.

Why is there a Need to Reevaluate the Current Approach to Development Economics ?

1. **Macro-Level Challenges**:

Existing development economics often focuses on micro-level interventions and overlooks broader challenges like national competitiveness, fiscal constraints, and global trade imbalances. A more comprehensive approach is required to address these larger economic issues.

2. **Political Realities**:

In democratic countries like India, populist policies often take precedence over long-term structural reforms. Development economics needs to be more politically feasible to ensure that proposed solutions are practical within existing political frameworks.

3. **Global Dynamics and Technological Shifts**:

With rapid advancements in technology and global market shifts, development economics must adapt. For example, the rise of electric vehicle production in China, as highlighted in the IMF's report, shows how technological changes can disrupt global markets, emphasizing the need for flexibility in economic policy.

4. **Sustainable and Inclusive Growth**:

It is crucial to ensure that economic development fosters not only growth but also poverty reduction, social inclusion, and sustainability, addressing environmental challenges and inequality.

5. **Interdisciplinary Approach**:

Development economics needs to integrate insights from political science, sociology, and environmental science to create a more holistic framework that accounts for the complex interdependencies between economic policies, political stability, and social well-being.

How Does India's Economic Performance Align with Global Development Economics?

1. **High Growth Rate**:

India's GDP growth rate continues to outpace the global average, with the IMF forecasting a 7% growth for 2024-25. Despite global slowdowns, India's economic resilience highlights its potential as a key emerging market.

2. **Domestic Demand as a Growth Driver**:

A significant portion of India's economic growth is driven by robust domestic demand, with consumer spending contributing to about 60% of GDP (World Bank, 2023). Public investment in infrastructure and social welfare programs helps shield the economy from external shocks.

3. **Demographic Dividend**:

India's population is young, with a median age of 28.4 years in 2024 (UN Population Division). This provides a large and growing workforce that can potentially drive long-term growth.

4. **Service Sector Dominance**:

India's Information Technology (IT) and Business Process Outsourcing (BPO) sectors are central to its economic performance. In FY 2023, India's IT exports reached USD 194 billion (NASSCOM), contributing significantly to both exports and employment.

5. **Infrastructure Development**:

India has ramped up public investment in infrastructure, with the government allocating USD 1.5 trillion (National Infrastructure Pipeline, 2020-2025) for development. Initiatives like Bharatmala (road infrastructure) and UDAN (regional air connectivity) are expected to create new economic opportunities.

6. **Digital Transformation**:

India has made significant strides in digital payment systems like UPI (Unified Payments Interface), with UPI transaction value increasing by 40% year-on-year to Rs. 20.07 trillion by June 2024. These efforts have enhanced financial inclusion, benefiting previously underserved populations.

What are the Challenges in Development Economics for India?

1. **Political Economy Constraints**:

India's development is constrained by political dynamics, with populist policies often prioritized over long-term reforms. Policies like cash transfers and subsidies can divert focus from critical reforms needed in areas like labor, taxation, and industry.

2. **Labour Market Rigidities**:

India faces skill gaps, low productivity, and rigid labor laws that hinder hiring flexibility and alignment with high-growth sectors. Labour market reforms are crucial to boosting productivity and economic competitiveness.

3. **Social Unrest and Protests**:

Labour-business tensions, particularly in manufacturing sectors, may impede investment and weaken the competitiveness of India's manufacturing sector. Addressing these social challenges is crucial for fostering a stable economic environment.

4. **Geopolitical Uncertainties**:

Global trade tensions, especially between the US and China, present both opportunities and risks for India. India must reduce its reliance on traditional markets and build diverse trade relationships to remain resilient in a changing global economy.

Way Forward

1. **Balancing Growth and Equity**:

Policies should focus on promoting inclusive growth by addressing income inequality, ensuring fair wages, and investing in education and healthcare. A balance between economic efficiency and social justice is key.

2. **Fostering Technological Adoption**:

India must embrace technological innovation in sectors like AI, automation, and green technologies to stay competitive. This requires investments in infrastructure and skill development.

3. **Boosting Labour-Intensive Sectors**:

India should focus on sectors such as textiles and garments, where it has competitive advantages due to low labour costs and established infrastructure.

4. **Advancing Technological Innovation**:

India needs to invest in cutting-edge industries like electronics, microchips, and renewable energy. Strengthening STEM education and promoting research and development (R&D) will support this effort.

5. **Reforming Labour Laws and Regulatory Frameworks**:

Simplifying and modernizing labour laws will make the business environment more flexible and attractive to foreign investment. Initiatives like "Make in India" and Ease of Doing Business reforms are vital to enhance competitiveness.

6. **Targeting Investment in Human Capital**:

Focusing on education, healthcare, and vocational training will improve labour productivity and prepare India's workforce for a competitive global economy.

7. **Engaging with International Institutions**:

Strengthening India's cooperation with global economic institutions like the IMF, World Bank, and WTO will help the country navigate complex global supply chains and trade agreements, securing favorable terms of trade.

Conclusion :

India's economy is navigating through a phase of high growth and resilience, driven by robust domestic demand, a young workforce, and a growing service sector. However, significant challenges like political economy constraints, labour market rigidities, and geopolitical uncertainties need to be addressed for sustained long-term development.

Cryptocurrency and Blockchain

Why in News?

Former US President Donald Trump recently expressed support for Bitcoin at a crypto gathering, highlighting the growing influence of cryptocurrency in global discussions on finance. As the world grapples with economic crises, inflation, and increasing dissatisfaction with traditional financial systems, there is a noticeable shift towards decentralized financial systems. Blockchain technology and cryptocurrencies offer a vision of financial autonomy, but their future viability and sustainability remain uncertain.

What is Cryptocurrency and How Does it Work?

Cryptocurrency is a decentralized digital or virtual currency that uses cryptography for security. Unlike

traditional currencies, cryptocurrencies operate independently of a central authority, such as a government or financial institution. Some popular examples of cryptocurrencies include Bitcoin, Ethereum, Ripple, and Litecoin.

1. Transactions on Blockchain:

- Cryptocurrency transactions are recorded on a public digital ledger, called the blockchain.
- A decentralized network of computers, called nodes, validates and verifies each new transaction before adding it to the blockchain.
- The cryptographic nature of the blockchain ensures that once transactions are recorded, they cannot be altered or tampered with.

2. Digital Wallets:

- To engage in cryptocurrency transactions, users must obtain a digital wallet, which stores public and private keys needed to send and receive cryptocurrencies.
- Public keys act like a bank account number, while private keys are used to sign transactions and validate ownership of the digital currency.

3. Mining Process:

- Cryptocurrency mining involves solving complex mathematical problems using computational power.
- Successful miners are rewarded with cryptocurrency, making it a decentralized and competitive process for validating transactions and maintaining the blockchain.

What is Blockchain Technology ?

Blockchain is a decentralized digital ledger that records transactions across a network of computers. It consists of a series of blocks, where each block contains multiple transactions, and every new transaction is linked to the previous one, forming a chain.

1. How Blockchain Works:

- Each time a transaction occurs, it is recorded on every participant's ledger, ensuring transparency and security.
- Decentralization ensures that no single entity can alter or delete previous transactions, offering a high level of security and trust.

2. Beyond Cryptocurrencies:

While blockchain is most commonly associated with cryptocurrencies like Bitcoin, it has broader applications across multiple sectors:

Financial Services: Financial institutions use blockchain to streamline processes, reduce fraud, and enhance transparency.

Education: Blockchain can store student records, including academic achievements, attendance, and degrees.

Supply Chain Management: Blockchain can track products from origin to consumer, ensuring transparency in the supply chain.

Legal Status of Cryptocurrency in India

In India, cryptocurrency remains unregulated but is not explicitly banned. However, the government has expressed concerns regarding its use, particularly in illegal activities.

1. Taxation on Cryptocurrency:

- The Indian government taxes cryptocurrency transactions. As per the Union Budget 2022-23, the transfer of virtual currencies is subject to a 30% tax.
- The National Payments Corporation of India (NPCI), in collaboration with several government departments, introduced Central Bank Digital Currency (CBDC) – the Digital Rupee (e-RUPI).

2. Central Bank Digital Currency (CBDC):

- CBDC is a digital version of fiat currency (like the Indian Rupee), issued and backed by the Reserve Bank of India (RBI).
- Unlike cryptocurrencies, CBDCs are legal tender and do not operate in a decentralized, unregulated environment.
- CBDCs aim to offer the benefits of digital currency while maintaining the stability and control provided by central banks.

Pros and Cons of Cryptocurrency

Pros of Cryptocurrency:

1. Blockchain-Driven Security and Transparency:

- The decentralized and cryptographic nature of blockchain ensures high security and transparency in transactions.

- Financial institutions benefit from blockchain by reducing fraud and operational costs.

2. Innovation and Tokenization:

- Blockchain allows for tokenization, converting real-world assets like property, stocks, or bonds into digital tokens.
- Tokenization can create new opportunities for financial instruments and asset management.

3. Potential for Financial Autonomy:

- Cryptocurrencies can empower individuals, particularly in unbanked or underbanked regions, by providing access to financial services without relying on traditional banks.
- It offers a new means of financial inclusion in economically unstable areas or countries with unreliable banking systems.

4. Reshaping Global Finance:

Cryptocurrencies challenge traditional financial systems by redefining ownership and offering a new paradigm for global trade and cross-border payments.

Cons of Cryptocurrency:

1. Volatility and Speculative Nature:

- Cryptocurrencies are highly volatile, with prices subject to extreme fluctuations driven by market sentiment and speculation.
- This volatility makes cryptocurrencies less suitable as a stable medium of exchange or store of value.

2. Regulatory Uncertainty:

- Governments and regulators around the world struggle to establish a consistent framework for regulating cryptocurrencies.
- Concerns about money laundering, tax evasion, and illegal activities make stringent regulations inevitable, but such measures could stifle innovation and hinder adoption.

3. Limited Acceptance and Practical Utility:

- Cryptocurrencies are not widely accepted by merchants and financial institutions, limiting their use in everyday transactions.
- The high volatility of crypto assets makes it difficult for businesses to set stable prices for goods and services, hindering the adoption of cryptocurrencies in daily commerce.

4. High Transaction Costs and Inefficiency:

- Cryptocurrency transactions often suffer from high fees and slow processing times, especially when networks are congested.
- This inefficiency makes cryptocurrencies less competitive when compared to traditional payment systems like credit cards and bank transfers.

Conclusion :

Cryptocurrency and blockchain technology represent a transformative shift in the world of finance, offering opportunities for decentralization, financial autonomy, and security. However, they also face significant challenges, including regulatory uncertainty, volatility, and limited practical utility. In India, while cryptocurrency remains unregulated, it is gaining attention amid the country's ongoing digital transformation. The absence of a clear regulatory framework poses risks to investors, businesses, and the economy at large. On the other hand, Central Bank Digital Currencies (CBDCs), such as the Digital Rupee, offer a more controlled and stable alternative to private cryptocurrencies.

US Federal Reserve's Rate Cut and Implications

Why in News?

The US Federal Reserve recently cut its benchmark interest rates by 50 basis points, marking its first significant reduction since the onset of the Covid-19 pandemic. This move signals the Fed's strategic approach to combating inflation while stimulating economic growth amid rising unemployment.

Why Did the US Federal Reserve Cut Interest Rates?

The US Federal Reserve's decision to cut interest rates stems from several factors:

1. Economic Recovery Post-Pandemic:

- After the Covid-19 pandemic, the Fed initially lowered interest rates to stimulate economic activity. However, as inflation rose due to global supply chain disruptions (exacerbated by the Russia-Ukraine conflict), the Fed raised rates to curb inflation.

- By mid-2023, inflation had begun to stabilize, nearing the Fed's target of 2%. However, the recent uptick in unemployment (4.2% in August 2024) raised concerns about a potential recession, pushing the Fed to adjust rates to balance inflation and employment.

2. Moderation of Inflation:

The Fed's goal is to bring inflation closer to its 2% target. With inflation showing signs of moderation, the rate cut aims to prevent the economy from slipping into a recession, while supporting job creation and price stability.

3. Dual Mandate:

The Federal Reserve operates under a dual mandate to maintain price stability (control inflation) and achieve maximum employment. The current rate cut reflects a strategic balancing of these objectives as the Fed works towards fostering job growth without igniting inflation.

4. Support for Economic Growth:

By lowering interest rates, borrowing becomes cheaper for both consumers and businesses, encouraging investment and consumption, which could help reduce unemployment and stimulate economic expansion.

How Inflation and Unemployment are Related?

The relationship between inflation and unemployment is central to the Fed's monetary policy decisions. Here's how they interact:

1. Inverse Correlation:

- Inflation and unemployment generally exhibit an inverse relationship: when one rises, the other tends to fall. This is known as the Phillips Curve.
- During periods of low unemployment, businesses raise wages to attract workers, leading to higher wages and, in turn, rising inflation.
- Conversely, when unemployment is high, there is less upward pressure on wages, leading to lower inflation.

2. Phillips Curve:

- The Phillips Curve suggests that as unemployment decreases, the demand for labor increases, driving up wages, which can lead to higher inflation.
- This model helps policymakers like the Fed balance the trade-off between inflation control and job creation. However, the relevance of the Phillips Curve has been debated in recent years due to changes in global labor markets and inflation dynamics.

How Will India Be Affected by the Federal Reserve Rate Cut?

India, as an emerging market, is significantly influenced by global economic trends, including the policies of major central banks like the US Federal Reserve. The rate cut in the US could have several implications for India:

1. Impact on Emerging Markets:

- Lower US interest rates make investing in countries like India more attractive. This is especially true for carry trades—a strategy where investors borrow in the US (where interest rates are low) and invest in India, where rates are higher. This allows them to profit from the interest rate differential.
- Carry trade inflows could lead to an increase in capital flows into India, strengthening investment in key sectors.

2. Increased Foreign Investment:

- The lower US rates could encourage global investors to borrow cheaply in the US and invest in India, potentially increasing Foreign Direct Investment (FDI) and access to cheaper debt.
- This influx of capital could help India sustain its economic recovery and support critical infrastructure projects.

3. Stock Market Sentiment:

- The US rate cut has led to positive sentiment in the Indian stock markets, as investors anticipate higher returns on investments due to reduced borrowing costs.
- Lower interest rates globally could attract foreign investors to India's equity markets, driving stock prices higher.

4. Crude Oil Prices:

- A weaker US dollar as a result of the rate cut may lead to lower oil prices for non-US dollar economies, including India.
- However, increased demand for oil from other regions could lead to higher oil prices, which would increase India's energy import costs and potentially reignite inflation in the country.

5. Impact on Currency Exchange Rates:

- A weaker US dollar (caused by the rate cut) could lead to a stronger Indian Rupee, which would benefit Indian importers by reducing the cost of imports.
- However, Indian exporters may face difficulties as their goods become more expensive in international markets, potentially reducing their competitiveness.

6. RBI's Response:

- The Reserve Bank of India (RBI) faces pressure to adjust interest rates in response to global changes. However, the RBI operates under different economic mandates than the US Federal Reserve.
- The RBI is primarily focused on controlling inflation and promoting GDP growth in India. The US Federal Reserve's decision to cut rates does not directly influence RBI's inflation targets (4% with a tolerance band of +/- 2%).
- The RBI's decisions are influenced more by domestic inflationary pressures and economic conditions than by US employment data.

Federal Tapering and its Implications

1. What is Federal Tapering ?

- Federal tapering refers to the gradual reduction of the US Federal Reserve's large-scale asset purchases, a monetary policy tool used during times of economic crisis (often associated with quantitative easing, or QE).
- The goal of tapering is to withdraw economic stimulus as the economy recovers, transitioning towards a more normalized monetary policy.

2. Implications for Emerging Markets:

- Tapering could lead to higher global interest rates as the US reduces its asset purchases, which could impact capital flows into emerging markets like India.
- This would result in higher borrowing costs for businesses in India and potentially reduce foreign investment inflows.

India's Monetary Policy Response

1. India's Repo Rate:

- At the 50th Monetary Policy Committee (MPC) meeting, the RBI decided to keep the policy repo rate unchanged at 6.50%, maintaining a cautious stance on monetary policy.
- The RBI's primary objective remains aligning inflation with the 4% target, with a tolerance band of +/- 2%. While the Fed is focused on job creation, the RBI is more focused on balancing inflation control with economic growth.

2. Inflation Control vs. Economic Growth:

- The RBI's approach to monetary policy will continue to be shaped by the trade-off between managing inflation and promoting economic growth.
- In the wake of global economic changes, the RBI must balance the impact of US interest rate cuts and their potential influence on Indian markets.

Conclusion :

The US Federal Reserve's rate cut is a strategic move to balance inflation control and economic growth in the US. While this decision positively impacts the global economy, especially emerging markets like India, it also presents certain risks, such as the potential for higher crude oil prices and a weaker US dollar.

50th Foundation Day of Coal India Limited

Why in News ?

Coal India Limited (CIL) recently celebrated its 50th Foundation Day, marking its establishment as the apex holding company for nationalised coking coal (1971) and non-coking coal mines (1973). The company plays a critical role in India's coal sector, contributing

significantly to the country's energy needs. CIL functions under the Ministry of Coal and is headquartered in Kolkata.

Key Facts About Coal India Limited

1. About CIL:

- Coal India Limited (CIL) is a state-owned coal mining corporation responsible for producing and managing coal resources across India.
- Founded in 1975, CIL is the world's largest coal producer, contributing around 78% of India's total coal production.

2. Organisational Structure:

- CIL is classified as a 'Maharatna' public sector enterprise and operates through 8 subsidiaries. Some notable subsidiaries include:
  - Eastern Coalfields Limited (ECL)
  - Bharat Coking Coal Limited (BCCL)
  - Mahanadi Coalfields Limited (MCL), which is the largest coal-producing subsidiary.
- CIL operates in 84 mining areas across 8 states in India, managing 313 active mines.

3. Strategic Importance:

- Coal accounts for 40% of India's primary commercial energy needs, with over half of India's installed power capacity being coal-based.
- In 2023-24, CIL produced 773.81 million tonnes (MT) of coal, representing a 10.04% growth.

4. Recent Developments:

- CIL unveiled its Strategy Report on Coal and Lignite Exploration and the Mine Closure Portal to manage the closure of non-viable mines.
- The company also announced the development of a 50 MW solar power plant at its Nigahi project (Singrauli, Madhya Pradesh), marking its commitment to sustainable energy.

Coal Sector in India: Key Points

1. History of Coal Mining:

- Coal mining in India began in 1774 in the Raniganj Coalfield along the Damodar River.
- The introduction of steam locomotives in 1853 significantly increased the demand for coal.

2. Post-Independence Development:

- The National Coal Development Corporation (NCDC) was established in 1956 to develop the coal industry systematically.
- **Nationalisation of Coal Mines**:
  - Coking coal mines were nationalised in 1971-72.
  - Non-coking coal mines were nationalised in 1973.

3. Current Coal Production:

India achieved 997.83 million tonnes (MT) of coal production in 2023-24, with CIL contributing 773.81 MT.

4. Coal Import:

- In 2022-23, India imported 237.668 MT of coal, primarily from countries like Indonesia, Australia, Russia, South Africa, and the US.
- Major coal-importing sectors include steel, power, cement, and coal traders.

5. Coal Classification:

- **Anthracite**: Highest quality coal (80-95% carbon), found in Jammu & Kashmir.
- **Bituminous**: Found in Jharkhand, West Bengal, Odisha, Chhattisgarh, and Madhya Pradesh.
- **Lignite**: Found in Rajasthan, Assam, and Tamil Nadu.
- **Peat**: Low-quality coal, primarily used in small-scale applications.

Economic Significance of the Coal Sector

1. Energy Backbone:

- Coal is the primary energy source, fueling thermal power plants and fulfilling over half of India's energy needs.
- India's coal demand is expected to rise to 1,462 MT by 2030 and 1,755 MT by 2047, underscoring its continued role in electricity generation.

2. Railway Freight:

Coal is the largest contributor to railway freight in India, accounting for nearly 49% of total freight income.

3. **Revenue Generation:**

- The coal sector contributes over ₹ 70,000 crore annually to the government through taxes, royalties, and GST.
- The District Mineral Fund and National Mineral Exploration Trust support socio-economic projects in coal-producing regions.

4. **Employment:**

The coal sector provides jobs to over 2 lakh individuals in CIL and its subsidiaries, along with thousands of contractual workers.

5. **Corporate Social Responsibility (CSR):**

CIL invests heavily in healthcare, education, water supply, and skill development in coal-producing regions, demonstrating a strong commitment to community welfare.

Challenges in India's Coal Sector

1. **Environmental Challenges:**

- **Air Pollution**: Coal burning leads to the emission of harmful substances like Sulphur dioxide, Nitrogen oxides, and Particulate Matter, causing acid rain, smog, and respiratory diseases.
- **Water Quality**: Excessive mining results in high levels of dissolved solids in nearby water bodies, further exacerbated by groundwater pumping.
- **Land Degradation**: Open-cast mining, which requires significant land acquisition, leads to deforestation and loss of biodiversity.

2. **Cost of Production:**

The average cost of production for coal in India is ₹ 1,500 per tonne, which is higher compared to other coal-producing countries, reducing the competitiveness of Indian coal.

3. **Coal Quality Issues:**

A significant portion of Indian coal is of inferior quality, particularly non-coking coal, which has lower efficiency for power generation.

4. **Investment in Renewables:**

India aims to achieve 500 GW of renewable energy capacity by 2030, but the dominance of the coal sector presents challenges in balancing investments between renewables and coal.

5. **Monopolistic Market Structure:**

The nationalisation of coal mines, with CIL being the dominant player, has led to concerns about monopolistic practices, including one-sided supply agreements that may disadvantage consumers.

How to Address Challenges in India's Coal Sector?

1. **Mitigating Environmental Challenges:**

- Install scrubbers, Flue Gas Desulfurization (FGD) units, and Electrostatic Precipitators (ESPs) to reduce harmful emissions from coal combustion.
- Promote water recycling and rainwater harvesting to mitigate the environmental impacts of coal mining.

2. **Promoting Competition:**

Open up the coal sector to more private players to increase competition and improve efficiency in both mining and distribution.

3. **Investment Diversification:**

Develop a roadmap for transitioning from coal to renewable energy, ensuring that investments in solar, wind, and hydropower do not stagnate due to the coal sector's dominance.

4. **Cost Management Initiatives:**

Focus on reducing the cost of coal production through the adoption of advanced mining techniques, automation, and better resource management to enhance efficiency.

5. **Greening Initiatives:**

Implement greening initiatives within the coal sector, such as the development of solar power plants and investments in clean coal technologies.

Conclusion :

The 50th Foundation Day of Coal India Limited marks a significant milestone in the country's coal industry. CIL continues to play a vital role in meeting India's energy needs, contributing heavily to power generation, employment, and revenue. However, environmental challenges, high production costs, and the transition to renewable energy present ongoing obstacles.

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Science & Technology

ICMR Announces 'First in the World Challenge' to Foster Innovative Health Solutions

In a move to encourage Indian scientists to develop groundbreaking solutions for complex health challenges, the Indian Council of Medical Research (ICMR) has launched the "First in the World Challenge." This new initiative aims to foster innovative, high-risk ideas that could lead to revolutionary breakthroughs in biomedical and health technologies, including vaccines, drugs/ therapeutics, diagnostics, and interventions.

ICMR's Role in Biomedical Research:

- The ICMR is India's apex body for the formulation, coordination, and promotion of biomedical research.
- It is one of the oldest medical research institutions in the world, dedicated to addressing public health issues through scientific discovery and innovation.
- This new challenge aligns with ICMR's mission of pushing the frontiers of scientific discovery by encouraging bold, out-of-the-box ideas that could have global impact.
- The "First in the World Challenge" is part of the Council's commitment to identifying and supporting cutting-edge research that could potentially lead to world-first biomedical innovations.

Objective of the "First in the World Challenge"

The scheme is designed to:

- **Foster bold research ideas**: It encourages scientists to propose novel and futuristic concepts that have never been tried or tested globally.
- **Promote new knowledge generation**: The focus is on discovery or development of breakthrough health technologies that can significantly impact health outcomes worldwide.
- **Encourage high-risk, high-reward research**: The Council acknowledges that the odds of success may be uncertain, but believes that the potential rewards justify taking such risks.

The ICMR aims to create a space where scientists can work on disruptive technologies or unconventional solutions that could radically transform health care, particularly in the areas of diseases and health systems that are currently difficult to tackle.

Key Features of the Challenge

- **Scope**: The challenge focuses on innovative, high-impact proposals that seek to develop solutions never seen before. This could include breakthrough ideas in vaccines, diagnostics, therapeutics, or health interventions.
- **Eligibility**: Proposals can be submitted by individuals or teams of researchers. Teams can include participants from single institutes or from multiple institutions, promoting collaboration across the scientific community.
- **Selection Process**: The selection committee will consist of experts with outstanding records in biomedical research, policy making, and innovation. The committee will assess proposals based on their potential for significant impact and their ability to introduce first-of-its-kind innovations in the biomedical field.

Criteria for Proposals

- **Bold and Innovative Ideas**: The proposals must be radical and disruptive—not incremental. ICMR is seeking ideas that are out-of-the-box, potentially leading to groundbreaking health technologies.
- **Global Impact**: The focus is on creating solutions that could improve health outcomes globally, not just in India. The challenge seeks ideas that can address health problems on a global scale.
- **High-Risk, High-Reward**: The scheme is designed to support high-risk projects with the potential for high rewards. ICMR understands that not all projects will succeed, but the potential for transformative impact makes the initiative worthwhile.

- **Exclusion of Incremental Innovations**: The scheme will not fund proposals aimed at incremental knowledge or process innovations. It is specifically looking for bold ideas that could represent a paradigm shift in biomedical sciences.

Why High-Risk, High-Reward Research?

- ICMR acknowledges that some of the most disruptive innovations in science come from taking calculated risks.
- Though the probability of success may be low, the potential impact of these breakthrough ideas could lead to revolutionary changes in global health.
- This approach is in line with ICMR's philosophy of being open to unconventional ideas that could potentially revolutionize biomedical science, even if every attempt may not succeed.
- The challenge aims to spark innovation that could ultimately lead to world-changing discoveries in health technologies.

What Happens Next?

- **Submission of Proposals**: Interested researchers and teams can submit their proposals, focusing on groundbreaking, high-risk ideas that align with the objectives of the challenge.
- **Evaluation and Selection**: The ICMR Selection Committee, consisting of distinguished experts in biomedical research and innovation, will assess the submitted proposals.
- **Funding and Support**: Successful proposals will receive funding and support from ICMR to develop and execute their innovative ideas, which could have the potential to transform global health outcomes.

Conclusion :

The "First in the World Challenge" launched by ICMR is a bold and innovative initiative aimed at fostering cutting-edge research to solve some of the world's toughest health problems. By supporting high-risk, high-reward research, ICMR is providing an opportunity for Indian scientists to lead the way in developing revolutionary health technologies that could transform global healthcare. This initiative underscores India's commitment to becoming a leader in biomedical innovation and contributing to better health outcomes worldwide.

Black Hole Triple System

Overview:

Scientists have recently discovered a "black hole triple system" for the first time in space.

What is the Black Hole Triple System?

- **What's in the System:**
  - **At the center**: A black hole is pulling in a small star that's getting closer to it.
  - **One star**: A star orbits the black hole once every 6.5 days.
  - **Another star**: A second star orbits the black hole, but very slowly, taking 70,000 years to complete one orbit.
- **Where is it?**

  This system is located 8,000 light-years away from Earth in the Cygnus constellation.
- **The Black Hole:**
  - The black hole in this system is called V404 Cygni and is nine times heavier than the Sun.
  - This black hole is one of the oldest known black holes, and it didn't form from a big star explosion (supernova) like most black holes. It was formed in a different way, known as direct collapse.

Why is This Discovery Important?

- Most black holes discovered before were in binary systems, which means they had only one partner like a star or another black hole.
- But this system has three objects — a black hole and two stars, making it unique.

What is a Black Hole?

A black hole forms when a large star (more than 2.5 times heavier than the Sun) explodes at the end of its life. After the explosion, the center of the star collapses into an object with extremely strong gravity, pulling everything in, even light.

Conclusion:

This new black hole triple system helps scientists understand more about how black holes form and work. It's a big step in learning about the universe and how stars and black holes interact.

What is a Transponder?

Overview:

The Indian government plans to install transponders on 100,000 fishing boats to improve communication and safety for fishermen at sea.

What is a Transponder?

- A transponder is a wireless device that receives a signal and automatically sends back a response.
- The word "transponder" is a mix of transmitter (sending a signal) and responder (receiving and replying to a signal).
- Transponders are used to identify and locate objects, such as boats, planes, or even in technologies like satellites.

How Do Transponders Work?

- Transponders work by using radio frequencies. When a signal is sent to them, they automatically respond with a signal that has identifying information, such as location.
- The information they send back can vary, but it usually includes an ID code or location details.
- Example: In aviation, an air traffic controller sends a signal (called an "interrogator signal") to an aircraft's transponder, and the transponder sends back the aircraft's location and identity, helping the controller track the plane in the air.

Common Uses of Transponders:

- Aircraft identification
- Communications satellites
- Car keys
- Sonar (used in submarines and ships)
- Electronic toll collection systems
- Motor sports (for tracking laps and tire identification)

What is Sonar?

- Sonar (Sound Navigation And Ranging) is a technology that helps detect objects underwater or on the seafloor.
- There are two types of sonar:
  - **Passive sonar**: Listens for sounds underwater.
  - **Active sonar**: Sends out sound waves and listens for the echo to identify objects, like submarines, fish, or rocks.

Conclusion:

Transponders play an important role in improving safety and communication in various fields, including fishing, aviation, and transportation. They are used to track and identify objects through wireless signals.

What is the Visible Emission Line Coronagraph (VELC)?

Introduction :

Scientists from the Indian Institute of Astrophysics (IIA), Bengaluru, have recently reported their first significant results from the Visible Emission Line Coronagraph (VELC) payload aboard India's ADITYA-L1 Mission. This mission is India's first attempt to observe the Sun from a unique vantage point, 1.5 million kilometers away from Earth, in order to study its outer layers and phenomena that affect space weather.

About the Visible Emission Line Coronagraph (VELC)

- VELC is the primary payload of the ADITYA-L1 Mission, which aims to explore and study the Sun, specifically its corona (the outermost layer of the solar atmosphere).
- The VELC is an internally occulted solar coronagraph—a specialized instrument designed to observe the Sun's corona, which is typically difficult to study because of the intense light from the Sun's core.

Key Features of VELC:

1. **Imaging, Spectroscopy, and Polarimetry:**
   VELC is capable of simultaneous imaging, spectroscopy, and spectro-polarimetry of the Sun's corona. This allows for a detailed study of the corona's properties.
2. **Solar Limb Observation:**
   The instrument works close to the solar limb, which is the edge of the Sun's visible surface, enabling scientists to study areas that are difficult to observe from Earth.

3. **Development and Location:**

The VELC was developed by the Indian Institute of Astrophysics (IIA) at its CREST (Centre for Research and Education in Science and Technology) campus, located in Hosakote, Karnataka.

4. **Components:**

The VELC consists of:

- Coronagraph (the main instrument)
- Spectrograph (to analyze light)
- Polarimetry module (to measure the Sun's magnetic field and the solar wind)
- Detectors and auxiliary optics (for enhancing the data quality).

Purpose and Goals of VELC :

The primary goal of VELC is to study the solar corona—the Sun's outermost and faintest layer. This area is crucial for understanding space weather, solar activity, and the effects on Earth's environment.

Key Observations:

- **Imaging the corona**: VELC will capture images of the solar corona down to 1.05 times the solar radius. This will provide the closest images ever captured of the corona.
- **Coronal Studies**: VELC will analyze the temperature, plasma velocity, density, and other characteristics of the solar corona.
- **Coronal Mass Ejections (CMEs)**: It will also study CMEs, which are massive expulsions of solar material that can affect space weather and impact Earth's magnetic field.
- **Solar Wind**: Understanding the solar wind—the continuous flow of charged particles from the Sun—will be another important aspect of VELC's research.

What is a Coronagraph ?

A coronagraph is a specialized instrument used to study the Sun's corona by blocking out the bright light from the Sun's central surface. This allows scientists to view the dimmer, outer corona, which is usually visible only during a solar eclipse.

- **Invention**: The coronagraph was invented in the 1930s by Bernard Lyot, a French astronomer.
- **Working Mechanism**: It uses a circular mask inside a telescope to block out the Sun's bright light, mimicking the effect of a solar eclipse. This allows the faint corona to be observed clearly without the interference of the Sun's brightness.

What are Coronal Mass Ejections (CMEs)?

- Coronal Mass Ejections (CMEs) are large expulsions of plasma and magnetic fields from the Sun's atmosphere (corona).
- During a CME, the Sun releases enormous amounts of electrons, protons, and heavier ions into space, which can travel outward into the solar system, including Earth's orbit.
- **Impact:** CMEs can affect Earth's magnetic field, causing space weather events such as geomagnetic storms, which can disrupt satellite communication, navigation systems, and even power grids.

Conclusion :

The Visible Emission Line Coronagraph (VELC) is a groundbreaking tool in solar science, designed to observe the Sun's corona in detail like never before. By using this technology aboard the ADITYA-L1 mission, India aims to expand our understanding of solar phenomena, including Coronal Mass Ejections and the solar wind, with important implications for space weather forecasting and protecting Earth's technology-dependent systems.

IL-35 Protein : A New Hope for Treating Type 1 and Autoimmune Diabetes

Overview :

Researchers at the Institute of Advanced Study in Science and Technology (IASST) in Guwahati, an autonomous institute under the Department of Science and Technology, have made an important discovery. They identified a specific protein, IL-35, which could play a key role in developing new treatments for Type 1 diabetes and autoimmune diabetes mellitus.

What is IL-35 Protein ?

- **IL-35** is a specific protein made up of two parts: IL-12α and IL-27β chains.
- It has been found to help protect against Type 1 diabetes and autoimmune diabetes, both of which involve the body's immune system attacking its own cells.

Functions of IL-35:

1. Regulation of Immune Response:

- o IL-35 helps regulate macrophage activation, which are cells involved in immune responses.
- o It also plays a role in controlling T-cell proteins (which are vital for immune defense) and regulatory B cells, which help to control inflammation.

2. Protecting Pancreatic Beta Cells:

- o One of IL-35's most important functions is its ability to inhibit immune cells that attack pancreatic beta cells—the cells responsible for producing insulin.
- o It reduces the activity of immune cells that produce inflammatory chemicals, which helps lower pancreatic cell infiltration, a key factor in Type 1 diabetes and autoimmune diabetes mellitus.

What is Autoimmune Diabetes Mellitus?

- Autoimmune diabetes mellitus, also known as Type 1 diabetes (T1DM), is a disease where the immune system mistakenly attacks and destroys the body's insulin-producing pancreatic beta cells.
- As a result, the body cannot produce enough insulin, leading to chronic insulin deficiency and lifelong dependence on external insulin.
- T1DM is a complex disease influenced by both genetic factors (inherited traits) and environmental triggers, which cause the immune system to attack the beta cells.

Triggers and Risk Factors for T1DM:

- Several environmental factors have been linked to triggering this autoimmune response, including:
  - o Certain viruses
  - o Higher birthweight and infant weight gain
  - o Dysbiosis of the gut microbiota (imbalance of gut bacteria)
  - o Dietary factors like vitamin D deficiency, omega-3 fatty acid deficiency, and high milk consumption.
- Currently, there are no effective preventive treatments or immunosuppressive therapies to stop the immune system from attacking the pancreas in Type 1 diabetes.

What is Immune Imprinting?

- Immune imprinting refers to the tendency of the immune system to remember the first variant of a pathogen (such as a virus or bacteria) it encounters—whether through infection or vaccination.
- When the body encounters a newer or slightly different variant of the same pathogen, the immune system tends to repeat its response based on the initial variant it first encountered.
- This phenomenon can sometimes affect how the immune system responds to new versions of diseases, like flu or COVID-19.

Conclusion :

The discovery of the IL-35 protein opens up new possibilities for treating Type 1 diabetes and autoimmune diabetes mellitus. By inhibiting immune cells that attack the pancreas, IL-35 could become a key part of future treatments that protect pancreatic beta cells, reducing the need for external insulin and potentially offering new hope for millions of people with these chronic conditions.

Bengal Boy with Rare Genetic Disease Receives Rs 16-Crore Life-Saving Medicine

Why in News?

Din Muhammad, a young boy from West Bengal, has recently received a life-saving gene therapy for Spinal Muscular Atrophy (SMA), a rare genetic disorder. The cost of the drug, Zolgensma, used for his treatment, amounts to an astounding 16 crore rupees. This significant medical achievement highlights both the challenges in accessing rare disease treatments in India

and the potential of crowdfunding to make such treatments accessible.

What is Spinal Muscular Atrophy (SMA)?

- Spinal Muscular Atrophy (SMA) is a genetic disorder that affects the motor neurons in the spinal cord, leading to muscle weakness and atrophy.
- The severity of SMA varies, but it generally impairs mobility and, in severe cases, can lead to respiratory failure.

Key Features of SMA:

- **Genetic Disorder**: SMA is caused by the deletion or mutation of a gene called SMN1 (Survival Motor Neuron 1), leading to insufficient production of the SMN protein, which is critical for the survival of motor neurons.
- **Symptoms**: The condition presents itself in different forms, ranging from mild to severe, but commonly includes difficulty in moving limbs, weakness in muscles, impaired ability to sit, crawl, or walk, and in extreme cases, difficulty in breathing.
- **Prevalence**: SMA affects 1 in 8,000 births worldwide, making it one of the most common genetic causes of death in infants.

What is Zolgensma?

- Zolgensma (onasemnogene abeparvovec-xioi) is a gene therapy used to treat SMA by addressing the genetic root cause of the disease.
- It works by delivering a functional copy of the SMN1 gene to the patient's cells, enabling the production of the SMN protein and halting or slowing down the progression of the disease.

Key Features of Zolgensma:

1. **Gene Therapy**: Zolgensma is one of the most advanced treatments for SMA, offering the potential for long-term survival and quality of life.
2. **Cost**: Priced at an exorbitant 16 crore rupees, Zolgensma is one of the most expensive drugs in the world, making it inaccessible for many families in India and other developing countries.
3. **Efficacy**: The drug is most effective when administered at an early age, ideally before the child turns two years old. Delaying treatment reduces the chances of success.

Din Muhammad's Story:

- Din Muhammad, a boy from East Medinipur, West Bengal, was born into an ordinary family. At just six months old, his mother noticed that he had difficulty moving his arms and legs.
- He could barely lift his legs, and his hands moved very slowly. His head control was weak, and he could not sit up or crawl like other children his age.

Diagnosis and Treatment Journey:

1. **Initial Signs**: Concerned about his developmental delays, Din's parents consulted a local pediatrician. However, after further examination, the family was advised to visit Kolkata for specialized care.
2. **Diagnosis**: After extensive testing at a hospital in Kolkata, Din was diagnosed with Spinal Muscular Atrophy (SMA).
3. **Accessing Treatment**: The treatment for SMA, particularly Zolgensma, is not widely available in India due to the high cost. Despite this, the family managed to access the drug through **crowdfunding**, raising the necessary funds to buy the life-saving treatment.

Significance of Peerless Hospital's Role:

- Peerless Hospital in Kolkata is one of the few hospitals in East India with the expertise and infrastructure to administer SMA gene therapy.
- According to Ravindra Pai, Managing Director of Peerless Hospital, the institution has a dedicated team of doctors trained to treat SMA, but such treatment is limited due to high costs.
- So far, only three children in East India have received this treatment, with two treated at Peerless Hospital, and one at NRS Hospital in Kolkata.

Challenges and Solutions for Rare Disease Treatment in India:

1. **High Treatment Costs**:
   The cost of Zolgensma is prohibitively high, making it unaffordable for most families in India. In this case, Din Muhammad's family managed to raise funds via crowdfunding, which is becoming an increasingly common method to access high-cost treatments for rare diseases in India.
2. **Limited Awareness and Availability**:
   Treatments for rare diseases like SMA are often not available in India due to a lack of awareness, high costs, and limited infrastructure. In this context, Peerless Hospital in Kolkata has emerged as one of the few hospitals in India providing this treatment.
3. **Crowdfunding as a Solution**:
   The crowdfunding model is proving to be a lifeline for families struggling to afford life-saving treatments. With increasing use of online platforms, people across the world can contribute to raising funds for treatments, thus democratizing access to healthcare.
4. **Role of Early Intervention**:
   SMA therapies like Zolgensma are most effective when administered early, preferably before the age of two. This underscores the importance of early diagnosis and the need for timely access to treatments.

Global and Local Impact of SMA Treatment Access:

1. **Global Impact**:
   The advent of gene therapy such as Zolgensma marks a significant milestone in the treatment of genetic disorders. It represents the cutting edge of biotechnology, offering hope to children with SMA worldwide. However, the high price of such therapies limits their accessibility in low-income countries.
2. **Local Impact in India**:
   India faces challenges in providing affordable healthcare for rare genetic conditions due to the high cost of treatments, underdeveloped healthcare infrastructure, and limited availability of specialized medical services. Efforts like crowdfunding and partnerships between hospitals and pharmaceutical companies may pave the way for broader access to such life-saving drugs.
3. **Awareness and Government Support**:
   Government intervention could be crucial in reducing the cost of rare disease treatments by negotiating with pharmaceutical companies for better pricing or creating subsidized healthcare programs for families affected by such conditions.
4. **Potential for Broader Access**:
   Gene therapy represents a transformative shift in the treatment of rare diseases. As these therapies become more mainstream and other drugs are developed, the costs may reduce, improving accessibility and affordability for families in India.

Way Forward:

1. **Enhancing Awareness**:
   More efforts are needed to raise awareness about rare diseases like SMA, so that children can receive early diagnosis and timely intervention, improving their chances of survival and quality of life.
2. **Government and Corporate Collaboration**:
   The government could collaborate with pharmaceutical companies to make treatments like Zolgensma more affordable and accessible for low-income families. Additionally, tax incentives for companies involved in rare disease treatments could encourage innovation in this sector.
3. **Expanding Crowdfunding Platforms**:
   Crowdfunding can play a critical role in making rare disease treatments accessible. Encouraging the use of online platforms to raise funds for critical healthcare needs can help alleviate financial burdens on affected families.
4. **Infrastructure Development**:
   There is a need for better healthcare infrastructure and expertise to treat rare diseases across India, particularly in non-metro cities. Setting up specialized paediatric departments equipped with the necessary medical technology would make it easier for patients to access cutting-edge treatments like gene therapies.

Conclusion :

The case of Din Muhammad underscores the challenges faced by families in India in accessing rare disease treatments due to high costs and limited healthcare infrastructure. However, the success of crowdfunding in helping Din receive Zolgensma highlights both the potential of modern gene therapy and the importance of collaborative efforts—from hospitals, governments, and communities—to address the healthcare needs of children with life-threatening conditions like Spinal Muscular Atrophy (SMA).

Indian Rare Earths Limited and UKTMP JSC Sign Agreement to Establish Indo-Kazakh Joint Venture

Why in News?

- IREL (India) Limited, a Public Sector Undertaking (PSU) under the Department of Atomic Energy (DAE), Government of India, and Ust-Kamenogorsk Titanium and Magnesium Plant JSC (UKTMP JSC), one of Kazakhstan's leading companies in titanium production, have signed an agreement to form an Indo-Kazakh Joint Venture Company (JVC) named IREUK Titanium Limited.
- This venture aims to establish a titanium slag production plant in India, using Ilmenite from IREL's operations in Odisha.
- The agreement was formalized on November 5, 2024, marking a significant step in the development of India's titanium value chain.

Key Highlights of the Agreement

1. **Formation of IREUK Titanium Limited**:
   - IREL (India) Limited and UKTMP JSC will collaborate to set up the joint venture IREUK Titanium Limited to produce Titanium Slag in India.
   - The agreement was signed by Dr. Deependra Singh, Chairman & Managing Director of IREL, and Ms. Assem Mamutova, President of UKTMP JSC, in the presence of senior officials, including Dr. A.K. Mohanty, Secretary of the Department of Atomic Energy (DAE), and Mr. Iran Sharkhan, Vice Minister of Industry & Construction of Kazakhstan.
2. **Significance for India**:
   - The joint venture will be a catalyst for developing the titanium value chain in India. The plant will beneficiate (or upgrade) low-grade Ilmenite into high-grade Titanium Feedstock.
   - The establishment of the plant is expected to generate employment opportunities in the Odisha region and contribute to the economic development of the area.
   - The venture also supports India's vision of becoming self-reliant (Atmanirbhar) in the production of titanium slag, an important material for aerospace and industrial applications.
3. **Strategic Importance for Kazakhstan**:
   - UKTMP JSC, one of the largest vertically integrated titanium producers in the world, will offtake (purchase) the Titanium Slag produced by the joint venture. This will help secure raw material for their titanium sponge production.
   - The partnership will also facilitate foreign exchange earnings for India, as UKTMP JSC is a major exporter of high-value titanium products to developed countries, including those in the aerospace industry (e.g., Boeing and Airbus).

About IREL and UKTMP JSC

1. **IREL (India) Limited**:
   - IREL is a Public Sector Undertaking (PSU) under the Department of Atomic Energy (DAE) of the Government of India.
   - It is engaged in the mining, processing, and supply of rare earth minerals and compounds, including Ilmenite, a key source for producing titanium feedstock.
   - The company has a reputation for high-quality mineral supply and is known for its operations in Odisha, where it produces a surplus of Ilmenite.
2. **UKTMP JSC (Ust-Kamenogorsk Titanium and Magnesium Plant)**:
   - UKTMP JSC is one of the world's largest vertically integrated titanium producers based in Kazakhstan.

- The company has expertise in producing a range of titanium products, including titanium sponge and ingots, and supplies products to industries like aerospace and defense.
- Titanium products from UKTMP JSC are certified by global aerospace manufacturers such as Boeing and Airbus, and the company exports 100% of its production to developed countries.

Role of the Joint Venture (JVC)

1. Titanium Slag Production:

- The primary objective of the IREUK Titanium Limited joint venture is to produce Titanium Slag from low-grade Ilmenite sourced from IREL's Odisha operations.
- Titanium Slag is a key raw material used in the production of titanium sponge, which is vital for industries like aerospace, defense, and manufacturing.

2. Technology Transfer:

- UKTMP JSC will provide the technology for producing Titanium Slag, leveraging its expertise in titanium processing.
- The collaboration will help India build technological capabilities in titanium processing, reducing dependency on imports for high-value titanium feedstocks.

3. Economic Impact:

- The establishment of the titanium slag production plant in Odisha will create local employment, bolster the Make in India initiative, and contribute to economic growth in the state.
- The project also aims to contribute to foreign exchange earnings for India through the export of titanium slag and other value-added products.

Strategic and Diplomatic Significance

1. Strengthening Indo-Kazakh Relations:

- The joint venture marks a significant milestone in the bilateral trade and strategic ties between India and Kazakhstan. It showcases the growing economic cooperation between the two nations in sectors like mineral resources, defense, and industrial technology.
- Kazakhstan, known for its vast mineral resources, is an important partner for India in sourcing raw materials for industrial development and manufacturing.

2. Alignment with India's Vision of Atmanirbhar Bharat:

- The establishment of IREUK Titanium Limited aligns with India's goal of achieving self-sufficiency in critical industrial sectors, such as titanium production.
- By utilizing domestic resources (like Ilmenite from Odisha) and enhancing production capacity, the venture helps India reduce its dependency on foreign suppliers for key materials, thus supporting the Atmanirbhar Bharat (self-reliant India) initiative.

3. Promoting Global Trade:

The collaboration also highlights India's growing role in the global titanium market. With the technology and resources available through this partnership, India can now become a significant player in the global titanium supply chain, especially for high-value aerospace applications.

Long-term Impact and Future Prospects

1. Boosting Titanium Production in India:

- The joint venture has the potential to significantly enhance India's titanium production capacity, providing a stable supply of high-grade titanium feedstock for the domestic and international market.
- It will also encourage the development of value-added titanium products within India, fostering a complete titanium value chain.

2. Employment Generation:

- The plant in Odisha will create direct and indirect employment opportunities, particularly in the fields of mining, processing, technology transfer, and manufacturing.
- Skill development programs and capacity-building initiatives will also be key components of the project, providing long-term benefits to the local workforce.

3. **Technology Upgradation**:

The transfer of advanced titanium processing technologies from UKTMP JSC to India will help upgrade industrial capabilities, making India more competitive in the global market for titanium products.

4. **Diplomatic and Economic Strengthening**:

This project can serve as a model for further collaborative ventures between India and other countries, boosting India's industrial diplomacy and economic integration with global supply chains.

Conclusion :

The formation of the IREUK Titanium Limited joint venture between IREL (India) Limited and UKTMP JSC marks a significant step toward strengthening India's position in the global titanium industry. By leveraging domestic resources and international expertise, this partnership will not only make India more self-reliant in the production of titanium slag but will also contribute to job creation, economic growth, and technological advancement. The initiative is a major move towards realizing the vision of Atmanirbhar Bharat and enhancing India's competitiveness in the global market.

C-DOT and IIT-Roorkee Sign Agreement for Development of Millimeter Wave Transceiver for 5G Rural Connectivity

Why in News?

- The Centre for Development of Telematics (C-DOT) and the Indian Institute of Technology-Roorkee (IIT-Roorkee) have signed an agreement under the Telecom Technology Development Fund (TTDF) scheme of the Department of Telecommunications (DoT).
- The aim is to develop a Millimeter Wave Transceiver for enhancing 5G rural connectivity in India.

What is Millimeter Wave (mmWave)?

- **Millimeter Waves** refer to **electromagnetic** waves with frequencies ranging from 30 GHz to 300 GHz and wavelengths between 10 mm and 1 mm.
- The mmWave spectrum is used for high-speed wireless communications, making it a crucial technology for the future of telecommunication systems like 5G and 6G.
- The International Telecommunication Union (ITU) refers to this frequency band as the Extremely High Frequency (EHF) band.

Advantages of Millimeter Wave (mmWave) Technology

1. **Higher Data Rates**:

Millimeter waves enable faster data transfer rates compared to lower-frequency bands used in existing communication networks, such as Wi-Fi and cellular networks.

2. **High Bandwidth Tolerance**:

The high frequency of mmWave allows for a higher tolerance to bandwidth, making it more suitable for high-speed data communication.

3. **Low Latency**:

Due to its high speeds and bandwidth capacity, mmWave technology significantly reduces latency, allowing for more responsive communication.

4. **Less Interference**:

mmWave signals have limited propagation and are less likely to interfere with neighboring cellular systems, reducing signal interference issues.

Significance of the Recent Agreement

1. **5G Rural Connectivity**:

The collaboration between C-DOT and IIT-Roorkee aims to develop a millimeter wave transceiver specifically designed for rural 5G connectivity. This will improve connectivity in remote and underserved areas of India, enhancing access to high-speed internet in rural regions.

2. **Encouragement of Local Manufacturing**:

The project will promote small and medium-scale industries to set up manufacturing units in India. The use of polymer-based structures in conjunction with metals will create job opportunities for India's engineering graduates.

3. **Reduced Dependence on Foreign Semiconductor Industries**:

By developing this technology domestically, India can reduce its reliance on foreign semiconductor

fabrication industries, which are crucial for the production of telecom hardware.

4. **Cost-Efficiency**:

   The proposed cost for developing mmWave technology is relatively low, yet it holds the potential to create substantial economic and technological opportunities for India.

5. **Intellectual Property Rights (IPRs)**:

   The project aims to generate valuable Intellectual Property Rights (IPRs), contributing to India's technological self-reliance and strengthening its position in the global telecommunications market.

6. **Skilled Workforce Development**:

   The initiative will help build a skilled workforce in India, capable of supporting the emerging millimeter wave/Sub-THz technologies used in 5G and 6G networks.

What Are Electromagnetic Waves ?

- Electromagnetic waves, such as light, are generated by the vibration of electrically charged particles.
- These waves consist of oscillating electric and magnetic fields, which move perpendicular to each other and to the direction in which the wave propagates.
- These waves can travel through a vacuum and various materials, and they form the basis of all wireless communication technologies, including radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays.

Conclusion :

The partnership between C-DOT and IIT-Roorkee to develop millimeter wave transceivers for 5G rural connectivity is a major step towards technological advancement and self-reliance in India's telecom sector. With its potential to boost high-speed rural connectivity, foster local manufacturing, and create job opportunities, this initiative aligns with India's vision of a digitally connected and self-reliant economy. It also lays the foundation for the future 5G and 6G technologies, positioning India as a leader in the global telecommunications landscape.

What is Voyager 2 Spacecraft ?

Overview:

Nearly four decades after NASA's Voyager 2 spacecraft made its historic flyby of Uranus, scientists have made new discoveries about the planet's unique magnetic field.

Key Facts About the Voyager 2 Spacecraft:

1. Launch and Mission:

- Voyager 2 is an unmanned space probe launched by NASA on August 20, 1977, just a few weeks before its sister spacecraft, Voyager 1.
- Primary Mission: Voyager 2's mission was to explore the outer planets of our solar system, including Jupiter, Saturn, Uranus, and Neptune, as well as their moons. After completing this mission, the spacecraft was set to continue its journey into interstellar space.

2. Achievements:

- Voyager 2 is the only spacecraft to have visited Uranus and Neptune.
- It carried a Golden Record, a phonograph record with sounds and images from Earth, meant as a message to potential extraterrestrial civilizations.

3. Key Discoveries:

- **Firsts**:
  - Voyager 2 is the only spacecraft to study all four of the solar system's giant planets (Jupiter, Saturn, Uranus, and Neptune) at close range.
  - It discovered a 14th moon of Jupiter.
  - It was the first human-made object to fly past Uranus and Neptune.
  - At Uranus, it discovered 10 new moons and two new rings.
  - At Neptune, it discovered five moons, four rings, and the Great Dark Spot, a mysterious storm in Neptune's atmosphere.

4. Interstellar Mission:

- After completing its primary mission, Voyager 2 continued its journey into interstellar space, where it is still sending back data on the interstellar medium (the matter that exists in the space

between stars) and the heliosphere (the bubble-like region of space dominated by the Sun's solar wind).

- Voyager 2 became the second spacecraft to enter interstellar space, joining Voyager 1 as the only human-made objects to travel beyond the influence of our Sun's solar wind.

5. Current Status:

Voyager 2 is currently the second most distant human-made object from Earth, following Voyager 1.

What is the heliosphere ?

- The heliosphere is a large bubble-like region of space created by the solar wind, a constant stream of charged particles sent out by the Sun.
- The solar wind extends past all the planets in our solar system, reaching up to three times the distance to Pluto, before it is stopped by the interstellar medium (the gas and dust between stars).
- The boundary where the solar wind is no longer able to push against the interstellar medium is known as the edge of the heliosphere.

Bio-Derived Foam

Overview:

Researchers from the Indian Institute of Science (IISc) have developed a biodegradable foam that could revolutionize the packaging industry, offering a sustainable solution to environmental challenges caused by plastic waste.

Key Features of Bio-Derived Foam:

1. Sustainable Alternative:

- Bio-derived foam provides an eco-friendly alternative to traditional plastic materials used in Fast-Moving Consumer Goods (FMCG) packaging.
- It is made from bio-based epoxy resins sourced from non-edible oils approved by the US Food and Drug Administration (FDA), and hardeners derived from tea leaves.

2. Environmentally Responsible:

- Unlike conventional materials like expanded polystyrene (EPS) and polyurethane foam, this biodegradable foam offers industries a sustainable packaging solution.
- The foam's dynamic covalent bonds allow it to break and reform under external stimuli, making it possible to mechanically reprocess or dissolve the foam in eco-friendly solvents without compromising its strength.

3. Biodegradability:

- Traditional foam packaging materials can take centuries to break down in landfills. In contrast, the bio-derived foam disintegrates within three hours when exposed to eco-friendly solvents at 80°C, offering a significant environmental advantage.
- It safely disintegrates in landfills without contaminating groundwater, further enhancing its sustainability compared to conventional plastic foams.

4. Market Significance:

- The Indian foam market is valued at $7.9 billion and is expected to grow to $11.1 billion by 2032, as per a report by Research and Markets.
- With less than 1% of the 2.3 million tonnes of plastic foam produced annually being recycled, this bio-derived foam offers a much-needed solution to the growing plastic waste crisis.

What is Resin?

- Resins are viscous, liquid polymers derived from organic or synthetic sources.
- Their primary advantage lies in their ability to transition from a liquid to a solid form, which can be customized into a homogeneous structure.
- This property makes resins highly useful in various applications, including coatings, adhesives, and as materials for composite manufacturing.

Operation Dronagiri : Revolutionizing Geospatial Technology in India

- In November, 2024, the Secretary of the Department of Science and Technology (DST) launched Operation Dronagiri at the Foundation for Innovation and Technology Transfer (FITT), Indian Institute of Technology (IIT) Delhi.
- This initiative aims to demonstrate how geospatial technologies can improve the quality of life for citizens and make business operations easier.

About Operation Dronagiri

Operation Dronagiri is a pilot project launched under the National Geospatial Policy 2022. Its main goal is to showcase how geospatial data and technology can be applied to various sectors, improving everyday life and boosting economic activity.

1. **Objective**: The project seeks to demonstrate the practical uses of geospatial technologies in agriculture, livelihoods, logistics, and transport, aiming to improve efficiency and quality of life. It is part of India's broader effort to liberalize and innovate in the field of geospatial data, creating infrastructure, skills, and standards for better use of this data.
2. **Geospatial Data Integration**: The project integrates **geospatial data** and technologies to demonstrate their potential applications in the chosen sectors. The idea is to show how spatial data can transform industries and help in better decision-making.
3. **Pilot Phase**:

   Operation Dronagiri will first be rolled out in five states:

   - Uttar Pradesh
   - Haryana
   - Assam
   - Andhra Pradesh
   - Maharashtra

4. In these states, the project will showcase how geospatial technologies can be applied to various fields like agriculture, livelihoods, and logistics and transport.
5. **Key Partnerships**: The project will collaborate with government departments, industries, corporates, and startups in its first phase. This will help build the foundation for a nationwide rollout of the project, spreading its benefits across India.
6. **Support from Geospatial Data Sharing**: The project will be supported by the Integrated Geospatial Data Sharing Interface (GDI). This platform will make spatial data accessible, facilitating the integration and use of this data for various applications.
7. **Oversight and Management**: The activities of Operation Dronagiri will be managed by the IIT Tirupati Navavishkar I-Hub Foundation (IITTNiF). Additionally, Geospatial Innovation Accelerators (GIAs) at several prestigious institutions—IIT Kanpur, IIT Bombay, IIM Calcutta, and IIT Ropar—will act as the operational arms of the project.
8. **Implementing Agency**: The project will be driven by the Geospatial Innovation Cell, which is part of the Department of Science and Technology (DST). This cell will oversee the implementation and coordination of all activities related to the project.

What is Geospatial Technology ?

Geospatial technology refers to a group of tools and technologies used to create and analyze data related to the earth's surface. These tools help to gather, map, and monitor geographic areas and changes in the landscape, urban spaces, and even in society. Some examples of geospatial technology include satellite imagery, geographic information systems (GIS), and global positioning systems (GPS).

1. **Purpose**:

   Geospatial technologies help in collecting data to understand geographic areas, monitor environmental changes, and analyze patterns in cities, landscapes, and human societies. For example, in agriculture, these technologies can be used to monitor crop health, while in logistics, they can help track the movement of goods.

2. **Applications**:

- **Mapping**: Geospatial technology creates maps of geographical areas.
- **Data Analysis**: It helps analyze patterns such as urban growth, climate change, and transportation networks.
- **Tracking Changes**: It tracks changes in landscapes, weather, infrastructure, etc.

Conclusion :

Operation Dronagiri is an ambitious initiative aimed at harnessing the power of geospatial technologies to bring about practical solutions in key sectors like

agriculture, logistics, and transport. With support from top research institutions and strong government backing, this project is set to revolutionize how geospatial data is used in India. By demonstrating its potential in a few states, the project hopes to create a model that can be expanded nationwide, improving the quality of life for citizens and enhancing India's business environment.

World Diabetes Day 2024

Overview:

- **Date**: World Diabetes Day is observed annually on November 14.
- **Purpose**: It raises awareness about diabetes, its prevention, and management.
- **2024 Theme**: *"Access to Diabetes Care: Empowering Better Health for All."*

Historical Context:

- **Inception**: World Diabetes Day was established in 1991 by the International Diabetes Federation (IDF) and World Health Organization (WHO).
- **United Nations Recognition**: In 2006, the United Nations officially recognized November 14 as World Diabetes Day.
- **Commemoration of Sir Frederick Banting**: The date was chosen to honor the birthday of Sir Frederick Banting (November 14), who, along with Charles Best, co-discovered insulin in 1922.

Global Significance:

- **Awareness Campaigns**: The day highlights the global diabetes epidemic, emphasizing the need for accessible healthcare and lifestyle changes to manage the disease.
- **Symbol of Unity**: Landmarks worldwide are illuminated with a blue circle, symbolizing unity in the fight against diabetes. People are encouraged to wear blue to show their support.
- **Activities**: Events such as awareness campaigns, educational seminars, health check-ups, and fundraising activities are held globally.

What is Diabetes?

- **Diabetes Mellitus** is a chronic metabolic disorder characterized by high blood sugar levels due to inadequate insulin production or poor insulin usage.
- **Types of Diabetes**:
  - o **Type 1 Diabetes**: The body does not produce insulin.
  - o **Type 2 Diabetes**: The body becomes resistant to insulin or does not produce enough.
  - o **Gestational Diabetes**: Occurs during pregnancy and usually resolves after childbirth.

Role of Insulin:

- Insulin is a hormone produced by the pancreas, crucial for regulating blood sugar levels.
- When insulin production is insufficient or ineffective, blood sugar levels rise, leading to complications in organs such as the heart, kidneys, eyes, and feet.

Pancreas Function: Pancreas is an organ located in the abdomen with two key functions :

- **Exocrine Function**: Secretes digestive enzymes to aid in food breakdown.
- **Endocrine Function**: Releases insulin to regulate blood sugar levels.

Challenges Highlighted by World Diabetes Day:

- **Access to Diabetes Care**: Many individuals worldwide lack access to the necessary healthcare resources for managing diabetes.
- **Health Education**: A focus on educating people about lifestyle changes that can prevent or manage diabetes.

By emphasizing global awareness and action, World Diabetes Day aims to reduce the diabetes burden and promote better healthcare access and preventive measures.

Unified Complex Radio Antenna (UNICORN)

Overview :

- **India-Japan Agreement**: India and Japan recently signed a Memorandum of Implementation (MoI) for the co-development of the UNICORN (Unified Complex Radio Antenna), a stealth mast for deployment on Indian Navy ships.

- **Significance**: This is India's first military technology transfer pact with Japan and follows a previous agreement on the transfer of defence equipment and technology between the two nations to strengthen their strategic ties.

About Unified Complex Radio Antenna (UNICORN):

- **Purpose**:

  UNICORN is an integrated antenna system designed to enhance the stealth capabilities of naval ships.
- **Functionality**:

  It is a mast with integrated communication systems that improve a ship's stealth characteristics, making it less detectable by radar and other surveillance technologies.
- **Development**:

  The system is developed by three Japanese companies:
  1. NEC Corporation
  2. Sampa Kogyo K.K.
  3. The Yokohama Rubber Co., Ltd.
- **Current Use**:

  These antennas are currently fitted on the Mogami-class frigates of the Japan Maritime Self-Defence Force (JMSDF).
- **Innovative Design**:

  Unlike traditional naval masts that have multiple antennas attached at various points, UNICORN consolidates them into a single radar dome (called a radome). This reduces the ship's radar cross-section, significantly enhancing its stealth capabilities.
- **Key Benefits**:
  - **Enhanced Stealth**: By reducing the cross-section of the mast, UNICORN enables ships to have a lower electronic signature, making them harder to detect.
  - **Improved Detection**: The optimal placement of antennas within the radome improves the detection distance of radio waves emitted from outside.
  - **Simplified Maintenance**: The integration simplifies both maintenance and installation processes of the antenna systems.
- **What is an Antenna?**

  An antenna is a specialized transducer that converts electric current into electromagnetic (EM) waves or vice versa. Antennas are used to transmit and receive non-ionizing EM fields, including radio waves, microwaves, infrared radiation (IR), and visible light.

Conclusion :

The UNICORN antenna system represents a significant advancement in naval technology, combining cutting-edge stealth features with enhanced communication and detection capabilities. This collaboration between India and Japan will help modernize the Indian Navy's capabilities, particularly in enhancing the stealth characteristics of its naval platforms.

One Day One Genome Initiative

Overview:

The One Day One Genome initiative is launched by the Department of Biotechnology (DBT) and Biotechnology Research and Innovation Council (BRIC) to showcase India's microbial potential and highlight the critical roles of microbial species in environmental, agricultural, and human health contexts.

About One Day One Genome Initiative:

- **Goal**:

  The initiative aims to release a fully annotated bacteriological genome isolated in India, making it freely available to the public. This will provide insights into India's unique microbial species and their significance.
- **Key Features**:
  - **Focus**: The initiative highlights unique bacterial species found in India, showcasing their role in various sectors such as agriculture, environment, and human health.
  - **Coordination**: It is coordinated by the Biotechnology Research and Innovation Council-National Institute of Biomedical Genomics (BRIC-NIBMG), an institute under DBT.

- **Public Accessibility**: The released genomes will be complemented with graphical summaries, infographics, and detailed genome assembly/annotation information, accessible to researchers and the general public.
- **Scientific and Industrial Use**: This data will stimulate discussions, innovations, and scientific research, with direct benefits to the community and ecosystem.

- **Impact**:

  Microbial Genomics Data: The initiative makes microbial genomics data more accessible to scientists, researchers, and the public, thus encouraging innovation in the biological sciences.

Role of Microorganisms:

- **Ecological Importance**:
  - Microorganisms are essential for maintaining the biogeochemical cycles, such as soil formation, mineral purification, and degradation of organic wastes and toxic pollutants.
  - They help in methane production and contribute to homeostasis on Earth.
- **Agriculture**:
  - Microorganisms are involved in nutrient cycling, nitrogen fixation, maintaining soil fertility, and assisting in stress responses of crops.
  - They play a significant role in controlling pests and weeds.
  - Symbiotic relationships: Microbes are symbiotically associated with plants, aiding in nutrient and water uptake.
- **Human Health**:
  - Microorganisms outnumber human cells in the body and are crucial for digestion, immunity, and even mental health.
  - While pathogenic microorganisms cause diseases, non-pathogenic microorganisms are essential for the defense against infections.

- **What is Homeostasis ?**

  Homeostasis refers to the automatic processes that help living organisms maintain a stable internal environment despite changes in external conditions. This self-regulation ensures the body functions optimally.

Conclusion :

The One Day One Genome initiative aims to unlock the vast potential of India's microbial biodiversity, contributing to the fields of genomics, agriculture, health, and environmental sustainability. By making microbial genomic data accessible, it paves the way for enhanced scientific collaboration, innovation, and application in real-world issues.

GSAT-N2 (GSAT-20)

Overview:

GSAT-N2 (also known as GSAT-20) is an advanced communication satellite launched by SpaceX's Falcon-9 rocket. The launch was a significant achievement for India's space capabilities.

About GSAT-N2 (GSAT-20) :

- **Developer**:

  The satellite was developed by New Space India Limited (NSIL), the commercial arm of ISRO under the Department of Space.
- **Launch Vehicle**:

  It was launched onboard SpaceX's Falcon-9 rocket into a geosynchronous transfer orbit (GTO).
- **Purpose** :
  - **Data and Internet Services**: The satellite is designed to provide data and internet services to remote regions, supporting in-flight Internet connectivity across the Indian subcontinent.
  - **Smart Cities Mission**: It aims to provide significant data transmission capacity to support India's Smart Cities Mission, which focuses on enhancing urban infrastructure and services.

Key Features :

- **Ka-band Communication**:
  GSAT-N2 operates in the Ka-band, offering high-throughput communication capabilities, and provides a throughput of around 48 Gbps.
- **Spot Beams**:
  The satellite is equipped with 32 user beams:
  - 8 narrow spot beams for the Northeast region.
  - 24 wide spot beams covering the rest of India.
- **User Access**:
  Designed to support a large user base through small user terminals. This is achieved via hub stations across mainland India that will manage the beams.
- **Lift-off Mass**:
  The satellite has a mass of 4,700 kg.
- **Mission Life**:
  It has a mission life of 14 years.
- **Significance**:
  It is India's highest throughput satellite, and the only one that operates exclusively in the Ka-band.

Why SpaceX's Falcon-9 Rocket Was Chosen:

- ISRO's Mark-3 launch vehicle can place up to 4,000 kg into a geostationary transfer orbit, but the GSAT-N2's mass of 4,700 kg required a different solution.
- Due to this weight constraint, ISRO chose to collaborate with SpaceX, marking India's first commercial collaboration with the private space company.
- What is a Geosynchronous Transfer Orbit (GTO)?
  A Geosynchronous Transfer Orbit (GTO) is a highly elliptical orbit used to transfer a spacecraft from a low Earth orbit (LEO) to a geosynchronous orbit (GEO). In GEO, the satellite's orbital period matches Earth's rotation, making it appear stationary relative to the Earth's surface, which is crucial for communication satellites.

Conclusion :

The GSAT-N2 (GSAT-20) satellite marks a major leap in India's space technology, with its high-throughput communication capabilities and its significant role in improving data transmission across India, especially for initiatives like the Smart Cities Mission. The use of SpaceX's Falcon-9 rocket highlights ISRO's growing collaboration with global space entities for advancing its space ambitions.

Binar Space Program : Impact of Solar Activity

Recent Event : Three small satellites from the Binar Space Program, developed by Curtin University in Australia, recently burned up in Earth's atmosphere. This was due to solar activity, highlighting how the Sun's behavior can impact satellites in space.

About the Binar Space Program

- **Objective**: The Binar Space Program is focused on advancing space research, specifically to improve our understanding of the Solar System and lower the cost and barriers for operating in space.
- **First Mission**: The program began in September 2021 with its first satellite, Binar-1.
  - Binar-1 was a CubeSat measuring just 10 centimeters and was launched into an orbit of 420 km.
  - It successfully completed 364 days in orbit, surviving longer than expected due to low solar activity at the time.
- **Follow-Up Missions**: After the success of Binar-1, the program launched three more CubeSats—Binar-2, Binar-3, and Binar-4.
  - These satellites had additional deployable solar arrays for increased surface area, which led to a higher expected exposure to solar activity.
  - The satellites were expected to survive for about 6 months but burned up much sooner due to increased solar activity.

What is Solar Activity ?

Solar activity refers to events like sunspots, solar flares, and solar wind—all caused by the Sun's fluctuating magnetic field. The Sun's magnetic field reverses every 11 years, and at the midpoint of this cycle, solar activity is at its peak.

Current Solar Cycle (Cycle 25): Recently, solar activity has been 1.5 times higher than expected for this phase of the solar cycle. This has had significant effects on satellites in orbit.

Impact of Solar Activity on Satellites

- **Solar Flares and Solar Wind**: These events result in stronger solar winds and solar flares, which can damage satellites' electrical systems and increase radiation levels in space.
- **Atmospheric Drag**: The most noticeable effect of high solar activity on satellites in low Earth orbit (less than 1,000 km) is atmospheric drag:
  - Solar energy causes the Earth's outer atmosphere to expand.
  - This expansion increases drag on satellites, forcing them to lose altitude and eventually re-enter the Earth's atmosphere. This is why satellites like Binar-2, Binar-3, and Binar-4 burned up faster than expected.
- **Other Satellites Affected**: Satellites in low Earth orbit, such as the International Space Station and Starlink satellites, are also impacted by this drag. They use thrusters to correct their orbits, but these adjustments are expensive.

What is Space Weather?

- Space weather refers to environmental conditions in space caused by the Sun, including solar flares and solar wind. These phenomena can impact satellites, communication systems, and navigation systems both in space and on Earth.
- Solar activity, in particular, can disrupt satellite operations, making it a key challenge for satellite operators to monitor and predict.

What are Solar Flares?

Solar flares are explosive events on the Sun's surface that release large amounts of electromagnetic radiation.

- **Duration**: They can last anywhere from minutes to hours and are seen as bright areas on the Sun.
- Solar flares are the most powerful explosive events in our solar system, and they can significantly affect satellites and astronauts in space by releasing bursts of radiation.

Conclusion :

The Binar Space Program is an important research project, but it also shows how solar activity can affect space missions. The unexpected early destruction of Binar-2, Binar-3, and Binar-4 demonstrates the impact of solar flares and solar wind on satellites in low Earth orbit. As solar activity increases, satellite operators must better understand space weather to protect missions and equipment in space.

MACE Telescope in Ladakh

Why in News?

The Major Atmospheric Cherenkov Experiment (MACE) telescope was recently inaugurated in Hanle, Ladakh. This marks a significant step forward in the field of gamma-ray astronomy. The MACE telescope allows scientists to explore gamma rays with energies exceeding 20 billion electron volts (eV), coming from sources beyond the Milky Way, such as pulsars, blazars, and gamma-ray bursts.

Key Features of MACE:

About MACE :

- **Altitude**: Located at an elevation of approximately 4.3 kilometers, MACE is the highest imaging Cherenkov telescope globally. It is the largest of its kind in Asia and the second-largest worldwide.
- **Technology**: MACE utilizes an Imaging Atmospheric Cherenkov Telescope (IACT) to detect high-energy gamma rays indirectly. When these rays enter Earth's atmosphere, they generate electron-positron pairs, which produce Cherenkov radiation.
- **Cherenkov Radiation**: MACE captures this faint blue light using advanced equipment, making it capable of detecting high-energy cosmic phenomena.
- **Light Collector**: The telescope has a 356 mirror panels arranged in a honeycomb structure, enhancing its stability and reflective area, which contributes to its observational power.

Research Objectives:

- **Cosmic Study**: MACE's primary goal is to study high-energy gamma rays from cosmic sources.

- **Dark Matter Research**: The telescope is aimed at studying dark matter by detecting gamma rays from Weakly Interacting Massive Particles (WIMPs), which may make up much of the universe's mass. It seeks to investigate the potential annihilation events of WIMPs.

Institutions Involved:

- **Bhabha Atomic Research Centre (BARC)**: Contributing to the development and operation of MACE.
- **Indian Institute of Astrophysics (IIA)**: Partnering in the scientific research and operation of the telescope.

Technological Innovations:

- **High-Resolution Camera**: MACE is equipped with a high-resolution camera that features 1,088 photomultiplier tubes. These tubes detect and amplify the faint signals generated by Cherenkov radiation.
- **Clear View from High Altitude**: The telescope's high altitude provides a clear view above atmospheric disturbances, enhancing its observational capabilities.

What is a Telescope ?

A telescope is an optical instrument designed to observe distant objects by collecting and magnifying light or other forms of electromagnetic radiation. There are various types of telescopes:

- **Optical Telescopes**: Used to observe visible light.
- **Radio Telescopes**: Detect radio waves.
- **Gamma-Ray Telescopes**: Capture high-energy gamma rays, such as the ones detected by MACE.

Gamma Rays and Related Health Hazards:

- **Gamma Rays**: These are high-energy electromagnetic waves with the shortest wavelength and the highest energy. Each gamma ray particle possesses more than 100,000 electron volts.
- **Cosmic Origins**: Gamma rays are produced by exotic cosmic objects like rapidly spinning pulsars, supernova explosions, black hole matter whirlpools, and gamma-ray bursts.
- **Health Risks**: Gamma rays can penetrate most materials, including human tissue, and are known to cause health hazards such as radiation sickness, DNA damage, increased cancer risk, and other long-term effects.

Other Similar Telescope Projects :

Indian Astronomical Observatory (IAO) :

- Located in Hanle, this is one of the highest astronomical observatories in the world. Operated by the Indian Institute of Astrophysics (IIA), it includes the Himalayan Chandra Telescope (HCT).

Dark Sky Reserve:

- A Dark Sky Reserve is a designation given to areas where policies are in place to minimize artificial light interference, allowing for better astronomical observations.

High Altitude Gamma Ray (HAGAR):

- Located at 4,270 meters in Hanle, Ladakh, HAGAR is the first high-altitude gamma-ray telescope array. It uses the atmospheric Cherenkov technique and was designed for a low-energy threshold with minimal mirror area.

Giant Metrewave Radio Telescope (GMRT):

- The GMRT consists of 30 fully steerable parabolic radio telescopes, each 45 meters in diameter. Operated by the National Centre for Radio Astrophysics at the Tata Institute of Fundamental Research, it is one of the world's largest radio telescope arrays.

Conclusion :

The MACE telescope represents a monumental leap in India's capabilities in gamma-ray astronomy and cosmic research. By enabling the study of high-energy gamma rays from distant cosmic sources, MACE opens up new possibilities in understanding dark matter, cosmic phenomena, and the fundamental forces of the universe. Located in the high-altitude region of Ladakh, the telescope adds to India's growing presence in the global astronomical community and strengthens its scientific advancements in space technology.

EDITORIALS

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Science & Technology

India Improves Ranking in Network Readiness Index 2024

Key Developments :

- **India's Progress**: India has climbed 11 ranks in the Network Readiness Index (NRI) 2024, now ranked 49th compared to 60th in the previous year (NRI 2023).
- **NRI 2024 Report**: Released on 21st November 2024 by the Portulans Institute, the NRI 2024 evaluates the network readiness of 133 economies based on four pillars:
  1. Technology
  2. People
  3. Governance
  4. Impact
- **Score Improvement**: India's score improved from 49.93 in 2023 to 53.63 in 2024, reflecting significant advancements in digital infrastructure and technology.

India's Achievements in NRI 2024

Indicator	India's Rank (2024)	Details
AI Scientific Publications	1st	India leads globally in the number of AI research publications.
AI Talent Concentration	1st	India has a high concentration of skilled professionals in the AI field.
ICT Services Exports	1st	India is the world leader in ICT services exports.
FTTH/Building Internet Subscriptions	2nd	India ranks 2nd in fiber-to-the-home (FTTH) internet subscriptions.
Mobile Broadband Internet Traffic	2nd	India ranks 2nd for mobile broadband traffic within the country.
International Internet Bandwidth	2nd	India has significant international internet bandwidth capacity.
Domestic Market Scale	3rd	India ranks 3rd for the scale of its domestic market for digital and telecom services.
Annual Investment in Telecommunication Services	4th	India ranks 4th for annual investments in its telecommunications sector.

Other Key Insights:

- **Lower-Middle-Income Countries**: India ranks 2nd in the lower-middle-income group, just after Vietnam.
- **Digital Progress**: India has made remarkable progress in digital transformation and technological innovation, positioning itself as a global leader in telecommunications.

India's Telecom Sector Advancements:

1. **Telecom Infrastructure Growth**:
   - **Tele Density**: Increased from 75.2% to 84.69% over the last decade.
   - **Wireless Connections**: Reached 119 crore (1.19 billion) connections.
2. **Digital India Initiatives**:
   - **Broadband Access**: Expanded broadband connectivity to rural areas through partnerships with tech companies.
   - **Internet Subscribers**: Jumped from 25.1 crore to 94.4 crore (from 251 million to 944 million), with a significant rise in wireless internet usage.
3. **Reforms**:
   - **Spectrum Management**: Improved spectrum management and regulatory frameworks.
   - **Ease of Doing Business**: Streamlined processes to foster a business-friendly environment in telecom.
   - **Consumer Protection**: Strengthened consumer rights and protections in the sector.
4. **Launch of 5G**:
   - **5G Services**: India launched 5G services in 2022, leading to a dramatic rise in mobile broadband speed.
   - **Global Ranking Improvement**: India's mobile broadband speed ranking rose from 118th to 15th globally.
5. **Future Goals**:

   Bharat 6G Vision: India's ambition to lead in 6G technologies, building on existing strengths in telecom infrastructure, data capabilities, and emerging technologies.

Conclusion :

India's rise in the Network Readiness Index (NRI) 2024 reflects its robust progress in the digital and telecommunications sectors. With advancements in AI, 5G, and broadband access, and a focus on future technologies like 6G, India is positioning itself as a global leader in network readiness and digital transformation. The country's performance underscores the success of initiatives like Digital India and the Department of Telecommunications' reforms, boosting India's global standing in tech and telecom sectors.

India's First AI Data Bank Launched to Boost National Security

Overview :

- In November, 2024, the Ministry of Science and Technology launched India's first Artificial Intelligence (AI) Data Bank, aimed at promoting innovation and strengthening the country's national security.
- The initiative provides essential datasets for researchers, developers, and startups, helping them create scalable AI solutions in sectors critical to national development.
- This marks a significant step in India's efforts to harness the transformative power of AI for both technological advancement and national defense.

Key Features of the AI Data Bank Launch

1. Objective and Purpose:

o The AI Data Bank aims to provide high-quality, diverse datasets to support the development of AI models and solutions.

o This will help researchers and developers design AI applications that can address critical challenges, from national security to disaster management and cybersecurity.

o The data bank is particularly focused on real-time analytics of satellite data, drone imagery, and IoT (Internet of Things) data, which can be used to improve intelligence gathering, monitoring, and response strategies related to security.

2. Enhancing National Security:

o The AI Data Bank will play a pivotal role in improving national security through the use of AI for predictive analytics.

o By processing vast amounts of data in real-time, AI can help forecast security threats, assist in defense operations, and improve crisis management.

o One of the core goals is to use AI to enhance the real-time monitoring of critical national assets and infrastructure through the integration of satellite, drone, and IoT data streams.

3. Launch Event and Theme:

o The launch took place at the 7th Edition of the ASSOCHAM AI Leadership Meet 2024.

o The event was centered around the theme "AI for India: Advancing India's AI Development – Innovation, Ethics, and Governance."

o The event provided a platform for policymakers, industry leaders, and experts to discuss how India can use AI to solve pressing issues, while also ensuring ethical, responsible usage in line with governance and data privacy concerns.

4. Strategic Goals of AI in India:

o AI for Development: Minister of Science and Technology, Jitendra Singh, emphasized AI's role in shaping India's future development.

o AI is seen as a backbone for driving economic growth, improving public service delivery, tackling climate change, and ensuring national security.

o The government aims to use AI in disaster management, allowing for better preparedness and more effective response to natural and man-made disasters.

5. Responsible AI Usage:

- Minister stressed that while AI is a powerful tool, it must be used optimally and with responsible handling to avoid misuse and bias.
- He emphasized that AI should serve to empower citizens, ensuring that the technology bridges divides rather than exacerbating them.
- AI Governance: India is focusing on establishing robust frameworks for AI governance, aiming to ensure that AI systems are transparent, fair, and equitable.
- Efforts are being made to address challenges like algorithmic bias and data privacy issues.

6. Impact on Key Sectors: AI is expected to have a transformative impact on multiple sectors including :

- **Governance**: Streamlining decision-making, improving transparency, and increasing citizen engagement.
- **Healthcare**: Enabling better diagnostic tools, personalized medicine, and healthcare management.
- **Education**: Facilitating personalized learning, smart classrooms, and more efficient educational systems.
- **Space Exploration**: AI can help analyze space data, improve satellite operations, and advance space missions.

7. Long-Term Vision:

- The AI Data Bank is part of India's broader vision to become a global leader in AI innovation.
- The government's strategic roadmap envisions AI as a key driver of national progress, capable of solving complex societal problems while enhancing security and economic development.
- The government is committed to inclusive AI that ensures all segments of society benefit from the technology, promoting equitable access and addressing any potential risks associated with technological advancements.

8. Challenges and Future Outlook:

- The development of AI technologies in India faces several challenges, including the need for data privacy safeguards, ethical considerations, and ensuring that AI systems are used in a transparent and inclusive manner.
- As AI continues to evolve, India is positioning itself as a key player in the global AI ecosystem, balancing innovation with responsibility.

Conclusion :

The launch of India's first AI Data Bank marks a significant milestone in the country's efforts to leverage artificial intelligence for national development and security. By making diverse, high-quality datasets available to researchers and developers, India aims to drive innovation while ensuring the responsible use of AI technologies. The initiative aligns with India's vision of becoming a leader in AI-driven solutions, improving sectors such as national security, disaster management, and public service delivery. As AI continues to shape the future, this data bank will be a critical resource for ensuring sustainable and ethical AI development in India.

India to Launch EU's Solar Observatory Satellite Proba-3

- The European Space Agency (ESA) is preparing to launch its Proba-3 mission, a project designed to revolutionize how we observe the Sun.
- The mission will involve two spacecraft flying together in a precise formation and will be launched on December 4, 2024, using the PSLV-XL rocket from India's Satish Dhawan Space Centre.

- Proba-3 will create an artificial solar eclipse, allowing scientists to observe the Sun's outer atmosphere, called the corona, continuously—something that has only been possible for a few minutes during natural solar eclipses.

What Makes Proba-3 Unique?

- **Artificial Solar Eclipse :**
  - The two spacecraft will work together to create a shadow in space that mimics a solar eclipse. This will let scientists observe the Sun's corona without interruption. Normally, the corona is only visible when the Moon blocks the Sun's bright light during a solar eclipse.
  - Sun's corona is the outermost part of the Sun's atmosphere, extending thousands of kilometers above the Sun's visible surface.
  - It's made up of gases, similar to Earth's atmosphere.
  - The corona is usually hidden by the Sun's bright surface, making it difficult to see without special instruments. However, it can be seen during a total solar eclipse, when the moon blocks out the Sun's light. The corona appears as a glowing white light surrounding the eclipsed Sun. It's safe to look at during a total eclipse once the Sun's surface is fully obscured
- **Flying in Formation with High Precision :**

  The two satellites need to stay in formation with incredible precision, keeping the shadow between them as thin as a fingernail. This requires advanced systems to control the satellites' movements, ensuring they stay aligned for up to six hours at a time. This precision will allow scientists to study the Sun in much more detail than ever before.

Launch and Orbital Details

- **PSLV-XL Rocket Launch :**

  The Proba-3 mission will be launched using India's PSLV-XL rocket, a reliable and well-tested launch vehicle developed by the Indian Space Research Organisation (ISRO). The rocket will take the 550 kg Proba-3 satellites into a special orbit that can reach altitudes up to 60,000 km.
- **Why a High Orbit?**

  The satellites will operate at very high altitudes to reduce the pull of Earth's gravity. This will help save fuel and allow the satellites to stay in formation longer—up to six hours in each cycle.
- **Mission Duration :**

  The two satellites will spend up to six hours at their highest point in orbit, where they can stay aligned with minimal fuel use. This helps make the mission more efficient and long-lasting.

Collaboration on Proba-3

- **International Teamwork :**

  The Proba-3 mission is a team effort involving 14 ESA member countries and other space organizations. This collaboration highlights the growing importance of working together in space research.
- **Role of the Royal Observatory of Belgium :**

  The Royal Observatory of Belgium will manage the mission's main scientific tool, ASPIICS (Advanced Space-based Solar Irradiance and Coronal Imaging System). This tool will gather data about the Sun's activity, including how solar events affect space weather, which can impact Earth's communication systems and satellites.
- **Mission Control :**

  The European Space Operations Centre (ESOC) in Belgium will handle the mission's control. The mission team has already completed detailed training to ensure everything goes smoothly once the satellites are in orbit.

Why Proba-3 is Important for Solar Research

- **Continuous Solar Observations :**

  For the first time, scientists will be able to observe the Sun's corona continuously. Normally, the corona can only be seen for a short time during a natural solar eclipse. The data gathered by Proba-3 will help scientists understand the Sun's activity and its effects on space weather, which can influence Earth's technological systems like GPS and satellite communications.

- **Studying Space Weather :**

  Proba-3's findings could help scientists better understand solar flares and coronal mass ejections (CMEs), which are bursts of solar energy that affect Earth's magnetosphere. By studying these events in real-time, scientists can improve their predictions of space weather and prepare for solar storms that could disrupt communication systems and power grids.

Challenges and Solutions

- **Technical and Logistical Issues :**

  The mission faced some challenges, such as problems with installing the batteries. However, these issues have been fixed, and the mission is still on track for its December 2024 launch. This shows how complicated and demanding space missions can be, requiring careful planning and problem-solving.

- **First ESA Launch from India Since 2001 :**

  Proba-3 will be the first ESA mission to launch from India since 2001. This highlights the growing partnership between ESA and ISRO and reflects the global nature of space exploration.

Conclusion :

The Proba-3 mission is a major breakthrough for solar research, offering a unique way to study the Sun's outer atmosphere and space weather. The successful launch aboard ISRO's PSLV-XL rocket will mark an important step in international cooperation and space technology. By providing new insights into the Sun, Proba-3 will deepen our understanding of solar activity and space weather, which has crucial effects on Earth's technology. This mission also strengthens the relationship between Europe and India in the field of space science.

GQ-RCP Platform for HIV Detection : A Breakthrough in Diagnostics

Why in News ?

Researchers at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute under India's Department of Science and Technology, have developed an innovative platform for the early and accurate detection of HIV. The platform, known as GQ Topology-Targeted Reliable Conformational Polymorphism (GQ-RCP), draws inspiration from diagnostics used for SARS-CoV-2 and marks a significant step forward in HIV detection, showcasing the innovative capabilities of India's research community.

Key Features of the GQ-RCP Platform

The GQ-RCP platform leverages the unique properties of G-Quadruplex (GQ) structures to detect HIV-derived DNA, offering several advantages over traditional diagnostic methods:

1. G-Quadruplex (GQ) Structure :

- GQ structures are four-stranded DNA conformations that play vital roles in gene regulation and maintaining genomic stability.
- The GQ-RCP platform uses these structures to target specific DNA sequences associated with HIV, allowing for more precise detection.

2. Enhanced Diagnostic Reliability :

- The platform offers a fluorometric test that targets HIV-specific DNA structures. This enhances the accuracy of HIV detection, reducing the likelihood of false positives — a common issue with many current diagnostic methods.
- Unlike less specific general DNA probes, the GQ-RCP platform's targeted approach promises to improve early detection and diagnostic reliability.

3. Detection Process :

- **The detection process involves:**

  Reverse transcription and amplification of a genomic segment.

  A pH-mediated process that transitions double-stranded DNA into its GQ conformation, enabling more accurate detection of HIV genetic material.

This cutting-edge technology could dramatically enhance the speed and precision of HIV diagnosis, particularly for early-stage infections, and help in reducing the burden on healthcare systems.

What is HIV?

Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system, weakening the body's ability to fight infections and diseases. Understanding the basics of HIV is essential to appreciating the significance of improved detection technologies like GQ-RCP.

HIV Overview :

- **Transmission**: HIV is spread primarily through the exchange of certain bodily fluids, including blood, semen, vaginal fluids, and breast milk.
- **Impact**: HIV primarily targets CD4 cells (a type of white blood cell) which are crucial for immune defense. If untreated, HIV can lead to Acquired Immunodeficiency Syndrome (AIDS), where the immune system is severely damaged, and the body becomes vulnerable to infections and certain cancers.
- **Treatment**: There is currently no cure for HIV, but antiretroviral therapy (ART) can help manage the disease by suppressing the virus and enabling people with HIV to live longer, healthier lives.

The State of HIV Infection in India :

India continues to face significant challenges with HIV, though recent trends show progress in controlling the epidemic.

1. Current Prevalence :

- According to the National AIDS Control Organization (NACO), as of 2021, around 2.4 million people are living with HIV in India, with an adult prevalence rate of 0.22%.
- The India HIV Estimates 2021 report shows a downward trend in new infections, suggesting that prevention and treatment programs are making an impact.

2. Demographic Distribution :

- HIV remains concentrated in high-risk populations:
  - **Female sex workers** : 2.61%
  - **Injecting drug users** : 5.91%
  - **Children under 15** : 3.5% of all infections
  - **Women** : Approximately 39% of the total HIV-positive population.

3. High-Prevalence States :

- The northeast region has the highest adult HIV prevalence:
  - **Mizoram** : 2.70%
  - **Nagaland** : 1.36%
  - **Manipur** : 1.05%
- **Southern states also report significant prevalence:**
  - **Andhra Pradesh** : 0.67%
  - **Telangana** : 0.47%
  - **Karnataka** : 0.46%

The southern states, including Maharashtra, Andhra Pradesh, and Karnataka, have the highest numbers of People Living with HIV (PLHIV).

Government Initiatives for HIV Prevention and Treatment

The Indian government has long recognized the importance of addressing HIV/AIDS, and a range of initiatives have been launched under the National AIDS Control Program (NACP).

1. National AIDS Control Program (NACP)

- The NACP, launched in **1992**, has been a cornerstone of India's fight against HIV. The program has evolved through several phases, focusing on prevention, treatment, care, and support for people living with HIV/AIDS.
  - **Phase I (1992-1999)**: Focused on awareness generation, blood safety, and establishing surveillance systems.
  - **Phase II (1999-2006)**: Expanded targeted interventions for high-risk groups and involved NGOs for implementation.
  - **Phase III (2007-2012)**: Scaled up interventions and strengthened surveillance.

- **Phase IV (2012-2021)**: Integrated HIV services into the public health system with a focus on comprehensive care.
- **Phase V (2021-2026)**: Aims to reduce new HIV infections and AIDS-related deaths by 80% by 2025-26 compared to 2010 levels.

2. Legislative Framework

- **HIV/AIDS Prevention and Control Act (2017)**: This law ensures the protection of the rights of people living with HIV/AIDS, guaranteeing non-discriminatory access to treatment and care.

3. International Support

- India also receives technical assistance and funding from international organizations such as UNAIDS, WHO, and the World Bank, along with private foundations like the Bill & Melinda Gates Foundation, which support efforts in HIV prevention, treatment, and research.

Conclusion :

The GQ-RCP platform represents a groundbreaking advancement in the early and accurate detection of HIV, offering a more reliable and targeted diagnostic tool for healthcare providers. This innovative platform enhances India's ability to manage HIV, complementing ongoing efforts through the National AIDS Control Program and other government initiatives. By improving detection and reducing false positives, the GQ-RCP platform will likely contribute to more effective HIV management and treatment, ultimately helping India in its ongoing battle against the HIV epidemic.

How Lightning Rods Prevent Lightning Strikes from Reaching People

Context :

With climate change making lightning strikes more frequent and deadly, the role of lightning rods in protecting lives and property has never been more important. In India, lightning strikes killed 2,887 people in 2022, highlighting the need for effective protection measures. Lightning rods are a proven technology that helps prevent lightning from reaching people by providing a safe path for the electrical discharge to follow.

1. What is Lightning?

Nature of Lightning:

- Lightning is an electrical discharge between charged particles in a cloud and the ground.
- Normally, the air acts as an insulator, preventing electric charges from moving. However, when the air is subjected to a high voltage (around 3 million volts/meter), its insulating properties break down, and lightning can occur.
- A build-up of electrical charges in the cloud eventually forces the air to conduct the energy, leading to a lightning strike.

Path of Lightning:

- Lightning strikes follow the path of least resistance, meaning it travels towards the object with the highest electric potential in its vicinity.

2. What is a Lightning Rod?

Function:

- A lightning rod is an electrical conductor designed to intercept lightning strikes.
- Lightning rods are typically pointed because pointed objects create stronger electric fields around them, which increases the likelihood of lightning striking them.
- As explained by Adhip Agarwala, an assistant professor at IIT Kanpur, pointy structures (like lightning rods) create stronger electric fields, ionizing the air around them and making them more attractive to lightning.

How It Works:

- The lightning rod offers a direct path for the lightning to travel down to the ground, preventing it from hitting the structure or people.
- Buildings and structures are equipped with a lightning rod, ensuring that the rod is the first point of contact for the lightning as it descends from the cloud.

Why Are Trees Dangerous?

- Trees, while tall, may not always provide a safe or preferred path for lightning because they often have multiple branches and irregular shapes, making it easier for lightning to strike other parts of the tree instead of a lightning rod.

3. Where Does the Current in a Lightning Rod Go?

Path to the Ground:

- Once the lightning strikes the rod, it is channeled down through a conductor wire that connects the lightning rod to the ground.
- The earth acts as a virtually unlimited reservoir of electric charge, absorbing the lightning energy safely and preventing damage to structures or people.

Role of Grounding:

- The wire is grounded deep in the earth, allowing the lightning's charge to dissipate safely into the ground. The earth has such a vast capacity to absorb electric charge that it is considered an infinite reservoir for electrical discharges.
- In electrical grids, lightning arresters are used to divert the high current into lines designed for high currents, protecting sensitive equipment and devices from being damaged by surges.

4. Can Lightning Evade a Lightning Rod?

Factors Leading to Failure:

- A lightning rod may **fail** if it is improperly installed :
  - If it is not at the correct height or angle.
  - If the rod is too close to other structures.
  - If it is corroded, damaged, or improperly grounded.
  - If an electrical discharge from the ground ascends to meet the descending strike, bypassing the rod.

Design and Installation Considerations:

- Engineers have made improvements to ensure that lightning prefers the rod over nearby structures.
  - The rod is positioned to be the first object lightning will encounter on its path downward.
  - Rods are designed to be in a minimum distance from any surrounding objects to maximize the chance of lightning striking them directly.

5. What Dangers Does a Lightning Rod Pose ?

Risks to Proper Functioning:

- The components of a lightning rod must be able to carry the strike safely into the ground. If the wire is bent into a U-shape, the distance between the two ends should be sufficient to prevent the current from arcing (jumping) across and short-circuiting the system.

Grounding Considerations:

- The grounding system must be efficient, meaning the wire should be buried in the earth at a location with high electrical conductivity to ensure the fast dissipation of electric charges.
- In the 1960s, U.S. engineer Herbert Ufer developed a system known as a concrete-encased electrode, which provided a better grounding material than soil.

6. Standards and Safety Guidelines for Lightning Rods

International Standards:

- The International Electrotechnical Commission (IEC) provides guidelines on the design, installation, and maintenance of lightning rods to ensure their effectiveness and safety.
- These standards help engineers identify failure points and outline best practices for designing systems that can safely manage lightning strikes.

Considerations for Risk Management:

- Policymakers and planners must weigh the risk and liability of lightning strikes when considering the installation of lightning rods in various structures.
- Proper maintenance, such as regular inspections for corrosion or wear, is essential to ensure the lightning rod remains effective throughout its life.

Conclusion : The Importance of Lightning Rods

In a world where lightning strikes are becoming more frequent and deadlier due to climate change, lightning rods play a vital role in protecting people and property from the dangers of electrical discharges. By providing a controlled path for lightning to travel safely into the ground, these devices save lives and prevent damage to infrastructure.

LignoSat : The World's First Wooden Satellite

Overview:

A team of Japanese researchers has launched the world's first wooden satellite, LignoSat. This is an experiment to test using wood in space missions, including future exploration of the Moon and Mars.

About LignoSat:

- **Name Origin:** The name LignoSat comes from the word "ligno" (Latin for wood) and "satellite".
- **Developers:** The satellite was developed by a team from Kyoto University and Sumitomo Forestry.
- **Objective:** The goal is to explore using wood as an eco-friendly, cost-effective material in space exploration.
- **Material:** LignoSat is made from magnolia wood, chosen for its strength and durability.
- **Mission:** LignoSat will first be sent to the International Space Station (ISS) aboard a SpaceX rocket from the Kennedy Space Center. Once at the ISS, it will be released to test how well the wood withstands the harsh space environment. The researchers will monitor its performance, looking for signs of strain and how it handles extreme temperatures.
- **Why Wood?**

  Wood is seen as a more environmentally friendly material for satellites. When the satellite finishes its mission and returns to Earth's atmosphere, wood won't cause the same air pollution as metal satellites, which release harmful particles during reentry.

About International Space Station (ISS)

1. Approval & Funding:

(a) **1984 :** The ISS was officially approved by President Reagan and funded by U.S. Congress.

(b) NASA sought international partners, and soon Canada, Japan, and ESA (European Space Agency) joined.

2. Early Development & Design (1984-1993):

(a) Design of the ISS took place from 1984 to 1993, with construction starting in the late 1980s across various countries.

(b) Russia was invited to participate in 1993.

3. NASA-Mir Program (1995–1998):

(a) **Phase 1:** NASA worked with Russia, sending astronauts to Mir Space Station using Space Shuttles.

(i) Mir was the first modular space station to enable semi-permanent human habitation in low Earth orbit.

(ii) It was operated from 1986 to 2001 by the Soviet Union and later by the Russian Federation.

(b) U.S. modified Russian modules to house international experiments, paving the way for the ISS.

4. Phase 2 : Building the ISS (1998 onwards)

(a) ISS Assembly began in 1998 with contributions from NASA, Roscosmos (Russia), ESA, JAXA (Japan), and CSA (Canada).

(b) The ISS is modular—components are launched and assembled in space.

5. International Collaboration :

(a) The ISS is a global project with 5 main agencies : NASA, Roscosmos, ESA, JAXA, and CSA.

(b) Each agency provides specific modules, and the station relies on contributions from all partners to function.

(c) ISS is a platform for space research, including human physiology, materials science, and biological studies.

6. Spacewalks (EVAs):

(a) Spacewalks are critical for ISS assembly, maintenance, and repairs.

(b) Over 260 spacewalks have taken place since 1998, involving astronauts from multiple countries.

7. ISS Technology:

(a) The ISS is the largest man-made object in space, with a pressurized volume of 900 m^3 and a mass of 400,000 kg.

(b) Solar arrays on the ISS generate 735,000 kWh of power annually.

8. Orbit & Operation :

(a) ISS orbits Earth at an altitude of 370–460 km, traveling at 28,000 km/h.

(b) Astronauts experience 16 sunrises and sunsets per day due to the station's rapid 90-minute orbit.

9. International Control :

(a) Primary Mission Control centers in the U.S. and Russia. Additional centers in Canada, Japan, and Europe manage the ISS's activities.

10. Future of the ISS :

(a) The ISS's operational life has been extended until at least 2030, with parts regularly replaced or upgraded to keep it functional.

11. Milestones :

(a) First spacewalk for ISS assembly: December 7, 1998.

(b) New modules added as recently as 2021.

12. Fun Facts :

(a) The ISS has 3 key nodes: Unity, Harmony, and Tranquility.

(b) ISS flies over 90% of the Earth's inhabited areas due to its orbital tilt of 51.6°.

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Ecology & Environment

Turtle Wildlife Sanctuary

Overview:

The National Green Tribunal has criticized officials in Uttar Pradesh for allowing mining in the Turtle Wildlife Sanctuary without proper consideration of environmental impact.

About Turtle Wildlife Sanctuary:

- **Location:** The Turtle Wildlife Sanctuary is in the Varanasi district of Uttar Pradesh, along a 7 km stretch of the Ganga River.
- **Significance:** It is the first freshwater turtle sanctuary in India.
- **Purpose:** The sanctuary was created to protect and help the Indian softshell turtles that live in the Ganga River. These turtles were released into the river as part of an effort to clean up the river by consuming half-burnt human bodies dumped in the water as part of Hindu funeral rites.

Why Turtles Are Important:

- The idea behind releasing the turtles was to naturally help remove the leftover, half-burnt bodies in the river, while also helping to increase the number of Indian softshell turtles, which were in danger of disappearing.
- The **Ganga Action Plan** supported breeding and releasing the turtles into the river.

How the Sanctuary Works:

- **Breeding Center:** The turtles are bred in Sarnath, and once mature, they are released back into the Ganges River.
- **Eggs:** Every year, around 2,000 turtle eggs are collected from rivers like the Chambal and Yamuna and brought to the center for hatching.
- **Other Animals:** The sanctuary is also home to the Gangetic Dolphin and various fish species like Rohu, Tengra, and Bhakur.

Indian Softshell Turtle (Nilssonia gangetica):

- The Indian softshell turtle is one of the largest freshwater turtles and can grow up to 940 mm in size.

- These turtles are omnivores, meaning they eat both plants and animals, including small fish, frogs, birds, and even religious offerings or dead bodies in the river.
- The Indian softshell turtle is found mostly in deep rivers and ponds with sandy bottoms in northern India.
- **Conservation Status:** They are heavily hunted for their meat and oil.

Conclusion:

The Turtle Wildlife Sanctuary plays an important role in protecting the Indian softshell turtles and keeping the Ganga River clean while supporting local wildlife, including dolphins and fish.

Key Facts about Papua New Guinea

Overview:

At the 16th Conference of Parties (COP16) to the Convention on Biological Diversity, environmental groups from Papua New Guinea highlighted the urgent issue of illegal logging. This is damaging one of the most biodiverse areas of the world.

About Papua New Guinea:

- **Location:** Papua New Guinea is an island country in the south-western Pacific. It includes the eastern half of New Guinea (the second largest island in the world) and many smaller offshore islands.
- **Neighbours:**
  - Indonesia to the west
  - Australia to the south
  - Solomon Islands to the south-east
- **Terrain:** The country is mainly mountainous but has some low-lying plains in the southern part of New Guinea.
- **People:** The islands were settled over 40,000 years by people known as Melanesians.
- **Languages:**
  - The official language is English, used for government and business.
  - Tok Pisin is the most widely spoken language in daily life.
- **Government:**
  - Papua New Guinea is a constitutional monarchy, meaning the country has a monarch (currently the British monarch) as head of state, represented by a governor-general.
  - The Prime Minister is the head of government.
- **Rainforests:**
  - The rainforests of Papua New Guinea are incredibly biodiverse, home to rare species like birds of paradise, tree kangaroos, and the Queen Alexandra's birdwing butterfly.
  - These forests cover only 1% of the Earth's land but play a vital role in absorbing carbon and supporting the indigenous communities.
- **Capital :** The capital of Papua New Guinea is Port Moresby.

Central Water Commission (CWC)

Overview :

A report from the Central Water Commission (CWC) shows that glacial lakes and other water bodies in the Himalayan region have grown by 10.81% between 2011 and 2024. This increase, caused by climate change, raises concerns about the risk of glacial lake outburst floods (GLOFs), which can lead to serious floods.

About Central Water Commission (CWC):

- **Purpose:**

  The CWC is a key government organization in India that deals with water resources.
- **Ministry:**

  It works under the Ministry of Jal Shakti, which is part of the Government of India.
- **Headquarters:**

  It is based in New Delhi.

Functions of CWC:

The CWC works on various water-related issues across India, such as:

- Flood control
- Irrigation (using water for farming)

- Navigation (ensuring rivers are safe for transport)
- Drinking water supply
- Water power development (using water to produce energy)

It also works on water conservation, building water projects, and carrying out studies related to water use.

Organization Structure:

- **Chairman:**

  The CWC is led by a Chairman, who also holds the position of Ex-Officio Secretary to the Government of India.

- **Three Main Wings:**

  The work of the CWC is divided into three main sections:

  1. Designs and Research (D&R) Wing
  2. River Management (RM) Wing
  3. Water Planning and Projects (WP&P) Wing

  Each wing is led by a full-time member, who is also an Ex-Officio Additional Secretary to the Government of India.

- **National Water Academy:**

  The National Water Academy in Pune trains engineers from both central and state governments in water management.

What are Glacial Lakes?

- Glacial lakes are large bodies of water that form when glaciers (large masses of ice) melt. When a glacier melts, it creates a depression in the ground, which fills with meltwater, forming a lake.
- **Danger:** As glaciers continue to melt, these lakes can grow larger. Many of these lakes are held in place by unstable ice or loose rocks. If the natural barrier breaks, the water can flood downstream areas, causing what is known as a Glacial Lake Outburst Flood (GLOF).

A Third of Ranthambore's 75 Tigers 'Missing', Rajasthan Sets Up Probe Committee

Why in News?

The Ranthambore Tiger Reserve in Rajasthan, one of India's most renowned tiger habitats, is facing a concerning situation as approximately a third of its tigers are reported missing. This has led to the formation of a three-member inquiry committee to investigate the disappearance. The committee is tasked with examining the situation and recommending measures to address the issue.

What is Ranthambore Tiger Reserve?

The Ranthambore Tiger Reserve is one of the largest and most famous wildlife reserves in Rajasthan, known for its rich biodiversity and being a key sanctuary for the Bengal tiger. Located in the Sawai Madhopur district of Rajasthan, the reserve is part of the Ranthambore National Park, which covers an area of about 1,334 square kilometers.

- **Notable Species**: The reserve is home to a diverse range of wildlife, but it is particularly famous for its population of **tigers**, making it one of the key tourist destinations for wildlife enthusiasts and photographers.
- **Tiger Conservation**: As a part of India's **Project Tiger**, Ranthambore is crucial in the conservation efforts for Bengal tigers, which have faced a sharp decline in numbers due to habitat loss, poaching, and other factors.

Current Situation: Missing Tigers in Ranthambore

As per an internal report, about 25 tigers, which constitute nearly one-third of the total tiger population in Ranthambore, are unaccounted for. The Chief Wildlife Warden of Rajasthan, Pavan Kumar Upadhyay, has taken notice of this alarming situation and has directed the formation of an investigation committee.

Key Points from the Report:

- **Total Tigers in Ranthambore**: There are an estimated 75 tigers in the Ranthambore Tiger Reserve, excluding the recently deceased tigers T-58 and T-86.

- **Missing Tigers**: A report dated October 14 states that 11 tigers have been unaccounted for more than a year, and 14 others have not been spotted for less than a year. This absence has raised concerns regarding their safety and whereabouts.
- **Satisfactory Response**: Despite repeated letters and inquiries by the Chief Wildlife Warden, the response from the Field Director and the management of Ranthambore has been unsatisfactory, prompting the formation of a probe committee.

The Probe Committee's Mandate

The inquiry committee, led by Rajesh Kumar Gupta, Additional Principal Chief Conservator of Forests (APCCF), and supported by Dr. T Mohan Raj and Manas Singh, has been given two months to conduct a detailed investigation. Their task includes:

1. **Investigating the Missing Tigers**: The committee will investigate the possible reasons behind the disappearance of the tigers, whether they have migrated, are unrecorded, or if there are other explanations.
2. **Efforts Made by Authorities**: The committee will examine the actions taken by the **Field Director** and the **Deputy Field Director** to trace the missing tigers and evaluate their effectiveness.
3. **Monitoring Records**: The committee will go through the tiger monitoring records, including camera trap data, pugmarks, and direct sightings, to assess the accuracy of reports and identify gaps in the monitoring system.
4. **Disciplinary Action**: If the committee finds any negligence or mishandling of the situation, they will suggest appropriate disciplinary actions against the concerned officials.
5. **Suggestions for Improvement**: The committee will also provide recommendations to improve the monitoring and tracking systems to ensure such issues are prevented in the future.

Challenges in Tiger Monitoring

1. **Monitoring Methods**:

o The monitoring of tigers in Ranthambore primarily relies on three methods:

  * **Pugmarks** (footprints),
  * **Direct Sightings** (by field staff),
  * **Camera Traps** (photographs).

2. However, the camera traps and direct sightings are considered more reliable. The absence of recent sightings or photographs of certain tigers raises questions about their location or possible migration.

3. **Possible Explanations for Missing Tigers**:

o **Migration**: Tigers in Ranthambore are known to occasionally migrate to other reserves, such as the Kuno Wildlife Sanctuary, located in Madhya Pradesh. It is possible that some of the missing tigers have migrated to other areas in search of new territories.

o **Unseen Areas**: Another possibility is that the tigers are in parts of the reserve that are hard to access or not covered by camera traps, making them harder to monitor.

o **Natural Causes**: While it is not ruled out, the authorities are cautious about jumping to conclusions, stating that these tigers may not have been poached or killed, but their absence could be due to natural reasons like migration or finding unmonitored hiding spots within the reserve.

Concerns Raised by Missing Tigers

1. **Decline in Tiger Population**:

The missing tigers raise concerns about the safety and health of the tiger population in Ranthambore. Any unexplained disappearance could point to poaching, human-wildlife conflict, or problems with the monitoring systems.

2. **Impact on Conservation Efforts**:

The disappearance of tigers without clear explanations can undermine ongoing conservation efforts in the reserve and may negatively affect the reputation of India's wildlife management system.

3. **Management Oversight**:

The lack of timely responses from the Forest Department and Field Director has prompted criticism from the Chief Wildlife Warden, highlighting inefficiencies in wildlife management and monitoring within the reserve.

Importance of Tiger Monitoring and Conservation

1. **National Significance**:

Tigers are not only a symbol of India's wildlife heritage but also play a vital role in maintaining the ecological balance of their habitat. Protecting tigers ensures the conservation of entire ecosystems.

2. **Global Concerns**:

Ranthambore is part of the tiger range countries initiative under Project Tiger, a global commitment to tiger conservation. Any threat to the tiger population in this region would have implications for India's biodiversity and its commitments to international conservation agreements.

3. **Ecosystem Health**:

The health of the tiger population is a key indicator of the overall health of the ecosystem in Ranthambore. The disappearance of tigers could suggest problems such as habitat degradation or the deterioration of prey species.

Way Forward:

1. **Improved Monitoring Systems**:

Ranthambore needs to enhance its monitoring infrastructure, including the expansion of camera traps, improved tracking methods, and better coordination between forest officers, local authorities, and conservationists.

2. **Training and Capacity Building**:

The Forest Department staff, including those stationed at Ranthambore Tiger Reserve, should receive regular training on the latest techniques in wildlife monitoring and data analysis to improve efficiency and effectiveness.

3. **Strengthening Legal Framework**:

There is a need for more stringent measures to ensure the protection of tigers from poaching, and illegal trade, and to address human-wildlife conflict effectively.

4. **Collaborative Conservation Efforts**:

The central and state governments, along with NGOs, local communities, and wildlife experts, should collaborate more closely to protect wildlife and ensure the sustainability of Ranthambore's ecosystems.

Conclusion :

The disappearance of 25 tigers from the Ranthambore Tiger Reserve has raised serious concerns regarding the status of the tiger population in one of India's most iconic wildlife sanctuaries. While the investigation is ongoing, this situation highlights the critical need for enhanced monitoring, better management practices, and a renewed commitment to tiger conservation. The findings of the probe committee will be pivotal in understanding the cause of the missing tigers and ensuring the future of these majestic creatures in the wild.

Black-Footed Ferret : Conservation Efforts and Status

Overview :

Recently, Antonia, a cloned black-footed ferret at the Smithsonian's National Zoo, gave birth to two healthy offspring. This marks an important step in improving the genetic diversity of the species, which is critical for its conservation.

About the Black-Footed Ferret:

- **Family**: It belongs to the weasel family and is the only ferret species native to North America.
- **Characteristics**: Black-footed ferrets are known for being alert, agile, and curious creatures with keen senses of smell, sight, and hearing.
- **Habitat**: They are primarily found in short or mid-grass prairies across the interior of North America, from southern Canada to northern Mexico. They make their homes in the abandoned burrows of prairie dogs, which provide shelter and hunting grounds.

- **Diet**: These ferrets are carnivorous and primarily feed on prairie dogs, though they may also eat ground squirrels, mice, or other small animals.
- **Reproduction**: One unique feature of their reproduction is delayed implantation, where the fertilized egg does not begin developing until conditions are favorable for gestation.

Conservation Status:

- **IUCN**: **Endangered**

  The population of black-footed ferrets has been severely impacted by habitat loss and diseases, particularly the spread of distemper and bubonic plague in prairie dog colonies.
- **CITES**: **Appendix I**

  They are listed in CITES Appendix I, which includes species that are threatened with extinction and require strict international trade controls.

Threats:

- The primary threats to the species are the loss of habitat due to agricultural expansion and human development, and the increase in diseases that affect prairie dogs, their primary food source.
- Additionally, climate change may also be altering their habitat and prey availability.

What are Grasslands ?

- Grasslands are expansive ecosystems characterized by grass vegetation and are typically found in semiarid or arid regions.
- They include savannahs and open prairies, and support a variety of species, including grazers, small mammals, and predators like the black-footed ferret.
- Grasslands are essential habitats for many species and serve as a buffer against climate change due to their carbon sequestration capabilities.

Rare Eurasian Otter Discovered in Pune District for the First Time During Rescue Mission

Context:

- A rare Eurasian Otter (Lutra lutra) was discovered for the first time in Pune District, Maharashtra, during a rescue operation led by the Pune Forest Department and the RESQ Charitable Trust.
- The discovery was made in Indapur, marking the first recorded presence of this species in the area, previously unknown in the region.

1. The Rescue Operation

The Initial Call:

- The rescue operation began after a call was received regarding a civet reportedly trapped in a deep well in Indapur, Pune District.
- Upon arrival, the team realized that instead of the expected civet, they found an unexpected Eurasian Otter, which had fallen into the well.

Team Involvement:

- The operation involved the following personnel:
  - **Forest Guards**: Milind Shinde, Anant Hukire, Shubham Kadu, Shubham Dhaitonde.
  - **RESQ Charitable Trust Team**: Nachiket Awadhani, Prashant Kaulkar, Dr. Shreekanth Deshmukh.
- A rescue plan was devised swiftly, and an auto-trap cage was placed to safely capture the otter, who was unable to escape on its own.
- After six hours of waiting, the otter entered the cage and was rescued successfully.

Transport to Treatment:

The otter was transferred to a RESQ ambulance and rushed to the Wildlife Transit Treatment Centre in Bavdhan, Pune for immediate veterinary care. The rescue team reached the centre by midnight.

2. Significance of the Discovery

First Recorded Sighting:

- The discovery of the Eurasian Otter in Pune District is historically significant, marking the first-ever documented presence of this species in the area.

- Although smooth-coated otters (Lutrogale perspicillata) were recorded in the region decades ago, Eurasian Otters had never been seen until this sighting.

Expert Comments:

- Mahadev Mohite, IFS, Deputy Conservator of Forests, Pune (Territorial), stated that this sighting was unprecedented for Pune, and efforts are now underway to investigate the otter's origin in Indapur, which could help in planning its future care and possible relocation.

3. Eurasian Otter (Lutra lutra): A Rare Species in India

Habitat and Distribution:

- The Eurasian Otter is a solitary, nocturnal species, typically found in clean, freshwater habitats like rivers, lakes, and marshes with abundant fish, their primary food source.
- In India, Eurasian Otters are rare and typically found in the Himalayan foothills, parts of Northeast India, and scattered sightings in the Western Ghats.

Ecological Role:

- As apex predators, Eurasian Otters play a crucial role in regulating fish populations, maintaining ecological balance in river ecosystems.
- Unlike the smooth-coated otter, which is more commonly seen, Eurasian otters are elusive and sensitive to water pollution and habitat disturbance.

Diet:

- Their primary diet consists of **fish**, and they thrive in **pollution-free, unspoiled freshwater ecosystems**.

4. Care and Rehabilitation of the Otter

Current Status:

- The rescued otter is a sub-adult male and is currently housed in a secure enclosure at the RESQ Charitable Trust's facility. The enclosure includes a water body and hides to create a natural environment for the otter to feel comfortable and acclimate.

Monitoring and Veterinary Care:

- The otter is being closely monitored 24/7 using remote vision cameras, and it has been observed to be active at night and feeding well.
- There are no visible signs of major injury, but a comprehensive medical assessment will be conducted once the otter has settled into its new environment.

Future Plans:

- The next steps involve further research on the otter's origin, and after the medical evaluation, the otter's potential rehabilitation and release back into its natural habitat will be assessed.

5. Importance of Conservation

Threats to Otter Populations:

- The Eurasian Otter is classified as Near Threatened by the International Union for Conservation of Nature (IUCN) due to threats like habitat loss, pollution, and illegal hunting.
- Habitat destruction, especially in freshwater ecosystems, is a major concern, as otters are highly sensitive to water pollution and disturbance in their environments.

Conservation Efforts:

- The discovery of the Eurasian Otter in Pune highlights the importance of monitoring wildlife and ensuring the protection of freshwater habitats.
- The rescue operation also underscores the need for community involvement and the role of organizations like RESQ Charitable Trust in wildlife conservation and rescue operations.

6. Way Forward

Research and Monitoring :

- Authorities are conducting further surveys in Indapur and surrounding areas to trace the possible origin of this otter and assess if there are more Eurasian Otters in the region.

Strengthening Habitat Protection :

- Protecting the freshwater ecosystems and ensuring pollution control will be key in conserving otter populations in the region.
- Ensuring the survival of otters requires a concerted effort towards clean water initiatives and preserving natural habitats.

Awareness and Education:

- Public awareness about the importance of otters in the ecosystem and the threats they face is crucial for long-term conservation.
- This discovery can serve as a platform for educating local communities about the importance of preserving their natural environment.

Conclusion :

The discovery of the Eurasian Otter in Pune District is a significant milestone for wildlife conservation in Maharashtra. This rare sighting offers an opportunity to strengthen efforts in protecting freshwater habitats and conserving otter populations in India. The successful rescue and ongoing rehabilitation of this otter also showcase the valuable role played by organizations like RESQ Charitable Trust in wildlife protection.

Lack of Rainfall Impacts Arrival of Migratory Birds in Kashmir Valley's Hokersar Wetland

Context :

The Hokersar wetland, located in the Kashmir Valley, has been experiencing significant ecological challenges due to a lack of rainfall and human-induced pressures. These issues have severely impacted the arrival and sustenance of migratory bird populations that depend on this habitat. As a Ramsar site, Hokersar plays a crucial role in providing refuge to a diverse range of migratory waterfowl species. However, in recent years, climate change and human activity have caused a dramatic decline in both water levels and bird arrivals.

1. What is the Hokersar Wetland ?

Ecological Significance:

- The Hokersar Wetland is a Ramsar site spread across approximately 13.75 square kilometers (down from 18.13 sq km in 1969), making it one of the most important wetland ecosystems in the Kashmir Valley.
- It serves as a vital stopover for migratory birds traveling from regions such as Siberia, China, Central Asia, and Europe.
- The wetland is home to reedbeds, which are crucial for providing food, shelter, and breeding grounds for a variety of bird species, including the little cormorant, common shelduck, and great crested grebe.

Importance for Migratory Birds:

- The wetland offers spawning grounds and nurseries for fish, making it an essential ecosystem for the survival of various species.
- In addition to supporting local bird populations, it provides a critical habitat for about two million migratory waterfowl each year.

2. Impact of Rainfall Deficit on the Wetland

Rainfall Shortage:

- Kashmir is currently facing an 81% rainfall deficit, significantly affecting the region's wetlands.
- The Srinagar district, where the Hokersar wetland is located, has faced a rainfall deficit ranging from 36% to 96% in October in the past few years.
- The lack of water has led to the receding of wetland waters, which usually starts after December-January, but this year, the water shortage began as early as October.

Consequences for Migratory Birds:

- Reyan Sofi, a local birdwatcher, noted that in typical years, over one lakh migratory birds arrive at Hokersar by this time, with numbers reaching millions by March and April. However, this year, only around 500 birds of a few species have been recorded.
- The wetland's role in providing essential habitat for migratory birds has been compromised due to reduced water levels.

3. Additional Human-Induced Pressures

Illegal Sand Mining:

- Illegal sand mining has compounded the wetland's ecological problems, affecting both water flow and habitat integrity.
- Mining activities have widened streams that feed into the wetland, from 15 meters to 30-50 meters, resulting in higher sediment levels in the water, which harms the wetland ecosystem.
- The Sukhnag Nallah and Doodhganga, two streams that supply water to Hokersar, have experienced reduced water flow due to mining activities, further depleting the wetland's water supply.

Encroachment and Sewage Pollution:

- Encroachment and the illegal dumping of sewage have caused significant degradation to the wetland's quality.
- Raja Muzaffar Bhat, a Right to Information (RTI) activist, emphasized that mining and encroachment have exacerbated the challenges, calling for immediate conservation measures.

4. What is Being Done to Address the Issue?

Action by Environmental Activists:

- Activists like Raja Muzaffar Bhat have raised concerns about the increasing encroachment and illegal mining in the region. In October 2021, Bhat highlighted the issue of illegal mining at Shaliganga Nallah, which led to the National Green Tribunal (NGT) halting operations at the site.
- However, ongoing environmental pressures continue to threaten the wetland's delicate balance.

Need for Conservation :

- Local experts and activists are advocating for the conservation and protection of the Hokersar wetland, stressing its importance for both local communities and migratory species.
- The wetland's degradation calls for urgent attention from both the government and local communities to ensure its restoration and long-term protection.

5. Challenges to Conservation Efforts

Changing Climate Patterns:

- Climate change has made erratic rainfall a more common occurrence, complicating conservation efforts.
- The shift in seasonal rainfall patterns is causing increased uncertainty in the timing and amount of water available to wetlands like Hokersar.

Sustainable Solutions:

- Sustainable water management strategies, alongside efforts to halt illegal activities, are essential to restoring the wetland and ensuring its continued role as a crucial stopover for migratory birds.

Conclusion : The Need for Immediate Action

The Hokersar wetland, once a thriving haven for millions of migratory birds, is now struggling due to climate change, rainfall deficits, and human activities such as illegal mining, encroachment, and pollution.

Union Minister Manohar Lal Launches CESL's 'EV as a Service' Programme

- On 10th November 2024, Shri Manohar Lal, the Union Minister of Power and Housing & Urban Affairs, launched the 'EV as a Service' programme by Convergence Energy Services Limited (CESL), a subsidiary of Energy Efficiency Services Limited (EESL), at the Major Dhyan Chand National Stadium in New Delhi.
- This program represents a significant push toward integrating electric vehicles (EVs) into government fleets and aligning with India's broader goals for environmental sustainability and energy security.

EV as a Service Programme:

- **Objective**: The programme is designed to accelerate the adoption of electric vehicles in government ministries, departments, Central Public Sector Enterprises (CPSEs), and other institutions across India.
- **Deployment Target**: CESL aims to deploy 5,000 electric cars within the government sector over the next two years. This ambitious target is part of the government's larger push toward reducing carbon emissions and advancing towards **net-zero emissions by 2070**.
- **Flexible Procurement Model**: The 'EV as a Service' programme offers a flexible procurement model, allowing government offices to choose from a range of EV makes and models based on their specific operational needs. This flexibility ensures that the government can adopt EVs that best suit their fleet requirements.

Contribution to Environmental Sustainability:

- **Carbon Emission Reduction**: By incorporating EVs into government fleets, CESL is playing a crucial role in reducing India's reliance on fossil fuels, thereby lowering carbon emissions and improving energy security.

- **Infrastructure Support**: Along with EV cars, CESL has already deployed nearly 2,000 EVs across India and is also facilitating the deployment of approximately 17,000 electric buses.

CESL's Role in Promoting Electric Mobility:

- **Leadership in EV Adoption**: According to Shri Vishal Kapoor, MD & CEO of CESL, the 'EV as a Service' programme follows the launch of the PM E-DRIVE Scheme, a national initiative aimed at accelerating India's transition to electric mobility.
- The programme is designed to create a collaborative ecosystem that includes manufacturers, fleet operators, policymakers, and users.
- **Long-Term Vision**: CESL is committed to supporting India's goal of a low-carbon economy by creating infrastructure that will serve as a benchmark for sustainable mobility.

EV Exhibition and Rally :

The event also featured an EV exhibition showcasing a variety of electric vehicles, including:

- E-bicycles
- Electric two-wheelers and three-wheelers
- Electric four-wheelers (cars)
- E-tractors
- E-mobile charging vans
- E-cargo pickups
- E-buses and E-trucks

An EV rally with over 100 electric vehicles from various segments was organized to highlight the versatility and scope of e-mobility solutions available in India. The rally emphasized the growing presence of clean mobility options in India and showcased CESL's commitment to sustainable transportation.

Conclusion :

The 'EV as a Service' programme is a major step in India's transition to electric mobility, particularly within government fleets. By deploying electric vehicles at a large scale, CESL is significantly contributing to reducing emissions, enhancing energy security, and supporting India's commitment to a sustainable future. This initiative is expected to have a lasting impact on India's transportation sector and play a vital role in achieving the nation's environmental goals.

Sirpur Lake: A Key Wetland in Indore, Madhya Pradesh

Key Highlights:

- **Recent Action**: Following an order from the National Green Tribunal, the Indore Municipal Corporation and police recently removed encroachments and 30 stalls from the catchment area of Sirpur Lake.

About Sirpur Lake:

- **Location**: Sirpur Lake is a human-made wetland situated in Indore, Madhya Pradesh.
- **Size & Age**: Spanning 670 acres, the lake is over 130 years old. It was created by Maharaja Shivaji Rao Holkar to provide a water supply for the city of Indore.
- **Historical Reference**: The lake is mentioned in the Indore City Gazette of 1908, where it was used for both water supply and recreational purposes.
- **Characteristics**: Sirpur Lake is shallow, alkaline, and nutrient-rich, and it typically floods during the monsoon.

Ecosystem & Biodiversity:

- **Habitat**: The lake supports a rich ecosystem with wetlands, shrub forests, grasslands, and deep and shallow water areas.
- **Fauna**: Sirpur Lake is home to 189 species of birds from 55 families, making it an important site for birdwatching within the city limits. Commonly sighted species include:
  - Painted Stork
  - Bar-headed Goose
  - Eurasian Wigeon
  - Several species of egrets, herons, and kingfishers.
- The lake also hosts a variety of reptiles, insects, butterflies, and fish.
- **Ramsar Site**: Sirpur Lake was designated as a Ramsar Site on January 7, 2022. Ramsar Sites are wetlands of international importance under the Ramsar Convention.

Ramsar Convention:

- The Ramsar Convention is an international treaty aimed at conserving and wisely using wetlands and their resources.
- It was adopted in 1971 in Ramsar, Iran, and came into force in 1975.
- Today, nearly 90% of UN member states are parties to the convention, working together to protect global wetland habitats.

Conclusion :

Sirpur Lake is an important ecological site in Indore, with its rich biodiversity and historical significance. The recent efforts to clear encroachments will help preserve the lake's natural habitat, ensuring it remains a vital part of the city's environment and a key destination for birdwatching and wildlife conservation.

New Male Tiger Spotted in Sahyadri Tiger Reserve

- A new male tiger has been spotted in the Sahyadri Tiger Reserve (STR) in Maharashtra, boosting the morale of wildlife enthusiasts and tourists.
- This marks an important moment for the reserve, as it has been several years since the presence of a tiger was recorded in the area.

Key Details of the Discovery

- **First Tiger Sighted Since 2018**:

  The Sahyadri Tiger Reserve had not recorded a tiger since 2018. However, on December 17, 2023, a tiger was spotted in the reserve. This tiger was initially unidentifiable, and was named 'STR-1'.
- **Ongoing Monitoring of STR-1**:

  Despite heavy rains in the following year, the reserve staff continued to monitor the movements of 'STR-1', confirming that it was still residing within the reserve by 2024.
- **Discovery of STR-2**:
  - On October 24, 2024, a camera trap set up in Chandoli National Park captured an image of another male tiger at 11:46 PM.
  - Upon reviewing the photo, the Tiger Cell research team confirmed that this tiger was different from 'STR-1' and named it 'STR-2'.
- **Previous Sightings of STR-2**:

  Girish Punjabi, a tiger researcher, revealed that 'STR-2' had been photographed earlier in 2022 in Radhanagari, which led to its official identification as 'STR-2'.
- **STR-1's Movement**:
  - The tiger cub 'STR-1' was first spotted in Radhanagari Wildlife Sanctuary in Kolhapur district on April 23, 2022, where it had been living for over two years.
  - The last photograph of STR-1 in Radhanagari was taken on April 13, 2024. Although 'STR-1' has not been spotted since, its continued presence in the region indicated that the Sahyadri Tiger Reserve ecosystem was thriving.

About Sahyadri Tiger Reserve:

- **Location**: It is located in the Sahyadri Ranges of the Western Ghats in Maharashtra.
- It is the northernmost tiger habitat in western ghats, with an area of almost 741.22 sq. km.
- The reserve spreads over Koyna Wildlife Sanctuary, forming the northern portion, and Chandoli National Park, forming the southern part of the reserve. STR was created by merging the areas of these two forests in 2007.
- The central portion of Sahyadri Tiger Reserve is occupied by the "Shivsagar" reservoir of the Koyana River and the "Vasant Sagar" reservoir of the Warana River.
- **History :**
  - The history of the area dates back to the Maratha Empire, and many forts built or captured by the first Maratha Emperor Shivaji Bhonsle can be found here.
  - The legendary temple from which Shivaji received the Bhavani Sword from divine providence is also said to be among the many ruins in this region.
- **Habitat**:
  - The total area of STR is undulating, with steep escarpments along the western boundary.

- The most distinct feature is the presence of numerous barren rocky and lateritic plateaus, locally called "Sadas", with less perennial vegetation and overhanging cliffs on the edges, along with numerous fallen boulders with dense thorny bushes.
- STR is the only place where climax and near-climax vegetation are plentiful and prospects of adverse anthropogenic influence in the future are minimal.

- **Flora:**
  - The forest cover here is that of moist evergreen, semi-evergreen, moist, and dry deciduous vegetation.
  - There are many medicinal and fruit-bearing trees along with the commercial hard wood trees in the reserve.
  - The most common floral species found here are Anjani (Memecylon umbellatum), Jambhul (Syzygium cumini), and Pisa (Actinodaphaone Angustifolia).
- **Fauna**:
  - The main carnivores are the tiger, leopard, and some lesser cats along with the wolf, jackal, and wild dog.
  - The large herbivores are several deer species like Barking Deer, Sambar, and other large and small animals like Indian Bison, Sloth Bear, Mouse Deer, Giant Indian Squirrel, and Macaque.

Conclusion :

The spotting of 'STR-2' in the Sahyadri Tiger Reserve is an encouraging sign for both wildlife conservationists and nature lovers. It demonstrates that the efforts to protect wildlife in the region are succeeding, and the reserve is becoming an increasingly important habitat for tigers in Maharashtra.

Sukhna Lake

The Union Ministry of Environment, Forest and Climate Change has recently issued a notification marking an eco-sensitive zone (ESZ) in the area around Sukhna Wildlife Sanctuary on the Haryana side, stretching from 1 km to 2.035 km.

About Sukhna Lake :

- **Location:** Sukhna Lake is an artificial lake situated in Chandigarh, India, at the foothills of the Shivalik Hills of the Himalayas.
- **Creation:** It was created in 1958 by damming the Sukhna Choe, a seasonal stream descending from the Shivalik Hills.
- **Size:** The lake covers an area of approximately 3 sq.km, with a length of 1.52 km and a width of 1.49 km.
- **Significance:** It has been declared a National Wetland by the Government of India.
- **Catchment Area:**
  - The catchment area of the lake consists of rugged terrain with steep slopes.
  - The soils are primarily alluvial sandy, mixed with clay layers, making it highly susceptible to soil erosion caused by water runoff.
  - The water entering the lake is silt-laden, contributing to the lake's sedimentation.

Sukhna Wildlife Sanctuary:

- **Location:** Adjacent to Sukhna Lake is the Sukhna Wildlife Sanctuary, covering an area of around 26 square kilometers.
- **Wildlife:** The sanctuary is home to a variety of species, including birds, mammals, and reptiles.
- **Migratory Birds:** It serves as a crucial habitat for exotic migratory birds, such as the Siberian duck, Storks, and Cranes, during the winter months.

What are Eco-Sensitive Zones (ESZs) ?

- Eco-Sensitive Zones (ESZs) are areas designated to act as "shock absorbers" for protected areas like wildlife sanctuaries and national parks.
- **Purpose:** They are created to minimize the negative impact of human activities on fragile ecosystems located nearby.
- **Role:** ESZs act as a transition zone, bridging areas that require higher protection with those that need lesser protection.

Panna Tiger Reserve (PTR) : Mass Vaccination of Stray Dogs

Overview :

Mass Vaccination of Stray Dogs: A mass vaccination campaign for stray dogs has commenced in and around Panna Tiger Reserve (PTR), Madhya Pradesh, to curb the threat of canine distemper virus (CDV) infection, which is spreading in wild animals within the reserve.

About Panna Tiger Reserve (PTR):

- **Location**:
  - Situated in the Vindhyan mountain range, in the northern part of Madhya Pradesh.
  - It is the only Tiger Reserve in the Bundelkhand region of India.
- **Area**:
  - The reserve covers 542 sq.km.
  - Declared a Project Tiger Reserve by the Government of India in 1994.
- **Landscape**:
  - Characterized by a 'Table Top' topography with extensive plateaus and gorges.
  - Ken River flows from south to north through the reserve.
- **Historical Importance**:

  The reserve is home to two-thousand-year-old rock paintings.

Flora:

- The reserve is primarily covered by dry deciduous forests interspersed with grassland.
- Teak forests are found in the northern part, while the eastern side is dominated by Teak-Kardhai mixed forests.
- Acacia catachu thrives on the dry, steep slopes of the plateaus.

Fauna:

- **Carnivores**:

  Tigers, Sloth Bears, Leopards, Striped Hyenas, Jackals, Wolves, Wild Dogs, Jungle Cats, and Rusty Spotted Cats.
- **Key Wildlife Link**:

  The Vindhya Hill ranges link the eastern and western populations of wild animals, promoting genetic diversity.

Canine Distemper Virus (CDV) Threat:

- **What is CDV?**

  A contagious and serious disease caused by the canine distemper virus (CDV) that affects the respiratory, gastrointestinal, and nervous systems of dogs and other mammals, particularly carnivores.
- **At-Risk Animals**:
  - Dogs, especially puppies under four months and unvaccinated dogs, are highly vulnerable.
  - Other mammals at risk include ferrets and various carnivores in the wild, such as those in PTR.
- **Transmission**:
  - CDV spreads mainly through aerosol droplets from infected animals, with infected dogs shedding the virus for months.
  - Symptoms include coughing, fever, and discharge from eyes/nose.
- **Prevention**:
  - There is no cure for CDV, and no antiviral drugs exist.
  - Vaccination is the most effective method of prevention.

Conclusion :

The ongoing vaccination efforts in Panna Tiger Reserve are vital to controlling the spread of canine distemper virus, which threatens the local wildlife. The reserve, with its rich biodiversity and unique landscape, plays a crucial role in the conservation of tiger populations and other endangered species.

Nugu Wildlife Sanctuary

Overview:

The National Tiger Conservation Authority (NTCA) has recommended notifying the entire Nugu Wildlife Sanctuary as a core and critical area of the Bandipur Tiger Reserve. However, these recommendations have yet to be implemented.

About Nugu Wildlife Sanctuary:

- **Location**:
  - Situated in the H.D. Kote taluk of Mysuru district, Karnataka.
  - It lies north of Bandipur National Park and is an integral part of the Nilgiri Biosphere Reserve.
- **Geographical Features**:
  - The sanctuary includes the backwaters of Nugu Dam on its western side.
  - It shares borders with Alaganchi State Forest, which is part of Bandipur Tiger Reserve on the southwest side.
  - The Nugu River, a tributary of the Cauvery, flows through the area and is dammed to create the Nugu Dam.
- **Climate**:
  - The region receives rainfall from both the southwest and northeast monsoons.
  - The average rainfall is 1000 mm annually.
- **Vegetation**:

  The forest is primarily composed of southern mixed deciduous trees and dry deciduous scrubs.
- **Flora**:

  Notable tree species include:
  - Dipterocarpus indicus
  - Calophyllum tomentosum
  - Hopea parviflora

Fauna:

- The sanctuary is home to a diverse range of fauna, including:
  - Elephants
  - Tigers
  - Leopards
  - Wild Dogs
  - Striped Hyenas
  - Sloth Bears
  - Gaurs
  - Sambhars
  - Chitals
  - Four-Horned Antelopes
- It also supports two significant riverine species:
  - Smooth-Coated Otter
  - Marsh Crocodile

- What is the National Tiger Conservation Authority (NTCA)?
  - The NTCA is a statutory body under the Ministry of Environment, Forest, and Climate Change (MoEFCC), established in 2005.
  - The NTCA was formed based on the recommendations of the Tiger Task Force and was given statutory status under Section 38L of the Wild Life (Protection) Amendment Act, 2006.
  - Its primary role is to strengthen tiger conservation across India.

Conclusion :

The Nugu Wildlife Sanctuary plays a crucial role in the conservation of tigers and other wildlife in the region. The sanctuary's biodiversity, particularly its tiger population, has made it an important area for conservation efforts, with potential expansion into the Bandipur Tiger Reserve for further protection.

Cao Bang Crocodile Newt

Overview:

The Cao Bang crocodile newt (Tylototriton koliaensis) is a new species of crocodile newt recently discovered in Vietnam's mountainous regions.

About Cao Bang Crocodile Newt:

- **Discovery**:

  Found in Vietnam's mountainous farm regions, specifically at elevations of 3,300 feet or higher.
- **Habitat**:

  This species inhabits mountain forests, where the climate varies from a colder dry season to a warmer rainy season.
- **Physical Features**:
  - **Size**: Medium-sized, about 5 inches in length.
  - **Body**: The newt has stout bodies with rough skin covered in wart-like scales.
  - **Head and Limbs**: It has a large head, with long, thin limbs.
  - **Coloration**:
    * The body is black, with bright orange markings on the fingertips and toes.
    * The stomach is dark gray, with an orange stripe running along the tail.

- **Breeding and Behavior**:
  - The newt breeds during the rainy summer in slow-flowing streams or temporary pools.
  - During the winter, they hide under rocks or cavities.

What is a Crocodile Newt ?

- **Definition**:

  A crocodile newt refers to a genus of salamanders primarily found in Asia. They are named for their rough, textured skin resembling the hide of a crocodile.

- **Physical Features**:

  Typically dark brown or black, with bright orange or red markings on their head, back, and tail.

- **Habitat**:

  Crocodile newts live near slow-moving streams, ponds, or marshes, where they lay eggs and find food.

- **Examples of Crocodile Newt Species**:
  - Tylototriton verrucosus (Himalayan crocodile newt)
  - Tylototriton shanjing (Emperor newt)
  - Tylototriton kweichowensis (Kweichow crocodile newt)
- **What are Salamanders?**
  - Salamanders are amphibians with a slender body and long tail. There are about 500 species of salamanders. They are often described as looking like a combination of a lizard and a frog.
  - They have moist, smooth skin like frogs, and long tails like lizards.

Conclusion :

The discovery of the Cao Bang crocodile newt adds to the rich biodiversity of Vietnam's mountainous ecosystems. This new species is a prime example of the unique amphibians found in Southeast Asia, contributing to our understanding of the region's biodiversity and the importance of conserving these delicate environments.

Guru Ghasidas-Tamor Pingla Tiger Reserve

Overview:

The Guru Ghasidas-Tamor Pingla Tiger Reserve in Chhattisgarh has been officially notified as the 56th Tiger Reserve in India, as announced by the Union Minister for Environment, Forest, and Climate Change.

About Guru Ghasidas-Tamor Pingla Tiger Reserve:

- **Location**:

  Situated in the northern part of Chhattisgarh, it borders Madhya Pradesh and Jharkhand. It is strategically positioned to connect various important tiger reserves.

- **Size and Rank**:

  It is the third-largest tiger reserve in India, following the Nagarjunasagar-Srisailam Tiger Reserve (Andhra Pradesh) and Manas Tiger Reserve (Assam).

- **Connectivity**:

  The reserve is connected to:
  - Bandhavgarh Tiger Reserve in Madhya Pradesh to the West.
  - Palamau Tiger Reserve in Jharkhand to the East.
  - It is also contiguous with the Sanjay Dubri Tiger Reserve in Madhya Pradesh.
- **Geographical Features**:
  - Located in the Chota Nagpur plateau and partly in the Baghelkhand plateau.
  - It serves as the origin of major rivers such as Hasdeo Gopad and Baranga.
  - It is a catchment area for rivers like Neur, Bijadhur, Banas, Rehand, and numerous smaller rivers.
- **Terrain**:

  The tiger reserve is blessed with diverse terrains that include dense forests, streams, and rivers, which provide an ideal environment for supporting a rich variety of wildlife, including tigers.

- **Faunal Diversity**:
  - The reserve is home to 753 species of fauna, including:

    365 invertebrates and 388 vertebrates.
  - The reserve's diverse ecosystems provide critical habitats for tigers and other wildlife.

Other Tiger Reserves in Chhattisgarh:

Chhattisgarh is home to several tiger reserves, including:

1. Udanti-Sitanadi Tiger Reserve
2. Achanakmar Tiger Reserve
3. Indravati Tiger Reserve

What is the National Tiger Conservation Authority (NTCA) ?

- NTCA is a statutory body under the Ministry of Environment, Forests, and Climate Change (MoEFCC).
- It was established under the Wildlife (Protection) Act, 1972, and later amended in 2006.
- **Purpose**: The NTCA is responsible for strengthening tiger conservation in India, with a focus on protecting tiger populations, preserving tiger habitats, and ensuring the effective management of tiger reserves across the country.

Conclusion :

The Guru Ghasidas-Tamor Pingla Tiger Reserve is an important addition to India's network of protected tiger habitats, contributing to both biodiversity conservation and wildlife protection. It plays a vital role in the National Tiger Conservation Programme, working towards the preservation of tigers and other endangered species in the region.

Bhu-Neer Portal

In November 2024, The Bhu-Neer portal was digitally launched by the Hon'ble Minister of Jal Shakti during the closing ceremony of India Water Week 2024. This portal aims to enhance the management and regulation of groundwater resources across India.

About Bhu-Neer Portal

- **What it is**:

  The Bhu-Neer portal is an advanced online platform developed by the Central Ground Water Authority (CGWA), under the Ministry of Jal Shakti, in collaboration with the National Informatics Centre (NIC). It is designed to improve the regulation and management of groundwater resources in India.
- **Key Features**:
  - **One-Stop Platform**: It provides a centralized hub for managing and regulating groundwater resources across the country.
  - **Legal and Regulatory Information**: The portal offers comprehensive details on the legal framework governing groundwater extraction, both at the state and national levels.
  - **Centralized Database**: Users can access important information on groundwater compliance, policies, and sustainable practices.
  - **User-Friendly Interface**: The portal simplifies the process of applying for groundwater withdrawal permits. It features tools like a PAN-based single ID system and NOC (No Objection Certificate) with a QR code for easy verification.
  - **Seamless Regulation**: The portal improves the ease of doing business by providing a faceless and streamlined process for applying for groundwater-related approvals.
  - **Real-Time Updates**: The portal allows project proponents to track their application status, pay statutory charges, and receive clarification on queries related to groundwater withdrawal.
- **Impact**:
  - **Improved Transparency and Efficiency**: By offering a digital interface, Bhu-Neer promotes transparency in the regulation of groundwater resources and encourages sustainable usage practices.
  - **Public Access**: The portal is now live for public use, and all project proponents can visit it for any queries, clarifications, and to track their applications.

What is the Central Ground Water Board (CGWB) ?

- **Definition**:

  The Central Ground Water Board (CGWB) is a government agency in India responsible for the scientific management of the country's groundwater resources. It was established in 1970 and operates under the Ministry of Jal Shakti.

- **Mandate**:

  The CGWB conducts groundwater surveys, monitors water quality, and implements policies related to groundwater conservation and usage across the country.

Conclusion :

The Bhu-Neer portal is a significant step toward digitalizing groundwater management in India. By providing a streamlined, transparent, and user-friendly platform, it facilitates better regulation of groundwater use, contributing to sustainable practices and improving overall groundwater management across the nation.

Tungareshwar Wildlife Sanctuary

Overview :

Recently, the National Green Tribunal (NGT) was informed that media reports claiming the disappearance of wild animals from Tungareshwar Wildlife Sanctuary in Maharashtra due to encroachments were "inaccurate" and "sensationalized." The authorities clarified that the sanctuary continues to be home to diverse wildlife despite some challenges.

About Tungareshwar Wildlife Sanctuary

- **Location**:
  - Situated in Palghar district, Maharashtra, around 75 km from Mumbai.
  - It serves as an important wildlife corridor connecting Sanjay Gandhi National Park (Borivali National Park) and Tansa Wildlife Sanctuary.
- **Size & Terrain**:
  - The sanctuary spans an area of 85 sq. km.
  - It features hilly terrain, dense forests, and small rivers/streams.
- **Vegetation**:

  The sanctuary boasts a diverse mix of ecosystems, including Dry Deciduous, Moist Deciduous, and Semi-Evergreen forests.

- **Flora**:

  The sanctuary is home to several species of trees, such as teak, bamboo, and mango.

- **Fauna**:
  - **Mammals**: Commonly spotted animals include the Leopard, Wild Boar, Barking Deer, Langur, Bonnet Macaque, Rhesus Macaque, and the Black-naped Hare.
  - **Birds**: The sanctuary hosts a variety of birds, including the Crested Serpent-eagle, Jungle Owlet, White-eyed Buzzard, Oriental Honey-buzzard, Emerald Dove, and Heart-spotted Woodpecker.
- **Cultural Significance**:

  The sanctuary is also home to several ancient temples, with the Tungareshwar Temple being the most famous. This temple is dedicated to Lord Shiva.

What is the National Green Tribunal (NGT)?

- **Establishment**:

  The National Green Tribunal (NGT) was established under the National Green Tribunal Act 2010.

- **Purpose**:

  The NGT is responsible for the effective and expeditious disposal of cases related to environmental protection, conservation of forests, and other natural resources.

- **Jurisdiction**:
  - **Principal Seat**: New Delhi.
  - **Other Regional Benches**: Bhopal, Pune, Kolkata, and Chennai.

Conclusion :

Despite recent media claims, Tungareshwar Wildlife Sanctuary continues to thrive as an important biodiversity hotspot in Maharashtra. Its role as a corridor between other protected areas and its rich flora and fauna make it a key conservation area. The NGT's role in overseeing environmental issues is crucial in ensuring the protection of such vital ecosystems.

Ashtamudi Lake

Recent Issue : A fish kill incident in Ashtamudi Lake has highlighted the ongoing environmental threats facing the lake ecosystem, such as:

- Sewage contamination
- Plastic pollution
- Encroachments
- Uncontrolled weed growth

About Ashtamudi Lake

- **Location**: Kollam district, Kerala, India
- **Type**: Ramsar Wetland (internationally recognized for its ecological importance)
- **Topography**: The lake is shaped like a palm, with multiple branches, hence the name Ashtamudi (meaning "Eight braids" in Malayalam).
- **Size**: It is the second-largest lake in Kerala.
- **Outlet**: The lake flows into the sea via the Neendakara estuary.
- **Water Source**: The Kallada River is the major source of water for the lake.

Historical Significance

- **Ancient Port**: Ashtamudi Lake has been historically significant as a port area since the 14th century. It was a key connection point for the ancient city of Quilon (now Kollam) to global trade routes.
- **Ibn Battuta's Accounts**: The Moroccan explorer Ibn Battuta referred to Quilon as a major trading hub, located along the banks of Ashtamudi Lake.

Ecological Importance

- The region is home to a variety of mangrove species, including two endangered species:
  - Syzygium travancoricum
  - Calamus rotang

What is an Estuary ?

An estuary is an area where freshwater from rivers or streams meets the ocean. The mixing of freshwater and seawater creates brackish water (slightly salty). Estuaries are highly productive ecosystems, supporting diverse plant and animal species.

National Dolphin Research Centre (NDRC)

Why in News ?

The National Dolphin Research Centre (NDRC) in Patna, established in 2024, has faced inactivity months after its inauguration. The center remains non-operational due to a lack of necessary equipment and skilled personnel, highlighting significant challenges in the conservation of the Gangetic River Dolphin.

Key Features of NDRC

- **Location**: The NDRC is strategically located near the Ganga River, which is the natural habitat of the Gangetic River Dolphin.
- **Purpose**: The center is dedicated to researching and conserving the Gangetic River Dolphin, focusing on:
  - Dolphin behavior studies
  - Habitat monitoring
  - Addressing conservation threats

Gangetic Dolphin Conservation Initiatives

1. **Project Dolphin**:
   - A nationwide initiative to conserve the Gangetic Dolphin and other aquatic species.
   - The project aims to protect their natural habitats, ensure sustainable populations, and mitigate anthropogenic pressures.
2. **Conservation Action Plan for the Gangetic Dolphin**:
   - Prepared by the National Ganga River Basin Authority (NGRBA).
   - **The plan outlines specific actions to:**
     - Protect habitats of the Gangetic Dolphin.
     - Involve local communities in conservation efforts.
     - Mitigate human-dolphin conflicts.
     - Conduct surveys to monitor dolphin populations and identify threats.
     - Promote awareness among local communities about the importance of dolphin conservation.

Protection Status of the Gangetic Dolphin

- **IUCN**: Listed as Endangered.

- **Indian Wildlife (Protection) Act, 1972**: Schedule I, offering the highest level of legal protection.
- **CITES (Convention on International Trade in Endangered Species)**: Listed in Appendix I, prohibiting international trade.
- **CMS (Convention on Migratory Species)**: Listed in Appendix I, recognizing its need for international conservation cooperation.

Conclusion :

The National Dolphin Research Centre (NDRC) holds significant potential for the conservation and study of the Gangetic River Dolphin. However, its current inactivity highlights the challenges in setting up such specialized institutions. Continued efforts under Project Dolphin and the Conservation Action Plan are critical for the protection of the Gangetic Dolphin, a species facing growing threats due to habitat degradation, human-induced conflicts, and pollution in the Ganga River. The protection status under national and international frameworks reinforces the importance of this conservation effort.

Discrepancies in Satellite Data on Farm Fires

Why in News?

The Supreme Court of India raised concerns over discrepancies in farm fire data collected via satellites, which are essential for monitoring air quality in areas like Delhi, Punjab, and Haryana. In response, the Indian Space Research Organisation (ISRO) acknowledged issues in satellite data accuracy and committed to developing better algorithms for more precise farm fire detection.

Issues with Current Satellite Data on Farm Fires

1. **Accuracy of Data:**
   - NASA's polar-orbiting satellites provide insufficient data for accurately counting farm fires, primarily due to limited observation windows over key regions like Punjab and Haryana.
   - The INSAT-3DR satellite, used by India, offers low-resolution images, which are inadequate for precise detection of farm fires.
   - There is also a lack of calibration and validation of satellite data specific to Indian regions.
2. **Climatic & Temporal Issues:**
   - Cloud cover and water vapor can obstruct satellite sensors, affecting the quality of data.
   - Seasonal changes and discrepancies in time-of-day observations complicate consistent fire detection.
3. **Evasion by Farmers:**

   Farmers time their stubble burning after satellite observation windows, avoiding detection and resulting in underreported farm fire data.
4. **Inconsistent Reporting:**

   Despite concerns, the Commission for Air Quality Management (CAQM) has not made necessary adjustments to the data public, raising transparency issues about the scope of stubble burning.

Need for Accurate Farm Fire Data in India

1. **Impact on Air Quality:**

   Farm fires, especially in Punjab and Haryana, contribute significantly to air pollution in the National Capital Region (NCR), particularly during winter months.
2. **Better Policy Planning:**

   Accurate data helps in timely policy interventions to regulate farming practices and promote alternatives to stubble burning.
3. **Health Risks:**

   Fine particulate matter (PM2.5) from farm fires poses severe health risks, leading to respiratory and cardiovascular issues. Reliable data aids in predicting and mitigating these health risks.

ISRO's Efforts to Improve Satellite Monitoring

- ISRO has recognized that its current data processing algorithms are unsuitable for accurate fire detection in Punjab and Haryana.
- Efforts are underway to improve satellite capabilities, including upgrades to the INSAT-3DS by February 2025.

- Newer satellites like RESOURCESAT-2A, with higher resolution imaging, could offer better monitoring of farm fires and their air quality impact.

What are Farm Fires ?

- Farm fires refer to deliberate burning of crop residue (mainly stubble) after harvest to quickly prepare fields for the next planting season. While cost-effective for farmers, this practice contributes to air pollution and soil degradation.
- **Concerns:**
  - **Air pollution**: Burning releases smoke, particulate matter, and greenhouse gases.
  - **Soil degradation**: Burning destroys essential soil nutrients like nitrogen, phosphorus, and potassium.
- **Crop Residue Management (CRM) Options:**
  - **In-situ Management**: Managing residues directly on the field (e.g., mulching, no-till farming).
  - **Ex-situ Management**: Removing residues for other uses (e.g., biomass power generation, animal feed, composting, industrial uses).

The Commission for Air Quality Management (CAQM)

- Established in 2020, CAQM coordinates air quality management across Delhi NCR and surrounding states. It replaced the Environmental Pollution (Prevention and Control) Authority (EPCA).
- **Powers**: CAQM issues directions, investigates air quality complaints, and formulates action plans for pollution control.
- One of its major initiatives is the Graded Response Action Plan (GRAP), a staged approach to tackling air pollution based on the Air Quality Index (AQI).

Stages of GRAP:

- **Stage I**: "Poor" AQI (201-300) — stricter vehicle enforcement.
- **Stage II**: "Very Poor" AQI (301-400) — limiting diesel generators, hotspot actions.
- **Stage III**: "Severe" AQI (401-450) — vehicle restrictions, school closures.
- **Stage IV**: "Severe+" AQI (>450) — stringent vehicle entry restrictions, possible shutdowns.

India's Crop-Residue Management (CRM) Initiatives

- **National Policy for Management of Crop Residue (NPMCR)**: Launched in 2014, NPMCR promotes the use of technology and machinery for in-situ residue management and provides financial support for innovative projects.
- Technologies like baler machines, bio-decomposers, and satellite-based monitoring play a key role in reducing stubble burning.

Way Forward

1. **Educating Farmers**: Awareness campaigns promoting alternatives to stubble burning and offering incentives for sustainable farming practices.
2. **Promoting CRM Techniques**: Adoption of in-situ and ex-situ methods to reduce reliance on burning.
3. **Revamping Satellite Monitoring**: Use of GEO Imaging Satellites and advanced techniques like high-resolution imagery and machine learning algorithms to improve fire detection accuracy.
4. **Pan-Regional Policy**: A consistent, coordinated policy addressing stubble burning across all affected states is needed to ensure compliance and effective enforcement.

Conclusion :

The issue of discrepancies in satellite data on farm fires points to significant gaps in monitoring systems, affecting the accuracy of air quality assessments and policy interventions. While ISRO is working to improve satellite capabilities, a holistic approach combining technological advancements, farmer education, and better crop-residue management strategies is essential for tackling the challenges posed by farm fires and improving air quality in affected regions.

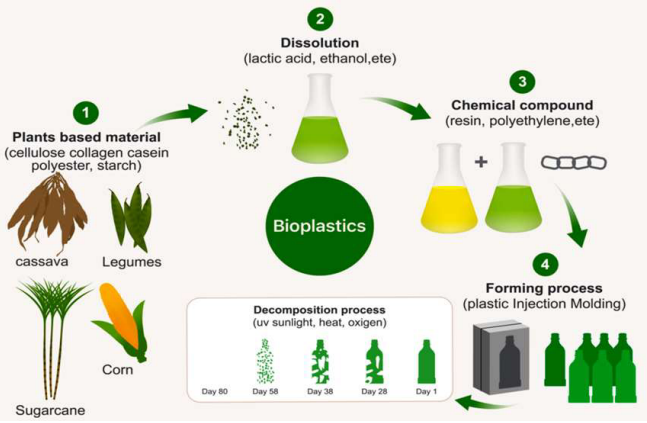
Bioplastics

Context:

In February 2024, Balrampur Chini Mills, one of India's leading sugar producers, announced a Rs 2,000 crore investment to establish India's first bioplastics factory. This move is set to revolutionize India's sugar industry, contributing to environmental sustainability by introducing biodegradable alternatives to traditional petroleum-based plastics. The project not only diversifies the sugar industry but also aims to address the growing concern over plastic pollution.

What are Bioplastics?

Bioplastics are plastics derived from renewable organic sources such as sugarcane, corn, and other plant-based materials, as opposed to traditional plastics that are made from petroleum. While many bioplastics are biodegradable or compostable, this is not always the case, as some may still be durable like conventional plastics.



How are Bioplastics Made ?

- **Polylactic Acid (PLA)**: Derived from sugar extracted from plants like corn and sugarcane, which is then processed into PLA, a common form of bioplastic.
- **Polyhydroxyalkanoates (PHA)**: Produced by microorganisms that convert organic material into biodegradable plastics.

Advantages of Bioplastics

1. **Environmental Benefits**:

o **Carbon Absorption**: The production of bioplastics helps absorb carbon dioxide (CO_2), potentially contributing to a neutral or negative carbon footprint compared to fossil-based plastics.

o **Non-Toxic**: Bioplastics do not contain harmful chemicals like phthalates, which are commonly found in petroleum-based plastics and are hazardous to human health.

2. **Economic Opportunities**:

For sugar companies, bioplastics provide a new revenue stream beyond traditional products like sugar and ethanol. The bioplastics project is expected to generate between Rs 1,700 crore to Rs 1,800 crore annually.

3. **Durability and Versatility**:

Bioplastics are as **strong** and **durable** as conventional plastics, making them suitable for a variety of applications, including:

* Food packaging
* Agricultural films
* Medical supplies

4. **Sustainable Resource Use**:

Bioplastics are produced from renewable resources, reducing the reliance on non-renewable materials like petroleum. This contributes to a more sustainable production model and lowers environmental impact.

Challenges of Bioplastics

1. **Production Costs**:

The cost of producing bioplastics is still relatively higher than that of traditional plastics due to the technology being in its developmental stages.

2. **Raw Material Supply**:

The supply of raw materials, such as agricultural waste and sugarcane, may be limited in certain regions. In India, the increased demand for sugarcane for both sugar production and bioplastic production poses a potential competition, which may lead to resource constraints.

3. **Balancing Agricultural Demands**:

India's sugar industry is expected to face a 4 million tonne decrease in sugar production in 2024-25. As bioplastics compete with sugar and ethanol needs, balancing these demands will be challenging.

Future Outlook for Bioplastics

1. **Technological Innovations**:

   Continued advances in bioplastic production methods will help to reduce costs and improve scalability. Research and development (R&D) will play a critical role in improving the efficiency and cost-effectiveness of bioplastics.

2. **Sustainable Raw Materials**:

   Ensuring a steady supply of raw materials—such as agricultural waste, sugarcane, and corn—will be crucial for meeting the increasing demand for bioplastics.

3. **Consumer Demand**:

   The increasing consumer demand for sustainable, eco-friendly products and packaging will drive the adoption of bioplastics, especially in environmentally conscious markets. As plastic pollution becomes a growing global concern, bioplastics could become a vital solution to mitigate environmental damage.

4. **Regulatory Support**:

   Government support through policies and incentives aimed at promoting sustainable production and green alternatives will further enhance the growth of the bioplastics industry.

Conclusion :

Bioplastics represent a promising alternative to traditional petroleum-based plastics, offering significant environmental benefits by reducing the carbon footprint and avoiding harmful chemicals. The investment by Balrampur Chini Mills is a pivotal step in transforming the sugar industry while promoting sustainability. However, challenges related to cost, raw material supply, and competing agricultural needs must be addressed for the widespread adoption of bioplastics. Continued innovation and growing consumer demand for eco-friendly solutions will likely drive the future of bioplastics in India and globally.

CEA Recognizes Indigenously Developed Surface Hydrokinetic Turbine Technology under Hydro Category

Date of Recognition: 26th November 2024

Recognized by: Central Electricity Authority (CEA)

Technology: Surface Hydrokinetic Turbine (SHKT)

Overview :

The Central Electricity Authority (CEA) has officially recognized Surface Hydrokinetic Turbine (SHKT) technology under the Hydro Category, marking a significant step in promoting renewable energy innovations and achieving India's net-zero emission targets. This recognition underscores the importance of alternate energy technologies in the country's pursuit of sustainable development in the power sector.

Key Details:

1. **What is SHKT ?**

- The Surface Hydrokinetic Turbine (SHKT) technology harnesses the kinetic energy of flowing water to generate electricity. Unlike conventional hydroelectric systems, which rely on potential energy created by dams or barrages to drive turbines, SHKT operates with practically zero potential head—meaning it doesn't require large civil structures to function.
- The kinetic energy is captured directly from the flow of water, making this technology suitable for locations where traditional hydropower solutions are not feasible due to the lack of significant head or height differentials.

2. **How SHKT Works**:

- SHKT turbines are placed on the surface of flowing water bodies, such as rivers, canals, or hydropower tailrace channels, where the flow velocity is sufficient to turn the turbines and generate electricity.
- This technology does not rely on large-scale infrastructure, such as dams or weirs, and can be deployed in locations that are not suitable for traditional hydropower projects.

3. Advantages of SHKT Technology:

- **Cost-Effective**: The generation cost of electricity from SHKT is estimated at ₹ 2-3 per unit, making it an affordable solution for power generation, especially in areas with limited access to grid infrastructure.
- **Ease of Installation**: SHKT systems are easy to install, reducing the time and cost associated with setting up traditional power generation infrastructure. This makes it an ideal option for remote areas or regions with poor grid accessibility.
- **Sustainability**: By utilizing the kinetic energy of flowing water, SHKT technology provides a sustainable and renewable solution for power generation without the environmental impact associated with large-scale hydroelectric projects, such as flooding and displacement.
- **Zero Need for Civil Infrastructure**: SHKT eliminates the need for expensive civil structures like dams, diversion weirs, or barrages, making it a low-cost alternative to conventional hydroelectric power systems.

4. Potential for SHKT in India:

- India has an extensive water infrastructure, including canals, tailrace channels, and other water bodies that could be leveraged for SHKT technology. By utilizing these existing resources, India can boost its renewable energy capacity without the need for major new construction projects.
- The technology has a potential to scale up to gigawatt (GW) levels, allowing for significant contributions to the country's power generation capacity.
- SHKT can play a crucial role in providing base-load, round-the-clock renewable energy to the grid, especially in areas where traditional grid connectivity is weak or unavailable.

5. Impact on India's Power Sector:

- The adoption of SHKT technology represents a significant milestone in India's efforts to transition to cleaner, more sustainable energy sources. It aligns with the country's goals of achieving net-zero emissions and reducing its carbon footprint.
- By tapping into renewable energy from existing water infrastructure, SHKT technology can diversify India's energy mix and help meet the growing demand for sustainable electricity in a rapidly developing nation.
- The technology also supports the government's vision of clean energy transitions and energy security, contributing to long-term sustainable development.

6. CEA's Role in Promoting SHKT:

- The CEA's recognition of SHKT technology highlights its commitment to fostering innovation in the power sector and exploring alternative technologies that can drive the country toward a greener future.
- The CEA has been actively promoting renewable energy innovations as part of India's broader strategy to reduce dependency on fossil fuels and improve the country's energy resilience.

Conclusion :

The recognition of Surface Hydrokinetic Turbine (SHKT) technology by the Central Electricity Authority (CEA) is a pivotal development in India's renewable energy landscape. By harnessing the kinetic energy of flowing water, SHKT presents a cost-effective, scalable, and sustainable solution to meet the nation's growing energy demands, especially in regions with poor grid connectivity.

What is Bar-Tailed Godwit ?

Overview :

In a fascinating natural event, five Bar-Tailed Godwits were recently spotted by a naturalist at Pulicat Lake. This sighting has drawn attention to the remarkable migratory habits and endurance of this bird species.

About the Bar-Tailed Godwit:

- **Scientific Name**: *Limosa lapponica*
- **Type**: Migratory Shorebird
- **Migration**: Known for its extraordinary endurance, the Bar-Tailed Godwit is a world record holder for non-stop migration, capable of flying long distances without rest.

Distribution:

- The Bar-Tailed Godwit breeds in the Arctic regions of northern Europe, Asia, and western Alaska.
- It migrates across vast distances, being found in Africa, the Persian Gulf, India, Southeast Asia, China, and Australia during its non-breeding season.
- In India, the species is observed in winter in Gujarat, Maharashtra, Karnataka, Goa, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, West Bengal, Tripura, and the Andaman and Nicobar Islands.

Remarkable Migration:

- The Bar-Tailed Godwit holds the world record for the longest non-stop flight by a bird. They have been recorded flying 13,500 km from Alaska to Tasmania in only 11 days, flying at an average speed of 50 km/h. During this remarkable journey, they lose almost half their body weight.

Features of Bar-Tailed Godwit:

- **Size**: Large wader birds, with females being larger than males.
- **Appearance**:
  - Mottled brown on the upper body and lighter, uniform buff color on the lower body.
  - White underwings.
  - Long, slightly upturned bill.
  - The tail has a distinctive barred white pattern with brown bars, giving the bird its name.

IUCN Status:

- The Bar-Tailed Godwit is listed as Near Threatened on the IUCN Red List, indicating that it faces potential risks due to habitat loss and climate change.

Pulicat Lake:

- **Location**: Pulicat Lake is the second-largest brackish water lake in India, located on the east coast.
- It spans the borders of Andhra Pradesh and Tamil Nadu and plays a crucial ecological and economic role for the region.

This bird's incredible migration and unique features make it an extraordinary example of nature's resilience. The sighting at Pulicat Lake highlights the importance of preserving such habitats for migratory species.

Siberian Demoiselle Crane

Overview:

A Siberian Demoiselle crane, nicknamed Sukpak, has set a new record by completing the longest migratory flight to Rajasthan, India, covering a distance of over 3,676 km. This remarkable journey highlights the bird's endurance and the importance of migratory routes for such species.

About the Siberian Demoiselle Crane:

- **Scientific Name**: *Anthropoides virgo*
- **Size**: The Siberian Demoiselle crane is the **smallest** species among the crane family.
- **Behavior**: These cranes exhibit both solitary and social behavior patterns. They can be seen alone or in groups, depending on the season and migration route.

Cultural Significance:

- In India, the Siberian Demoiselle crane is symbolically important and is known by local names such as **Koonj** or **Kurjaa**.

Migration:

- **Migratory Patterns**: The Siberian Demoiselle crane is a migratory bird, known for traveling long distances between its breeding grounds and wintering areas.
- **Migration Route**: While most Demoiselle cranes typically pass through Himalayan valleys and enter India via Nepal, the Sukpak crane took a different route, traveling through Russia, Kazakhstan, Turkmenistan, Afghanistan, and Pakistan before entering India via Jaisalmer.

Habitat:

- The Siberian Demoiselle crane inhabits fields, deserts, steppes, and plains, generally in areas close to water sources such as rivers or wetlands.

Distribution:

- These cranes are found in Central Eurosiberia, with a range extending from the Black Sea to Mongolia and Northeast China.
- **Breeding Range**: They breed in Central Eurasia, from the Black Sea region to Northeast China and Mongolia.

- **Wintering Range**: During the winter months, they migrate to the Indian subcontinent and sub-Saharan Africa.

Conservation Efforts in India:

- **Khichan, Rajasthan**: This region has become a key stopover for migratory birds like the Demoiselle crane. Khichan has also been recognized as India's first reserve dedicated to this species.

Conservation Status:

- **IUCN**: The Siberian Demoiselle crane is currently listed as Least Concern on the IUCN Red List, indicating that the species is not immediately at risk.
- **Threats**: Despite their status, these cranes face various threats, including:
  - Drainage of wetlands and habitat loss
  - Illegal pet trade
  - Hunting pressure

What is the role of the International Union for Conservation of Nature (IUCN) ?

The IUCN plays a crucial role in the global conservation efforts by:

- Assessing the conservation status of various species.
- Providing data and analysis on biodiversity trends.
- Offering guidance and frameworks to improve conservation actions and policies globally.

Through the IUCN Red List, it helps to categorize species based on their conservation risk, guiding efforts to protect endangered species and ecosystems.

Himachal Urges Centre to Explore Green Hydrogen Trains on Kalka-Shimla Heritage Track

- On November 4, 2024, Himachal Pradesh Chief Minister Sukhvinder Singh Sukhu appealed to the Central government to consider the possibility of running green hydrogen-powered trains on the Kalka-Shimla narrow-gauge railway.
- This historic railway is not only an important transportation route in Himachal Pradesh but is also a UNESCO World Heritage Site, recognized for its unique mountainous path from Kalka to Shimla.

Call for Green Energy Transformation

- In a letter addressed to Union Railway Minister Ashwini Vaishnaw, Sukhvinder Singh Sukhu highlighted the importance of transitioning the Kalka-Shimla railway to a green hydrogen-powered system.
- The move aligns with the state's ambition to become a "green energy state" by 2026, a goal that is central to Himachal Pradesh's environmental and economic strategies.
- The Chief Minister emphasized that this transition would support Himachal's broader efforts to contribute to India's climate commitments, specifically the Nationally Determined Contributions (NDCs) under the Paris Agreement.
- Additionally, the shift to green energy on this iconic railway would promote sustainable development while enhancing the region's eco-friendly image.

Green Energy Strategy for Himachal Pradesh

The Chief Minister further outlined a 6-pronged strategy that the state government is implementing to turn Himachal Pradesh into a certified green energy state. Key initiatives include:

1. **Transition to Renewable Energy**: The state plans to replace its thermal power consumption of 1,500 Million Units (MUs) with energy from renewable sources such as hydro, solar, and wind power. Currently, Himachal consumes around 13,500 MUs of energy, with a significant portion already derived from renewable sources.
2. **Achieving 90% Renewable Energy Consumption**: By ensuring that 90% of the

energy consumed by the state is sourced from renewables, Himachal Pradesh aims to become a "fully Green State", which would earn it certification as a leader in clean energy.

3. **Solar Power Initiatives**: The state is planning to establish a solar power generation capacity of 2,000 Megawatts over the next four to five years, contributing significantly to its renewable energy targets.
4. **Green Hydrogen Production**: Himachal Pradesh is making strides in green hydrogen production, with the first facility in collaboration with Oil India Limited (OIL) already in progress. The state is also in talks with private investors to establish more such facilities, which could play a crucial role in the green energy transition.

Kalka-Shimla Railway's Significance:

- The Kalka-Shimla railway holds great historical and cultural value, traversing a mountainous route with stunning views.
- In 2008, it was added to the UNESCO World Heritage Site list as part of the Mountain Railways of India, making it an important landmark in the country's heritage and tourism.
- Transforming this iconic railway into a green energy-powered route would not only align with Himachal Pradesh's sustainability goals but also set an example for other regions, combining heritage conservation with modern clean energy solutions.

Conclusion :

Chief Minister Sukhvinder Singh Sukhu's request to the Central government underscores Himachal Pradesh's commitment to achieving its goal of becoming India's first certified green energy state by 2026. By exploring the feasibility of using green hydrogen on the Kalka-Shimla heritage rail line, the state hopes to lead by example in sustainable transportation and energy transition, while continuing to honor its rich heritage. The move is part of a broader effort to reduce carbon emissions, enhance renewable energy usage, and create new economic opportunities for the state.

Greens Alert Forest Minister Khandre About Threat to Elephants in Shettihalli Sanctuary

- On November 9, 2024, Environmental activists raised serious concerns over the growing threat to elephants in the Shettihalli Wildlife Sanctuary in Karnataka, following the death of a young male elephant.
- The elephant died from electrocution after it wandered into a cornfield in Veeragarana Bairanakoppa on November 5, coming into contact with a live wire.
- The field, owned by a local villager, led to the booking of the landowner under the Wildlife Protection Act.

Previous Incidents of Elephants Electrocution

- This tragic incident is not the first of its kind.
- Just 2 years ago, two male elephants met the same accident in the same area.
- The repeated occurrence of such elephant deaths, combined with alleged lapses in the investigations, has raised concerns about the effectiveness of wildlife conservation efforts in the region.

Activists Urge Forest Minister to Take Immediate Action

In light of these incidents, activist Nitin Herale has written to Forest Minister Eshwar B Khandre, urging immediate measures to protect elephants in the sanctuary. Herale's letter outlines several key demands, including:

- A comprehensive survey of the sanctuary's range.
- Identification of encroached areas within the sanctuary.

- Transfer of a veterinarian from the forest department, citing concerns over current management.
- A thorough investigation into irregularities within the wildlife division.
- Restructuring of the elephant camp for better care and management.
- Proper utilization of vehicles for patrolling and monitoring the sanctuary.
- Finalization of the buffer zone to protect wildlife from human encroachment.
- Accountability for farmers who are electrifying their fields, posing a deadly risk to wildlife.

Shettihalli Sanctuary's Biodiversity and Challenges

- The Shettihalli Wildlife Sanctuary, established in 1974, is one of Karnataka's largest and most biodiverse sanctuaries.
- It is home to a variety of wildlife, including elephants, leopards, and sloth bears.
- However, the sanctuary faces significant challenges from human-wildlife conflict, particularly from electrocution deaths of elephants, which endanger the survival of these species.
- The sanctuary's wildlife is also at risk due to encroachments, where human activities increasingly threaten the natural habitats of the animals.
- Environmentalists argue that the repeated incidents, lack of proper investigation, and inadequate protective measures are putting the survival of elephants and other wildlife at significant risk.

Call for Immediate Action :

With the sanctuary being one of the most biodiverse in the state, these alarming deaths have prompted calls for increased attention to the region's wildlife conservation efforts and better management practices to ensure the safety of the elephants and other species living there.

EDITORIALS

Crux of The Hindu & Indian Express

Ecology & Environment

National Fertilizers Ltd (NFL) foray into Nano Liquid Urea Production

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NFL

National Fertilizers Limited

- National Fertilizers Ltd (NFL) is a state-owned enterprise and a leading player in India's fertilizer industry.
- It is the largest urea producer among Central Public Sector Enterprises (CPSEs) in India.
- NFL's primary business includes the manufacturing of a variety of fertilizers, crop protection products, and seeds.
- New Foray into Nano Urea Production: On November 24, 2024, NFL announced its entry into nano liquid urea production at its Nangal plant in Punjab.
- This move marks NFL's commitment to advancing agricultural innovation through the use of cutting-edge nanotechnology.
- The company plans to produce 1.5 lakh (150,000) bottles of 500ml nano urea daily, which will cater to the increasing demand for more efficient, environmentally friendly fertilizers.
- **Field Research:** NFL is conducting extensive field research to assess the effectiveness and acceptance of various nano urea variants currently available in the market, ensuring that the product meets agricultural needs.

What is Nano Urea?

- Nano urea is an innovative nanotechnology-based fertilizer that provides nitrogen to plants, a crucial nutrient for plant growth.
- It is developed by the Indian Farmers Fertiliser Cooperative Limited (IFFCO) and is the only nano fertilizer approved by the Government of India.
- It is included in the Fertilizer Control Order (FCO), which governs the regulation of fertilizers in India.
- Particle Size and Structure: Nano urea has a particle size of 20-50 nanometers (nm), which is much smaller than conventional urea.
- The smaller size gives nano urea a much larger surface area, allowing for better absorption by plants.
- This increased surface area means that nano urea provides 55,000 nitrogen particles in place of just 1,000 nitrogen particles found in a 1mm urea prill.
- **Efficiency:** Nano urea is more efficient than traditional urea because it releases nitrogen more slowly and is more easily absorbed by plants, reducing wastage.
- The gradual release of nitrogen helps plants access nutrients more effectively over a longer period.

Key Benefits of Nano Urea

- **Increased Nutrient Uptake:** Nano urea enhances the efficiency of nitrogen uptake by plants, ensuring that crops receive the necessary nutrients for better growth and productivity.
- **Reduced Nitrogen Loss:** Traditional urea can release nitrogen into the atmosphere as greenhouse gases like nitrous oxide, contributing to air pollution and climate change. Nano urea's slow-release mechanism ensures that nitrogen is utilized by plants rather than being lost to the environment.
- **Environmental Benefits:** The production process of nano urea is energy-efficient, producing fewer carbon emissions and reducing its overall carbon footprint compared to conventional fertilizers.
- **Improved Crop Productivity and Soil Health:** By improving the efficiency of nitrogen use, nano urea is expected to boost crop yields, enhance soil health, and improve the nutritional quality of produce.
- **Balanced Fertilizer Use:** Nano urea addresses the imbalanced and excessive use of conventional fertilizers, helping to maintain healthy soil and reduce the negative environmental impacts of over-fertilization.

National Fertilizers Ltd (NFL) Role in Expanding Agribusiness

- **Expanding Product Range:** NFL has a strong presence in the fertilizer industry and is expanding its reach to include alternative fertilizers like nano urea.
- The company aims to meet the growing demand for more efficient and environmentally friendly fertilizers, helping to sustain agricultural productivity while reducing environmental harm.
- **Commitment to Sustainability:** NFL's move into nano urea production aligns with India's broader goals of promoting sustainable agriculture and achieving self-sufficiency in food production.
- By embracing innovative technology, NFL seeks to support the Indian government's focus on enhancing farm productivity and environmental conservation.

About Indian Farmers Fertiliser Cooperative Limited (IFFCO)

- **IFFCO Overview:** Indian Farmers Fertiliser Cooperative Limited (IFFCO) is India's largest multi-state cooperative society and one of the largest fertilizer manufacturers in the country.
- Founded in 1967, IFFCO began with 57 cooperative members and has grown to include over 36,000 cooperatives across India, making it the largest cooperative federation in the world.
- **Innovation and Contributions:** IFFCO is known for its pioneering work in the development of nano urea and is a key player in India's fertilizer sector.
- As of now, IFFCO's Nano Urea is the only nano fertilizer approved by the Government of India for agricultural use.
- **Focus on Sustainability:** IFFCO is committed to sustainable agriculture and promoting environmentally friendly farming practices.
- Its nano urea product, which is produced through an energy-efficient process, exemplifies this commitment.

Conclusion : NFL's Strategic Shift to Nano Urea

With the launch of nano urea production, National Fertilizers Ltd (NFL) is stepping into the future of agriculture in India. The company's Nangal plant will produce 1.5 lakh bottles of nano urea daily, marking a significant shift in NFL's strategy towards sustainable farming practices.

UAE Launches Global Energy Efficiency Alliance at COP29

Overview:

- At the COP29 summit, hosted in Azerbaijan, the UAE unveiled an ambitious initiative to create the *Global Energy Efficiency Alliance*.
- This initiative aims to double global energy efficiency rates by 2030 and contribute significantly to carbon emission reductions.
- The UAE is positioning itself to lead this global effort, building on the momentum generated by the UAE Consensus at COP28, where countries, organizations, and corporations committed to reducing emissions and promoting sustainable resource use.

Key Objectives of the Alliance:

1. **Doubling Global Energy Efficiency by 2030**: The core goal is to significantly increase energy efficiency worldwide, with a target of doubling the global rate of energy efficiency by the year 2030.
2. **Emissions Reduction**: The initiative will directly contribute to reducing greenhouse gas emissions and mitigate climate change, aligning with global environmental goals.
3. **Sustainable Resource Management**: The alliance will focus on the sustainable use of natural resources, ensuring that energy efficiency efforts are not only effective but also ecologically responsible.

Leadership and Role of the UAE :

- The UAE will take a leadership role in the alliance by sharing its expertise in energy efficiency.
- The country has a strong track record of investing in and advancing energy-efficient technologies and strategies.
- The UAE plans to foster knowledge transfer, enabling countries and organizations worldwide to adopt best practices in energy efficiency.
- The alliance will also focus on developing public-private partnerships, encouraging investment in energy efficiency initiatives by involving both governments and private sector actors.

Strategic Focus Areas :

1. **Knowledge Sharing and Capacity Building**:
   - o A central focus will be the exchange of best practices in energy efficiency across countries and sectors.
   - o This will include technical knowledge, implementation strategies, and success stories.
   - o Capacity building efforts will help countries build the infrastructure and skills needed to improve energy efficiency.
2. **Standardization Efforts**:

   The alliance will work on creating global standards for energy efficiency, helping ensure that efforts in different regions are aligned and effective.
3. **Supporting African Nations**:
   - o A key emphasis will be on assisting African nations, many of which are at the forefront of energy sustainability challenges.
   - o The alliance will provide financing solutions and technological support to help these countries develop and implement energy-efficient systems.
4. **Public-Private Partnerships and Investments**:
   - o The UAE aims to foster strategic public-private partnerships to accelerate energy efficiency projects.
   - o Investment in energy efficiency initiatives will be a priority, with a focus on mobilizing capital for large-scale projects that can drive meaningful change.

Energy Efficiency : What Does It Mean?

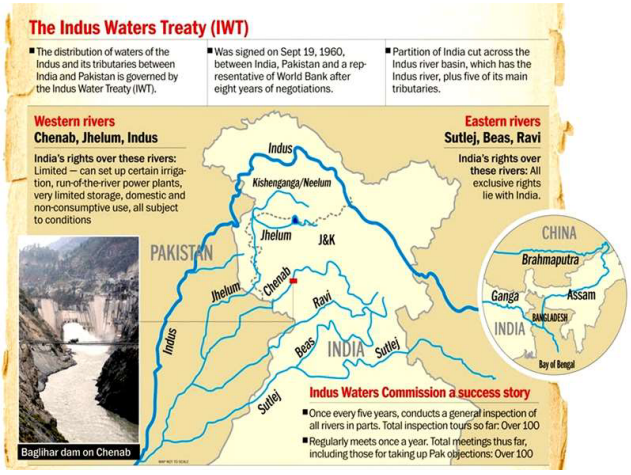
Energy efficiency refers to the practice of using less energy to perform the same task, effectively eliminating energy waste. It is a key strategy in reducing overall energy demand, minimizing environmental impact, and lowering energy costs. By enhancing energy efficiency, countries can achieve several important benefits :

- **Reduction in greenhouse gas emissions**: More efficient use of energy reduces the amount of energy consumed, and thus the emissions associated with energy production.
- **Lower demand for energy imports**: Efficient energy use decreases the need for energy imports, leading to enhanced energy security.
- **Economic Benefits**: By reducing energy consumption, households and economies save money, freeing up resources for other priorities.
- **Environmental Impact**: Improved energy efficiency helps conserve natural resources, reduces pollution, and mitigates climate change.

Conclusion :

The Global Energy Efficiency Alliance, launched by the UAE at COP29, represents a bold and comprehensive effort to accelerate the global transition to energy sustainability. By aiming to double global energy efficiency by 2030, the initiative is not only a critical step in combating climate change but also an opportunity to foster economic growth and social development. Through collaboration, knowledge sharing, and investment in energy-efficient technologies, the alliance will help create a more sustainable and equitable future for all nations, with particular support for Africa's energy challenges.

Anger Mounts in Rajasthan Over Pollution in River Sutlej : Local Leaders Blame Punjab's Industries



Why in News ?

- Protests erupted in Sri Ganganagar, a district in Rajasthan, against the alleged pollution of the Sutlej River, which residents blame on industrial effluent discharges from factories in neighboring Punjab.

- Local leaders and farmers have raised concerns over the health impacts of pollution in the river, which flows through both states.
- Protests included a shutdown of markets and schools in several towns, with demonstrators accusing Punjab's industrial activities, particularly in cities like Ludhiana, for contaminating the water.

Background: The Sutlej River

- **Geography**:
  - The Sutlej River is the longest of the 5 tributaries of the Indus River system.
  - It originates in Lake Rakshastal in Tibet and flows through Himachal Pradesh, Punjab, and into Pakistan before merging with the Chenab River.
- **Hydrological Significance**:
  - The river's course is shaped by snowmelt from the Himalayas and the monsoon rains.
  - The river supports major hydroelectric projects such as the Bhakra Dam, Karcham Wangtoo Plant, and Nathpa Jhakri Dam.
  - The Sutlej and Chenab Rivers together form the Panjnad, which eventually merges with the Indus River in Pakistan.
- **Indus Waters Treaty of 1960**:
  - The Indus Waters Treaty governs water use between India and Pakistan.
  - Under this treaty, the Sutlej, along with the Beas and Ravi rivers, is allocated to India.
  - These waters play a vital role in India's agriculture and energy sectors.

The Pollution Problem: Industrial Effluents and Their Impact

1. **Buddha Nala**:

- Buddha Nala is a seasonal stream originating from the Malwa region of Punjab.
- It passes through Ludhiana, an industrial hub, and eventually drains into the Sutlej River.
- This nala carries industrial effluents, including chemicals, dyes, and leather waste from Punjab's factories, significantly affecting water quality.

2. **Pollution in Sutlej**:

- Protestors claim that the pollution is caused by untreated industrial effluents, primarily from chemical, cloth, and leather industries in Ludhiana and other parts of Punjab.
- Rawinder Singh, an organizer of the protest, stated that despite the establishment of sewage treatment plants (STPs) in Punjab, the impact has been minimal.
- He pointed out that the polluted water causes health problems, including skin diseases and gastrointestinal issues.

3. **Government Response**:

- Rajasthan's Sri Ganganagar District Collector, Manju, acknowledged receiving complaints regarding the presence of heavy metals in the water, but lab tests have not confirmed these claims.
- The local authorities are monitoring the issue and hope for a resolution from both Punjab and Rajasthan state governments.

4. **Political and Public Outcry**:

- Farmer leaders and local political parties, including Rupinder Singh, an MLA from Karanpur (Sri Ganganagar district), have been vocal about the issue.
- Singh stated that despite petitions being filed against Punjab in the National Green Tribunal (NGT), no effective action had been taken.
- The National Green Tribunal had previously fined the Punjab government ₹ 50 crore in 2018 for uncontrolled industrial discharge into the Sutlej and Beas rivers.
- The tribunal had also directed both Rajasthan and Punjab to submit quarterly compliance reports on measures to address industrial pollution.

Key Concerns and Reactions

1. **Environmental and Health Impact**:

- The pollution of the Sutlej River poses a serious environmental threat.
- The river serves as a source of water for irrigation, drinking, and hydropower.

- Contaminated water affects not only human health but also agricultural productivity in the region.
- Reports of heavy metals and industrial chemicals in the river, if true, could lead to long-term damage to the ecosystem and public health in both states.

2. Impact on Local Communities:

- The pollution is affecting the farming communities around Sri Ganganagar district, where agriculture is the main livelihood.
- Poor water quality is leading to crop damage and is increasing the use of costly water treatment methods.
- Public protests and the closure of markets and schools reflect the growing anger and discontent within the community.

3. Role of NGT and Legal Interventions:

- The National Green Tribunal (NGT) has been actively involved in this issue, but there is a growing concern about the lack of implementation of its orders.
- The tribunal's fines and directives have not been effective in curbing the discharge of industrial waste into the rivers.

Potential Solutions and Way Forward

1. Improved Effluent Treatment:

- Both Punjab and Rajasthan need to strengthen the enforcement of environmental laws and ensure that sewage treatment plants (STPs) are functioning effectively.
- The state governments should also encourage upgradation of existing treatment infrastructure to handle industrial effluents.

2. Enhanced Monitoring and Transparency:

- A joint monitoring mechanism involving both state governments and the NGT could improve transparency and ensure compliance with environmental standards.
- Regular independent audits of industrial plants could ensure that they meet pollution control norms.

3. Community Engagement and Awareness:

- Local communities need to be engaged in the process of environmental protection, and their concerns must be heard and addressed effectively.
- This could include organizing awareness campaigns on pollution and its effects on health.

4. Legal Action:

- Stronger enforcement of legal frameworks is needed to ensure that industries do not bypass pollution control measures.
- Continued legal action through the NGT and other forums may be required to hold violators accountable.

Conclusion :

The pollution of the Sutlej River, mainly due to industrial discharge from Punjab, has sparked significant protests in Sri Ganganagar and surrounding areas in Rajasthan. This issue, which has persisted for more than two decades, continues to pose serious environmental and health threats to local communities.

Global Market for Key Clean Technologies Set to Triple to $2 Trillion by 2035: IEA Report

- Recently, The International Energy Agency (IEA) has released a report showing that the global market for key clean technologies is set to more than triple in the next decade, growing from $700 billion in 2023 to over $2 trillion by 2035.
- This growth is driven by the ongoing global energy transitions and the rising demand for clean energy solutions as countries work toward reducing emissions and securing energy supplies.
- The new IEA report, titled Energy Technology Perspectives 2024 (ETP-2024), explores the future of six major clean technologies: solar panels (solar PV), wind turbines, electric vehicles (EVs), batteries, electrolysers for hydrogen production, and heat pumps.

What's Driving the Growth ?

1. Boom in Clean Energy Manufacturing:

- The market for clean technologies is experiencing rapid expansion, with countries investing heavily in manufacturing these technologies.
- This is driven by the need for energy security, economic growth, and the goal of cutting emissions.
- China, Europe, and the United States are currently leading the charge in clean energy manufacturing, though India is increasingly becoming an important player.

2. Global Trade of Clean Technologies:

- As the market grows, trade in clean technologies will also see a sharp increase.
- The value of global trade in clean energy technologies will more than triple over the next decade, reaching $575 billion by 2035—which is more than 50% larger than the current global trade in natural gas.
- This creates a complex relationship between energy, industrial, and trade policies.
- Governments are under pressure to align their trade policies, manufacturing plans, and energy security strategies to capitalize on the emerging clean energy economy.

3. Impact of Government Policies:

- Major policy frameworks like the U.S. Inflation Reduction Act and the EU Net-Zero Industry Act are having a big impact on the growth of clean energy technologies.
- However, China remains the dominant player in global clean tech manufacturing.
- By 2035, China's clean tech exports are expected to exceed $340 billion, on par with the current oil export revenues of Saudi Arabia and the UAE.

Opportunities for Developing Countries

1. Unlocking Potential in Emerging Economies:

- While Southeast Asia, Latin America, and Africa currently account for less than 5% of the value generated from clean tech production, the IEA report highlights significant opportunities for emerging economies.
- Countries in these regions can take advantage of their natural resources, competitive advantages, and strategic investments to become key players in the global clean energy market.

2. Sectoral Opportunities for Developing Nations:

- Southeast Asia could become one of the lowest-cost producers of polysilicon and wafers for solar panels in the next decade.
- Brazil in Latin America could become a leading producer of wind turbines for export to other markets in the Americas.
- North Africa has the potential to become an EV manufacturing hub by capitalizing on its low-cost labor and proximity to European markets.
- Sub-Saharan Africa could leverage its access to green hydrogen and become a major producer of low-emission iron for the steel industry.

3. Strategic Partnerships and Investments:

- For these emerging economies, success will depend on strategic partnerships, increased investment, and the ability to bring down high financing costs.
- The IEA emphasizes that these regions can succeed by leveraging their strengths and integrating into global cleantech value chains.

Global Energy Security Implications

1. Energy Resilience and Supply Chains:

- The shift from fossil fuels to clean energy technologies could actually enhance the resilience of global energy supplies.
- Unlike fossil fuels, which need to be replenished constantly (such as oil and gas), clean energy equipment like solar panels and wind turbines offer a durable stock of energy generation capacity.

  For example, the solar panels from one large cargo ship could generate as much electricity as the natural gas from 50 LNG tankers or coal from 100 bulk ships.

2. Geopolitical Considerations and Energy Security:

- Energy security is also shifting with the rise of clean energy technologies.
- A significant share of the global trade in clean energy technologies passes through key maritime trade routes.
- For example, half of global clean energy tech trade currently passes through the Strait of Malacca—a critical chokepoint in Asia.
- This is far more than the 20% of fossil fuel trade that passes through the Strait of Hormuz, which is traditionally a major energy route for oil and gas.

IEA's Strategic Recommendations

1. Encourage Competition and Innovation:

- While governments are eager to capitalize on the clean energy market, the IEA stresses the importance of ensuring competition in the sector.
- Innovation and cost reduction should be promoted alongside energy and climate goals.
- Governments need to develop policies that support long-term growth while also promoting a competitive and innovative clean energy sector.

2. Balanced Industrial and Trade Policies:

- The report shows the importance of coordinating energy, industrial, and trade policies to ensure that countries can benefit from the opportunities offered by the clean energy transition.
- Trade policies will play a key role in ensuring that countries with advanced clean tech industries can meet the demand in emerging markets, creating a global energy transition that benefits both developed and developing economies.

About International Energy Agency (IEA)

1. Overview

- **Nature**: Autonomous intergovernmental organization.
- **Framework:** Operates within the OECD (Organisation for Economic Co-operation and Development) framework.
  - **OECD (Organisation for Economic Co-operation and Development)**:
    - An international organization comprising 38 countries (as of 2024).
    - **Focus:** Promoting democracy and the market economy.
    - Established on Dec 14, 1960, by 18 European countries, plus the United States and Canada.
    - **Goal:** Shape policies that foster prosperity, equality, opportunity, and well-being for all.
- **Mission**: Works with governments and industry to shape a secure and sustainable energy future for all.

2. Background

- **Creation**: Founded in 1974 in response to the **1973-1974 oil crisis**.
  - **Trigger:** An oil embargo by major oil producers caused a significant spike in oil prices and exposed vulnerabilities of industrialized nations reliant on oil imports.
  - **Initial Goal**: To ensure security of oil supplies.
- **Evolution**: Over time, the IEA's mandate expanded to include:
  - Tracking and analyzing global energy trends.
  - Promoting sound energy policies.
  - Fostering multinational cooperation in energy technologies.
  - Focusing on renewable energy, environmental protection, and climate change.

3. Current Role

- The IEA is the **global energy authority**, offering data, analysis, and solutions on:
  - All energy sources (fossil fuels, renewables, etc.).
  - All technologies (energy production, distribution, efficiency, etc.).

4. Membership

- 31 Member Countries (as of 2024).
- 13 Association Countries and 5 Accession Countries.

- **Criteria for Membership:**
  - Must be an OECD member.
  - Must meet specific requirements, including:
    * Crude oil and/or product reserves equivalent to 90 days of the previous year's net imports.
    * A demand restraint program to reduce oil consumption by up to 10%.
    * Legislation for Co-ordinated Emergency Response Measures (CERM) on a national basis.
    * Mechanisms for oil companies to report data on request.
    * Ability to contribute to collective IEA actions.
- **India's Membership**: India became an Associate Member of the IEA in 2017.

5. Key Reports Published by IEA

- **World Energy Outlook**: Annual flagship publication analyzing global energy trends and projections.
- **World Energy Balances**: Comprehensive database of global energy data.
- **Energy Technology Perspectives**: Focuses on technology innovation and the future of energy systems.
- **World Energy Statistics**: Provides detailed energy data and statistics.
- **Net Zero by 2050**: Pathway report for achieving net-zero emissions by 2050.

Conclusion :

The global market for clean energy technologies is poised for massive growth over the next decade, with the potential to exceed $2 trillion by 2035. As countries transition to cleaner energy sources, the manufacturing and trade of clean technologies will become central to global energy and economic policies. This presents a significant opportunity for both developed and emerging economies, particularly those that can strategically position themselves in the clean energy supply chain.

COP16 Ends in Disarray : Despite Breakthroughs, Key Issues Left Unresolved

1. The 16th Conference of Parties (COP-16) to the Convention on Biological Diversity (CBD) took place in Cali, Colombia from October 21 to November 1, 2024.
2. During this conference, India launched an updated National Biodiversity Strategy and Action Plan (NBSAP) to align with the Kunming-Montreal Global Biodiversity Framework (KMGBF).
3. **COP16 Theme :** Peace with Nature.

The 16th meeting of the Conference of the Parties (COP16) to the Convention on Biological Diversity (CBD) ended in confusion and indecision on Saturday after almost 12 hours of negotiations. The summit aimed to address critical issues about biodiversity conservation and protecting nature. While some important agreements were made, key issues remained unsolved, meaning countries will have to continue talks at a meeting in Bangkok in 2024.

Background of the Convention :

- **Previous Meetings:** COP-15 held in Montreal, Canada, in 2022, resulted in the Kunming-Montreal Global Biodiversity Framework (KMGBF).
- **30-by-30 Agreement:** One of the main outcomes from COP-15 was the commitment to protect 30% of the world's lands and waters by 2030.

  Currently, less than 17% of terrestrial areas and about 10% of marine areas are protected.

Key Goals of the KMGBF

The KMGBF established 23 global action-oriented targets, which include :

1. **30-by-30 Protection Goals:** Conserve at least 30% of lands and oceans by 2030.

2. **Invasive Alien Species:** Reduce their introduction by 50% and mitigate their impacts by 2030.
3. **Pollution Control:** Minimize pollution risks to tolerable levels by 2030.
4. **Benefit-Sharing Mechanism :** Develop mechanisms for sharing benefits derived from digital sequence information (DSI) related to genetic resources and traditional knowledge.
5. **Integration of Biodiversity :** Mainstream biodiversity considerations into policies, regulations, planning, and development processes.

Kunming-Montreal Global Biodiversity Framework (KMGBF)

- **Purpose :** A multilateral treaty aimed at halting and reversing biodiversity loss globally by 2030, adopted during the 15th Conference of the Parties in December 2022.
- **Support for SDGs:** The KMGBF is designed to support the Sustainable Development Goals and builds on achievements from the 2011–2020 Strategic Plan for Biodiversity.

Goals and Objectives

- **Restoration Targets:** Aims for the effective restoration of at least 30% of degraded terrestrial, inland water, marine, and coastal ecosystems by 2030.
- **Action-Oriented Targets:** Includes 23 global targets focused on urgent action needed to reverse biodiversity loss.

Long-Term Vision

- **Collective Commitment:** Envisions a commitment to living in harmony with nature by 2050, providing foundational guidance for current and future biodiversity conservation efforts.

Key Developments and Breakthroughs at COP16:

- **Global Tax on Genetic Data from Nature: Cali Fund**
  - Genetic data from nature (called Digital Sequence Information, or DSI) is increasingly used in products like medicines but has often been accessed without payment. A major agreement at COP16 was the decision to introduce a global tax on companies that profit from using this data.
  - **Criteria for Companies**: Companies will need to meet two out of three criteria :
    * Sales of over $50 million.
    * Profits of over $5 million.
    * $20 million in total assets.
  - **Contribution to DSI Fund**: Companies meeting these criteria will have to contribute 1% of their profits or 0.1% of their revenue to the DSI fund.
  - **Potential Fund Size**: The fund could raise more than £1 billion (about $1.25 billion) each year for nature conservation.
  - **Benefit to Indigenous Communities**: At least 50% of the fund will go to Indigenous communities involved in conservation work, ensuring that poorer countries benefit from the use of their natural resources.
- **Indigenous and Local Communities' Permanent Role in Decision-Making :**
  - A significant achievement at COP16 was the decision to give Indigenous peoples and local communities a permanent role in the UN biodiversity process. This means they will no longer need to rely on governments to represent their interests in environmental talks.
  - For over 20 years, Indigenous groups had only an informal role, but now they will be able to participate in discussions directly. This is the first time any UN environmental body has taken such a step.
  - **Inclusion of Afro-descendant People**: The decision also includes Afro-descendant communities—people of African descent living in the Americas—giving them formal recognition in biodiversity decision-making.
- **Failure to Raise $200 Billion Annually for Biodiversity Protection**:
  - One of the main goals of COP16 was to agree on a plan to raise $200 billion every year by

2030 to protect nature. This target was set in 2022 but no clear plan was made to achieve it.

- **$20 Billion Pledge for Poorer Countries**: Richer countries had promised to give $20 billion each year to help poorer countries protect biodiversity, but this goal was not met, leaving developing nations frustrated.
- **Frustration from Developing Countries**: Representatives from countries like Sierra Leone expressed anger, saying that governments can easily raise money for crises like pandemics and wars, but are not willing to provide similar funding to protect the planet's nature.

- **No Progress on New Finance Mechanism**:
  - Poorer countries, especially those in Africa and Brazil, called for a new way to distribute biodiversity funds. The current system, managed by the Global Environment Facility (GEF), is seen as difficult to access and controlled by richer nations. This issue was not resolved at COP16.
  - Countries from the Global South argued that a fairer and more transparent system was needed to ensure that all nations have access to the financial resources they need.
- **No Agreement on How to Monitor Progress**:
  - One of the most critical issues that remained unresolved at COP16 was how to monitor progress on the 23 biodiversity targets set at COP15 in Montreal (2022). Despite having a draft monitoring framework agreed upon by most countries, COP16 ran out of time to formalize it.
  - Without a clear system for tracking progress, the risk is that these targets, which aim to halt biodiversity loss, will remain unmonitored and therefore unachievable.
- **National Biodiversity Targets:**
  - **Submissions**: Out of the CBD's 196 Parties, 119 countries submitted national biodiversity targets to help achieve the 23 targets outlined in the KMGBF.
  - **NBSAPs**: As of now, 44 countries have submitted National Biodiversity Strategy and Action Plans to support these targets.
- **Synthetic Biology**
  - **New Thematic Action Plan**: Introduced to address inequities through capacity-building, technology transfer, and knowledge-sharing among developing countries.
  - **Definition**: Synthetic biology involves using engineering principles to create new organisms or modify existing ones through techniques such as DNA sequencing and genome editing.
- **Invasive Alien Species**
  - **Guidelines**: Proposed guidelines for managing invasive alien species, which include creating new databases, enhancing cross-border trade regulations, and improving coordination with e-commerce platforms.
- **Global Action Plan on Biodiversity and Health**
  - **Approval**: A Global Action Plan was approved to address the emergence of zoonotic diseases, prevent non-communicable diseases, and promote sustainable ecosystems.
  - **One Health Approach**: Embraces a holistic approach recognizing the interconnected health of ecosystems, animals, and humans.

Challenges and Criticism of COP16 Negotiations

1. **Time Problems**:

- Many delegates from developing nations, such as Fiji, were forced to leave early because they could not afford to change their flight schedules.
- This impacted the legitimacy of decisions made at the summit, with some fearing that the lack of quorum for critical votes may undermine agreements reached during the summit.

2. **Weak Leadership from Richer Countries**:

- Oscar Soria of the Common Initiative think tank criticized countries like the European Union, China, Canada, Switzerland, Japan, and the UK for not taking strong action. These countries had been instrumental in setting the targets at COP15 but did not show the leadership needed at COP16.

- The European Union and countries like France were particularly criticized for not advancing key actions like changing harmful subsidies, increasing protected areas, or implementing national biodiversity plans.

3. Disappointing Results on Financial Commitments:

- Bernadette Fischler Hooper from WWF called the lack of progress on financial commitments "disappointing". She said that the summit ended on a negative note with few concrete results.
- While many officials and countries talked about the need to increase funding for biodiversity, there was no clear plan for how to achieve the promised $200 billion in annual funding, leaving the biodiversity crisis still underfunded.

4. Inability to Meet Funding Promises:

- The $200 billion annual funding goal for 2030, and the $20 billion pledge from richer countries, were not achieved. Delegates from poorer countries expressed concern that rich nations were not keeping their promises and that financial resources were not being mobilized fast enough to protect the planet's nature.
- Jiwoh Abdulai, Sierra Leone's Environment Minister, pointed out that governments can mobilize funds quickly for health crises or wars, but are failing to do the same for the environmental crisis.

Key Decisions (and Missed Opportunities) at COP16

1. Agreement on Tax for Genetic Data Use:

The DSI tax on companies using nature's genetic data was one of the few successes at COP16. The tax could generate over $1 billion annually, helping fund nature conservation. However, the voluntary nature of the agreement means that countries will need to implement it within their own laws, and there are no guarantees that all countries will do so.

2. Indigenous Rights and Representation:

Giving Indigenous communities a permanent role in biodiversity decision-making was hailed as an important achievement. This ensures that these communities will have a formal voice in discussions, helping ensure their rights are respected in environmental decisions.

3. Failure to Agree on Financial and Monitoring Systems:

While there was some progress on the DSI tax, COP16 failed to agree on how to finance biodiversity protection or how to track progress towards the targets. The lack of agreement on these issues left many important questions unanswered.

Global Reactions and Criticism

- Brian O'Donnell, director of the Campaign for Nature, emphasized that the summit lacked the urgency needed to tackle the biodiversity crisis. He warned that business as usual will not solve the problems facing the planet.
- Catherine Weller from Fauna & Flora also expressed frustration, saying that while the agreement on the DSI tax was a step forward, the lack of progress on funding and tracking meant that biodiversity targets are still in danger of being ignored.

India's Contribution to COP-16:

India has been actively involved in the CBD processes, with a delegation led by Minister of State for Environment Kirti Vardhan Singh.

Key highlights from India's participation include:

1. Updated Biodiversity Plan:

- India plans to spend approximately ₹ 81,664 crore (around $10 billion) on biodiversity and conservation initiatives from 2025 to 2030.
- From 2018 to 2022, the country invested ₹ 32,207 crore (about $4 billion) in biodiversity efforts.

2. Funding Requirements:

- To meet future financial requirements for biodiversity initiatives, India emphasized the need for funding beyond regular government allocations.
- Indian officials stressed that international financial support would be essential to achieve the targets outlined in the KMGBF.

- Target 19 of the KMGBF calls for mobilizing $200 billion per year for biodiversity, including $30 billion through international financing.

3. Significant Conservation Initiatives:

- India highlighted its establishment of the International Big Cat Alliance, which aims to protect seven major big cat species, reflecting a commitment to global wildlife conservation.
- The number of Ramsar sites in India has increased from 26 to 85 since 2014, with projections to reach 100 soon.
- These sites are wetlands recognized for their ecological significance.

onclusion : A Missed Opportunity for Urgent Action

COP16 ended with some successes but also significant failures. Key decisions, like the DSI tax and giving Indigenous communities a permanent role, marked progress. However, the summit did not deliver on key issues like funding for biodiversity protection or monitoring systems to track progress.

Convention on Biological Diversity :

- **Origin**: The Convention was opened for signature in 1992 at the United Nations Conference on Environment and Development (Rio Earth Summit).

  The Convention on Biological Diversity (CBD) entered into force on 29 December 1993.
- **Secretariat:** Montreal, Canada.
- **Ratification:** The CBD has been ratified by 196 nations, making it one of the most widely adopted international treaties.

  The United States is the only UN member state that has not ratified the convention.

The UN Convention on Biological Diversity (CBD) 1993

- Legally binding treaty to conserve biodiversity
- CBD Conference of Parties is the governing body of the Convention

MEETINGS OF THE CONFERENCE OF THE PARTIES

- **COP 1 (1994):** Nassau, Bahamas—
  Proposed 29 December as International Day for Biological Diversity.
- **EXCOP 1:** First Extraordinary Meeting of the Conference of the Parties—
  - At Cartagena, Colombia (Feb 1999) & Montreal, Canada (Jan 2000)
  - Adoption of Cartagena Protocol on Biosafety
- **COP 5 (2000):** Nairobi, Kenya—
  UNGA adopted 22 May as International Day for Biological Diversity.
- **COP 6 (2002):** The Hague, Netherlands—
  Global Taxonomy Initiative, Global Strategy for Plant Conservation adopted
- **COP 8 (2006):** Curitiba, Brazil—
  Global Biodiversity Outlook (GBO) Report 2 (GBO 1 in 2001)
- **COP 10 (2010):** Nagoya, Japan—
  - Nagoya Protocol (Access to Genetic Resources and Fair & Equitable Sharing of Benefits) adopted.
  - Strategic Plan for Biodiversity 2011-20 and Aichi Biodiversity Targets.
- **COP 11 (2012):** Hyderabad, India—
  - GBO 3
- **COP 14:** Sharm El-Sheikh, Egypt.

COP 15 :

PHASE-I

- **Theme:** Ecological Civilization: Building a Shared Future for All Life on Earth.
- Held in Kunming, China (October 2021)
- Kunming Biodiversity Fund.

PHASE-II

- Held in Montreal, Canada
- Adopted Post 2020 Global Biodiversity Framework
  - 4 goals & 23 targets to be achieved by 2030.
  - 30 by 30 Target - restore 30% degraded ecosystems and protect at least 30% of the world's lands, oceans and coastal areas by 2030.
- No single country met all 20 Aichi targets (expired in 2020) within its own borders.

❐❐❐

Geography

India's Commitment to the Sendai Framework for Disaster Risk Reduction

On November 1, 2024, P.K. Mishra, the Principal Secretary to Prime Minister Narendra Modi, reaffirmed India's commitment to the Sendai Framework for disaster risk reduction at the G-20 Disaster Risk Reduction (DRR) Working Group ministerial meeting held in Belem, Brazil. Mishra emphasized the need for increased international collaboration in technology transfer, knowledge sharing, and sustainable development to enhance disaster resilience globally.

The Sendai Framework for Disaster Risk Reduction (DRR)

The Sendai Framework, adopted by the United Nations in 2015, aims to reduce disaster risks worldwide. Its core objectives include:

- Reducing disaster risk and losses in terms of lives, livelihoods, health, and economic, social, cultural, and environmental assets.
- Protecting people, businesses, communities, and countries from the devastating effects of natural and man-made disasters.

The framework encourages countries to implement disaster risk reduction (DRR) policies, ensure preparedness, and reduce the vulnerability of communities to disasters.

India's Leadership in Global Disaster Risk Reduction

India has been taking proactive steps to reduce disaster risks, both domestically and internationally. In the recent G-20 meeting held in Brazil, P.K. Mishra led a high-level Indian delegation. Here are the key takeaways from India's role in global DRR efforts:

- **Ministerial Declaration**: The Indian delegation played a key role in achieving consensus on the first ministerial declaration on disaster risk reduction.
- **Disaster Risk Reduction Working Group**: The working group was established at India's G-20 presidency in 2023. This group focuses on fostering global cooperation in disaster risk management.

India's Five Key Priorities in Disaster Risk Reduction

During the meeting, Mr. Mishra highlighted India's proactive approach to disaster risk reduction based on the following five key priorities:

1. **Early Warning Systems**
   India has invested heavily in early warning systems to predict disasters and minimize their impact on communities.
2. **Disaster-Resilient Infrastructure**
   Emphasizing the need for infrastructure that can withstand the impact of natural disasters, India has focused on building resilient cities and infrastructure.
3. **Disaster Risk Reduction Financing**
   Increasing financial resources to fund disaster mitigation efforts and improving access to financing for disaster-affected regions.
4. **Resilient Recovery**
   Ensuring that affected communities can recover quickly and effectively after disasters, with a focus on long-term resilience.
5. **Nature-Based Solutions**
   Promoting sustainable, nature-based approaches to disaster management, such as reforestation, wetland restoration, and floodplain management.

India's Global Initiatives: Coalition for Disaster Resilient Infrastructure (CDRI)

Another significant initiative shared by P.K. Mishra at the meeting was India's Coalition for Disaster Resilient Infrastructure (CDRI). Launched by Prime Minister Modi, the CDRI has become a global platform for ensuring disaster-resilient infrastructure.

- **Membership**: As of 2024, the CDRI includes 40 countries and seven international organizations as members.
- **Objective**: The coalition aims to build infrastructure that can withstand extreme weather events, thereby reducing disaster risks globally.

India's Response to Extreme Heat and Traditional Practices

Extreme heat has become a significant issue, particularly in the context of climate change. In response, Mr. Mishra shared India's efforts to address this issue, focusing on adaptation to local conditions. Some of the key steps include:

Traditional Practices: India has incorporated traditional knowledge, such as rainwater harvesting, passive cooling techniques, and community-based heat resilience measures, into its approach.

International Collaboration and Bilateral Discussions

India's participation in the G-20 meeting also highlighted the importance of international cooperation in tackling global disaster risks. Key aspects include:

- **Troika Meeting**: India participated in a troika meeting with the Ministers of Brazil and South Africa to discuss the future direction of the Disaster Risk Reduction Working Group.
- **Bilateral Meetings**: India held bilateral discussions with the following countries to further advance disaster risk reduction efforts:
  - Brazil
  - Japan
  - Norway
  - South Africa
  - South Korea
  - Germany
- **Support for South Africa**: Mr. Mishra congratulated Brazil for scaling up the working group to the ministerial level and expressed India's support to South Africa for continuing the work during its G-20 presidency next year.

India's Growing Role in Global Disaster Risk Reduction Efforts

India's participation in the G-20 and its leadership in disaster risk reduction underscore the country's growing influence in shaping global policies for disaster resilience. Key points include:

- **International Cooperation**: India is playing an active role in fostering international collaboration to address disaster risks and climate change.
- **Commitment to a Safer World**: By participating in global forums and sharing knowledge and experiences, India is positioning itself as a key player in ensuring a disaster-resilient future.

Conclusion: Building a Safer and More Resilient World

India's leadership in the G-20 Disaster Risk Reduction Working Group and its commitment to the Sendai Framework reflect its strong stance on disaster risk reduction. The country's efforts to integrate technology transfer, knowledge sharing, and sustainable development are setting the stage for a safer, more resilient world.

How Consumption of Kodo Millet Led to the Death of 10 Elephants in Madhya Pradesh

In November 2024, 10 elephants from a herd of 13 died in Bandhavgarh Tiger Reserve, Madhya Pradesh. According to Vijay N Ambade, Principal Chief Conservator of Forests (Wildlife), the deaths are suspected to be linked to mycotoxins associated with kodo millet consumption.

What is Kodo Millet?

- Kodo millet (Paspalum scrobiculatum) is a type of millet known by various regional names such as Kodra in Hindi and Varagu in Tamil.
- It is a widely cultivated crop in India, Pakistan, Vietnam, Indonesia, and parts of West Africa.
- In India, Madhya Pradesh is one of the largest producers, with the millet being grown mainly in tropical and subtropical regions, especially in arid and semi-arid areas.
- The millet is grown on poor soils and has a variety of culinary uses, including in dishes like idli, dosa, papad, chakli, porridges, and rotis.

Why Do Farmers Grow Kodo Millet?

- Kodo millet is considered a staple food for many tribal and economically weaker sections of India. Its cultivation is widespread due to several advantageous properties:
  a. Drought tolerance
  b. High yield potential
  c. Excellent storage properties
- Furthermore, kodo millet is nutrient-rich, containing vitamins and minerals. It is also gluten-

free, easy to digest, and contains antioxidants that may have anti-carcinogenic properties.

- The presence of dietary fiber in the millet helps with glucose absorption and cholesterol regulation, according to studies.

The History of Kodo Millet Poisoning

- The issue of kodo millet poisoning is not new. The first known case of human poisoning linked to kodo millet was reported in 1922 in the Indian Medical Gazette.
- A case involving four individuals, including a 50-year-old woman and two children, was documented after they consumed bread made from kodo flour and later experienced symptoms like vomiting, unconsciousness, and shivering.
- In 1983, a research paper highlighted the death of elephants from consuming kodo millet, marking the first documentation of kodo poisoning in animals.
- In 1985, researchers identified the link between mycotoxins, particularly Cyclopiazonic Acid (CPA), and kodo millet poisoning.

Why Does Kodo Millet Become Poisonous?

- Kodo millet is mainly cultivated in dry and semi-arid regions, and certain environmental conditions (such as rainfall during the maturing period) can lead to fungal infections in the grains. These fungal infections often result in the production of mycotoxins, particularly Cyclopiazonic Acid (CPA), which causes kodo poisoning.
- Ergot—a parasitic fungal infection—often affects the millet crop. If kodo millet grains are infected with Ergot fungi, the resulting mycotoxins make the millet toxic. Infected grains are referred to as "poisoned kodo" or "Matawna Kodoo" in northern India.
- Once kodo millet becomes contaminated with mycotoxins, it becomes difficult to remove the toxins since they are stable even after cooking or processing.

Impact of Toxic Kodo Millet on Animals

When animals consume toxic kodo millet, it primarily affects their nervous system and cardiovascular health. The symptoms of kodo poisoning include:

- Vomiting
- Unconsciousness
- Shaking limbs
- Cold extremities
- Giddiness
- Tremors
- Rapid pulse

Cyclopiazonic Acid (CPA) is the primary toxin found in contaminated kodo millet, and it leads to several health complications:

- Degeneration and necrosis in various organs.
- Cardiomyocyte damage and impaired heart function.
- Liver dysfunction.
- Gastrointestinal disorders.
- Inflammation in the intestines.

Veterinarians treating the elephants in Madhya Pradesh observed similar symptoms, leading to a suspicion that the toxic millet contributed to their deaths.

Recent Incident in Madhya Pradesh

- In October 2024, 10 elephants from a herd of 13 in Bandhavgarh Tiger Reserve died after consuming toxic kodo millet. The elephants showed symptoms consistent with kodo poisoning, including vomiting, unconsciousness, and cardiac distress.
- This incident follows a similar event in 2022, where one elephant also died from kodo millet poisoning.

What Can Be Done to Prevent Kodo Poisoning?

Researchers suggest several measures to combat the issue of kodo poisoning:

1. **Biocontrol Agents**: Use of microbes that reduce fungal development and mycotoxin secretion in millet crops.
2. **Improved Agricultural Practices**: Farmers are encouraged to adopt better practices, such as:
   - Sorting and proper storage of millet, preferably in airtight containers to prevent fungal contamination.
   - Protecting harvested crops from rain to reduce fungal growth.
   - Avoiding the practice of moistening plants before threshing, which can facilitate the spread of fungi.

3. **On-site Detection**: Since mycotoxins are difficult to detect with the naked eye, rapid detection methods such as enzyme-linked immunosorbent assays (ELISA), biosensors, and lateral flow assays (LFAs) are gaining popularity for early detection.

How Are Kodo Millets Checked for Mycotoxins?

Additional Deputy Director at Kanan Pendari Zoological Garden in Bilaspur, explains that mycotoxins are invisible to the naked eye. Chemical trace analysis is required to detect them. Some common detection methods include:

- Chromatographic methods like Thin Layer Chromatography (TLC) and Gas Chromatography (GC).
- Liquid Chromatography-Mass Spectrometry (LC-MS) for highly accurate detection.

However, these techniques are time-consuming, so rapid diagnostic tools such as ELISA and biosensors are being developed for faster, on-site testing.

Conclusion :

The death of 10 elephants in Bandhavgarh Tiger Reserve underscores the risks associated with toxic kodo millet consumption, especially during certain environmental conditions that foster fungal infections in crops. The issue is not only a concern for wildlife but also poses a potential health risk to humans. However, advancements in biological control methods and improved agricultural practices can help mitigate these risks, ensuring safer cultivation and consumption of this valuable millet crop.

Agrivoltaic Farming

Overview:

During the Seventh Session of the International Solar Alliance (ISA) in New Delhi, the practical implementation of agrivoltaic systems was demonstrated to delegates from various countries.

About Agrivoltaic Farming:

- **Definition**: Agrivoltaic farming involves growing crops underneath solar panels.
- **Panel Setup**: The solar panels are positioned 2-3 meters above the ground and tilted at a 30-degree angle, providing shade to the crops and protecting them from extreme weather.
- **Dual Use**: This system allows the simultaneous use of land for both agriculture and solar energy generation.
- **Alternative Setup**: Panels can also be placed on greenhouse roofs to ensure light and rainwater reach crops, while still offering access for farm machinery.
- **Adjustable Systems**: Some solar panels are mounted on poles or frames and can rotate or form a canopy, controlling the amount of sunlight and shade the crops receive.

Advantages of Agrivoltaic Farming:

1. **Increased Land Use Efficiency**: It allows solar farms and agriculture to share the same land, eliminating the need for competing land use.
2. **Improved Crop Growth**: Research shows certain crops thrive under solar panels, benefiting from the shade that protects them from heat stress and reduces water loss.

What is a Solar Farm ?

A solar farm is a large-scale renewable energy system that generates electricity from the sun, and does so without emitting carbon dioxide (CO_2), making it an environmentally-friendly energy source.

Assam's 2000 MW Subansiri Lower Hydroelectric Project Nearing Completion, 93% Work Finished

Key Highlights:

- The Subansiri Lower Hydroelectric Project, a run-of-river dam located on the Subansiri River at the Assam-Arunachal Pradesh border near Gogamukh in Dhemaji district, is nearing completion.
- The project is set to begin power generation in March 2025, initially targeting 750 MW, with full capacity of 2000 MW expected by March 2026.
- 93% of the construction work has been completed, including the 116-meter-high concrete gravity dam finished in June 2023.

Project Timeline and Power Generation:

- The NHPC (National Hydroelectric Power Corporation) aims to start generating 750 MW of power from March 2025 using 3 of the 8 turbines.

- Two turbines have already been installed, and the third is in the process of being installed.
- Full commissioning of the project is planned for March 2026, with all 8 turbines expected to generate 2000 MW.

Construction Challenges and Delays:

- **Natural Disasters**: The project faced delays due to natural obstacles, including the damage of diversion tunnels. Five tunnels were initially planned, but only one was operational, and it was blocked by a major landslide on October 27, 2023, hindering the installation of the radial gates needed to control water flow.
- **Radial Gates**: As of now, 6 of the 9 radial gates have been installed, with 3 remaining. These gates are crucial for regulating water flow into and out of the dam. NHPC plans to complete their installation after the monsoon season.

Power Generation Plans:

- **Initial Power Generation**: By March 2025, 3 turbines will be operational, generating 750 MW. Each turbine has a capacity of 250 MW.
- **Full Power Generation**: Once fully operational, the project will generate 2000 MW from 8 turbines. The remaining turbines will be activated once the final spillway radial gates are installed, allowing the project to reach its full capacity by March 2026.

Delays Due to Public Opposition:

- **Public Protests**: Construction was initially delayed due to widespread opposition from Assamese residents and various organizations, who raised concerns about the dam's safety, particularly for people living downstream. The Assam government even recommended halting the project, citing risks associated with the fragile hills and the seismic zone in which the dam is located.
- **Suspension and Resumption**: The project was suspended from December 2011 to October 2019 due to protests and clearance issues. It resumed in October 2019 after obtaining necessary clearances from the National Green Tribunal.

Estimated Cost of the Project:

- As of March 31, 2024, 93% of the construction work has been completed, with the project cost standing at ₹ 20,834 crore.
- The final cost is expected to reach ₹ 22,000 crore by the time the full capacity of 2000 MW is commissioned in 2026. The initial estimated cost in 2002 was ₹ 6,285 crore.

Conclusion:

The Subansiri Lower Hydroelectric Project, which has faced multiple delays and challenges, is now set to provide significant power generation for the region. Once completed, it will be a crucial part of India's renewable energy capacity, contributing 2000 MW to the national grid by 2026. Despite delays, including opposition from local communities and natural disasters, the project is moving forward with most of the construction completed, and power generation is set to begin in March 2025.

State of Climate 2024 Report : WMO

Overview :

The World Meteorological Organization (WMO) released its State of Climate 2024 report at the UN Climate Change Conference (COP29), forecasting 2024 to become the warmest year on record, primarily driven by the ongoing El Niño event.

Key Findings of the State of Climate 2024 Report:

- **Record Global Temperatures:**

  From January to September 2024, the global mean surface temperature was 1.54°C above pre-industrial levels, significantly influenced by a strong El Niño. The decade of 2015-2024 is likely to be recorded as the warmest decade on record.

  Long-term Impact: Despite the high temperatures, long-term averages remain slightly below the 1.5°C threshold set by the Paris Agreement.
- **Persistent El Niño Effects:**

  El Niño maintained above-average global temperatures for 16 consecutive months from June 2023 to September 2024, with experts warning that such warming patterns could push temperatures beyond critical climate thresholds.

- **Ocean Warming:**

  Ocean heat trends from 2023 are continuing into 2024, with ocean warming exacerbating climate change impacts, including altered marine ecosystems and more intense weather events.
- **Depletion of Sea Ice:**
  - **Antarctic Sea Ice:**

    The annual minimum sea ice extent reached 2 million sq km, the second-lowest since satellite monitoring began in 1979. The maximum extent also marked a historically low level at 17.2 million sq km.
  - **Arctic Sea Ice:**

    The annual minimum for Arctic sea ice was 4.3 million sq km, with a maximum of 15.2 million sq km, indicating a long-term decline in ice coverage.

About El Niño:

- El Niño represents the warmer-than-normal phase of the El Niño-Southern Oscillation (ENSO), causing global temperature and rainfall shifts.
- **Southern Oscillation:**

  This refers to fluctuations in air pressure over the tropical Pacific Ocean, influencing wind patterns and ocean temperatures.
- **Sea Surface Temperatures (SSTs):**

  During an El Niño event, SSTs in the equatorial Pacific Ocean become warmer than the long-term average, influencing weather systems worldwide.
- **Irregular Occurrence:**

  El Niño occurs irregularly every two to seven years, making it challenging to predict.

Global and Regional Impacts of El Niño:

- **Global Impacts:**
  - **Warmer Global Temperatures:**

    El Niño contributes to global temperature increases, often resulting in heatwaves and extreme weather events across the globe.
  - **Disrupted Weather Patterns:**

    El Niño alters weather patterns globally, causing droughts in some regions while triggering heavy rainfall and flooding in others.
  - **Ocean Warming:**

    Warming of the oceans leads to coral bleaching and marine heatwaves, threatening marine life and ecosystems.
- **Regional Impacts:**
  - **India:**

    El Niño weakens the monsoon season, increasing the risk of heatwaves and droughts, which impacts agriculture and water availability.
  - **South America (Peru Coast):**

    Decreased fish populations due to disrupted ocean currents and nutrient upwelling, combined with heavy rainfall and flooding.
  - **Southeast Asia:**

    Countries like Indonesia and Malaysia face drought and wildfires, along with flooding in some areas.
  - **Australia:**

    Increased risk of droughts, particularly in the eastern and southern regions, leading to more frequent and intense bushfires.
  - **North America:**

    California and other western states experience heavy rainfall and flooding, while the southwestern U.S. faces increased heatwaves.

Difference Between El Niño and La Niña:

- **El Niño:**

  Characterized by warmer-than-average sea surface temperatures in the equatorial Pacific, influencing global weather patterns.
- **La Niña:**

  The opposite phase, marked by colder-than-normal sea surface temperatures in the same region, causing a different set of global climate effects, often leading to cooler global temperatures and varied regional impacts.

About the World Meteorological Organization (WMO):

- **Origin:**

  The WMO was established in 1950 as a specialized agency of the United Nations for meteorology

(weather and climate), operational hydrology, and related geophysical sciences. It originated from the International Meteorological Organization (IMO), founded in 1873.

- **Headquarters:**
  Located in Geneva, Switzerland.
- **Governance:**
  - **orld Meteorological Congress:** The supreme body of the WMO, meeting every four years to set policies and adopt regulations.
  - **Executive Council:** A 36-member body that implements policies.
  - **Secretariat:** Headed by a Secretary-General, responsible for administrative functions.

Reports Published by WMO:

- **State of the Climate Reports:**
  These annual reports provide an overview of global climate conditions, including temperature, precipitation, and extreme weather events.
- **Global Climate Reports:**
  Assess the long-term climate trends and their implications.
- Atlas of Mortality and Economic Losses from Weather, Climate, and Water Extremes:
  A resource documenting the impacts of extreme weather on human life and economic activity.
- **United in Science Reports:**
  Provide scientific assessments of the latest climate science and its future implications.
- Global Climate Observing System (GCOS) Reports:
  Offer updates on the status of global climate observations and data collection.

Carbon Dioxide (CO_2)

Overview:

- **India's CO_2 Emissions**: According to a report by Global Carbon Project, India's carbon dioxide emissions from burning fossil fuels are expected to rise by 4.6% in 2024, which is the highest increase among major economies.

About Carbon Dioxide (CO_2):

- **Physical Properties**:
  Colorless gas with a faint, sharp odor and a sour taste.
- **Role as a Greenhouse Gas**:
  - CO_2 is a greenhouse gas that traps heat in the Earth's atmosphere, contributing to global warming.
  - It plays a significant role in the greenhouse effect, where heat from the sun is trapped by gases in the atmosphere, raising the Earth's temperature.
- **Sources of CO_2**:
  - **Fossil Fuels**: Major emissions come from the extraction and combustion of fossil fuels like coal, oil, and natural gas.
  - Wildfires and Volcanic Eruptions: These are natural processes that also release CO_2.
- **Climate Change Impact**:
  - CO_2 is one of the primary drivers of anthropogenic (human-caused) climate change. The gas remains in the atmosphere for long periods, contributing significantly to long-term global warming.
  - **Persistence in the Atmosphere**: CO_2 lingers much longer in the atmosphere than other greenhouse gases. After being emitted:
    * 40% remains in the atmosphere for 100 years.
    * 20% persists for 1,000 years.
    * 10% can stay for up to 10,000 years.
- **Uses of CO_2**:
  - Refrigeration and fire extinguishers.
  - Inflating life rafts and life jackets.
  - Blasting coal and foaming rubber and plastics.
  - Promoting plant growth in greenhouses.
  - Carbonated beverages and animal immobilization before slaughter.
- **What is the Greenhouse Effect ?**
  The greenhouse effect is the process by which heat is trapped near the Earth's surface by greenhouse gases (like CO_2, methane, and water vapor). These gases absorb and re-radiate infrared radiation, preventing heat from escaping into space, thereby warming the Earth's surface.

Conclusion :

Carbon Dioxide (CO_2) is a critical greenhouse gas contributing significantly to climate change. With its long atmospheric lifespan, the increase in CO_2 emissions from human activities, such as burning fossil fuels, remains a central concern for global climate policies. Addressing CO_2 emissions is essential for mitigating climate change and reducing global warming.

Tsunami Ready Recognition Programme

Overview:

- Recently, twenty-four coastal villages in Odisha were recognized by the Intergovernmental Oceanographic Commission (IOC) of UNESCO as 'Tsunami Ready'.

About Tsunami Ready Recognition Programme:

- **Developed by**:

  The Intergovernmental Oceanographic Commission (IOC) of UNESCO.
- **Aim**:

  To build resilient communities through awareness and preparedness strategies to protect lives, livelihoods, and property from tsunamis.
- **Goal**:

  The main goal is to improve coastal community preparedness for tsunamis and minimize the loss of life and property.
- **Implementation**:
  - The program is a voluntary, performance-based initiative.
  - It promotes collaboration among national and local warning agencies, emergency management agencies, government authorities, scientists, community leaders, and the public.
  - Communities that meet the 12 established preparedness indicators (covering Assessment, Preparedness, and Response) will be recognized as Tsunami Ready by UNESCO/IOC.
- **Recognition Details**:
  - The recognition is renewable every four years.
  - The criteria for recognition include fulfilling 12 indicators, which assess the community's ability to respond to tsunamis effectively.

What is a Tsunami?

- A tsunami is a series of large waves caused by the sudden displacement of water due to events like earthquakes.
  - The displacement of the ocean floor causes these waves, which can travel across entire ocean basins.
  - Tsunamis are typically linked with underwater earthquakes but can also be caused by volcanic eruptions or landslides.
- **What is UNESCO's Intergovernmental Oceanographic Commission (IOC)?**
  - The IOC promotes international cooperation in marine sciences to improve the management of the ocean, coasts, and marine resources.
  - India has been a member of the IOC since 1946.

Conclusion :

The Tsunami Ready Recognition Programme is an important initiative for improving the preparedness of coastal communities against tsunamis. The recent recognition of villages in Odisha highlights India's commitment to enhancing disaster resilience and protecting vulnerable coastal populations.

Sabarmati River

Overview:

The Sabarmati Riverfront Development Project is a major initiative aiming to transform around 38 kilometers of riverbanks between Ahmedabad and Gandhinagar, covering seven phases. The first phase, which spans 11 kilometers on each side of the river, has started monetizing, marking an important step in the project's progress.

About the Sabarmati River:

1. **Origin**:

   The Sabarmati River originates in the Aravalli Hills of Rajasthan, near Udaipur. It flows southward, eventually meeting the Bay of Khambhat in the Arabian Sea.

2. **Length and Geography**:
   - The river covers a total distance of 371 kilometers, with 48 kilometers of its course passing through Rajasthan and the remaining 323 kilometers through Gujarat.
   - The Sabarmati Basin extends over the states of Rajasthan and Gujarat, covering an area of 21,674 square kilometers.
   - The basin has a maximum length of 300 kilometers and a maximum width of 150 kilometers.
3. **Course Through Cities**:
   The river flows north-south through Ahmedabad, dividing the city into its western and eastern halves.
4. **Catchment Area**:
   The river's total catchment area is 21,674 square kilometers, encompassing both agricultural and non-agricultural land.
5. **Geographical Boundaries**:
   - The river basin is bordered by the Aravalli Hills in the north and north-east.
   - To the west, it is bounded by the Rann of Kutch.
   - To the south, it meets the Gulf of Khambhat.
6. **Agricultural Significance**:
   A significant portion of the Sabarmati Basin, about 74.68%, is covered by agricultural land, highlighting the region's dependence on the river for farming and irrigation.

Tributaries:

The Sabarmati River receives water from several tributaries:

- **Left-bank tributaries**:
  - Wakal River
  - Hathmati River
  - Vatrak River
- **Right-bank tributary**:
  - Sei River

What is a Gulf?

- A Gulf is a large area of sea that is almost entirely surrounded by land, except for one narrow opening to the sea.
- Gulfs can be formed through natural processes, such as when a large rock collapses or a piece of land sinks, causing a big indentation that fills with water.
- Erosion can also lead to the creation of gulfs over time.

Conclusion :

The Sabarmati River plays a crucial role in the region's geography, economy, and agriculture. The ongoing Sabarmati Riverfront Development Project aims to enhance its surroundings, offering both ecological and economic benefits for the people of Ahmedabad and Gandhinagar.

Biofloc Technology and Recirculating Aquaculture Systems

In November 2024, India's aquaculture sector is increasingly adopting Biofloc Technology (BFT) and Recirculating Aquaculture Systems (RAS) as sustainable and efficient solutions for fish farming.

About Biofloc Technology (BFT) and Recirculating Aquaculture Systems (RAS)

Biofloc Technology (BFT):

- **What it is**:
  Biofloc Technology is a closed-tank fish farming method where water is kept clean through the use of beneficial bacteria. These bacteria convert organic waste (from uneaten feed and fish excreta) into microbial biomass, which can be consumed by the fish or shrimp.
- **Key Bacteria Involved**:
  Heterotrophic bacteria such as Bacillus, Pseudomonas, Nitrosomonas, Nitrobacter, Acinetobacter, and Alcaligenes are used in this process.
- **Advantages**:
  - **Water Purification**: The bacteria break down organic waste, keeping the water clean without frequent water changes.
  - **Disease Reduction**: The cleaner water reduces the risk of diseases, lowering the need for chemicals or antibiotics.

- **Sustainability**: Fish can consume the microbial biomass produced by the bacteria, reducing the need for additional feed, making it cost-effective and environmentally friendly.
- **Aeration**: The system includes aeration to maintain the oxygen levels required for the bacteria's activity and to reduce the chance of infection.
- **Space Efficiency**: BFT is suitable for small-scale farmers as it can be established in small areas, even backyard farming. However, the system can be costly to set up initially.

Recirculating Aquaculture Systems (RAS):

- **What it is**:

  Recirculating Aquaculture Systems (RAS) is another closed-loop, tank-based farming method that recycles water after filtration, making it efficient and sustainable for fish farming.
- **How it works**:
  - **Water Filtration**: The system filters and cleans water to remove waste, ensuring the water remains safe for the fish.
  - **Automated System**: It uses mechanical and biological filtration units along with culture tanks to manage water quality and prevent pathogen entry.
  - **Biosecurity**: The system reduces the need for external chemicals or antibiotics as it minimizes the risk of disease, creating a bio-secure environment.
  - **Controlled Environment**: RAS allows for optimal **temperature**, **oxygen levels**, and **cleanliness**, ensuring healthy conditions for fish growth.
  - **Indoor and Urban Farming**: This system can be set up indoors or in areas without natural water sources, allowing farming to be done near cities, where demand for fish is high.

What is Aquaculture ?

On 21st November 2024, The Food and Agriculture Organization (FAO) of the United Nations offered its expertise to address the impact of climate change on the country's aquaculture and the fishing community involved in it.

About Aquaculture:

- **Definition**:

  Aquaculture refers to the breeding and cultivation of aquatic plants, animals, and organisms for commercial, recreational, and scientific purposes. It is similar to agriculture, but instead of growing plants on land, aquaculture involves the rearing of aquatic organisms, both in marine (saltwater) and freshwater environments.
- **Types of Aquaculture**:
  - **Marine Aquaculture**: Farming of aquatic species in coastal waters, including the ocean.
  - **Freshwater Aquaculture**: Farming in rivers, lakes, and ponds.
  - Aquaculture can even occur on land in tanks, using both marine and freshwater species.
- **Purpose**:

  Aquaculture serves various purposes:
  - **Food production**: For human consumption.
  - **Industrial products**: Such as fishmeal and fish oil.
  - **Sport fisheries**: For recreational fishing.
  - **Bait**: For other fishing operations.
  - **Ornamental purposes**: Including aquarium fish.
  - **Pharmaceuticals and chemicals**: Providing organisms for research and product development.
- **History**:

  Aquaculture has been practiced since 500 BC. However, it became commercially significant only in the mid-20th century as demand for seafood grew globally.
- **Aquaculture's Growth**:

  It is one of the fastest-growing forms of food production in the world today. Currently, more than half of all seafood consumed by humans comes from aquaculture.

- **Species Farmed in Aquaculture**:

  More than 550 aquatic species are farmed globally, including:

  - **Fish**: Carp, catfish, salmon, tilapia.
  - **Shellfish**: Shrimp, oysters, clams, mussels, scallops.
  - **Seaweed**: Farmed in marine environments, accounting for 27% of the annual global aquaculture production.

Major Producers:

- **China**:

  China is the largest producer of aquaculture products, accounting for nearly 60% of all farmed seafood worldwide.

- **Other Leading Producers**:
  - Indonesia
  - India
  - Vietnam

These countries are significant players in global aquaculture production, meeting the growing demand for seafood both locally and internationally.

What is the Food and Agriculture Organization (FAO)?

- **Definition**:

  The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations (UN). It was established in October 1945 and is the oldest permanent specialized agency of the UN.

- **Mandate**:

  FAO's main goals are:

  - To improve nutrition and increase agricultural productivity.
  - To raise the standard of living in rural populations.
  - To contribute to global economic growth.

- **Roles**: FAO coordinates international efforts to:
  - Develop programs for agriculture, forestry, fisheries, and land and water resources.
  - Promote sustainable food systems and support food security efforts around the world.

Conclusion :

Aquaculture is a vital and rapidly expanding industry that plays a key role in meeting the global demand for seafood. With the support of organizations like the FAO, efforts are underway to improve aquaculture practices, especially in the face of climate change challenges.

Global Soil Conference 2024 and Soil in India

Why in News ?

The Global Soil Conference (GSC) 2024 was recently held in New Delhi. The event emphasized the critical role of soil health in ensuring food security, mitigating climate change, and sustaining ecosystem services. The conference highlighted the global and local challenges of soil degradation and the need for sustainable soil management practices.

Global Soil Conference 2024 : Key Insights

About the Conference

The Global Soil Conference 2024 (GSC), organized by the Indian Society of Soil Science (ISSS) in collaboration with the International Union of Soil Sciences (IUSS), focused on addressing challenges related to soil and resource management. It provided a platform for global dialogue on how improving soil health can drive sustainability in multiple sectors.

- **Theme:** *Caring Soils Beyond Food Security: Climate Change Mitigation & Ecosystem Services*

Key Highlights:

- **Soil Health Crisis:** Soil degradation is a major issue globally, reducing productivity and threatening food security. In India, nearly 30% of soil is compromised due to erosion, salinity, pollution, and loss of organic carbon.
- **International Cooperation:** The conference stressed the importance of international collaboration to combat soil erosion, aligning with Sustainable Development Goal 15 (SDG 15), which aims to protect terrestrial ecosystems and halt land degradation.

SDG 15 Objectives:

- Combat desertification and land degradation
- Restore biodiversity and halt biodiversity loss
- Promote sustainable use of terrestrial ecosystems

Soil Health Concerns in India

India is facing significant soil health issues that have implications for its agricultural productivity and overall environmental sustainability.

1. Soil Degradation:

- Over one-third of India's land is at risk of degradation due to unsustainable farming practices.
- The causes include improper irrigation, overuse of chemical fertilizers, and deforestation.

2. Soil Erosion & Fertility Loss:

- India loses 15.35 tonnes of soil per hectare annually.
- This erosion leads to reduced crop yields, economic losses, and environmental damage like floods and droughts.

3. Soil Salinity:

- Excessive salt accumulation in soil impairs water infiltration, disrupts nutrient uptake, and decreases crop productivity.
- Areas affected: Punjab, Haryana, Gujarat, and parts of the Sunderbans.

4. Low Organic Content & Nutrient Deficiency:

- Indian soils have very low organic content (around 0.54%), which leads to nutrient deficiencies.
- Over 70% of India's soils are either acidic or alkaline, further disrupting soil health.

5. Desertification:

- Regions like Rajasthan and parts of Madhya Pradesh are experiencing desertification, which exacerbates soil degradation, lowers fertility, and increases vulnerability to climate shocks.

6. Diversion of Fertile Land:

- Fertile agricultural land is being diverted for non-agricultural purposes like urbanization, industrial development, and infrastructure projects, which contributes to the loss of valuable soil.

India's Soil Conservation Initiatives

The Indian government has introduced various schemes and policies to address soil health issues and promote sustainable agriculture.

1. Soil Health Card (SHC) Scheme:

- Provides farmers with information on soil nutrient status to guide them in efficient fertilizer use and soil management.
- **Improves soil health** and reduces the overuse of chemical fertilizers.

2. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):

- Focuses on improving irrigation facilities and water-use efficiency in agriculture.

3. Zero Budget Natural Farming (ZBNF):

- Encourages chemical-free farming using local resources to improve soil health and reduce input costs.

4. National Mission on Natural Farming (NMNF):

- Promotes organic and natural farming practices to improve soil fertility and reduce dependency on chemical fertilizers.

Soil Classification and Types in India

India's diverse landscape gives rise to different soil types that vary in texture, fertility, and agricultural potential. The Soil Survey of India classifies soils based on factors like genesis, color, composition, and location.

Major Soil Types in India

Soil Type	Distribution	Characteristics	Main Crops Grown
Alluvial Soils	Northern plains, river valleys, east coast	Rich in potash, poor in phosphorus; sandy loam to clay; subject to flooding	Rice, wheat, sugarcane, cotton
Black Soil	Deccan Plateau, Maharashtra, Madhya Pradesh	Clayey, deep, rich in lime, iron, magnesium; retains moisture; prone to cracking	Cotton, sorghum, pulses, millets
Red and Yellow Soil	Eastern and Southern Deccan Plateau	High iron content, varying fertility depending on granularity; low nitrogen and phosphorus	Wheat, rice, millets, pulses, groundnut
Laterite Soil	Kerala, Karnataka, Tamil Nadu	Rich in iron and potash; poor in organic matter; leached soils due to heavy rainfall	Cashew, tea, coffee, rubber
Arid Soil	Rajasthan, Punjab, Haryana	Sandy, saline, poor in moisture and humus; high evaporation and calcium content	Barley, cotton, millet, pulses
Saline Soil	Gujarat, coastal deltas, Sundarbans	High in sodium, potassium, magnesium; poor drainage; infertile without gypsum treatment	Rice, wheat, barley
Peaty Soil	Bihar, Uttarakhand, coastal West Bengal	High organic content, waterlogged; acidic, rich in humus	Rice, jute
Forest Soil	Himalayas, Western Ghats	Loamy or silty in valleys; acidic, low in humus in snowbound areas; fertile in lower valleys	Tea, coffee, spices, tropical fruits

Soil Profile and Layers

A soil profile is a vertical cross-section that shows various soil layers or horizons, each with distinct properties. The main horizons are:

1. **O Horizon (Organic Layer):** Contains decomposing organic matter like leaves and twigs.
2. **A Horizon (Topsoil):** Rich in nutrients and supports plant growth.
3. **E Horizon (Leached Layer):** Mineral-rich layer from which nutrients are leached out.
4. **B Horizon (Subsoil):** Contains minerals leached from upper layers; often rich in clay and iron.
5. **C Horizon (Parent Rock):** Composed of weathered bedrock.
6. **R Horizon (Bedrock):** Unweathered rock beneath the soil.

Improving Soil Health in India: Recommendations

1. **Policy Interventions:**
   Strengthen initiatives like the Soil Health Card (SHC) to ensure better soil management and informed fertilizer use by farmers.
2. **Carbon Sequestration:**
   Soil carbon sequestration practices such as reduced tillage, cover cropping, and agroforestry can enhance soil fertility and sustainability.
3. **Sustainable Farming Practices:**
   - Large-scale adoption of no-till farming (as seen in Brazil) could reduce soil erosion and improve soil health.
   - Promoting crop rotation, organic farming, and agroforestry can restore soil nutrients and improve ecosystem resilience.

Conclusion :

The Global Soil Conference 2024 underscored the need for a global approach to soil health management to ensure food security, mitigate climate change, and preserve ecosystems. In India, urgent action is required to address soil degradation, including enhancing soil conservation efforts, adopting sustainable farming practices, and strengthening policies. Addressing soil health is essential for the long-term agricultural and environmental sustainability of the country.

Coking Coal as a Critical Mineral : A Strategic Resource for India

Why in News ?

A recent report by NITI Aayog titled "Enhancing Domestic Coking Coal Availability to Reduce the Import of Coking Coal" has proposed that coking coal be included in India's list of critical minerals. The report underscores the significance of this mineral for India's steel industry and the broader economy, highlighting the need to reduce the country's reliance on imports.

Why Should Coking Coal Be Declared a Critical Mineral ?

1. Meeting Critical Mineral Criteria

Coking coal fulfills all the criteria necessary for it to be declared a critical mineral for India:

- **Economic Importance**: Coking coal is essential for steel production, which drives infrastructure development and job creation.
- **High-Supply Risk**: India imports around 85% of its coking coal, making it highly vulnerable to supply disruptions. This is a higher import dependence compared to other regions, such as the European Union (62%).
- **Lack of Substitutes**: Coking coal has unique properties necessary for steelmaking, and there are no viable substitutes that can replace it in the blast furnace.

2. Importance for Steel Production

- **Steel Manufacturing**: Coking coal is used to produce coke, a key material for steel production. Coke acts as both a fuel and a reducing agent in the blast furnace, making it indispensable for converting iron ore into molten iron.
- **Cost of Steel**: Coking coal accounts for approximately 42% of the cost of steel production. Ensuring an affordable and stable supply of coking coal is crucial to maintaining competitive steel prices, especially for infrastructure development.

3. High Import Dependence

- **Import Levels**: India's high dependence on imports (about **85%**) creates vulnerability in the

steel sector. In FY 2023-24, India imported 58 million tonnes of coking coal, costing an estimated Rs 1.5 lakh crore.

- **Domestic Reserves**: India has significant reserves of coking coal, with 16.5 billion tonnes of medium-quality coal and 5.13 billion tonnes of prime-quality coal. If harnessed effectively, these reserves could reduce import dependence and bolster **energy security**.

4. Steel Industry Competitiveness

- **Cost Reduction**: Increasing the domestic production of coking coal can lower steel production costs. By reducing reliance on imports, India can make its steel industry more globally competitive.
- **Enhanced Utilization**: The current capacity utilization of PSU washeries is under 32%, with low yields of clean coal. Investments in better technologies and efficient operations could increase output and reduce overall costs.

5. Alignment with Global Practices

- **Global Recognition**: The European Union has already declared coking coal as a critical raw material, alongside other critical minerals such as lithium and rare earth elements. By classifying coking coal similarly, India can align its policies with global standards and prioritize its strategic importance.

6. Energy Security and Sustainability

- By focusing on developing its domestic coking coal resources, India can reduce its dependency on international markets and improve energy security. This aligns with India's broader energy goals, including achieving Net Zero emissions by 2070.

Coking Coal and India

India is the largest importer of coking coal globally, and its increasing demand for steel has led to a rise in imports. India is also the second-largest producer of crude steel after China, but the country faces challenges due to high import dependence.

1. High Import Dependency

- **H1 FY25 Imports**: India's coking coal imports reached 29.6 million tonnes in the first half of FY25, marking a six-year high. Australia, the US, and Russia are the top suppliers of coking coal to India.
- **Diversification of Sources**: While Australia's share of India's imports has decreased from 80% to 54%, there has been a rise in sourcing from Mozambique and Indonesia.

2. Steel Production Growth

- **Rising Imports**: The increase in coking coal imports coincides with India's growing steel production. As India continues to expand its steel manufacturing capacity, the demand for coking coal is expected to increase.

3. Strategic Importance

- **Coking Coal for Steelmaking**: To produce one tonne of steel, about 780 kg of coking coal is required. Coking coal is not only a key input for steel but also contributes to by-products like tar, ammonia sulfate, benzole, and coke oven gas, which have uses in chemicals and power generation.

What is Coking Coal ?

Coking coal, also known as metallurgical coal, is a naturally occurring sedimentary rock found within the earth's crust. It is primarily used in the production of coke, which is an essential component of the steelmaking process.

Key Characteristics of Coking Coal

- **Composition**: Coking coal contains more carbon, less ash, and less moisture than thermal coal, which is used for power generation.
- **Coke Formation**: When heated in the absence of air, coking coal undergoes a process called coking, which removes volatile compounds and turns it into coke, a carbon-rich material that burns at high temperatures in the blast furnace.

Role in Steelmaking

- **Fuel and Reducing Agent**: Coke provides the carbon monoxide (CO) needed to reduce iron ore into molten iron in the blast furnace. The coke burns at temperatures of 1,000°C to 1,200°C, facilitating the chemical reaction that separates iron from its ore.

Global Producers

- The largest producers of coking coal in 2022 were:
  - **China**: 62%
  - **Australia**: 15%
  - **Russia**: 9%
  - **USA**: 5%
  - **Canada**: 3%

Critical Minerals for India

India has identified 30 critical minerals essential for its economic development and technological advancement. These minerals are necessary for industries ranging from energy production to electronics.

India's Critical Minerals

- These minerals include lithium, cobalt, nickel, rare earth elements, and graphite, all of which are key to sectors like electric vehicle (EV) production, green energy technologies, and electronics.
- India faces significant import dependence, particularly for minerals like lithium (100% import dependency).

India's Initiatives to Secure Critical Minerals

India has taken several steps to secure a steady supply of critical minerals:

1. **Mineral Security Partnership (MSP)**: A strategic initiative to ensure the uninterrupted supply of minerals essential for India's industries.
2. **Supply Chain Resilience Initiative (SCRI)**: A program to diversify sources and reduce reliance on single countries for critical minerals.
3. **Investment Partnerships**: India has strengthened ties with countries like **Australia** through partnerships aimed at securing mining and refining capabilities.
4. **Khanij Bidesh India Ltd (KABIL)**: A state-owned company focused on securing overseas mineral assets.
5. **Mines and Minerals (Development and Regulation) Amendment Act, 2023**: To streamline the mining process and increase production of critical minerals.

Conclusion : Coking Coal as a 'Critical Mineral'

Declaring coking coal as a critical mineral is essential for India's economic and industrial growth. With substantial domestic reserves and an ever-growing demand for steel, boosting the production of coking coal can help reduce reliance on imports, lower production costs, and increase the global competitiveness of India's steel industry.

Basic Animal Husbandry Statistics 2024

The Basic Animal Husbandry Statistics 2024 (BAHS), recently released by the Ministry of Fisheries, Animal Husbandry & Dairying on National Milk Day (26th November), provides key data on livestock production and trends in milk, eggs, meat, and wool. This data is crucial for understanding the growth of the animal husbandry sector, its economic impact, and the progress made toward self-sufficiency in animal products. The statistics are based on the Integrated Sample Survey (ISS) conducted from March 2023 to February 2024 and provide critical insights into India's major livestock products.

Key Highlights of the BAHS 2024

1. **Milk Production**:
   - **Total Milk Production**: India's milk production for 2023-24 is estimated at 239.30 million tonnes, reflecting a 3.78% increase over 2022-23.
   - **Global Ranking**: India remains the largest producer of milk globally.
   - **Top Milk Producers in India**: Uttar Pradesh, Rajasthan, and Madhya Pradesh.
   - **Per Capita Milk Availability**: Increased to 471 grams per day in 2023-24, up from 459 grams per day in the previous year.
2. **Egg Production**:
   - **Total Egg Production**: Estimated at 142.77 billion eggs for 2023-24, marking a 3.18% growth from the previous year.
   - **Global Ranking**: India holds the 2nd position in global egg production.
   - **Top Egg Producers in India**: Andhra Pradesh, Tamil Nadu, and Telangana.

3. **Meat Production**:

- **Total Meat Production**: India's total meat production is estimated at 10.25 million tonnes for 2023-24, reflecting a 4.95% increase over the previous year.
- **Top Meat Producers in India**: West Bengal, Uttar Pradesh, and Maharashtra.

4. **Wool Production**:

- **Total Wool Production**: India's wool production is estimated at 33.69 million kg for 2023-24, showing a 0.22% increase from the previous year.
- **Top Wool Producers in India**: Rajasthan, Jammu & Kashmir, and Gujarat.

5. **Livestock Growth**:

- From 2014-15 to 2022-23, the livestock sector grew at a compound annual growth rate (CAGR) of 7.38% at constant prices.
- The share of livestock in agriculture's Gross Value Added (GVA) increased from 24.32% in 2014-15 to 30.38% in 2022-23, reflecting the growing importance of the livestock sector in the Indian economy.

21st Livestock Census

1. **Overview**:

- The 21st Livestock Census was recently launched by the Ministry of Fisheries, Animal Husbandry & Dairying.
- It is conducted every five years to collect data on the population of domesticated animals, poultry, and stray animals across India.
- This is the 21st census since its inception in 1919, with the most recent census conducted in 2019.

2. **Data Collection**:

The census will collect detailed data on species, breed, age, sex, and ownership status of animals.

3. **Animals Covered**:

- The census will cover 16 animal species, including:
  - Cattle, buffalo, mithun, yak, sheep, goat, pig, camel, horse, ponies, mule, donkey, dog, rabbit, and elephant.
- A total of 219 indigenous breeds recognized by the ICAR-National Bureau of Animal Genetic Resources (NBAGR) will be included.

4. **Poultry**:

The census will also include **poultry birds**, such as:

- Fowl, chicken, duck, turkey, geese, quail, ostrich, and emu.

Conclusion :

The Basic Animal Husbandry Statistics 2024 highlights India's growing livestock sector, with significant increases in production across key products like milk, eggs, meat, and wool. India continues to be a global leader in milk and egg production, while also making progress in other areas like meat and wool. The 21st Livestock Census will provide critical data to further enhance policies and strategies for the sustainable growth of the animal husbandry sector. The sector's increasing share in agriculture's GVA underscores its rising importance in India's economic framework, particularly in the context of rural development and food security.

EDITORIALS

Crux of The Hindu & Indian Express

Geography

Telangana Among 17 States and UTs in 'Core Cold Wave Zone'

Overview:

- Telangana, along with 16 other states and Union Territories, has been identified as part of the 'Core Cold Wave Zone' in India, as per a public advisory issued by the National Programme on Climate Change and Human Health (NPCCHH) under the Ministry of Health and Family Welfare.
- This advisory warns of potential cold wave conditions across these regions from November to March, with the highest frequency of extreme cold events expected in December and January.

Key Details:

1. **Cold Wave Zone:**

- The 'Core Cold Wave Zone' includes the following 17 states and Union Territories.

* Telangana
* Himachal Pradesh
* Jammu and Kashmir
* Delhi
* Rajasthan
* Gujarat
* Chhattisgarh
* Jharkhand
* Odisha
* Punjab
* Uttarakhand
* Ladakh
* Haryana
* Uttar Pradesh
* Madhya Pradesh
* Bihar
* West Bengal

o These regions are expected to experience cold wave conditions, with temperatures dipping significantly, especially in December and January, when cold events are most frequent.

2. Cold Wave Duration:

o The cold wave season spans from November to March.

o December and January are particularly prone to extreme cold events in many parts of these states and UTs, making them the months with the highest likelihood of cold waves.

3. Cold Wave Criteria:

o According to the India Meteorological Department (IMD), cold wave conditions are defined based on temperature thresholds:

* For plains, the minimum temperature should be 10°C or below.
* For hilly regions, the minimum temperature should be 0°C or below.

o The Core Cold Wave Zone is likely to experience such temperatures, putting certain vulnerable groups at increased risk.

4. Vulnerable Groups:

o The public advisory highlights the populations most at risk during cold wave conditions:

* Homeless individuals
* Elderly people
* Economically disadvantaged individuals
* Pregnant and lactating women
* Children
* Outdoor workers
* Farmers
* Managers of night shelters

o These groups are particularly vulnerable to the harmful effects of prolonged exposure to extreme cold.

5. Health Risks:

o Cold waves can lead to severe health risks, especially for those without adequate protection or shelter:

* **Hypothermia**: A condition where the body's temperature drops dangerously low, impairing normal bodily functions.
* **Frostbite**: Damage to body parts like fingers, toes, and ears due to freezing temperatures.
* **Immersion Foot**: A non-freezing cold injury caused by prolonged exposure to cold, wet conditions, often affecting feet.
* **Fatalities**: In extreme cases, prolonged cold exposure without adequate precautions can result in death.

o **Prevention**: The advisory urges people to take preventive measures to stay warm and reduce the risk of health complications from the cold.

6. Cold Wave Advisory for Telangana:

o Telangana, which has been experiencing dipping night temperatures, is particularly affected by this cold wave.

o People in the state are advised to take precautions against the harsh cold, particularly during the peak cold months.

o Authorities have been asked to ensure the safety of vulnerable groups, such as the homeless and outdoor workers, during the cold wave conditions.

Precautionary Measures:

- **Protection from Cold:**
  - o Wear warm clothing (multiple layers) to prevent heat loss.
  - o Ensure adequate shelter for vulnerable populations, including the elderly and homeless.
  - o Keep homes warm using safe heating methods.
- **Health Precautions:**
  - o Stay dry, as wet clothing increases the risk of cold-related health issues.

- Keep hands, feet, and face covered to avoid frostbite.
- For outdoor workers and farmers, ensure frequent breaks in warm shelters.

- **Emergency Services:**
  - Local authorities should be prepared to provide emergency shelter and assistance to those at risk.

Conclusion :

With Telangana and other states in the Core Cold Wave Zone, it is crucial for the government and citizens to take proactive steps to minimize the health risks associated with cold wave conditions. Vulnerable populations must be given particular attention to ensure their safety during this winter season. The advisory from the NPCCHH serves as a timely reminder to prepare for the challenging cold wave months ahead.

India to Host Global Cooperative Conference for the First Time

Overview

- India is set to host the International Cooperative Alliance (ICA) Global Conference in Delhi from November 25 to 30, 2024.
- This marks the first time in the 130-year history of the ICA that the conference will be held in India.
- The event, organized with the initiative of IFFCO (Indian Farmers Fertiliser Cooperative Limited), will feature around 3,000 delegates, including representatives from over 100 countries, with 1,000 foreign delegates.
- Prime Minister Narendra Modi will launch the United Nations International Year of Cooperatives 2025 at the event, underscoring the significance of the global cooperative movement.

Key Highlights of the Global Cooperative Conference

1. **Historic Event in India:**
   - For the first time, India will host the Global Cooperative Conference organized by the International Cooperative Alliance (ICA).
   - The ICA is the premier body for the global cooperative movement, founded in 1895, and the conference is set to be held in Delhi from November 25 to 30, 2024.
   - The event is a historic moment for India, as the country has a significant presence in the global cooperative sector, with 25% of the world's cooperatives based in India.
2. **Key Participants:**
   - The conference will see the participation of around 3,000 delegates, including 1,000 foreign delegates from over 100 countries.
   - Notable international figures attending the event include:
     * Bhutan Prime Minister Dasho Tshering Tobgay
     * Fiji Deputy Prime Minister Manoa Kamikamica
   - The Union Cooperation Minister Amit Shah will chair the inaugural session of the conference as Chief Guest on November 25, 2024.
3. **Theme of the Conference:**
   - The theme of the conference is "Cooperatives Build Prosperity for All".
   - **The subthemes include:**
     * **Enabling Policy and Entrepreneurial Ecosystems**: Discussing how cooperatives can be supported through favorable policies and entrepreneurial ecosystems.
     * **Nurturing Purposeful Leadership to Create Prosperity for All**: Focusing on leadership in cooperatives that ensures inclusive growth and prosperity.
     * **Reaffirming The Cooperative Identity**: Reaffirming the fundamental principles and values that guide cooperatives globally.
     * **Shaping the Future: Towards Realizing Prosperity for All in the 21st Century**: Envisioning the future role of cooperatives in fostering global prosperity.

4. India's Role in the Global Cooperative Movement:

- India is home to around 8 lakh cooperatives, making it a leader in the global cooperative sector.
- According to Cooperation Secretary Ashish Kumar Bhutani, 25% of the world's cooperatives are based in India, showcasing the country's vital role in the movement.
- The conference will provide a platform for India's cooperative sector to demonstrate its strength and potential on the global stage.

5. Sustainability and Social Responsibility:

- IFFCO Managing Director U.S. Awasthi emphasized that the event will be carbon-neutral and that efforts have been made to ensure its environmental sustainability.
- To support the initiative, 10,000 Peepal trees have been planted across the country.
- Vegetarian food will be served during the conference, and there will be no alcohol to ensure the event is environmentally and socially responsible.

6. Pakistan's Participation:

- When asked about Pakistan's participation, Secretary Ashish Kumar Bhutani stated that over 100 countries have confirmed their participation, but some countries require protocol approvals from the Ministry of External Affairs.
- Specific details regarding the participation of Pakistani representatives were not clarified, though it was indicated that protocols were being followed for such cases.

7. Significance of the Event:

- The conference serves as an important opportunity for India to showcase the strength and diversity of its cooperative sector, which has a crucial role in the country's economy, particularly in agriculture, finance, and rural development.
- The event also aims to promote greater global cooperation in the field of cooperatives and sustainable development, as cooperatives are seen as key players in creating prosperity and achieving inclusive growth.

8. Global Cooperation on Cooperatives:

- The event is set to bring together thought leaders, policymakers, and cooperative professionals to discuss the future of the global cooperative movement.
- It will highlight the role of cooperatives in fostering economic resilience, social inclusion, and environmental sustainability, crucial to addressing global challenges such as poverty, climate change, and inequality.

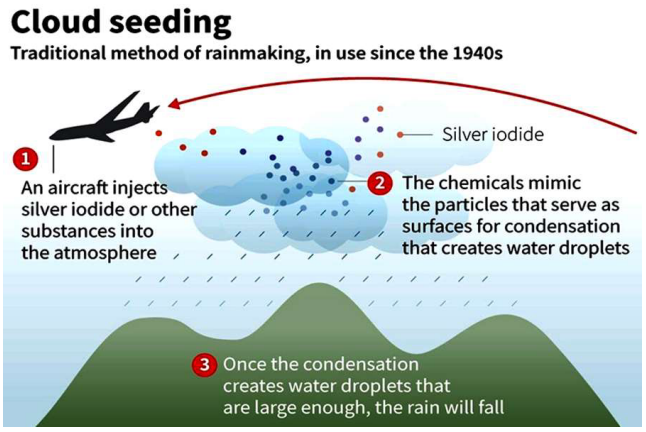
Conclusion :

India's hosting of the ICA Global Cooperative Conference is a significant moment for the country, recognizing its leadership role in the cooperative sector. The conference will provide a global platform for cooperatives to share knowledge and build networks aimed at achieving sustainable prosperity. With its focus on policy innovation, entrepreneurial ecosystems, and inclusive leadership, the event is expected to catalyze further growth in the cooperative movement and its role in global development.

What is Cloud Seeding ? The Science Behind Artificial Rain That Delhi's Air Needs

- As Delhi struggles with severe air pollution, the idea of cloud seeding has come up as a possible short-term solution to improve the city's air quality.
- The Air Quality Index (AQI) in Delhi has been in the "severe plus" category for several days, with readings consistently above 450, which is very unhealthy.
- On 19 November 2024, Delhi Environment Minister Gopal Rai asked the Central Government for help and requested Prime Minister Narendra Modi to assist in making artificial rain happen to fight the growing air pollution in Delhi.

What is Cloud Seeding ?



- Cloud seeding, also called artificial rain, is a method used to change the weather and encourage rain.
- It works by adding certain materials to the clouds to make them release rain.

How Does Cloud Seeding Work?

- The process involves putting materials like silver iodide, potassium iodide, or dry ice into the clouds.
- These materials act like seeds that water droplets can form around, making the clouds heavier and causing them to release rain or snow.
- The materials added to the clouds help boost rainfall by giving water droplets a place to form and grow.

How is Cloud Seeding Done?

- Cloud seeding can be done in different ways, including:
  - Aircraft flying through clouds to release the seeding materials.
  - Generators on the ground that send particles into the air.
  - Sometimes, rockets are used to send seeding materials into the clouds.

Cloud Seeding and Air Pollution

- In addition to increasing rain, cloud seeding is also thought to help clear pollutants from the air.
- The idea is that rainfall will help to settle down dust and other harmful particles, temporarily improving the air quality by removing airborne pollutants.

Delhi Government's Interest in Cloud Seeding

- The Delhi government has been considering cloud seeding as a way to reduce the constant air pollution.
- The Indian Institute of Technology (IIT) Kanpur has proposed a cloud seeding project to the Delhi government.
- The estimated cost for the project is about Rs 1 lakh per square kilometer.

  The project is under review by the Delhi government.

Is Artificial Rain Effective ?

The effectiveness of cloud seeding, especially for improving air pollution, is still debated by scientists.

Challenges and Effectiveness

- Some studies have shown small increases in rain due to cloud seeding, but it is unclear if it has any lasting effect on air quality.
- Experts warn that cloud seeding should not be seen as a long-term fix for air pollution.
- It may give some temporary relief, but it doesn't tackle the main causes of pollution.

Problems with Cloud Seeding in Delhi:

1. **Right Weather Conditions:**
   - Cloud seeding works only if there are the right weather conditions, like clouds with enough moisture.
   - If the weather is not right, cloud seeding may not be effective.
   - Delhi's current weather may not always be good for cloud seeding to work.
2. **Environmental Concerns:**
   - There are worries about the environmental impact of using chemicals in the air for cloud seeding.
   - The long-term effects of adding these chemicals to the atmosphere are still not well understood.
   - Some experts say that instead of relying on cloud seeding, the focus should be on reducing pollution at its source, such as through stricter laws on emissions from cars and industries.
3. **Temporary Impact:**
   - Even if cloud seeding leads to some rain, experts believe it will only help in the short term.

- It won't fix the main reasons for the pollution, like vehicle emissions, burning of crops, and industrial pollutants.

The Need for Long-Term Solutions

While cloud seeding might bring temporary relief, experts stress that long-term solutions are needed to solve the pollution problem. These should include:

- Stronger pollution controls for industries.
- Cleaner vehicles with lower emissions.
- Better waste management and cleaner energy sources.

Focus on the Real Causes of Pollution

- Rather than depending on technology like cloud seeding, experts say the focus should be on solving the real causes of pollution, such as cutting down on car emissions, open crop burning, and moving to cleaner energy sources.
- To improve air quality in Delhi for the long term, sustainable changes are necessary, focusing on pollution prevention rather than relying on temporary fixes.

In conclusion, cloud seeding could offer some temporary relief from Delhi's severe air pollution, but it should not be seen as a permanent fix. The real solutions lie in tackling the sources of pollution, like emissions and burning, with long-term, sustainable policies.

Discovery of the Largest Coral Colony on Earth in the Solomon Islands

Context and Discovery:

- In October 2024, researchers from National Geographic's Pristine Seas team made a major discovery in the Solomon Islands, located in the southwest Pacific Ocean.
- The team found the world's largest coral colony, so big that it can be seen from space.
- Why it matters: This discovery shows both the size and age of the colony, while also highlighting how fragile coral reefs are, especially with the ongoing threat of climate change.

Key Details about the Coral Colony:

- **Size and Structure**:
  - The coral is about 112 feet by 105 feet in size.
  - It lies 42 feet underwater and rises about 16 feet from the ocean floor.
  - Age: It is believed to be around 300 years old, though it could be even older.
- The discovery happened just one day before the team planned to move to a new area for their research.
- A videographer, working on documenting the effects of climate change, found the coral by accident.

Coral Species and Features:

- The colony is made up of almost a billion small coral polyps that live together as a single organism.
- This coral is known as Pavona clavus, or shoulder blade coral, named for its shape that looks like columns or shoulders.
- The coral's colours include shades of brown, yellow, red, pink, and blue, creating a beautiful, vibrant underwater scene.

What are Corals?

Corals are marine organisms from the phylum Cnidaria, typically found in warm, shallow ocean waters. These fascinating creatures are colonial, meaning they live in groups and build massive underwater structures called coral reefs.

1. **Coral Polyps**: Corals are made up of tiny individual animals known as polyps. A polyp has a simple structure:
   (a) A mouth surrounded by tentacles.
   (b) They feed on zooplankton (small marine organisms) by capturing them with their tentacles.

2. **Symbiotic Relationship:** Many types of corals also have a unique symbiotic relationship with zooxanthellae, a type of photosynthetic algae.
3. The algae live inside the coral polyps and provide energy to the corals through photosynthesis.
4. In return, corals provide the algae with nutrients.
5. **Coral Reefs:** Over time, corals accumulate their calcium carbonate skeletons, forming large, complex structures known as coral reefs.
6. These reefs are crucial to marine ecosystems, providing habitat and shelter for a vast array of marine species.

Importance of Corals:

- **Critical for Marine Life**: Corals create coral reefs, which are home to many sea creatures.
- **Threatened by Climate Change**: Corals are at risk because of warmer ocean temperatures caused by climate change.
- This can lead to coral bleaching and large-scale deaths of coral.
- However, this specific coral colony seems to have been protected, likely because it lives at deeper depths, where the water is cooler.

Resilience and Protection:

- The survival of this coral is significant because it has managed to avoid many of the worst effects of warming waters, possibly due to its location in deeper waters, which help shield it from extreme temperatures.

Geography and Location : Solomon Islands

1. The Solomon Islands is an archipelago located in the south-western Pacific Ocean.
2. It consists of nearly 1,000 islands, though only 147 are inhabited.
3. The islands are spread over an area of 461,000 sq.km, with 28,446 sq.km being landmass.
4. The nearest neighboring countries are:
   - o Vanuatu to the southeast.
   - o Papua New Guinea to the west.

Key Facts

1. **Capital**: **Honiara**, located on Guadalcanal, the largest island.
2. **Ethnic Composition**:
   a. 93% Melanesian
   b. 4% Polynesian
   c. 1.5% Micronesian
   d. 1.5% Other
3. **Languages**:
   a. English is the official language.
   b. There are also around 120 vernacular languages, including Solomon Islands Pidgin.
4. **Government**:
   a. The Solomon Islands operates as a parliamentary democracy within the Commonwealth.
   b. The British monarch is represented by a Governor-General, appointed by the Parliament for a 5-year term.

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Internal Security

Indian Army Contingent Departs for India-US Joint Special Forces Exercise 'Vajra Prahar'

- The Indian Army contingent has departed for the 15th edition of the India-US Joint Special Forces Exercise VAJRA PRAHAR. This edition of the exercise is set to take place from 2nd to 22nd November 2024 at the Orchard Combat Training Centre in Idaho, USA.
- The last edition of Vajra Prahar was conducted in December 2023 at Umroi, Meghalaya. This will be the second joint exercise of 2024 between the Indian Army and the US Army, following the Exercise Yudh Abhyas 2024 held in Rajasthan in September 2024.

Composition of the Contingents

- **Indian Army Contingent:** 45 personnel, representing Special Forces units of the Indian Army.
- **US Army Contingent:** 45 personnel, representing the elite Green Berets of the US Army.

Aim of the Exercise

The primary objective of Exercise Vajra Prahar is to enhance military cooperation between India and the United States. Specifically, the exercise focuses on:

- Improving interoperability between the two armies.
- Fostering jointness and mutual exchange of special operations tactics.
- Enhancing combined capabilities for conducting joint Special Forces Operations in desert and semi-desert environments.

The exercise aims to focus on the high degree of physical fitness, joint planning, and joint tactical drills essential for special forces operations.

Key Drills and Aspects to Be Rehearsed

During the Vajra Prahar 2024 exercise, the contingents will focus on a variety of specialized drills and tactics, including:

- Planning a Joint Team Mission
- Reconnaissance Mission
- Employment of Unmanned Aerial Systems (UAS)
- Execution of Special Operations
- Actions of Joint Terminal Attack Controllers (JTAC)
- Psychological Warfare in Special Operations

These drills aim to sharpen the capabilities of both armies in conducting highly specialized operations under various combat conditions.

Benefits of the Exercise

Exercise Vajra Prahar will provide both Indian and US Special Forces with the opportunity to:

- Share best practices and experiences in conducting joint special operations.
- Improve inter-operability between the two forces, enabling them to work seamlessly in future joint missions.
- Strengthen the bond and camaraderie between soldiers from the two nations, enhancing mutual trust and fostering closer military ties.

The exercise will not only boost military cooperation but also help both armies develop a deeper understanding of each other's tactics and operational strategies.

Conclusion

Exercise Vajra Prahar 2024 marks a significant milestone in the growing defense cooperation between India and the US. With a focus on enhancing interoperability, joint special operations tactics, and mutual learning, this exercise is set to further strengthen the military ties between the two nations, contributing to a shared vision of peace, stability, and security in the region and beyond.

Minuteman III : U.S. Intercontinental Ballistic Missile (ICBM)

In November 2024, The U.S. Army is scheduled to conduct a test launch of a Minuteman III hypersonic nuclear missile hours after the close of voting on Election Day. This test is part of the ongoing maintenance and readiness of the missile system.

About Minuteman III Missile

- The LGM-30G Minuteman III is an American intercontinental ballistic missile (ICBM), developed to carry nuclear payloads across long distances.
- LGM stands for:
  - **L**: Silo-launched
  - **G**: Surface attack
  - **M**: Guided missile
- It first became operational in the early 1970s.
- The Minuteman III is a key part of the U.S. nuclear triad, which includes land-based missiles, submarine-launched missiles, and strategic bombers.
- It was originally designed by the Boeing Corporation and was meant to be in service for only about 10 years, but it has been extensively modernized.
- The Ground-Based Strategic Deterrent (GBSD) system, its planned replacement, is expected to be operational by 2029.
- The Minuteman III was the first U.S. missile to be fitted with Multiple Independently Targetable Reentry Vehicles (MIRVs), allowing it to carry several warheads that can strike multiple targets independently.
- The U.S. currently possesses an estimated 440 Minuteman III missiles in its arsenal.

Features of the Minuteman III Missile

- **Type:** Three-stage, solid-fuel missile
- **Length:** 18.2 meters (about 60 feet)
- **Diameter:** 1.85 meters (about 6 feet)
- **Launch Weight:** 34,467 kg (approximately 76,000 lbs)
- **Speed:** Hypersonic, reaching speeds of about 15,000 mph (Mach 23 or 24,000 km/h) at burnout
- Range: Maximum range of 13,000 km
- **Payload:** Can carry three re-entry vehicles, though it currently carries a single nuclear warhead under arms control agreements between the U.S. and Russia.
- The missile is stored and launched from hardened silos and is connected to an underground launch control center through secure, protected cables.
- It has a fast launch time, nearly 100% testing reliability, and backup airborne launch controllers to ensure retaliatory capabilities are preserved in case of an attack.

What are Ballistic Missiles?

- **Ballistic missiles** are strategic weapons systems that are powered by rockets in multiple stages. Once the fuel is used up, the missile follows a **ballistic trajectory** (a curved path) to deliver its payload.
- These missiles can carry a variety of warheads, including conventional explosives, chemical, biological, or nuclear munitions.
- Ballistic missiles are launched from a fixed point but follow an unpowered arc into space before descending onto their target.

Conclusion :

The Minuteman III is a crucial component of the U.S. defense strategy, ensuring the country's ability to launch a retaliatory strike if necessary. The ongoing modernization and testing of the missile system, such as the upcoming test launch, showcase its importance in maintaining national security and deterrence capabilities.

Israel Moves Forward on Deploying Arrow-3 Missile Defence System in Germany (2025)

Context :

Israel's Defence Ministry has announced that it is coordinating with the German Federal Ministry of

Defence for the deployment of the Arrow-3 missile defence system in Germany by 2025. This move is part of a broader $3.5 billion defence deal made between Israel and Germany, marking Israel's largest-ever defence sale.

What is Arrow-3 Missile Defence System ?

- The Arrow-3 is an exo-atmospheric anti-ballistic missile defence system designed to intercept long-range ballistic missile threats before they re-enter the Earth's atmosphere.
- Developed jointly by Israel Aerospace Industries (IAI) and the U.S. Missile Defense Agency, the Arrow system was designed to address emerging missile threats, particularly from adversaries like Iran.
- The Arrow system includes Arrow-2 and Arrow-3 interceptors, with Arrow-3 being the more advanced system in the series.

Deployment:

- Israel and Germany signed an agreement for the purchase of the Arrow-3 system in 2023, as part of a $3.5 billion deal, marking a significant step in international defence cooperation between the two nations.
- The deployment of Arrow-3 to Germany in 2025 is part of Europe's broader efforts to strengthen its missile defence infrastructure, particularly in the wake of Russia's invasion of Ukraine, which has escalated regional security concerns.

Key Features of the Arrow-3 System

Technology:

- **Hypersonic Speed**: Arrow-3 travels at five times the speed of sound, making it highly effective at intercepting fast-moving threats.
- **Range and Altitude**: The system can engage targets at a range of 2,400 km and at an altitude of 100 km, placing it in the upper layer of the missile defence network.
- **Hit-to-Kill Technology**: Arrow-3 uses hit-to-kill technology, meaning it destroys the incoming missile by physically colliding with it, rather than relying on an explosive warhead.

Components:

- The system uses solid-fueled interceptors for high-speed interception of short- and medium-range missiles.
- Launchers, radars, and a battle management system work together to track, identify, and intercept incoming ballistic missiles.

Capabilities:

- **Multi-Target Acquisition**: Arrow-3 is equipped with advanced radar and tracking systems that allow it to track multiple threats simultaneously, providing robust protection for large areas.
- **Advanced Fire Control**: It integrates early warning systems and fire control radar for precise target identification and interception.

How Arrow-3 Works

- **Launch and Guidance**: The interceptor is launched vertically and then reorients towards the estimated interception point.
- **Targeting**: Once in flight, the high-resolution electro-optical sensor identifies and locks onto the target, guiding the interceptor to collide with and destroy the warhead of the incoming missile.
- **Exo-Atmospheric Engagement**: Unlike lower-layer systems, Arrow-3 engages threats outside the Earth's atmosphere, ensuring the destruction of the missile before it re-enters the atmosphere, significantly reducing the risk of collateral damage.

Israel's Strategic Defence Systems

- Arrow-3 serves as the upper layer in Israel's sophisticated air and missile defence systems. Below it are the other two systems:
  - **Iron Dome**: A short-range system designed to intercept threats like rockets and mortars.
  - **David's Sling**: A mid-range system aimed at intercepting larger missiles.

Together, these systems form a comprehensive shield against a wide array of missile threats, from short-range rockets to long-range ballistic missiles.

Proven Effectiveness:

- **Recent Success**: The Arrow system demonstrated its capabilities in April and October 2023, successfully intercepting missiles in high-profile attacks, including an Iranian missile and drone assault.
- These successful interceptions have generated global interest in purchasing the technology.

Ballistic Missiles : A Growing Threat

What are Ballistic Missiles ?

- **Ballistic missiles** are launched into the atmosphere, following a rocket-powered trajectory before descending toward their target.
- These missiles can carry conventional or nuclear warheads, making them a serious threat to nations with adversaries possessing missile capabilities.
- Their long-range and high-speed nature make them difficult to intercept without advanced defence systems like Arrow-3.

Strategic Implications for Israel and Germany

Israel's Defence Industry:

- Israel's defence technology, particularly the Arrow missile system, has positioned the country as a global leader in missile defence.
- The sale of the Arrow-3 to Germany further strengthens Israel's geopolitical standing in Europe.

Germany's Defence Strategy:

- In light of growing threats in Europe, especially following Russia's war on Ukraine, Germany is significantly increasing its defence budget and modernising its military capabilities.
- The deployment of the Arrow-3 system will significantly enhance Germany's defence infrastructure, providing additional protection against missile threats.

Global Interest and Future Prospects

Interest from Other Countries:

- Following its successes in intercepting missiles, there has been growing international interest in acquiring Arrow-3.
- Countries in the Middle East, Europe, and beyond are looking to enhance their own missile defence capabilities.

U.S. Involvement:

- The United States is a key partner in the Arrow program, with Boeing contributing to its production. The U.S. Missile Defense Agency has collaborated with Israel on the system's development and continues to support its global deployment.

Way Forward for Israel and Germany

- **Enhanced Defence Cooperation**: The deployment of Arrow-3 in Germany will strengthen the Israel-Germany defence partnership, paving the way for future cooperation on missile defence and other security issues.
- **Broader European Impact**: This deal highlights the increasing focus on collective defence in Europe, especially as countries face new threats from missile-capable adversaries.
- **Ongoing Innovation**: Both Israel and Germany will likely continue to invest in innovative defence technologies to stay ahead of emerging threats, with the Arrow-3 system playing a key role in future defence strategies.

Conclusion :

The deployment of Israel's Arrow-3 missile defence system in Germany by 2025 represents a significant step in international missile defence cooperation. The system's advanced capabilities make it an essential asset for both Israel and Germany, and its effectiveness against long-range ballistic missile threats positions it as a critical component of NATO and European defence. With growing global interest, the Arrow-3 is poised to play a key role in the evolving landscape of missile defence.

Exercise Sea Vigil

Overview :

The Indian Navy will conduct the fourth edition of the 'Sea Vigil-24', a Pan-India Coastal Defence Exercise, on 20th and 21st November 2024.

About Exercise Sea Vigil:

- **Conceptualization:** Sea Vigil was initiated in 2018 to assess and validate the effectiveness of the maritime security measures implemented since the 26/11 Mumbai attacks.
- **Objective:** The primary aim is to activate India's Coastal Security apparatus and evaluate the overall Coastal Defence mechanism.
- **Participants:** This year's Sea Vigil-24 will involve 6 Ministries and 21 Organizations/Agencies, making it a multi-agency initiative.
- **Focus Areas:**
  - o **Coastal Assets Security:** The exercise will concentrate on strengthening the security of critical coastal assets, including ports, oil rigs, single point moorings, cable landing points, and other coastal infrastructure.
  - o **Inclusion of Other Services:** The Indian Army and Air Force will participate, along with a significant deployment of ships and aircraft, enhancing the exercise's scale and scope.
- **Engagement with Communities:**

  The exercise will engage the coastal population, including the fishing communities, NCC (National Cadet Corps) students, and Bharat Scouts and Guides, with the goal of raising awareness about maritime security.
- **Importance:** Sea Vigil is a national-level exercise that provides a comprehensive assessment of India's maritime defence capabilities and its security infrastructure.
- **Precursor to TROPEX:** Sea Vigil-24 will serve as a precursor to the biennial Theatre Level Readiness Operational Exercise (TROPEX) conducted by the Indian Navy, which assesses the operational readiness of the Navy and other armed forces.

What is the National Cadet Corps (NCC) ?

- The National Cadet Corps (NCC) is a Tri-Services organization involving the Indian Army, Navy, and Air Force.
- **Purpose:** The NCC is tasked with grooming young individuals into disciplined, patriotic citizens of India.
- **Established:** It was founded under the National Cadet Corps Act XXXI of 1948 by the Ministry of Defence (MoD).

Bharat National Cyber Security Exercise (Bharat NCX 2024)

On 20th November 2024, The Bharat National Cyber Security Exercise (Bharat NCX 2024) is a major initiative aimed at strengthening India's cybersecurity resilience. This exercise is conducted by the National Security Council Secretariat (NSCS) in collaboration with Rashtriya Raksha University (RRU). It brings together key stakeholders from the government, public organizations, and private sectors to address the growing challenges in safeguarding India's critical information infrastructure.

Key Features of Bharat NCX 2024:

1. **Cyber Defense and Incident Response Training**:
   - o Participants will undergo immersive training focused on strengthening cybersecurity defense and incident response skills.
   - o This includes simulations of cyberattacks on both IT (Information Technology) and OT (Operational Technology) systems.
2. **Live-Fire Simulations**:

   Live-fire cyberattack simulations will test participants' readiness to handle real-world cyberattacks. These exercises are designed to improve preparedness and response strategies.
3. **Strategic Decision-Making Exercise**:

   A Strategic Decision-Making Exercise will bring together senior management from various sectors to simulate responses to a national-level cyber crisis. This aims to enhance decision-making under pressure and improve leadership during cybersecurity incidents.

4. **CISO's Conclave**:

   The exercise will host a CISO (Chief Information Security Officer) Conclave, where CISOs from government, public, and private sectors will share insights, discuss the latest cybersecurity trends, and explore government initiatives in securing cyberspace.

5. **Bharat Cybersecurity Startup Exhibition**:

   The Bharat Cybersecurity Startup Exhibition will showcase innovative cybersecurity solutions developed by Indian startups, highlighting their role in strengthening India's cybersecurity infrastructure.

6. **Leadership Engagement and Capacity Building**:

   The exercise emphasizes leadership engagement and capacity building, aiming to foster a unified approach to addressing emerging cybersecurity challenges in India.

About the National Security Council Secretariat (NSCS)

The National Security Council Secretariat (NSCS) is a key government body under the Prime Minister's Office (PMO), responsible for coordinating and planning India's national security policies. It serves as an advisory body to the Prime Minister on matters related to defense, internal security, and foreign policy.

- **Role**: The NSCS helps in formulating strategies on national security, provides assessments of security threats, and coordinates responses across different government departments.
- **Leadership**: The Prime Minister heads the NSCS, and its daily operations are managed by the National Security Advisor (NSA), who oversees policy-making and decision-making in collaboration with other security agencies.

Conclusion :

The Bharat NCX 2024 is a significant initiative for enhancing India's cybersecurity capabilities. By bringing together government bodies, industry leaders, and experts, it aims to strengthen India's ability to defend against cyber threats and improve national resilience to emerging challenges in the digital landscape.

16th Anniversary of 26/11 Attacks

Why in News?

On 26th November 2008, a terror group Lashkar-e-Taiba (LeT), based in Pakistan, carried out a series of coordinated attacks in Mumbai at multiple locations, including the Taj Mahal Palace Hotel, Nariman House, Oberoi Trident, and Chhatrapati Shivaji Railway Station. The attacks led to significant loss of life and exposed critical vulnerabilities in India's national security infrastructure, spurring extensive reforms in counter-terrorism measures.

Indian Security Vulnerabilities Exposed by 26/11 Attacks

1. **Intelligence Failures:**

   Lack of real-time information sharing between agencies allowed terrorists to operate undetected for hours before the attack.

2. **Maritime Security Weaknesses:**

   The attackers hijacked an Indian fishing trawler and traveled to India using Pakistani-flagged vessels. The porous coastline and lack of coordination among the Indian Navy, Coast Guard, and Marine Police left coastal areas vulnerable.

3. **Digital Vulnerabilities:**

   The attackers used advanced communication tools, including satellite phones, to maintain contact with their handlers in Pakistan. India lacked the ability to counter such technological threats.

4. **Lack of Specialised Training:**

   Indian security forces were not equipped to handle urban terror attacks targeting multiple sites simultaneously.

5. **Slow Response:**

   A delayed response, combined with poor coordination among various agencies, allowed terrorists to hold multiple locations for several hours.

Steps Taken to Strengthen Security Post-26/11 Attacks

1. **Revamping Maritime Security:**

- The Indian Navy took charge of overall maritime security. The Coast Guard was tasked with managing territorial waters, and new marine police stations were established along the coast.
- Sagar Prahari Bal was formed for better coastal patrolling and rapid responses.
- Vessels over 20 meters in length were mandated to install the Automatic Identification System (AIS).

2. **Improved Intelligence Coordination:**

The Multi-Agency Centre (MAC) of the Intelligence Bureau (IB) was strengthened to ensure better coordination of intelligence sharing between central agencies, armed forces, and state police.

3. **Institutional Measures:**

- The National Counter-Terrorism Centre (NCTC) was established to coordinate counter-terrorism efforts.
- The Crime and Criminal Tracking Network & Systems (CCTNS) and National Intelligence Grid (NATGRID) were introduced to enhance data sharing and help counter threats more effectively.

4. **Legal Reforms:**

- Amendments to the Unlawful Activities Prevention Act (UAPA) broadened the definition of terrorism to enable more proactive counter-terrorism measures.
- The National Investigation Agency (NIA) was set up to handle terrorism cases across states.

5. **Modernisation of Police Forces:**

- Increased funding for police stations, upgrading their technology, and improving training for handling modern threats, including terrorism.
- The National Security Guard (NSG) set up regional hubs for rapid deployment.

6. **International Cooperation:**

- The US helped gather evidence during the attacks and provided real-time information, which was crucial for prosecuting terrorists.
- In 2018, Pakistan was placed on the FATF grey list, leading to global pressure on Pakistan to take action against terror groups like LeT and JeM.

7. **Sensitisation Campaigns:**

Campaigns were launched to increase awareness about maritime threats and encourage the reporting of suspicious activities.

Persistent Lacunas in Indian Coastal Security

1. **Monitoring Challenges:**

India's 7517 km-long coastline, including the mainland and islands, makes comprehensive monitoring difficult. Thousands of fishing boats and dhows operate along the coast, complicating security operations.

2. **Inadequate Surveillance Coverage:**

While vessels over 20 meters are required to have AIS, smaller boats remain outside the radar, posing potential risks.

3. **Diverse Threat Landscape:**

The variety of threats—from terrorism to smuggling and illegal migration—makes coastal security complex. Migrants, especially from neighboring countries like Bangladesh and Sri Lanka, may also pose security risks.

4. **Over-reliance on Local Communities:**

Relying on fishermen for intelligence poses risks, especially in areas where there is a lack of cooperation due to fear or distrust.

5. **Poor Infrastructure:**

State police forces often lack modern equipment, training, and coordination, hampered by political interference.

Way Forward for Strengthening Counter-Terrorism Measures

1. **Deterrence & Offensive Strategies:**

Responses like surgical strikes and airstrikes should be institutionalized as part of India's counterterrorism policy to deter cross-border terrorism.

2. **Multi-Agency Training & Exercises:**

Regular, large-scale multi-agency exercises involving local law enforcement, paramilitary

forces, and intelligence agencies should be expanded nationwide to ensure coordinated action in emergencies.

3. **Coordination with Specialized Forces:**
   Local police must work closely with national counterterrorism units such as the NSG to ensure smooth coordination during an attack.
4. **Empowering Decision-Makers:**
   Decision-makers at various levels (local, state, and national) must be empowered with greater authority to act swiftly during emergencies.
5. **Urban Disaster Management Plans:**
   Cities must have comprehensive disaster management plans, covering both natural disasters and terrorist attacks.
6. **Building Cybersecurity Expertise:**
   Integrating cybersecurity training with physical security training will help better counter online radicalization and digital threats.
7. **Establishing 'Awake Cells':**
   Community-based 'Awake Cells' comprising local youth and citizens can help bridge the gap between the public and security agencies, offering real-time intelligence and aiding in the identification of suspicious activities.

Conclusion :

The 26/11 attacks exposed serious vulnerabilities in India's security infrastructure, particularly in intelligence sharing, maritime security, and counter-terrorism response. Over the years, significant measures have been taken to bolster security, including reforms in maritime security, intelligence coordination, and legal frameworks. Despite these advancements, challenges remain in ensuring comprehensive surveillance, infrastructure improvement, and local community cooperation. Moving forward, India must adopt a multi-pronged approach to counter-terrorism, including strategic deterrence, specialized training, and enhanced coordination across all levels of government and security agencies.

Indian Army Receives Advanced Sabal 20 Logistics Drone from Endure Air

Date of Delivery: November 2024

Delivered by: EndureAir

Recipient: Indian Army, Eastern Theatre of Operations

Overview:

In a significant move to enhance the Indian Army's logistical capabilities, EndureAir, a private drone manufacturer, has delivered the Sabal 20 logistics drone to the Eastern Theatre of Operations. This delivery marks a crucial step in modernizing the army's operational efficiency, especially in challenging and remote terrains, and aligns with India's ongoing defense modernization efforts.

Key Details:

1. **About Sabal 20**:
   - The Sabal 20 is an advanced electric unmanned aerial vehicle (UAV) developed specifically for aerial logistics. It is designed to carry essential supplies over long distances, making it especially useful for military operations in difficult and inaccessible areas.
   - The drone has a payload capacity of up to 20 kilograms, which is approximately half of its own weight. This allows it to carry critical supplies, such as ammunition, food, and medical equipment, to remote forward positions where traditional transport methods may not be viable.
2. **Key Features of Sabal 20**:
   - **Vertical Take-Off and Landing (VTOL)**: The Sabal 20 utilizes VTOL technology, which enables it to take off and land in confined spaces, making it ideal for operations in difficult environments and areas with limited infrastructure.
   - **Variable Pitch Technology**: The drone incorporates variable pitch rotors similar to the Chinook helicopter, which improves its load-carrying capacity and stability. This technology allows it to perform exceptionally well in high-altitude terrains and areas with challenging weather conditions.

- **Tandem Rotor Configuration**: The tandem rotor setup minimizes turbulence and enhances lift, enabling the drone to carry heavier loads with greater stability, even in rugged and elevated landscapes.
- **Stealth Capability**: Its low **rotor speed** design reduces the noise produced during operations, providing a stealth advantage for sensitive military missions.
- **High Altitude Performance**: The Sabal 20 is designed to operate effectively at high altitudes, which is particularly crucial for areas like the Himalayan region, where the Indian Army is often deployed.

3. Significance for the Indian Army:

- The Sabal 20 enhances the Indian Army's ability to deliver supplies to remote, forward-operating bases in regions where conventional vehicles cannot operate due to terrain or logistical challenges.
- This delivery is part of the Indian Army's broader effort to modernize its logistics and operational capabilities, particularly in border areas and regions with difficult terrain.
- The drone's aerial logistics capacity allows for faster and more flexible responses, especially in emergency situations where traditional supply chains might be slow or disrupted.

4. Indigenous Manufacturing and Strategic Importance:

- Dr. Abhishek, Director and Co-founder of EndureAir, emphasized that the company's development of the Sabal 20 aligns with India's "Make in India" and "Atmanirbhar Bharat" (self-reliant India) initiatives. The focus is on building indigenous defense technology to reduce dependence on foreign suppliers and promote self-sufficiency in defense capabilities.
- The Sabal 20 is an example of India's growing capabilities in the field of unmanned aerial systems (UAS), showcasing the country's potential to develop and deploy cutting-edge defense technology domestically.

5. Comparison with China's Drone Technology:

- China has developed a range of UAV technologies for military use, but the Sabal 20 offers unique features that differentiate it from similar technologies, particularly in its payload capacity, high-altitude performance, and stealth design.
- While China's drones have made significant strides, the Sabal 20's specialized features make it a distinct asset for the Indian military, especially for operations in rugged terrains and high-altitude regions like the Himalayas.

Conclusion :

The induction of the Sabal 20 logistics drone into the Indian Army's arsenal is a major step toward modernizing the army's capabilities in aerial logistics, improving operational efficiency, and enhancing supply chain management in challenging terrains. With its advanced features, including VTOL, tandem rotor configuration, and stealth capabilities, the Sabal 20 significantly boosts the Indian Army's ability to operate in remote and high-altitude environments. This indigenous innovation underscores India's commitment to advancing self-reliant defense technologies while maintaining a strategic edge in modern warfare.

Indian Army Launches 'EKLAVYA' Online Digital Platform for Officers' Training

Date of Launch: 28th November 2024

Launched by: General Upendra Dwivedi, Chief of the Army Staff (COAS)

Platform Name: Eklavya

Overview:

In a significant move to enhance the training and professional development of its officers, the Indian Army launched the 'Eklavya' online digital platform. This initiative is in line with the Army's vision for the "Decade of Transformation" and the "Year of Technology Absorption" (2024), both of which aim to modernize and streamline various aspects of military operations and training through the use of technology.

Key Details:

1. **Purpose of Eklavya Platform**:

- Eklavya is an online learning platform developed to support the training of officers in the Indian Army. The platform will help officers upgrade their skills, gain new knowledge, and undergo specialized training in various areas, all from the convenience of their locations, without needing to attend physical courses for every skill update.
- It facilitates continuous professional development for officers, allowing them to register for courses at any point during their service, making it a flexible and accessible solution for modern military training.

2. **Development and Cost**:

- The Eklavya platform has been developed under the guidance of the Headquarters Army Training Command with sponsorship from the Army War College.
- The development of the platform was completed at zero cost in collaboration with the Bhaskaracharya National Institute of Space Applications and Geoinformatics (BISAG-N), Gandhinagar, and the Directorate General of Information Systems.
- The platform is hosted on the Army Data Network, ensuring a secure and scalable infrastructure to accommodate the large-scale participation of officers and training institutions.

3. **Categories of Courses**: The Eklavya platform offers three main categories of courses:

(i) Pre-Course Preparatory Capsules:

* These courses contain study material for offline physical courses conducted at various Category 'A' Training Establishments. The aim is to shift the basic foundational knowledge to the online format, thus allowing physical training sessions to focus on more advanced, application-oriented content.
* The online courses will help decongest existing physical training schedules and generate more time to include emerging concepts related to modern warfare, enhancing the overall quality of training.
* Officers can register for courses at any point in their service, regardless of their attendance in physical courses, allowing for flexibility and continuous learning.

(ii) Appointment or Specific Assignment-Related Courses:

* These courses are designed for officers assigned to specialized roles (e.g., information warfare, financial planning, veteran affairs, defence land management), where on-the-job training (OJT) is essential. These courses help officers to quickly gain domain-specific knowledge after receiving their posting orders.
* The courses in this category will assist officers in acquiring the skills needed for specific roles, making them more efficient in their new positions and helping them specialize in areas crucial to the evolving needs of the military.

(iii) Professional Development Suite:

* This suite includes a range of advanced courses aimed at enhancing the strategic, leadership, and operational skills of officers. Courses cover topics like Strategy, Operational Art, Leadership, Finance, Emerging Technology, and Organizational Behavior.
* The focus is on fostering holistic professional growth, helping officers prepare for high-level responsibilities and stay updated with the latest developments in military strategy and technology.

4. **Additional Features**:

- **Knowledge Highway**: The platform includes a searchable repository of journals, research papers, and articles, allowing officers to access a wealth of information related to their professional development. This feature encourages continuous self-learning and professional military education, providing a rich source of academic and practical knowledge.
- **Scalable Architecture**: The platform's scalable design allows it to seamlessly integrate with

multiple training establishments across the Army, each capable of hosting an extensive range of courses tailored to different specializations and ranks.

5. **Impact and Significance**:

- **Flexibility**: Officers can pursue various courses online without interrupting their physical training schedules, offering greater flexibility in managing their time and learning.
- **Modernization of Training**: The Eklavya platform embodies the Indian Army's efforts to embrace technology and digital tools to modernize training and education, ensuring that its officers remain well-equipped to handle the challenges of modern warfare.
- **Encouraging Domain Specialization**: The availability of specialized online courses supports the Army's goal of building officers with domain-specific expertise, ultimately enhancing the operational efficiency of the force.

Conclusion :

The launch of the Eklavya platform marks a significant leap forward in the Indian Army's training and development processes. By offering flexible, online training solutions, Eklavya allows officers to continuously upgrade their skills and acquire new knowledge, thereby enhancing their professional competence and operational readiness. This initiative aligns with the Indian Army's modernization goals and its "Decade of Transformation" vision, fostering a future-ready force equipped with the latest technological tools and specialized knowledge required for contemporary military operations.

India-Vietnam Joint Military Exercise "VINBAX 2024" in Ambala, Haryana

Introduction to VINBAX 2024

- The 5th edition of the India-Vietnam Joint Military Exercise titled VINBAX 2024 began at Ambala, Haryana.
- The exercise, which will run from November 4 to 23, 2024, is being conducted in Ambala and Chandimandir.
- This joint military training is a continuation of the successful exercises held between the two nations, with the last one conducted in Vietnam in 2023.
- VINBAX 2024 marks a significant milestone in the defence cooperation between India and Vietnam and reflects the growing strength of their bilateral military ties.

Key Features of VINBAX 2024

1. **Expanded Scope and Participation:**

- This year's exercise is notable for its expanded scope, which now includes Bi-Service participation for the first time.
- Personnel from both the Indian Army and the Indian Air Force, along with their Vietnamese counterparts, will be taking part.
- The Indian contingent consists of 47 personnel from the Indian Army, including a Regiment of the Corps of Engineers and personnel from other arms and services.
- The Vietnamese contingent, also comprising 47 personnel, will be represented by troops from the Vietnam People's Army.

2. **Focus on UN Peacekeeping Operations:**

- The primary goal of VINBAX 2024 is to enhance the joint military capabilities of both countries, particularly in the areas of engineering tasks and medical support during United Nations Peacekeeping Operations.
- The exercise will simulate tasks outlined under Chapter VII of the United Nations Charter, which deals with peacekeeping operations in conflict zones.

3. **Field Training and Disaster Relief:**

- This year's exercise will be conducted as a field training exercise, featuring a 48-hour validation exercise.

- This will include demonstrations of Humanitarian Assistance & Disaster Relief (HADR) operations, showcasing the combined efforts of both countries to provide assistance in the wake of natural disasters or humanitarian crises.
- Both the Indian and Vietnamese contingents will display their technical military skills while executing military operations similar to those conducted in UN missions.

4. Strengthening Mutual Confidence and Interoperability:

- The exercise aims to strengthen mutual confidence and improve the interoperability between the Indian Army and the Vietnam People's Army.
- A major component of the exercise is the sharing of best practices between the two forces, particularly in the areas of engineering and medical support during peacekeeping operations.

5. Cultural Exchange:

In addition to military training, the exercise will also provide both contingents with the opportunity to learn about each other's social and cultural heritage. This is part of a broader effort to build closer ties and mutual understanding between India and Vietnam.

Significance of VINBAX 2024 for India-Vietnam Relations

1. Strengthening Bilateral Military Cooperation:

- The VINBAX exercise series has become an important tool in enhancing defence cooperation between India and Vietnam.
- With both countries sharing common interests in regional security, this exercise provides a platform to discuss and improve their military strategies, particularly concerning peacekeeping operations under the United Nations.

2. Strategic Partnership:

- India and Vietnam have been steadily deepening their strategic partnership, with a strong focus on defence ties, security cooperation, and joint military training.
- This joint exercise also reflects India's commitment to supporting peacekeeping operations worldwide and furthering its role in global security initiatives.

3. Regional Security and Stability:

- Given the evolving security situation in the Indo-Pacific region, this exercise also contributes to ensuring peace and stability in the region.
- India and Vietnam share mutual concerns over regional security, particularly in relation to issues such as freedom of navigation and maritime security in the South China Sea.

Conclusion :

VINBAX 2024 represents a significant advancement in the military relationship between India and Vietnam. By expanding the scope of the exercise to include Air Force participation and incorporating field training and humanitarian relief operations, both countries are not only improving their military capabilities but also strengthening their bilateral ties. The joint exercise provides an important opportunity for both countries to enhance their interoperability, share best practices, and promote regional security and stability. It also serves as a reminder of the growing importance of international military cooperation in maintaining peace, particularly in the context of United Nations peacekeeping missions.

Third Edition of MAHASAGAR - A High-Level Virtual Maritime Interaction

Why in News ?

- The third edition of MAHASAGAR—a high-level virtual interaction organized by the Indian Navy—was conducted on 5th November 2024.
- During this event, Admiral Dinesh Kumar Tripathi, Chief of the Naval Staff of India, engaged with the Heads of Navies and Maritime Agencies from Indian Ocean Region (IOR) littoral nations.
- The theme of this year's discussion was "Training Cooperation to Mitigate Common Maritime Security Challenges in the IOR."
- The interaction focused on addressing shared maritime security challenges in the region through

training collaboration and enhancing the maritime security capacities of the countries involved.

- MAHASAGAR—which translates to "vast ocean" in Hindi—represents India's commitment to promoting security, stability, and cooperation in the IOR, with an emphasis on training and capacity building.
- This edition of MAHASAGAR was attended by senior leaders from maritime agencies and naval forces of IOR littoral countries, including Bangladesh, Comoros, Kenya, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, Sri Lanka, and Tanzania.

Key Highlights of MAHASAGAR 2024

1. Purpose and Objective of MAHASAGAR:

- MAHASAGAR is an outreach initiative by the Indian Navy, designed to foster cooperation and dialogue between the navies and maritime agencies of IOR nations. The goal is to promote the "Active Security and Growth for All" in the region (SAGAR), a strategic concept championed by India.
- The event is aimed at strengthening regional cooperation to mitigate common maritime security challenges through joint efforts, including training and the development of necessary maritime capabilities among littoral nations.
- Training cooperation is emphasized as a critical aspect of the region's collective security, helping to build skilled maritime manpower to address contemporary challenges like piracy, maritime terrorism, illegal fishing, and human trafficking.

2. Focus on Training Cooperation:

- The key theme of this edition was the need for collaborative training programs to improve maritime security in the IOR. All participating nations discussed the importance of developing requisite capacities and skilled personnel who can tackle shared security challenges in the maritime domain.
- Training cooperation is vital to ensuring that maritime forces and agencies in the IOR are well-equipped to respond to emerging challenges and build a robust maritime security architecture that benefits all nations in the region.

3. The Strategic Importance of the Indian Ocean Region (IOR):

- The Indian Ocean is a critical area for global maritime trade, with over 80% of global oil trade passing through its waters. The region is also home to a complex mix of security challenges, including piracy, terrorism, and illegal activities.
- The IOR is crucial for global maritime security, as it connects vital shipping routes between East Asia, Africa, the Middle East, and Europe. As a result, ensuring its security is of paramount importance for the peace and stability of the global maritime community.
- The IOR is strategically important for India, which is increasingly positioning itself as a regional leader in maritime affairs. India's SAGAR initiative reflects its vision of a peaceful, stable, and prosperous Indian Ocean, where all countries work together to secure shared interests.

4. Collaborative Maritime Security:

- The discussions during the MAHASAGAR interaction also focused on how training can lead to the development of maritime security frameworks that are responsive and adaptive to contemporary challenges.
- The participating nations agreed that joint training exercises, sharing of best practices, and the use of advanced technologies are essential tools to enhance operational effectiveness in safeguarding the IOR's maritime domain.
- The cooperation during MAHASAGAR underscores the importance of regional partnerships in addressing issues such as illegal maritime activities, humanitarian assistance, and disaster relief during times of crisis.

India's Role and Strategic Vision:

- The Indian Navy's MAHASAGAR initiative plays a key role in promoting India's maritime leadership in the IOR. As part of its broader Indo-Pacific strategy, India has been proactively engaging with littoral states to strengthen maritime security and foster capacity-building across the region.

- India's SAGAR doctrine underscores the importance of cooperation among Indian Ocean nations to ensure that the region remains free from external threats and unregulated activities.
- Training cooperation helps Indian Navy share its knowledge and capabilities with smaller regional players, ensuring that they are better prepared to handle their maritime security challenges, ultimately contributing to regional stability.

Future of MAHASAGAR:

- Since its inception in 2023, MAHASAGAR has become a highly anticipated event in the IOR, and its bi-annual nature ensures that the countries involved can continuously evaluate and refine their maritime security cooperation.
- Moving forward, MAHASAGAR is expected to evolve into a more comprehensive training platform with a focus on specialized training in areas such as counter-piracy operations, humanitarian assistance and disaster relief, and maritime domain awareness.

Conclusion :

The third edition of MAHASAGAR 2024 highlighted the growing need for regional cooperation and training collaboration to address shared maritime security challenges in the Indian Ocean Region. As the Indian Navy's flagship outreach program, MAHASAGAR exemplifies India's commitment to promoting maritime peace, security, and prosperity through collaborative efforts with IOR littoral nations.

First Ever Space Exercise 'Antariksha Abhyas – 2024' Hosted by Defence Space Agency

Exercise Dates: 11-13 November 2024

Location: New Delhi

- India has launched its first-ever space exercise, Antariksha Abhyas – 2024, organized by the Defence Space Agency (DSA) under the Headquarters Integrated Defence Staff.
- This 3-day exercise aims to enhance India's understanding of the strategic importance of space in military operations and address the growing challenges to space-based assets and services.

Objective of the Exercise:

Antariksha Abhyas – 2024 is designed to:

- War-game the growing threats to space-based assets and services.
- Secure national strategic objectives in space.
- Integrate India's space capabilities into broader military operations.
- Identify vulnerabilities in military operations that could arise from disruptions or denial of space-based services.

Key Features:

Participants: The exercise will involve participants from:

- o Defence Space Agency (DSA) and its allied units.
- o Personnel from the Indian Army, Navy, and Air Force.
- o Specialist branches under the Headquarters Integrated Defence Staff, such as the Defence Cyber Agency, Defence Intelligence Agency, and Strategic Forces Command.
- o Representatives from Indian Space Research Organisation (ISRO) and the Defence Research & Development Organisation (DRDO).

Opening Address by CDS Gen Anil Chauhan:

In his opening remarks, Chief of Defence Staff (CDS) General Anil Chauhan emphasized the critical role of space in modern defense and security. He stated:

- Space is no longer just the "final frontier," but a crucial enabler for India's defense capabilities.
- India, with its strong legacy in space exploration and growing military capabilities, is well-positioned to tackle challenges related to space-based assets.
- He highlighted the need for India to secure its national interests in space, as the domain is becoming:
  - o **Congested**: More space objects and activities are crowding the area.
  - o **Contested**: Competition is increasing for control and access to space.
  - o **Competitive**: Nations and private players are vying for space superiority.

- **Commercial**: The space sector is becoming an important part of the global economy.

General Chauhan emphasized the importance of innovation and collaboration with key organizations like DRDO, ISRO, and academic institutions to develop cutting-edge technologies and state-of-the-art systems to safeguard India's space capabilities.

Purpose and Goals of the Exercise:

The primary goals of Antariksha Abhyas – 2024 are:

1. **Enhanced Understanding**: To help participants gain a deeper understanding of space-based assets and services, and how they are integrated into military operations.
2. **Operational Dependency**: To highlight the **dependence** on space capabilities for modern warfare and defense strategies.
3. **Vulnerability Assessment**: To identify vulnerabilities and challenges in the conduct of military operations if space-based services are disrupted or denied.
4. **Collaboration**: Foster collaboration among different military branches, defense agencies, and space organizations to enhance the overall security and resilience of India's space infrastructure.

Importance of Space in Modern Warfare:

Space is increasingly seen as a critical element of national security. Modern military operations, communication, navigation, and intelligence-gathering heavily depend on space-based systems. Given the growing threats from other nations and the increasing militarization of space, it is vital for India to secure its space assets and be prepared for any disruptions or attacks in space.

Participants and Stakeholders:

- **Defence Space Agency**: The key agency leading the exercise, tasked with overseeing India's space defense capabilities.
- **Indian Armed Forces**: Representatives from the Army, Navy, and Air Force will actively participate to understand how their operations depend on space systems and how to safeguard them.
- **Defence Cyber Agency**: This agency plays a crucial role in addressing cyber threats to space-based systems, which are becoming a growing concern.
- **Defence Intelligence Agency**: Will contribute insights into how space-based intelligence is vital for national security.
- **Strategic Forces Command**: Involved in understanding the role of space in nuclear deterrence and other strategic defense operations.
- **ISRO & DRDO**: India's premier space and defense research organizations will collaborate to provide insights into current and future space capabilities, helping the military develop a robust defense strategy for space.

Conclusion :

The Antariksha Abhyas – 2024 exercise represents a significant step in India's efforts to strengthen its space defense capabilities. It brings together various branches of the military, defense agencies, and space organizations to create a comprehensive approach to managing and securing space-based assets. With the growing congestion and competition in space, it is essential for India to maintain a strong, resilient, and innovative space defense strategy to protect its national interests.

DRDO's Long Range Land Attack Cruise Missile Passes Maiden Flight Test

- **Overview:**

  In a significant advancement for India's defense capabilities, the Defence Research and Development Organisation (DRDO) successfully conducted the maiden flight test of its Long Range Land Attack Cruise Missile (LRLACM).
- The test, conducted on a Tuesday in November 2024, took place at the Integrated Test Range (ITR) in Chandipur, Odisha, marking a major step in India's quest for self-reliance in precision missile technology.

Key Highlights of the Test:

1. Launch Details:

- The missile was launched from a mobile articulated launcher at the Integrated Test Range (ITR), located off the coast of Odisha.
- The flight test was observed by senior DRDO officials and representatives from the Indian Armed Forces, which will be the primary users of the missile.

2. Performance Assessment:

- The missile successfully followed a pre-programmed flight path and used waypoint navigation to demonstrate its precision.
- It exhibited advanced maneuverability by executing complex flight maneuvers while adjusting to different speeds and altitudes.
- All sub-systems of the missile performed as expected, meeting primary mission objectives.

3. Monitoring and Tracking:

- The missile's flight was closely monitored by various range sensors including Radar, Electro-Optical Tracking Systems (EOTS), and telemetry deployed at multiple locations across the test range.
- These sensors ensured comprehensive tracking of the missile throughout its flight path.

4. Advanced Capabilities:

- The missile demonstrated its ability to execute high-precision long-range strikes, which is crucial for tactical and strategic operations.
- It is equipped with state-of-the-art avionics and software that enhance its operational reliability and performance.

LRLACM : All You Need to Know

1. Development and Design:

- The LRLACM was developed by DRDO's Aeronautical Development Establishment (ADE), located in Bengaluru, with collaboration from multiple DRDO laboratories and Indian industries.
- This missile is part of India's broader push towards developing indigenous defense technologies, reducing dependency on foreign arms suppliers.

2. Operational Flexibility:

- The LRLACM is designed for launch from mobile ground-based systems as well as frontline ships.
- This versatility allows it to be deployed across various platforms, enhancing its operational flexibility.
- The missile uses a universal vertical launch module, which makes it adaptable for a wide range of military assets.

3. Development Partners:

- Bharat Dynamics Limited (BDL) in Hyderabad and Bharat Electronics Limited (BEL) in Bengaluru served as the Development-Cum-Production Partners, contributing to the production and development of key components.

4. Strategic Importance:

- The missile is intended for long-range precision strikes, and it is seen as a critical tool for enhancing India's strike capabilities in both defensive and offensive operations.
- The successful test is seen as a significant achievement in the context of India's defense self-reliance and technological capabilities.

Future Prospects:

1. Next-Generation Cruise Missiles:

- The LRLACM is expected to pave the way for the development of even more advanced cruise missiles that can cover longer ranges with greater accuracy and speed.
- DRDO's future focus will likely include enhancing the missile's range, payload capacity, and stealth features to make it a more formidable weapon system.

2. Impact on Defense Procurement:

- The success of this missile marks an important shift in India's defense procurement strategy, with a greater emphasis on indigenous development.
- It also has implications for India's arms export potential, as advanced systems like the LRLACM could attract interest from international markets, particularly those seeking to diversify their defense sources.

Conclusion:

The successful maiden flight test of the Long Range Land Attack Cruise Missile (LRLACM) marks a significant achievement for India's defense research and technology capabilities. Developed by DRDO, the missile represents a leap forward in India's ability to conduct long-range, precision strikes.

EDITORIALS

Crux of The Hindu & Indian Express

Internal Security

Swedish PM Calls Baltic Sea 'High Risk' After Suspected Cable Sabotage

The route of the Chinese-registered cargo ship Yi Peng 3 through the Baltic Sea

Background

- **Incident**: Swedish Prime Minister Ulf Kristersson has called the Baltic Sea a "high-risk" area after the suspected sabotage of two undersea telecom cables.
- These cables connect Sweden, Lithuania, Finland, and Germany and were recently damaged under unclear circumstances.
- **Chinese Ship**: A Chinese ship, the Yi Peng 3, was near the cables when they were damaged.
- The ship has stayed anchored in the Kattegat Strait between Sweden and Denmark since November 19, which has raised questions about its involvement.
- However, China has denied any responsibility for the incident.

Key Developments

1. **Swedish Government's Response**:
   - **Prime Minister's Statement**: Kristersson said Sweden is taking the matter seriously, but they are not blaming anyone yet.
   - He mentioned that the Baltic Sea is becoming more dangerous, and there is a high risk of dangerous activities in the area.
   - **Offshore Wind Farm Decision**: Before the cables were cut, Kristersson's government stopped plans for 13 offshore wind farms in the Baltic Sea, saying they posed security risks.
   - He made it clear that this decision was not related to any knowledge of the cable damage beforehand.
2. **Investigations**:
   - **Crime Scene Analysis**: Swedish authorities have completed their investigation of the damaged cables, which were located near Gotland and Öland islands.
   - They are now studying the materials to understand what caused the damage and continue their investigation.
   - **International Cooperation**: The investigation is being done with help from other countries. A joint investigation group will start working together soon to share information and resources.
   - **Monitoring the Chinese Ship**: The Danish navy, along with the German and Swedish coastguards, are keeping watch over the Chinese ship, Yi Peng 3, which is still anchored in the area.
3. **Sweden's NATO Membership**:
   - Security in NATO: After joining NATO, Kristersson said that Sweden feels "safer and more secure" within the alliance.
   - He acknowledged that some US leaders, including President-elect Donald Trump, had been skeptical about NATO in the past, but now Sweden is focused on increasing its own defense responsibilities in the alliance.
   - **US Role:** Kristersson pointed out that both the Republican and Democratic parties in the US have wanted European countries in NATO to take on more responsibility for their own security.
   - Sweden is actively working towards this.

4. **Nordic and Baltic Summit**:

- **Regional Cooperation**: Leaders from countries including Denmark, Norway, Finland, Estonia, and Poland met in Sweden to discuss security in the region.
- The meeting was held at the Swedish prime minister's retreat in **Harpsund**.
- **Polish Proposal**: Polish Prime Minister Donald Tusk suggested a navy policing initiative where countries would conduct joint military patrols in the Baltic Sea to protect against the growing threat from Russia.
- **Support for Ukraine**: The leaders also agreed to keep supporting **Ukraine** in its war against Russia by sending more ammunition and defense help.
- They passed a resolution condemning Russia's actions and the threat it poses to peace and security in Europe and beyond.

5. **Long-Term Impact**:

Future Decisions: Prime Minister Kristersson warned that the choices made by these leaders in the coming months will have important consequences for the future of regional and global security.

Implications and Future Outlook

- **Growing Risks**: The situation highlights the growing risks to undersea cables and other infrastructure in the Baltic Sea.
- Countries in the region are becoming more cautious about activities in these waters.
- **Geopolitical Tensions**: The involvement of a Chinese ship and NATO's growing presence in the region show that tensions are rising, especially with Russia's actions and China's influence.
- **Defense Plans**: The countries are making plans to strengthen their defense and military cooperation, particularly in the face of Russian aggression and potential future threats to the region's security.

About the Baltic Sea

Aspect	Details
Location	Semi-enclosed inland sea in Northern Europe, part of the North Atlantic Ocean.
Geographical Extent	Extends from southern Denmark to nearly the Arctic Circle, separating the Scandinavian Peninsula from the rest of continental Europe.
Connection to Other Seas	Connects to the Atlantic Ocean via the Danish Straits.
Coastline Length	Approximately 8,000 km.
Surrounding Countries	Denmark, Germany, Poland, Lithuania, Latvia, Estonia, Russia, Finland, Sweden.
Area	Covers around 377,000 sq. km.
Length and Width	The Baltic Sea is about 1,600 km long and 193 km wide.
Canals and Connections	- Connected to the White Sea via the White Sea Canal.
	- Connected to the North Sea's German Bight via the Kiel Canal.
Major Gulfs	- Gulf of Bothnia (north)
	- Gulf of Finland (east)
	- Gulf of Riga (south)
Water Type	Largest brackish inland water body in the world, with lower salinity levels than the World Oceans due to freshwater inflows and shallow depths.
Rivers and Streams	More than 250 rivers and streams flow into the Baltic Sea. The **Neva** River is the largest river draining into the sea.
Islands	Over 20 islands and archipelagos, including **Gotland**, the largest island, located off the coast of Sweden.

DRDO Successfully Conducted A Flight Test of India's 1st Long-Range Hypersonic Missile

- India's Defence Research and Development Organisation (DRDO) successfully conducted the flight test of its first long-range hypersonic missile on November 17, off the coast of Odisha.
- This achievement marks a significant milestone for India, positioning it among a select group of nations capable of developing and testing such advanced military technology.

Significance of the Test

The Defence Minister Rajnath Singh described the test as a historic moment, highlighting it as a major step for India in the field of advanced military technologies. With this success, India joins a small group of countries that have the ability to develop and test hypersonic missiles.

- The missile was launched from Dr. APJ Abdul Kalam Island, off the coast of Odisha.
- This location is named after India's former president and renowned missile scientist, Dr. APJ Abdul Kalam.

Key Features of the Hypersonic Missile

- **Range**: The missile has the ability to strike targets over 1,500 kilometers away and can carry different types of payloads.
- **Indigenous Development**: The missile was developed by several DRDO laboratories, along with industry partners.
- The core development took place at the Dr. APJ Abdul Kalam Missile Complex in Hyderabad.

What is a Hypersonic Missile?

- A hypersonic missile is a missile that travels at speeds of at least Mach 5, which is five times the speed of sound (around 1 mile per second).
- Hypersonic missiles are much faster and more maneuverable than traditional ballistic missiles, which follow a fixed, predictable path.

There are two main types of hypersonic weapons:

1. **Hypersonic Glide Vehicles (HGV)**: These are launched from a rocket and then glide towards the target.
2. **Hypersonic Cruise Missiles (HCM)**: These missiles are powered by **scramjets** (air-breathing engines), which help maintain high speeds after the initial launch.

Advantages of Hypersonic Missiles

- **Long-Range Strike**: Hypersonic missiles can strike distant targets, including highly protected or time-sensitive targets like moving missiles or critical facilities.
- **Difficult to Track**: Due to their high speed and low flight path, hypersonic missiles are hard to detect using traditional radar systems or surface-based sensors.
- **Kinetic Energy**: Hypersonic missiles use kinetic energy (energy from motion) to destroy targets, including structures that are hard to penetrate using conventional weapons, such as underground facilities.

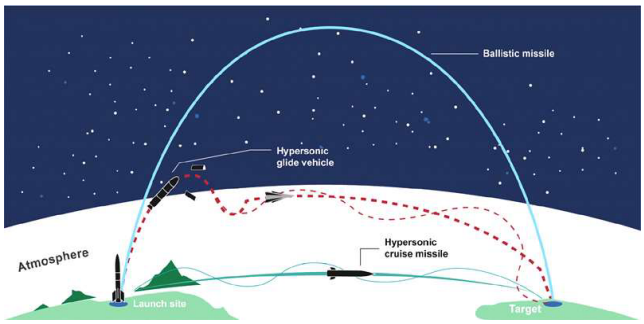
Challenges of Hypersonic Missiles

- **Heat and Friction**: The extreme speeds create significant heat due to air resistance, requiring special materials that can withstand such conditions.
- **Precision Maneuverability**: The missile must be extremely precise in its movement, which makes the design and operation of these missiles highly complex.
- **Communication Difficulties**: It is difficult to maintain communication with a hypersonic missile during flight due to its high speed and altitude.
- **Cost**: Developing and producing hypersonic missiles is much more expensive than traditional ballistic missiles due to their cutting-edge technology.

Global Race in Hypersonic Technology

- **Russia**: Russia is a leader in hypersonic missile development. In 2022, Russia used a hypersonic missile for the first time during the Ukraine conflict, targeting an underground warehouse in Ivano-Frankivsk.
- **China**: China is also advancing in hypersonic missile technology, with several successful tests of its own hypersonic weapons.
- **United States**: The U.S. is heavily investing in hypersonic missile technology. In May 2023, the U.S. Army awarded Lockheed Martin a $756 million contract to develop a ground-based hypersonic missile system, known as the Long Range Hypersonic Weapon (LRHW).
- **Other Countries**: Several nations, including France, Germany, Australia, Japan, Iran, and Israel, are also working on developing hypersonic missile systems.

Ballistic Missiles *Vs.* Hypersonic Missiles



Feature	Ballistic Missiles	Hypersonic Missiles
Flight Path	Predictable, arcing trajectory (sub-orbit or atmospheric)	Unpredictable, maneuverable path within the atmosphere
Speed	Varies; fast during re-entry (Mach 20+), but not hypersonic	Mach 5+ (greater than five times the speed of sound)
Maneuverability	Non-maneuverable after launch	Highly maneuverable during flight
Targeting and Accuracy	Accurate with modern guidance (GPS, inertial)	Highly precise, difficult to track due to maneuverability
Launch Platforms	Si los, submarines, mobile launchers	Aircraft, land-based platforms, sea-based systems
Range	Short-range, medium-range, ICBMs (intercontinental range)	Medium to long-range, depending on type (HGV or HCM)
Defense Systems	Defended by ABM systems like THAAD, Aegis	Extremely hard to intercept with current defense systems
Role and Usage	Strategic deterrence (ICBMs, nuclear), conventional strikes	Precision strikes, capable of defeating modern defenses
Development Status	Established for decades, widely deployed	Emerging technology, still under development
Cost and Complexity	High cost but relatively mature technology	Expensive, cutting-edge technology, still evolving
Flight Environment	Re-enters Earth's atmosphere from space (ICBMs)	Entire flight remains within the atmosphere
Interception Difficulty	Medium (depending on missile type, can be intercepted)	Very high due to speed and unpredictability
Example Countries	U.S., Russia, China, North Korea, India, etc.	U.S., Russia, China, India (in development stages)

Conclusion :

India's successful flight test of the long-range hypersonic missile represents a major leap forward in the nation's defense capabilities. The test highlights India's growing strength in the global race to develop advanced military technologies, particularly hypersonic weapons. While there are still challenges—especially related to heat, precision, and communication—the advantages offered by these missiles, such as speed, maneuverability, and long-range strike potential, make them a game-changing asset for national security

Up to US to Decide What to Do with Decommissioned HAWK Missiles, Taiwan Says

Why in News?

- Taiwan's Defence Minister, Wellington Koo, recently said that it is up to the United States to decide the future of Taiwan's decommissioned HAWK anti-aircraft missiles.
- This statement came in response to a question about whether Taiwan might send these older missiles to Ukraine to aid in its defense against Russia.
- Taiwan has not made any formal announcement about sending weapons to Ukraine, but it has been a strong moral supporter of Ukraine since Russia's invasion in 2022.

Key Points from Taiwan's Defence Minister's Statement:

1. **Taiwan's Position on Decommissioned Missiles**:
   - Taiwan's HAWK missiles are no longer in use and are being decommissioned as part of the island's military upgrades.
   - Minister Wellington Koo emphasized that Taiwan no longer needs the HAWK missiles and that their disposal is being handled in line with regulations.
   - When asked whether these missiles could be sent to Ukraine, Koo clarified that it is ultimately up to the United States to decide what happens to the missiles.
   - If the US requests the missiles back, Taiwan will follow procedures to return them.
   - After that, it would be for the US to decide their future use, possibly including sending them to Ukraine.
2. **Taiwan's Support for Ukraine**:
   - While Taiwan has expressed strong moral support for Ukraine, citing parallels between Taiwan's

situation and Ukraine's struggle against Russian aggression, it has not publicly announced sending military aid to Ukraine.

- Taiwan sees a connection between its own defense needs and Ukraine's fight against Russia, especially in the face of growing threats from China, which claims Taiwan as part of its territory.

3. Taiwan's Ongoing Military Upgrades:

- Taiwan is in the process of modernizing its defense systems, including upgrading its missile defense capabilities.
- A key development is a $2 billion deal with the United States for the National Advanced Surface-to-Air Missile System (NASAMS).
- The NASAMS system, which includes AMRAAM Extended Range missiles, has been used in combat by Ukraine and is designed to improve Taiwan's air defense, especially against modern threats like drones.

4. About the HAWK Missile System:

- The HAWK (Homing All the Way Killer) missile system was developed during the Cold War era to target enemy bombers.
- While the US military no longer uses the HAWK, it was a significant component of Taiwan's defense system for many years.
- Although the HAWK system is outdated compared to more modern air defense systems, its latest versions are still effective against low-altitude targets, like small drones used by Russia in its attacks on Ukraine.

Background on HAWK Missiles:

1. HAWK System:

- The Raytheon MIM-23 HAWK missile system was initially developed by the United States in the 1960s to defend against enemy bombers.
- Over time, it has been upgraded by various countries, including Denmark, Netherlands, and Norway.
- The system is capable of intercepting targets flying at low altitudes (as low as 60 meters), making it effective against slow-moving drones or missiles.
- The US military phased out the HAWK system in favor of more advanced defense systems, but it remains in service with several other countries, including Taiwan.

2. Use in Ukraine:

- Although the HAWK is considered less advanced than newer missile defense technologies, the system has been adapted to counter specific threats in Ukraine, particularly drone attacks.
- Ukraine has been facing a heavy barrage of one-way attack drones from Russia, and the HAWK's capabilities against such low-altitude threats could still be valuable.

Taiwan's Growing Defense Relations with the United States:

- The recent $2 billion NASAMS deal highlights the deepening defense ties between Taiwan and the United States, as Taiwan seeks to strengthen its ability to defend itself against China.
- The NASAMS is a medium-range air defense system that has already been proven in battle in Ukraine, making it a critical addition to Taiwan's defense infrastructure.
- The US's support for Taiwan's defense is part of its broader strategy to counter Chinese aggression in the Indo-Pacific region.
- As Taiwan faces an increasing threat from China, which views Taiwan as part of its territory, military and strategic partnerships with the US are becoming more critical for Taiwan's security.

Implications for Global Security:

1. Missile Support to Ukraine:

- The potential transfer of Taiwan's decommissioned HAWK missiles to Ukraine would add to the growing number of military supplies from Western nations and their allies to Ukraine.
- It would also demonstrate how countries with outdated or surplus military equipment can contribute to Ukraine's defense without directly sending new weapons.

2. Taiwan's Defense in Context of China:

- Taiwan's ongoing military upgrades, such as the NASAMS system, are crucial as they ensure Taiwan's self-defense capabilities in the face of a potential Chinese invasion.
- The situation also brings attention to the broader geopolitical rivalry between China and the United States, with Taiwan caught in the middle.
- The United States' role in Taiwan's defense is critical, both for the island's security and as a counterbalance to Chinese expansion in the region.

Conclusion :

Taiwan's decision to leave the future of its decommissioned HAWK missiles in the hands of the United States highlights the close military ties between the two countries, as well as Taiwan's willingness to support Ukraine in its fight against Russian aggression. However, Taiwan has been cautious not to directly send military aid to Ukraine, instead offering moral support and strengthening its own defenses, particularly against the growing threat from China.

Russia Says Ukraine Fired 6 American-made Missiles After US Lifts Ban

- On 19th November 2024, Russia's Defence Ministry reported that Ukraine launched six US-made ATACMS missiles at Russia's Bryansk region.
- This occurred shortly after US President Joe Biden eased restrictions on the use of American-made weapons by Ukraine in the ongoing conflict.
- The Russian ministry stated that five of the missiles were shot down by the Russian military, and a sixth missile was destroyed.
- The debris from the missiles fell on an unspecified military facility, causing a fire.
- Fortunately, no casualties were reported from the incident.
- Meanwhile, Ukraine claimed it hit a military weapons depot in Bryansk in the early hours of the morning, but did not specify which weapons were used for the attack.
- The Ukrainian General Staff reported that several explosions were heard in the targeted area.

US Lifts Restrictions on Long-Range Missiles

- President Joe Biden authorized the use of US-supplied long-range missiles, allowing Ukraine to target areas deeper inside Russia.
- This change came after Russia's President Vladimir Putin had positioned North Korean troops along Ukraine's northern border, likely in an effort to reclaim territories that had been captured by Ukrainian forces.
- Russia reacted strongly to this move, stating that the decision to send long-range American missiles to Ukraine "marks a new round of tension" in the Ukraine-Russia war.

Putin's New Nuclear Doctrine

- On the same day, Vladimir Putin signed a revised nuclear doctrine.
- Under this new policy, Russia declared that any conventional attack on the country that is supported by a nuclear power would be considered a joint attack on Russia.
- This indicates that Russia would view an attack involving nuclear support as a nuclear threat.

About the Army Tactical Missile System (ATACMS)

The Army Tactical Missile System (ATACMS) is a powerful surface-to-surface missile used by the US military and several other countries. key facts about this weapon:

- **Manufacturer**: Lockheed Martin (US-based defense company).
- **Alternate Name**: Also known as the M39 in the US Army, and MGM-140 as per the Department of Defense (DoD).

- **First Use**: The missile was first used during the 1991 Persian Gulf War.
- **Operators**: Apart from the US, the missile is operated by countries like Bahrain, Greece, South Korea, Taiwan, and the United Arab Emirates.

Key Features of ATACMS:

- **Range**: The missile has a range of approximately 190 miles (305 km).
- **Guidance**: It is an inertially guided ballistic missile, capable of striking targets with high accuracy.
- **Propulsion**: The missile uses a single-stage solid propellant.
- **All-Weather Capability**: It can be launched in all weather conditions, 24/7.
- **Firing Platforms**: The ATACMS is launched from two main systems:
  - o High Mobility Artillery Rocket System (HIMARS)
  - o M270 Multiple Launch Rocket System (MLRS)
- **Payload**: The missile can carry cluster munitions, which release hundreds of bomblets over a large area, causing extensive damage by hitting multiple targets rather than using a single warhead.

What is the High Mobility Artillery Rocket System (HIMARS)?

The High Mobility Artillery Rocket System (HIMARS) is a lightweight multiple rocket launcher developed by Lockheed Martin. This system is designed to target and destroy various military assets, including:

- Artillery and air defense systems
- Light armor and personnel carriers
- Troop and supply concentrations

HIMARS is highly mobile and can be quickly relocated to support military operations in a variety of terrains.

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History, Art & Culture

Willingdon Island

Overview:

- The rejuvenation of Willingdon Island, a once-thriving center for port-related activities in Kochi, Kerala, has become a focal point in trade union discussions. There are growing calls for concrete measures to restart its commercial operations.

About Willingdon Island:

- **Location**:
  Willingdon Island is one of the most beautiful locations in the Kochi area of Kerala.
- **Man-Made Island**:
  The island is man-made and was named after Lord Willingdon, who served as the British Viceroy of India.
- **Significance**:
  - o It is among the largest man-made islands in India.
  - o It hosts the Kochi Naval Base of the Indian Navy, the Central Institute of Fisheries Technology, and the Port of Kochi.
  - o The island is connected to the mainland by the Venduruthy Bridge.

Who Was Lord Willingdon (1931-1936) ?

- Lord Willingdon was the 22nd Viceroy and Governor-General of India during his tenure from 1931 to 1936.
- **Major Events during His Tenure**:
  - o **Government of India Act, 1935**: Introduced during his time, this act marked a significant step towards constitutional reforms in India.
  - o **Second Round Table Conference (1931)**: Lord Willingdon's tenure saw the participation of Mahatma Gandhi as a representative of the Indian National Congress.
  - o **Communal Award (1932)**: Introduced by British Prime Minister Ramsay MacDonald, it aimed at increasing the representation of minorities in Indian governance, but it also led to tensions between communities.

- **Poona Pact (1932)**: A historic agreement between Gandhi and Dr. B.R. Ambedkar concerning the fair representation of backward classes in the legislative councils.
- **Third Round Table Conference (1932)**: This conference failed as neither Gandhi nor the Congress participated.

Key Fact: An archipelago is a group or chain of islands scattered in a lake, river, or ocean.

Conclusion:

Willingdon Island remains a key location in the Kochi area, with its historical and strategic importance tied to the Indian Navy and Port of Kochi. Efforts to revive its commercial operations are part of the broader discussions around improving the region's port infrastructure and economic activities.

Who are the Mâori ?

Overview:

- Recently, New Zealand's parliament was briefly suspended after a protest by Mâori legislators, who performed a haka (a ceremonial dance) in opposition to a controversial Bill.

About the Mâori:

- **Indigenous Tribe**:

  The Mâori are an indigenous tribe of New Zealand, with a history of inhabiting the islands for centuries. They were the first settlers in New Zealand and have a deep cultural connection to the land.
- **Settlement**:

  The Mâori originally settled in the northern parts of the North Island, while the South Island was less densely populated by Mâori people.
- **Cultural Origins**:

  Culturally, the Mâori are Polynesians, closely related to the peoples of eastern Polynesia. Their roots trace back to the broader Polynesian culture.
- **Struggles and Survival**:

  Over centuries, Mâori culture has faced colonial suppression and attempts to take their land, first by the British Crown and later by other settlers. Despite these challenges, Mâori culture has endured and remains a central aspect of New Zealand's identity.

Language:

- **Mâori Language**:

  The Mâori language, or Te Reo Mâori, is part of the Polynesian Group within the Austronesian language family. Despite historical challenges, the Mâori language is still spoken by a portion of the Mâori population.
  - **Language Fluency**: Around one-third of Mâori people still speak their ancestral language, though the majority are also fluent in English.
- **Population**:

  According to the 2013 census, there are 598,605 Mâori in New Zealand, making up 14.9% of the country's population.

Cultural Identity:

- **Distinctive Costumes**:

  Mâori costumes are an important visual representation of their heritage, deeply reflecting their connection to ancestral spirits and the land.
- **Haka**:

  The haka is perhaps the most well-known aspect of Mâori culture. This traditional war dance is performed with intense facial expressions, rhythmic movements, and loud chants. It is used to express strength, unity, and pride, often performed at ceremonial occasions, such as protests or welcoming guests.
- **Ta Moko (Tattoos)**:

  Ta moko refers to the traditional Mâori art of tattooing, which is a significant part of Mâori identity. These tattoos are unique to each person and have deep social and cultural meanings.
  - **Symbolism**: The tattoos symbolize social status, genealogy, personal achievements, and cultural heritage.
  - **Facial Tattoos**: It is common to see tattoos on the face, which represent a person's life experiences and familial connections.

- **What is Polynesia ?**

  Polynesia is a region in the Pacific Ocean consisting of over 1,000 islands. It forms a vast triangle known as the Polynesian Triangle, with points at Hawai'i to the north, Easter Island to the southeast, and New Zealand to the southwest. This region is known for its shared cultural traits and linguistic similarities across its islands.

Conclusion :

The Mâori people are a proud and resilient indigenous group with a rich cultural heritage that has withstood centuries of colonization. Their language, haka, and ta moko tattoos are integral to their identity. Despite challenges, Mâori culture continues to thrive and play a central role in shaping New Zealand's national identity today.

Centenary of Bose-Einstein Statistics

Why in News?

The centenary of Bose-Einstein statistics was recently celebrated, commemorating the ground-breaking work of Satyendra Nath Bose on particle indistinguishability. His contributions laid the foundation for key advancements in quantum mechanics, including the Bose-Einstein Condensate (BEC), which continue to shape modern physics.

Who was Satyendra Nath Bose?

- **Birth**: Born on January 1, 1894, in Calcutta (now Kolkata).
- **Academic Excellence**: A prodigious student with a particular interest in mathematics, Bose was inspired by Jagadish Chandra Bose, the pioneer in radio wave research.
- **Contribution to Quantum Mechanics**: Bose ventured into **quantum mechanics**, leading to his revolutionary work on particle behavior.

Satyendra Nath Bose's Contribution to Science

- **Bose-Einstein Statistics**:
  - In 1924, Bose published a paper titled "Planck's Law and the Hypothesis of Light Quanta", in which he introduced a novel way of counting particles as indistinguishable entities, particularly photons.
  - Albert Einstein recognized the significance of Bose's work, expanding on it, which led to the formulation of Bose-Einstein statistics and the prediction of Bose-Einstein Condensates (BEC).
  - **Challenge to Classical Mechanics**: Bose-Einstein statistics challenged the classical assumption that particles are distinguishable, and instead, proposed that certain particles, bosons, are indistinguishable from one another.
- **Bose-Einstein Statistics**:

  Distinguished between two types of quantum particles:
  - **Bosons**: Named after Bose, these particles can occupy the same quantum state and are indistinguishable. This property enables phenomena like superconductivity and superfluidity.
  - **Fermions**: These particles obey the Pauli Exclusion Principle, meaning no two fermions can occupy the same quantum state simultaneously (e.g., electrons).
- **Bose-Einstein Condensate (BEC)**:
  - **Theory**: The BEC is a unique state of matter that occurs when bosonic atoms are cooled to near absolute zero (-273.15°C). The atoms merge into a single quantum entity, exhibiting wave-like properties.
  - **Experimental Confirmation**: Though theoretical until then, the BEC was experimentally confirmed in 1995 by Eric Cornell and Carl Wieman, who received the Nobel Prize in 2001 for their work.

Relevance in Modern Physics

- Bose's work remains central to modern physics, influencing a wide range of fields such as:
  - Quantum Computing
  - Superconductivity
  - **Cosmology**: Contributions to understanding the Higgs boson and fundamental particles.
- The principles of Bose-Einstein statistics continue to be vital in condensed matter physics and have applications in quantum technologies.

Awards and Recognition

- **Padma Vibhushan (1954)**: Bose was awarded India's second-highest civilian award.
- **National Professor (1959)**: Bose was appointed India's National Professor, the highest honor for a scholar, a position he held for 15 years.
- Widely regarded as the Father of the God Particle, his contributions to theoretical physics are celebrated globally.

Conclusion :

Satyendra Nath Bose's work, particularly in developing Bose-Einstein statistics, reshaped our understanding of the quantum world. His insights continue to impact modern science, from particle physics to advancements in technologies like quantum computing. The centenary of Bose-Einstein statistics underscores the enduring legacy of his contributions to quantum mechanics.

Raja Raja Chola I and Chola Administration

Why in News?

The birth anniversary of Chola emperor Raja Raja Chola I was recently celebrated during the Sadhaya Vizha festival in Thanjavur, Tamil Nadu. Born as Arulmozhi Varman in 947 CE, he took the title Rajaraja, meaning "King among Kings." His reign (985-1014 CE) left a lasting legacy in military, cultural, and administrative spheres.

Key Facts About Rajaraja Chola I

About:

- **Parentage:** Rajaraja I was the third child of Parantaka Chola II and Vanavan Mahadevi.
- **Military Achievements:** Known for his military prowess, Rajaraja won several key battles:
  - **Battle of Kandalur Salai (988 CE):** A naval victory against the Cheras (Kerala).
  - **Conquest of Kerala and Pandya Kingdoms:** Destroyed the Pandya capital Madurai and conquered Kollam, renaming the region *Rajaraja Mandalam*.
  - **Sri Lanka Invasion (993 CE):** Captured the northern half of Sri Lanka.
  - **Victory over Chalukyas:** Annexed territories in Karnataka, including Gangavadi and Nolambapadi.

Navy & Trade:

- Strengthened the Chola Navy, earning the Bay of Bengal the title "Chola Lake".
- Nagapattinam (TN) became the key port for maritime trade.

Cultural & Religious Contributions:

- A dedicated Shaivite, Rajaraja built the Brihadeshwara Temple in Thanjavur, a UNESCO World Heritage site and an exemplary piece of Dravidian architecture.
- The Nataraja statue, depicting Lord Shiva in the cosmic dance, became a symbol of Chola cultural achievement.

Chola Administration

Centralized Governance:

- Rajaraja Chola I maintained strong centralized control, aided by a structured council of ministers, and a clear hierarchy of officials.

Provincial and Local Administration:

- The empire was divided into Mandalams (provinces), which were further divided into Kottams, Nadus (districts), and Urs (villages).
- The Nadu and Village Assemblies were key components of local governance, granting substantial autonomy to local units. These bodies were involved in decision-making, maintaining public infrastructure, and managing markets.

Revenue System:

- The land revenue system collected taxes as a share of the agricultural yield, with other taxes on customs, mines, and professional activities.
- Local self-government ensured that smaller administrative units like Nadus and Villages had their own councils for managing public affairs.

Key Cultural Contributions:

Brihadeshwara Temple:

- The Brihadeshwara Temple (1010 CE) is a masterpiece of Dravidian architecture, featuring monumental structures and exquisite mural paintings. It also contains inscriptions recording Rajaraja's military exploits and temple donations.

Nataraja Statue:

- The **Nataraja statue**, an iconic symbol of Lord Shiva's cosmic dance, showcases Chola-era expertise in metallurgy and sculpture. Its symbolism includes creation, preservation, and destruction, with detailed elements like the Damaru (drum) and Agni (flame).

Maritime Power and Trade:

Naval Strength:

- Rajaraja Chola I and his successors built a powerful navy that extended its influence over Southeast Asia, including Java and the Malay Peninsula, through their successful maritime trade.
- Key ports such as Mamallapuram and Nagapattinam became major trading hubs for goods like spices, textiles, and precious stones.

Shipbuilding & Trade Relations:

- Chola maritime activity was supported by Kappal Sattiram, a treatise on shipbuilding. The empire established strong trade relations with China, West Asia, and Southeast Asia.

Conclusion :

Raja Raja Chola I's reign (985-1014 CE) marked an era of military conquests, cultural flowering, and administrative efficiency. His military victories expanded the Chola empire across South India and into Southeast Asia. His contributions to art, particularly through the Brihadeshwara Temple and the Nataraja statue, remain key highlights of Chola architecture. The Chola's advancements in local governance, maritime power, and trade further reinforced their legacy as one of the most influential dynasties in Indian history.

The Maha Kumbh Mela 2025 : Embracing Unity in the Sacred Waters of Prayagraj

Why in News?

- The Maha Kumbh Mela 2025 is set to take place in Prayagraj, from January 13 to February 26, 2025, marking one of the most significant spiritual gatherings in the world.
- The Mela, which is celebrated once every 12 years at four locations in India, will be a grand celebration of faith, unity, and cultural heritage.
- This event is unique in its blend of religious significance, cultural heritage, and community spirit.
- The 2025 Maha Kumbh Mela will hold additional significance due to its continued celebration of India's ancient traditions, its recognition by UNESCO as an Intangible Cultural Heritage, and its global outreach, drawing international pilgrims who wish to partake in the sacred rituals.

Key Highlights of the Maha Kumbh Mela 2025

1. Sacred Pilgrimage of Unity and Faith:

- The Maha Kumbh Mela is deeply rooted in Hindu mythology and marks one of the largest peaceful gatherings on earth, drawing millions of pilgrims to bathe in the holy waters of the Triveni Sangam (the confluence of the Ganges, Yamuna, and the mythical Sarasvati rivers) in Prayagraj.
- **The Kumbh Mela rotates between four holy locations:** Haridwar, Ujjain, Nashik, and Prayagraj, with each event considered a once-in-a-lifetime opportunity for spiritual renewal and purification.

2. The Significance of the Sacred Rituals:

- **Sacred Bathing (Snan)**: The act of bathing in the holy waters of the Sangam is the primary ritual.
- Pilgrims believe that it purifies them of sins and helps them attain moksha (liberation from the cycle of birth and rebirth).
- The significance of these rituals transcends physical cleansing and is believed to offer spiritual liberation.
- **Shahi Snan (Royal Bath)**: Certain auspicious dates during the Kumbh, such as Paush Purnima, witness the Shahi Snan, where saints and followers of different Akharas (spiritual orders) take part in a grand procession.
- This procession, called Peshwai, involves sadhus traveling on elephants, horses, and chariots, symbolizing unity and spiritual power.
- Pilgrims also participate in spiritual discourses, listen to devotional music, and engage in rituals led by revered sadhus, immersing themselves in the deep spiritual practices of Hinduism.

3. Cultural Confluence and Community Spirit:

- The Maha Kumbh Mela is a vibrant cultural celebration in addition to being a spiritual event.
- Cultural performances, traditional music, dance, arts, and craftsmanship all contribute to a rich sensory experience.
- The Mela also showcases a deep social unity, where people from various parts of India and the world come together, regardless of their cultural backgrounds, in pursuit of a common spiritual goal.

4. International and National Significance:

- The Kumbh Mela is more than a religious event; it is a manifestation of national unity and a symbol of India's ancient heritage.
- The Mela offers an opportunity for international and domestic pilgrims to experience India's spiritual and cultural wealth.
- The gathering at the Maha Kumbh Mela promotes global understanding, as pilgrims from diverse backgrounds, including ascetics, seekers of spiritual wisdom, and everyday Hindus, congregate in a shared pursuit of enlightenment and unity.

Historical Journey of the Kumbh Mela

1. Ancient Origins:

- The Kumbh Mela's origins date back to ancient times, with references found in the Maurya and Gupta periods (4th century BCE to 6th century CE).
- Over time, the Mela grew in scale, evolving from small regional gatherings to the grand national event it is today.
- Hindu Mythology states that the Kumbh Mela commemorates the mythical story of the Samudra Manthan (churning of the ocean), in which the nectar of immortality (amrita) was sought by gods and demons. The four locations of the Kumbh are believed to be places where drops of this nectar fell.

2. Royal Patronage and Growth:

- During the medieval period, the Kumbh Mela received patronage from several royal dynasties, including the Cholas in the south, and the Mughals in the north.
- Emperor Akbar is noted for his participation, and in 1565, he allowed the Naga Sadhus (ascetic holy men) to lead the royal procession, symbolizing religious tolerance and unity across communities.
- In the colonial period, British administrators, like James Prinsep, documented the scale and cultural significance of the event, fascinated by its magnitude and the unity it fostered among diverse populations.

3. Post-Independence Resurgence:

- Post-independence, the Maha Kumbh Mela became a symbol of India's national identity and unity. The event's growth reflects India's modernization while preserving its ancient traditions.
- In 2017, the UNESCO recognized the Kumbh Mela as an Intangible Cultural Heritage of Humanity, solidifying its global importance.

Celebration of Unity and Spiritual Harmony

1. A Universal Message of Unity:

- The Maha Kumbh Mela stands as a testament to the unity of humanity. The diverse crowd—comprising pilgrims from various faiths, regions, and cultures—comes together to seek inner peace and spiritual fulfillment, transcending borders, languages, and belief systems.
- International Pilgrims from around the world travel to India for the Kumbh Mela, drawn by its universal message of peace, tolerance, and the quest for enlightenment.

2. Shared Pursuit of Spiritual Fulfillment:

- The Mela encourages people to come together as one community, united in their spiritual pursuit. This event serves as a reminder that, despite the diversity of religious practices and beliefs, the longing for spiritual growth is a common thread that unites humanity.

3. Environmental and Social Impact:

- The event's organization focuses not only on the spiritual aspects but also on the logistics, health facilities, safety measures, and the environmental sustainability of such a massive gathering. The authorities focus on eco-friendly practices, clean bathing areas, and effective crowd management to ensure a safe and meaningful experience for millions.

Conclusion :

The Maha Kumbh Mela 2025 in Prayagraj is set to be more than just a religious event; it is a profound journey of the self. It serves as a reminder of the timeless human desire for spiritual growth, inner peace, and community unity. Amidst the chaos of modern life, the Mela offers a rare moment to pause, reflect, and connect with a deep spiritual tradition that has transcended centuries. For those who attend, the Maha Kumbh Mela is not only about the sacred waters of Prayagraj but also about a shared human journey toward enlightenment, peace, and understanding, reinforcing the profound message that, despite our differences, we are all united in our quest for the divine.

EDITORIALS

Crux of The Hindu & Indian Express

History, Art & Culture

PM to Inaugurate 1st Bodoland Mahotsov in New Delhi

Key Details:

- **Event**: 1st Bodoland Mahotsov (Festival)
- **Inauguration by**: Prime Minister Shri Narendra Modi
- **Date**: 15th November 2024 (6:30 PM)
- **Venue**: SAI Indira Gandhi Sports Complex, New Delhi
- **Duration**: Two-day event (15th & 16th November 2024)
- **Theme**: "Peace and Harmony for Prosperous Bharat".

Purpose of the Event:

- The Bodoland Mahotsov is a cultural, linguistic, and literary festival aimed at promoting peace, harmony, and prosperity through the celebration of Bodo culture and heritage.
- It is a major step towards promoting unity among the Bodo people and other indigenous communities of the North Eastern region of India, particularly in Assam, West Bengal, Nepal, and bordering areas.
- The festival highlights the role of cultural and linguistic diversity in the development of a vibrant Bodo society.

Objectives of the Mahotsov :

1. **Promoting Peace and Unity**:
   The event marks the ongoing journey of peace in the Bodoland region, particularly after the Bodo

Peace Accord of 2020, which resolved decades of conflict and violence.

2. The agreement, achieved under the leadership of Prime Minister Modi, is evidence of the commitment towards peacebuilding in the region and serves as a model for resolving similar issues in other areas.
3. **Cultural and Linguistic Integration**:
   The festival will emphasize the importance of preserving and promoting the Bodo language, traditions, and customs, while also focusing on the cultural contributions of other communities from the Bodoland Territorial Region (BTR).
4. It is an opportunity for the Bodo people, spread across Assam, West Bengal, Nepal, and other international border areas, to showcase their rich heritage.
5. **Promoting Bodo Society's Development**:
   The Mahotsov aims to create a more integrated Bodo society by celebrating cultural diversity, fostering educational advancements, and promoting tourism, particularly through themes such as ecological biodiversity and the tourism potential of the Bodoland region.

Significance of the Event:

- **Cultural Revival**: The event will showcase Bodo literature, language, traditions, and customs through various sessions and discussions.
- Special focus will be on how Bodo culture contributes to India's overall heritage.
- **Education Focus**: One of the key discussions will address the National Education Policy (NEP) 2020 and its role in promoting mother-tongue instruction, particularly in Bodo and other indigenous languages.
- **Tourism Development**: The festival will also explore opportunities for promoting tourism in the Bodoland region, which is known for its scenic beauty, cultural richness, and ecological diversity.

Participants:

- The event will witness over 5,000 participants including cultural enthusiasts, academics, artists, and political leaders from across India and neighboring countries such as Nepal and Bhutan.
- Delegates will come from various states including Assam, West Bengal, Nagaland, Meghalaya, Arunachal Pradesh, and Tripura, as well as international representatives.

The Bodo Tribe:

- **Historical Background**: The Bodo tribe is one of the earliest known ethnic groups to inhabit Assam, historically linked to the Indo-Mongoloid or Indo-Tibetan family.
- The Bodos have distinctive linguistic and cultural traits that differentiate them from other ethnic groups in India.
- **Geographic Distribution**: Bodo-speaking communities are found across Assam (especially in the Brahmaputra Valley), West Bengal, and Nepal.
- In Assam, they are known as the Bodos or Boros, and in Lower Assam and West Bengal, they are referred to as Meches.
- **Language**: The Bodo language belongs to the Tibeto-Burman family, which is spoken by a large number of people in the northeastern region, including in parts of Assam, West Bengal, and Myanmar (Burma).

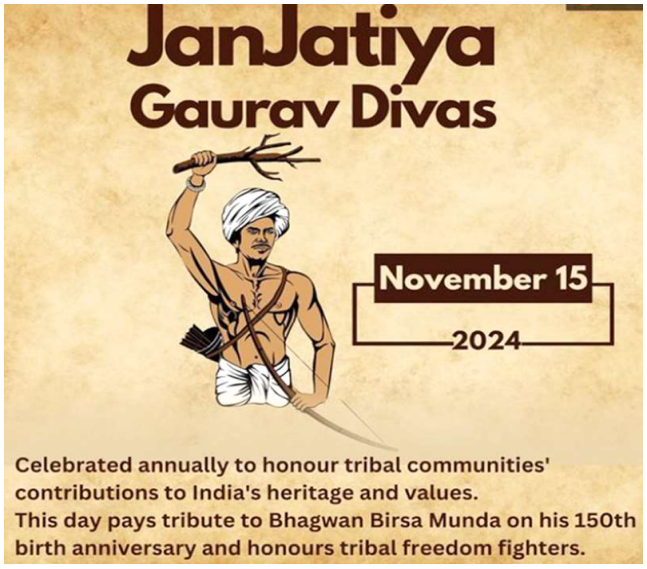
Implications for the Region:

- **Socio-political Impact**: The Bodo Peace Accord (2020) was a landmark agreement that addressed the long-standing demands of the Bodo people, which included autonomy, recognition of the Bodo language, and a separate administrative body.
- The successful implementation of the peace agreement has played a crucial role in reducing insurgency and fostering a stable political environment in the region.
- **Economic Development**: The festival can also have significant economic benefits for the region by boosting **cultural tourism**, enhancing the region's profile, and bringing attention to its untapped potential in terms of biodiversity, natural resources, and cultural heritage.

Conclusion :

The Bodoland Mahotsov is not only a celebration of the Bodo culture but also a symbol of the region's transformation post the peace agreement. It serves as a beacon of unity, peace, and prosperity, and is a platform for strengthening the ties between the indigenous Bodo community and other regions of India. By promoting cultural exchange and tourism, it aims to unlock the economic potential of Bodoland while preserving and celebrating its rich cultural identity.

Janjatiya Gaurav Divas : Honoring Tribal Contributions



Overview

Janjatiya Gaurav Divas is celebrated annually on 15th November to honor the contributions and sacrifices of India's tribal communities, particularly in the freedom struggle. This day also marks the birth anniversary of Birsa Munda, a prominent tribal leader and freedom fighter. The Prime Minister of India released a commemorative coin and postal stamp in honor of Birsa Munda, paying tribute to his legacy.

What is Janjatiya Gaurav Divas?

- **Background**: The day was first celebrated in 2021 as part of the Azadi Ka Amrit Mahotsav, marking 75 years of India's independence. It was introduced to recognize the significant contributions of tribal freedom fighters.
- **Tribal Movements**: Various tribal communities such as the Santhals, Tamars, Bhils, Khasis, and Mizos led anti-colonial movements like Birsa Munda's Ulgulan (Revolution), showing remarkable courage and sacrifice.

Key Highlights of Janjatiya Gaurav Divas 2024

1. **PM-JANMAN**:

   The Prime Minister inaugurated 11,000 houses under the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN), which aims to improve the living conditions of tribal people.

2. **Mobile Healthcare Units**:

   23 Mobile Medical Units (MMUs) were launched to provide healthcare to remote tribal areas. Additionally, another 30 MMUs were inaugurated under the Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA).

3. **Tribal Entrepreneurship & Education**:

o The Prime Minister inaugurated 300 Van Dhan Vikas Kendras (VDVKs), which aim to support tribal entrepreneurship.

o He also inaugurated 10 Eklavya Model Residential Schools (EMRS) for tribal students and laid the foundation for 25 more EMRS.

4. **Cultural Preservation**:

o Two Tribal Freedom Fighters' Museums were inaugurated in Chhindwara and Jabalpur (Madhya Pradesh).

o Two Tribal Research Institutes were inaugurated in Srinagar (Jammu & Kashmir) and Gangtok (Sikkim) to preserve tribal culture and history.

Who Was Birsa Munda?

1. **Early Life**:

   Born on 15th November 1875 in the Chota Nagpur Plateau (now in Jharkhand), Birsa Munda belonged to the Munda tribe. His early life was marked by moving between villages, which exposed him to the hardships faced by tribal communities.

2. **Founder of the Birsait Sect**:

o Birsa Munda founded the Birsait sect to revive tribal identity and resist efforts by British authorities and missionaries to convert tribal populations.

o He gathered followers, especially from the Munda and Oraon communities, to resist colonial rule and missionary influence.

3. **Ulgulan (The Great Tumult)**:

   In 1899, Birsa led the Ulgulan movement, using guerrilla tactics to challenge British colonialism and promote the creation of a tribal self-governed state known as "Birsa Raj".

4. **Arrest and Legacy**:

o Birsa was arrested in 1900 and died under mysterious circumstances in Ranchi jail on 9th June 1900, at the age of 25.

o His efforts led to the introduction of laws protecting tribal land rights. The state of Jharkhand was established on his birth anniversary in 2000, honoring his contributions to tribal rights and the freedom movement.

5. **Sardari Agitation**:

The Sardari Agitation (1858-90) was a tribal resistance movement against socio-economic exploitation, including forced labor and illegal rent hikes in Chotanagpur. It was led by the Sardars, who were tribal leaders resisting British and local oppressive practices.

Key Government Initiatives Supporting Tribal Development

1. **Financial and Social Initiatives**:

- Union Budget 2024-25 allocated Rs 13,000 crore to the Ministry of Tribal Affairs, marking a 73.6% increase from the previous year.
- The DAJGUA program, with an outlay of Rs 79,156 crore, aims to address infrastructure gaps in tribal areas and benefits over 5.38 crore people across 63,843 villages.

2. **PM-JANMAN**:

Launched in 2023, this initiative focuses on supporting Particularly Vulnerable Tribal Groups (PVTGs) with healthcare, financial inclusion, and community-based schemes.

3. **Pradhan Mantri Adi Adarsh Gram Yojana (PMAAGY)**:

This scheme focuses on providing basic infrastructure to tribal-majority villages. It identifies around 36,500 villages with significant tribal populations and aims to improve living conditions, especially in aspirational districts.

Education and Income Generation for Tribals

1. **Eklavya Model Residential Schools (EMRS)**:

EMRS aims to provide quality education to Scheduled Tribes students, especially in remote areas. It helps bridge the educational gaps in tribal communities.

2. **Adivasi Shiksha Rinn Yojana (ASRY)**:

This scheme provides soft loans for tribal students pursuing higher education, supporting their academic aspirations.

3. **Scholarships for Tribal Students**:

Several scholarships are available for tribal students, including Pre-Matric and Post-Matric Scholarships, National Overseas Scholarship, and National Fellowship for higher education.

4. **Income Generation Schemes**:

- The Term Loan Scheme offers up to 90% business loans for tribal entrepreneurs.
- Adivasi Mahila Sashaktikaran Yojna provides concessional loans for tribal women to promote entrepreneurship.
- Micro Credit Scheme supports tribal groups with loans up to Rs 5 lakh for income-generating activities.

Health and Welfare Initiatives

1. **Sickle Cell Anaemia Elimination Mission**:

A mission aimed at reducing the prevalence of sickle cell anaemia in tribal communities through awareness, testing, and healthcare support.

2. **Mission Indradhanush**:

This initiative aims to vaccinate children in tribal areas, ensuring they receive all essential immunizations.

3. **Nikshay Mitra Initiative**:

This initiative provides support for Tuberculosis patients, focusing on those in tribal regions, to improve healthcare access and treatment adherence.

4. **National Health Mission (NHM)**:

This program supports the healthcare infrastructure in tribal areas by ensuring access to primary healthcare services and health awareness programs.

5. **Pradhan Mantri Matru Vandana Yojana**:

This welfare scheme provides financial support to pregnant women and lactating mothers in tribal areas, helping to improve maternal health.

Conclusion :

Janjatiya Gaurav Divas not only honors the sacrifices of tribal leaders like Birsa Munda but also sheds light on the government's efforts to promote tribal welfare through various financial, educational, and healthcare initiatives. The increased attention to tribal development, especially through programs like PM-JANMAN and DAJGUA, is helping to bridge the socio-economic gaps faced by tribal communities and ensuring their cultural preservation and economic empowerment.

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YOJANA ANALYSIS : NOVEMBER 2024

1. Evolution of the Indian Constitution: Constitutional Amendments

Introduction:

- The Constitution of India is the supreme law that governs the country's political framework.
- Its evolution reflects the changing socio-political, cultural, and economic realities of the nation.
- Constitutional amendments have played a vital role in adapting the Constitution to meet the evolving needs of society while preserving its core values.

Evolution of the Constitution During British Rule:

The Indian Constitution traces its roots back to the colonial era when a series of constitutional developments paved the way for an independent India. The key milestones during British rule were:

1. **The Government of India Act, 1858:** This Act established direct British control over India, ending the rule of the East India Company.
2. **Indian Councils Acts (1861 & 1892):** These Acts introduced limited representative governance, allowing Indians to participate in legislative councils.
3. **The Government of India Act, 1909 (Morley-Minto Reforms):** This expanded legislative councils and introduced separate electorates for Muslims, marking the start of communal representation.
4. **The Government of India Act, 1919 (Montagu-Chelmsford Reforms):** This Act introduced the dyarchy system, separating central and provincial functions, and allowed for limited self-governance through legislative councils.
5. **The Government of India Act, 1935:** The most significant precursor to the Indian Constitution, it introduced a federal structure, a bicameral legislature, and reserved seats for minorities and marginalized groups.

These acts formed the foundation for the development of a constitutional framework that would eventually lead to an independent India.

Constitutional Amendment of a Federal Constitution

- India's Constitution is federal in nature but with a strong unitary bias.
- In a federal setup, amendments are essential to maintain the balance of power between the Union and the States.
- Amendments have played a key role in addressing the needs of national integration and socio-economic justice, adjusting the allocation of powers between the two.

Need for Constitutional Amendments

1. **Changing Social Norms:** Over time, societal practices evolve, and the Constitution must address issues like caste discrimination, gender equality, and minority rights to remain relevant.
2. **Political Realities:** The political dynamics of India change over time, necessitating constitutional amendments to accommodate new states, changes in the electoral system, or the structure of governance.
3. **Judicial Interpretations:** As the judiciary interprets the Constitution, it may give rise to new meanings, requiring formal amendments to clarify or expand constitutional provisions.
4. **Technological and Global Developments:** Technological advancements, economic shifts, and international developments also pose new challenges, demanding constitutional reforms, especially in digital governance, economic policies, and global cooperation.

Procedure for Amending the Constitution

Article 368 of the Indian Constitution lays down the process for amendments, which is divided into three categories:

1. **Amendments by Parliament:** Certain provisions can be amended by a simple majority in both Houses of Parliament (e.g., the name of a state).
2. **Amendments Requiring a Special Majority:** Some provisions, such as the distribution of powers between the Union and States (under Article 368), require a special majority in both Houses of Parliament.

3. **Amendments with State Consent:** Some amendments, like changes to the representation of states in Parliament, require the approval of not only Parliament but also the consent of at least half of the states.

Power of Parliament to Amend the Constitution

- Article 368 grants Parliament the authority to amend the Constitution, but this power is not absolute.
- While Parliament can amend most provisions, certain basic features of the Constitution, such as federal structure and fundamental rights, cannot be altered by ordinary amendments.
- The Kesavananda Bharati case (1973) established the Doctrine of Basic Structure, limiting Parliament's ability to amend essential aspects of the Constitution, ensuring that core values such as democracy, republicanism, separation of powers, rule of law, and individual freedoms are preserved.

Kesavananda Bharati Case (1973) and the Doctrine of Basic Structure

- The Kesavananda Bharati case is one of the most significant rulings in Indian Constitutional history.
- The Supreme Court ruled that while Parliament has the power to amend the Constitution, it cannot alter its basic structure.
- This doctrine was pivotal in protecting the fundamental principles of the Constitution and preventing arbitrary amendments that could undermine its core values.

Landmark Constitutional Amendments Since 1950

1. **First Amendment (1951):** This amendment imposed reasonable restrictions on the freedom of speech and expression, prohibited untouchability, and allowed the state to limit property rights for social justice.
2. **Seventh Amendment (1956):** It reorganized states based on linguistic and administrative considerations, creating states like Andhra Pradesh and Tamil Nadu, and updated the Union List.
3. **Forty-Second Amendment (1976):** Often called the "Mini-Constitution".
   (a) The 42nd Amendment amended Preamble and changed the description of India from "sovereign, democratic republic" to a "sovereign, socialist, secular, democratic republic", and also changed the words "unity of the nation" to "unity and integrity of the nation".,
   (b) It curtailed judicial review, expanded the Directive Principles of State Policy, and centralized power in the Union during the Emergency period.
4. **Forty-Fourth Amendment (1978):** This amendment reversed undemocratic changes made during the Emergency, restored the right to property as a legal right (under Article 300A), and limited the state's ability to suspend fundamental rights.
5. **Fifty-Second Amendment (1985):** Known as the Anti-Defection Law, it disqualified elected representatives who switched parties or voted against party directives, ensuring political stability.
6. **Sixty-First Amendment (1988):** This lowered the voting age from 21 to 18, thus increasing youth participation in the democratic process.
7. **Seventy-Third and Seventy-Fourth Amendments (1992):** These amendments mandated the creation of elected local governments (Panchayats and Municipalities), devolved powers to local bodies, and provided reservations for women and marginalized communities.
8. **Ninety-Ninth Amendment (2014):** It introduced the National Judicial Appointments Commission (NJAC) to replace the Collegium system for judicial appointments. However, the NJAC was struck down by the Supreme Court in 2015 for violating judicial independence.
9. **Hundred and First Amendment (2016):** This amendment introduced the Goods and Services Tax (GST), simplifying India's tax system and promoting economic integration.

Conclusion :

The Indian Constitution is a living document that evolves in response to the changing needs of society. Constitutional amendments ensure that the Constitution remains relevant, effective, and adaptable to contemporary challenges. While the power to amend rests with Parliament, it is tempered by judicial oversight to safeguard fundamental principles. The landmark amendments have shaped India's democratic structure, responding to political, social, and economic needs, while strengthening the commitment to justice, equality, and social welfare.

2. Role of the Indian Constitution in Promoting Social Justice

Introduction:

- The Indian Constitution, adopted on 26th January 1950, is not just a legal document that defines the structure of government but also a powerful tool for promoting social justice in India.
- Social justice, in the Indian context, aims at ensuring fairness and equitable distribution of resources, opportunities, and benefits, especially to those who have been historically marginalized or disadvantaged.
- The Constitution, through its various provisions, sets the framework for creating a just society by addressing issues of equality, discrimination, and oppression.

Preamble : A Commitment to Social Justice

The Preamble to the Indian Constitution envisions an egalitarian society by setting the goals of Justice, Liberty, Equality, and Fraternity.

- Justice refers to the social, economic, and political justice that the Constitution seeks to secure for all citizens.
- The Preamble directly commits to securing social justice, which means ensuring that every individual enjoys equal rights and opportunities, especially the marginalized and vulnerable communities.

Preamble lays the foundation for a legal and social framework aimed at reducing inequalities and promoting the dignity of every individual.

Fundamental Rights : Guaranteeing Equality and Protection

The Fundamental Rights (Articles 12-35) form the bedrock of the Indian Constitution's commitment to social justice. These rights guarantee individual freedoms, equality before the law, and protection against discrimination. Some key articles that directly promote social justice include :

- **Article 14:** Guarantees equality before the law and equal protection of the laws, ensuring that all citizens are treated fairly, regardless of their social or economic background.
- **Article 15:** Prohibits discrimination on the grounds of religion, race, caste, sex, or place of birth, thus providing a legal framework to challenge discriminatory practices against Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs).
- **Article 16:** Ensures equality of opportunity in public employment, prohibiting discrimination based on caste, religion, or sex.
- **Article 17:** Abolishes untouchability, which had been a pervasive social practice, ensuring that no individual is treated as "untouchable" and denying them their basic human dignity.

These provisions are fundamental to achieving social justice, by ensuring that the law acts to eliminate inequality and discrimination.

Directive Principles of State Policy: Guiding the State's Welfare Agenda

The Directive Principles of State Policy (DPSPs), enshrined in Part IV of the Constitution (Articles 36-51), guide the government in formulating policies and laws that promote social justice. Although the DPSPs are not justiciable (i.e., they are not enforceable in courts), they serve as moral obligations for the state to act towards social welfare.

Key DPSPs focusing on social justice include:

- **Article 38:** Directs the state to promote the welfare of the people by securing a social order based on justice, and reducing inequalities in income and wealth.
- **Article 39:** Ensures that the state makes provisions for the adequate livelihood of all citizens, guarantees equal pay for equal work for both men and women, and protection from economic exploitation.

- **Article 41:** Guarantees the right to work, education, and public assistance in cases of unemployment, old age, sickness, or disablement.
- **Article 42:** Directs the state to secure just and humane conditions of work and ensure maternity relief.
- **Article 46:** Directs the state to promote the educational and economic interests of SCs, STs, and other backward sections of society, thereby addressing the historical disadvantages they face.

These principles guide the government's efforts to address economic disparities, social injustices, and provide welfare benefits to the disadvantaged.

Reservation and Affirmative Action : Ensuring Access to Opportunities

The Constitution recognizes the importance of affirmative action to uplift marginalized communities and ensure that they have access to opportunities in education, employment, and political participation.

- **Article 15(4):** Empowers the state to make special provisions for the advancement of socially and educationally backward classes, including SCs, STs, and OBCs.
- **Article 16(4):** Allows the state to provide reservations in public employment for backward classes, ensuring that they are adequately represented in government jobs.

These provisions have led to reservation policies in education and employment, which aim to level the playing field and ensure that historically disadvantaged communities have access to opportunities they were previously denied.

Judicial Interpretation and Activism : Expanding the Scope of Social Justice

The judiciary has played a significant role in promoting social justice in India, through judicial interpretations that have expanded the scope of Fundamental Rights and Directive Principles. Key judicial contributions include:

- **Right to Life and Personal Liberty (Article 21):** The Supreme Court has expanded the interpretation of Article 21 beyond physical harm to include health, education, shelter, and environmental justice, which are essential to ensuring a decent quality of life for marginalized communities.
- **Public Interest Litigation (PIL):** PIL has allowed the judiciary to address social justice issues that affect vulnerable groups, such as prisoners, women, children, and persons with disabilities. It has been a powerful tool to ensure that the poor and marginalized have access to justice.
- **Landmark Judgments:**
  - **Vishaka *Vs.* State of Rajasthan (1997):** This case led to the formulation of guidelines for preventing sexual harassment at the workplace, which is crucial in promoting gender justice.
  - **National Legal Services Authority *Vs.* Union of India (2014):** This case recognized the rights of transgender persons, affirming their right to equality and dignity.

Through judicial activism, the Indian judiciary has been proactive in interpreting the Constitution to uphold social justice, especially for those who face systemic discrimination and exclusion.

Social Justice Through Legislation

Beyond constitutional provisions, various laws enacted by Parliament have been crucial in advancing social justice in India. Some of the key legislations include:

- **The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989:** This law aims to prevent atrocities and discrimination against SCs and STs, ensuring their protection from social and economic exploitation.
- **The Right to Education Act, 2009:** This Act ensures free and compulsory education for children aged 6-14 years, with a particular focus on socially disadvantaged children.
- **The Protection of Women from Domestic Violence Act, 2005:** Provides legal protection to women facing domestic violence, empowering them to seek legal recourse.
- **The Maintenance and Welfare of Parents and Senior Citizens Act, 2007:** This Act ensures that parents and senior citizens are not neglected by their families and have the legal right to seek maintenance.

These laws are critical in addressing social inequalities and offering legal remedies for vulnerable and marginalized communities.

Challenges and the Way Forward

Despite the robust framework of the Constitution and supporting legislation, several challenges persist in achieving true social justice in India:

1. **Caste-based Discrimination:** While untouchability has been abolished, caste-based discrimination remains entrenched in many parts of India.
2. **Gender Inequality:** Women, especially in rural areas, continue to face discrimination in areas such as education, employment, and social mobility.
3. **Economic Inequality:** Significant wealth disparities persist, with large sections of the population living below the poverty line and facing economic marginalization.
4. **Access to Justice:** The cost of litigation and legal barriers often prevent marginalized groups from accessing justice in the courts.

Conclusion :

The Indian Constitution is a powerful tool for promoting social justice, with its provisions on fundamental rights, directives for state policy, and affirmative action playing a crucial role in reducing inequalities. However, achieving true social justice requires continued efforts in legislation, judicial activism, and social participation. By addressing existing challenges and strengthening the legal and social frameworks, India can move closer to the inclusive and equitable society envisioned by the Constitution.

3. The Future of AI in India: Profiling Concerns and Criminal Investigations

Introduction

- The integration of Artificial Intelligence (AI) is revolutionizing sectors like commerce, governance, and law enforcement in India.
- This rapid technological evolution presents significant challenges, particularly in balancing innovation with concerns around privacy and ethics.

Key Legislations Shaping AI in India:

1. **Digital Personal Data Protection Act (DPDP Act) 2023:**
   - Regulates the collection, storage, and processing of personal data, especially behavioral data.
   - Empowers users with rights to access, correct, and erase their data, thereby prioritizing data protection and privacy.
2. **Bharatiya Nyaya Sanhita (BNS) 2023:**
   - A law focusing on criminal investigations, with provisions for the use of AI in enhancing investigative processes.
   - It provides legal support for the seizure of digital devices and access to personal data for criminal investigations, reinforcing digital forensics.

AI and Profiling

- Profiling in AI involves analyzing behavioral data (e.g., user interactions, online activities) to predict potential outcomes.

  Common in personalized services such as recommendation engines, financial risk assessments, and targeted advertising.
- **Privacy Concerns:**

  Profiling raises significant privacy issues, as it involves deep analysis of personal data without explicit user consent or transparency.
- **DPDP Act 2023 and Profiling:**
  - The DPDP Act 2023 defines behavioral data as personal data and gives individuals the right to:
    - Access and correct their data.
    - Erase their data, if they choose.
  - This regulation challenges traditional AI models that rely on continuous data aggregation to deliver services like targeted ads and recommendations.
- **Transitioning to Privacy-First AI Models:**

  Businesses and tech companies must adapt to privacy-first AI models that prioritize user consent while still providing personalized services.

Global Context of AI Regulations

- India's approach to AI governance aligns with global standards such as:

  EU's General Data Protection Regulation (GDPR):
  - GDPR requires explicit consent for data collection and mandates privacy-centric AI systems.

- GDPR's principles of data minimization and user control resonate with India's DPDP Act, ensuring that privacy rights are upheld while leveraging AI for innovation.

- **Global and Domestic Shifts:**

  Both domestic laws (DPDP Act) and international regulations (GDPR) reflect a global trend towards safeguarding user rights while allowing technological advancements.

AI in Criminal Investigations and Predictive Policing

1. AI in Law Enforcement:

- **Predictive Policing:** AI algorithms are used to analyze data and predict potential criminal activities, helping law enforcement agencies prevent crimes before they occur.
- **Example:** UK's National Crime Agency (NCA) uses AI to monitor online behavior and combat child exploitation by identifying at-risk individuals and potential perpetrators.

2. Applications of AI in India:

- **Crime Investigations:** AI systems analyze large datasets (e.g., social media activity, location history) to detect fraud, cybercrime, and terrorist activities.
- The BNS 2023 enhances law enforcement's capabilities to handle digital evidence, such as seizing devices and accessing personal data for investigation purposes.

3. Role of AI in Crime Prevention:

- AI enables predictive policing by identifying crime patterns and forecasting potential crimes.
- **Example:** In the UK, the NCA uses AI to track online behavior and identify child exploitation risks. This system provides preemptive interventions and helps prevent crimes before they occur.

Challenges and Ethical Concerns

1. Privacy Risks:

- The expansion of law enforcement powers to access personal data can lead to unlawful surveillance and privacy violations.
- Adequate oversight mechanisms are necessary to protect individual rights and prevent misuse of this data.

2. Bias in Algorithms:

- AI systems, especially in predictive policing, can perpetuate existing biases if trained on biased data.
- This could lead to discriminatory outcomes based on race, gender, socio-economic status, etc., disproportionately affecting marginalized communities.

3. Accountability and Oversight:

- Ensuring algorithmic transparency and judicial oversight is crucial to maintaining accountability in AI deployment.
- Lack of oversight could lead to the misuse of AI in criminal investigations, potentially violating rights and freedoms.

AI's Role in Predictive Policing

- AI uses behavioral data and patterns (common in e-commerce for product recommendations) to forecast potential crimes.
  - The ability to predict crime before it happens enables preemptive policing.
  - However, accuracy is crucial-false predictions could harm individual freedoms and violate privacy rights.
- To ensure fairness, transparency, and accountability, law enforcement agencies must:
  - Adopt robust AI systems.
  - Provide training to officers.
  - Establish safeguards to prevent misuse and ensure AI operates ethically.

AI in Action: The UK's National Crime Agency

- The National Crime Agency (NCA) has been using AI since 2019 to combat child exploitation by monitoring online behaviors.
  - AI helps the NCA identify at-risk individuals and predict potential perpetrators, enabling early interventions.
  - This ethical use of AI highlights the importance of human oversight, transparency, and public trust in AI systems.

- **Lessons for India:**
  - o India can draw inspiration from the NCA's approach to cyberbullying, online harassment, and terrorist recruitment.
  - o Developing similar AI frameworks could assist India in addressing growing cyber threats.

Challenges and Road Ahead for AI in India

1. **Balancing Innovation with Privacy and Fairness:**

- The DPDP Act 2023 provides robust protection for personal data, but this may create challenges for businesses that rely on extensive data usage.
- The BNS 2023 allows the use of AI in predictive policing, but its implementation requires ethical standards and proper training for law enforcement.

2. **Key Priorities for AI in India:**

- Auditing AI tools to prevent biases and ensure that AI systems are fair and transparent.
- Establishing transparency in algorithmic decisions and judicial oversight to ensure fairness in criminal justice applications.
- Implementing user safeguards, such as the ability to correct and erase personal data.

3. **Global Frameworks as Guidance:**

- EU's GDPR and UK's NCA serve as models for India in creating AI systems that respect individual rights while benefiting society as a whole.

4. **India's Future with AI:**

- **India's future in AI requires:**
  - o Evolving legal frameworks to keep pace with technological advancements.
  - o Collaboration among stakeholders-government, tech companies, law enforcement, and civil society.
  - o A focus on accountability to ensure AI is deployed responsibly, balancing privacy, fairness, and innovation.

4. Criminal Justice System Reforms : Evaluating the Impact of BNS

Introduction :

- The Bharatiya Nyaya Sanhita (BNS) 2023 replaces the Indian Penal Code (IPC) 1860, marking a significant shift from punitive justice (focused on punishment) to restorative justice (focused on rehabilitation and protection).
- Alongside the Bharatiya Nagarik Suraksha Sanhita (BNSS) 2024 and Bharatiya Sakshya Adhiniyam (BSA) 2023, these reforms aim to decolonize India's legal system and address modern-day challenges.
- These laws come into effect from 1 July 2024.

Key Features and Changes in BNS 2023

Philosophical Shift in Justice

- The BNS 2023 emphasizes justice delivery over mere punishment, protecting vulnerable groups and focusing on social rehabilitation.

  Unlike the colonial-era IPC, which was punitive in nature, the BNS seeks to adopt a more restorative approach, focusing on rehabilitation, protection, and reintegration into society.

Unmasking Organized Crime

- BNS takes strong measures against organized crime, with provisions to combat syndicate-based crimes, terrorism, and hate crimes, among other significant threats to societal stability.

Key Additions in Bharatiya Nyaya Sanhita (BNS) 2023

A. New Offences Against Women and Children

1. Deceptive Relationships (Section 69):

- Criminalizes sexual intercourse through deceit or identity suppression.
- Penalty: up to 10 years' imprisonment.
- Resolves ambiguities in past legal interpretations, strengthening protections for victims.

2. Exploitation of Children (Section 95):

- Penalizes the use of children to commit offences, particularly sexual exploitation or pornography.
- Penalty: Minimum 3 years' imprisonment.
- Tackles misuse of minors by organized criminals and sexual exploiters.

B. New Offences Against Human Body

1. Mob Lynching (Section 103(2)):

- Punishes group murders (5+ people) motivated by discriminatory or prejudiced reasons.
- Penalty: Death or life imprisonment.
- Implements Supreme Court's 2018 guidelines for mob violence (Tehseen Poonawalla case).

2. Organized Crime (Section 111):

- Defines and criminalizes crimes committed by criminal syndicates, including land grabbing, cybercrimes, and trafficking.

3. Petty Organized Crime (Section 112(1)):

- Introduces penalties for minor syndicate crimes, including snatching, gambling, and unauthorized betting.

4. Grievous Hurt and Hate Crimes (Section 117):

- Addresses grievous hurt that causes permanent disability or vegetative states (e.g., Aruna Shanbaug case), with punishments of life imprisonment.
- Penalizes hate-motivated violence with up to 7 years imprisonment.

C. Offences Against the Nation

1. Defining Terrorism (Section 113):

- Defines terrorism as acts aimed at undermining India's sovereignty, unity, or security.
- Provides a legal framework to combat domestic and international terrorist threats.

2. Acts Endangering Sovereignty and Integrity (Section 152):

- Replaces the colonial sedition law (Section 124A of IPC) with provisions targeting actions that threaten India's unity.
- Punishment: Life imprisonment or up to 7 years with a fine, particularly for secessionist or separatist activities.

3. Protection of Public Servants (Section 195(2)):

- Penalizes threats or use of criminal force against public servants during riot control or dispersing unlawful assemblies.
- Penalty: Up to 1 year imprisonment or fines.

4. Tackling Misinformation (Section 197(1)(d)):

- Legal provisions to address fake news and propaganda on social media and traditional media.
- Balances the need for public safety with freedom of speech under Article 19(1)(a).

5. Extraterritorial Abetment (Section 48):

- Penalizes individuals outside India who abet crimes within the country.
- Allows trials for absconding abettors under the Bharatiya Sakshya Adhiniyam, circumventing extradition issues.

D. Offences Against Property

1. Snatching (Section 304(1)):

- Defines theft involving the forcible seizure of movable property, particularly addressing chain and mobile snatching.
- Focuses on crimes that disproportionately target vulnerable groups like women and the elderly, with a provision that was absent in the IPC.

E. Expanded Definitions

1. Child (Section 2(3)):

Child is defined as anyone below 18 years of age, standardizing the definition across laws.

2. Gender (Section 2(10)):

- Expands the definition of gender to include males, females, and transgenders.
- Ensures equal legal protection for transgender individuals, in line with the Supreme Court's 2014 judgment.

F. New Punishment Provision

1. Community Service (Section 4(f)):

- Introduces community service as a punishment for first-time petty offenders.
- Inspired by Indian restorative justice philosophy, this provision aims to rehabilitate offenders through constructive societal contributions rather than traditional punitive measures.

Impact of BNS 2023 on Criminal Justice Reform

Restorative Justice Focus

- The BNS 2023 shifts the focus from punishment to restorative justice, emphasizing rehabilitation, protection, and prevention.
- It provides more comprehensive protections for women, children, and marginalized groups, addressing gender and social justice issues that were not adequately addressed in the IPC.

Combatting Modern Crimes

- The introduction of new offences (e.g., deceptive relationships, mob lynching, organized crime) reflects the evolving nature of criminal activity in India.
- The legal framework offers stronger tools to counter emerging threats, such as cybercrimes, terrorism, and hate crimes.

Dealing with Misinformation and Threats to National Security

- The BNS introduces provisions to counter fake news, terrorism, and misuse of digital platforms, enhancing national security while balancing freedom of speech.
- The removal of the sedition law (Section 124A of IPC) aligns with the shift towards a more democratic and progressive legal framework.

Addressing Organized Crime

- The introduction of laws targeting organized crime (e.g., land grabbing, human trafficking, cybercrimes) strengthens India's capacity to tackle large-scale, syndicated criminal activities that were previously difficult to prosecute.

Conclusion :

The Bharatiya Nyaya Sanhita (BNS) 2023, along with other legal reforms like the BNSS 2024 and BSA 2023, marks a significant step towards modernizing India's criminal justice system. By addressing contemporary issues such as organized crime, terrorism, and gender-based violence, the BNS 2023 aims to create a more equitable, effective, and restorative justice system, while ensuring protection for vulnerable populations and enhancing national security.

5. Redefining Law in a Cyber Age : India's Legislative Shift Against Modern Crime

Introduction :

The digital age has drastically reshaped the way people interact, but it has also led to a significant increase in cybercrime. India, as a rapidly growing digital economy, faces a surge in online crimes like fraud, data breaches, and cyber espionage.

In response, India has introduced three key legislative reforms:

- Bharatiya Nyaya Sanhita (BNS)
- Bharatiya Nagrik Suraksha Sanhita (BNSS)
- Bharatiya Sakshya Adhiniyam (BSA)

These laws are designed to modernize India's criminal justice system to effectively tackle cybercrime and secure the country's digital future.

1. The Evolution of Cybercrime and Its Challenges:

- Historical Perspective: Traditionally, India's criminal justice system was built to handle physical crimes with clear evidence such as fingerprints, testimonies, or footprints. These crimes had geographic boundaries, and law enforcement could effectively operate within these limits.
- Cybercrime Characteristics: Unlike traditional crimes, cybercrime operates in a borderless digital world. Cybercriminals can operate globally, exploiting weaknesses in digital infrastructure, committing fraud, and stealing data without leaving physical evidence. The evidence, typically in the form of digital data, can be easily hidden or erased, complicating investigations and prosecutions.
- Challenges in Investigation: Cybercrimes often lack tangible evidence, making it harder for authorities to gather proof and prosecute offenders. Moreover, criminals can conceal their tracks behind encrypted data, multiple servers, or even destroy digital footprints entirely. These issues highlight the need for a legal framework that adapts to the complexities of the digital age.

2. BNS: A Modern Approach to Crime Jurisdiction

- Virtual Jurisdiction: The Bharatiya Nyaya Sanhita (BNS) focuses on adapting India's legal framework to deal with the digital era. It shifts from the traditional concept of jurisdiction, where crimes happen within physical boundaries, to virtual jurisdiction-where crimes can occur across multiple locations, both within India and globally.
- Example of Cybercrime: For instance, in the case of a cyberattack on a bank, the victim might be in one state, the server could be in another, and the criminal could be located in yet another state or country. The BNS allows law enforcement agencies to act across different jurisdictions, enabling them to pursue cybercriminals regardless of geographical location.
- Key Function: It ensures that investigations and prosecutions are not limited by physical boundaries, making the criminal justice system more efficient in the digital age.

3. BNSS: Enhancing Security in the Digital Age

- Focus on Protection: The Bharatiya Nagrik Suraksha Sanhita (BNSS) complements the BNS by focusing on safeguarding citizens in a digital environment. It addresses the rising scale and sophistication of cybercrime and equips law enforcement agencies with the tools necessary to combat these modern threats.
- Section 176(3): One important provision is Section 176(3), which mandates forensic audits in cases involving cybercrime, especially when financial fraud or data theft is involved. This provision acknowledges that digital evidence can be hidden or erased and provides a framework for more thorough investigations.
- Digital Forensics: The BNSS strengthens digital forensic practices, allowing investigators to analyze large volumes of data, trace encrypted communications, and track digital footprints. This approach standardizes forensic investigations, ensuring that digital evidence is preserved and analyzed properly.

4. BSA: Revolutionizing Digital Evidence Handling

- Handling Digital Evidence: The Bharatiya Sakshya Adhiniyam (BSA) provides clear guidelines for the collection, preservation, and presentation of digital evidence. Unlike physical evidence, digital data can be easily modified or deleted, making it crucial to follow strict protocols to ensure its integrity.

- Admissibility in Court: In cybercrimes such as identity theft or online fraud, digital evidence may include email records, transaction histories, or social media activity. The BSA ensures this evidence is handled with the same care as physical evidence, making it admissible in court and helping to strengthen the prosecution's case.
- Ensuring Justice: By standardizing the processes for handling digital evidence, the BSA ensures that justice is not delayed or denied due to procedural issues, safeguarding individuals from cybercriminals who might attempt to manipulate or destroy evidence.

5. The Need for Specialized Cybercrime Units and Digital Forensics:

- Specialized Expertise: Investigating cybercrime requires specialized skills in digital forensics. While India already has cybercrime units in several states, the increasing scale and complexity of cybercrime demand further strengthening of these units.
- Investment in Infrastructure: For effective cybercrime investigations, India needs to invest in digital forensic laboratories, provide advanced training programs for police officers, and upgrade existing infrastructure. This will ensure that law enforcement agencies can keep pace with the rapidly evolving landscape of cybercrime.

6. Looking Ahead: Future-Proofing India's Legal System:

- Adapting to Emerging Threats: The introduction of the BNS, BNSS, and BSA is a significant step in modernizing India's criminal justice system. However, as technologies like artificial intelligence, blockchain, and quantum computing evolve, new forms of cybercrime will emerge.
- Continuous Investment: To remain effective, India's legal system must be agile and adaptable, with continuous investment in cybersecurity, digital forensics, and law enforcement training. This ongoing effort will ensure that the system can address the challenges posed by emerging cyber threats.

Conclusion :

The BNS, BNSS, and BSA represent a forward-thinking approach to digital security, equipping India's legal system to tackle the growing threat of cybercrime. By strengthening specialized cybercrime units, enhancing digital forensic capabilities, and providing law enforcement with the necessary tools and knowledge, India is laying the foundation for a safer digital future. However, these reforms must be supported by robust infrastructure, continuous training, and an unwavering commitment to adapt to the evolving nature of cybercrime.

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Persons in News

Maria Branyas

She is recognized as the world's oldest person, passed away in 2024, at 117 years old in her nursing home in Spain. Born in San Francisco in 1907, she moved to Spain and lived through major historical events, including the 1918 flu pandemic, both World Wars, and Spain's civil war. Branyas spent her later years in Catalonia, where she married Dr. Joan Moret in 1931 and raised three children, 11 grandchildren, and many great-grandchildren. She outlived her husband, who passed in 1976, and her son August, who died in a tractor accident at 86.

Yamandú Orsi

Yamandú Orsi has been elected as Uruguay's next president following a closely contested runoff election, signaling a return to centre-left governance after five years of conservative rule. Born on June 13, 1967, in Canelones, Uruguay, Orsi grew up in a modest family with a father who worked as a vineyard farmer and a mother who was a seamstress. His political views were shaped by Uruguay's military dictatorship (1973-1983), and he was influenced by the ideals of José Mujica, a former president and guerrilla leader. Orsi joined Mujica's Popular Participation Movement and served as mayor twice before running for president. Known for his simple lifestyle, Orsi enjoys rural life and often drinks with mates in public. He has pledged not to live in the presidential palace when he assumes office in March 2025.

Jasdip Singh

Prime Minister Narendra Modi was honored with the Dr. Martin Luther King Jr. Global Peace Award for his efforts toward inclusive development, particularly his work for minority upliftment. The award was presented by Washington Adventist University and the Association of Indian American Minorities (AIAM) at the Sligo Seventh-day Adventist Church in Maryland. AIAM, recently launched to support minority communities within the Indian American diaspora, also aims to unite these communities. The organization is led by Jasdip Singh, a prominent Sikh philanthropist, who serves as its Founder and Chairman. AIAM's seven-member Board of Directors includes representatives from various Indian minority groups, such as Sikhs, Christians, Hindus, Muslims, and Indian Jews. In his speech, Singh expressed AIAM's support for Modi's vision of a "Developed India" by 2047, praising his leadership's inclusive approach and the commitment to providing equal opportunities for all communities.

Duma Boko

Duma Boko, from the Umbrella for Democratic Change (UDC), has been announced as Botswana's new president, marking a significant political shift as he replaces the long-ruling Botswana Democratic Party (BDP). Chief Justice Terence Rannowane made the announcement on national television. In Botswana, elections are held to elect 61 members of the National Assembly and 609 local councilors. To win, a party must secure at least 31 seats in the National Assembly. In the recent elections, Boko's UDC won 34 seats, while the BDP, which had governed since Botswana's independence in 1966, only won 4 seats. This historic result ends the BDP's nearly 60 years of political dominance, with outgoing President Mokgweetsi Masisi conceding defeat. This election marks the first time the BDP has lost its majority in nearly six decades, signaling a potential shift in Botswana's policies under Boko's leadership.

Prime Minister Narendra Modi

Nigeria awarded Prime Minister Narendra Modi its highest civilian honor, the Grand Commander of the Order of the Niger (GCON), during his first official visit to the country. The award was presented by President Bola Tinubu at a ceremony at Aso Rock Villa in Abuja. The GCON is Nigeria's top civilian award, given to individuals who have made significant contributions to the country. Modi is the second foreign recipient of this honor, with Queen Elizabeth II being the first in 1969. President Tinubu praised Modi's leadership, highlighting his ability to win three consecutive elections in a diverse and complex society like India. Tinubu noted that the award reflects Nigeria's appreciation for India's partnership. Earlier in the week, Dominica also honored Modi with its highest national award, the Dominica Award of Honour, recognizing his support during the COVID-19 pandemic and efforts to strengthen India-Dominica relations. This award will be conferred at the upcoming India-CARICOM Summit in Guyana. With the GCON and the Dominica Award, Modi has now received 17 international civilian honors, underscoring his leadership and India's growing global influence. Notable past awards include recognitions from Saudi Arabia, Afghanistan, and France. PM Modi's visit to Nigeria follows his participation in the G20 Summit in Rio de Janeiro, and the upcoming India-CARICOM Summit will further deepen ties with Caribbean nations, continuing to strengthen India's diplomatic relations globally.

Union Minister Gajendra Singh Shekhawat

The Ustad Bismillah Khan Yuva Puraskar, honoring young artists, will be presented on November 22, 2024, at the Dr Ambedkar International Centre in New Delhi, with Union Minister Gajendra Singh Shekhawat presenting the awards. Established in 2006, the award recognizes artists under 40 in fields like music, dance, drama, folk and tribal arts, and puppetry, with each recipient receiving a ?25,000 cash prize, a plaque, and an angavastram. Following the ceremony, a Festival of Performing Arts will be held from November 22 to 26, featuring performances by the awardees at three venues: Meghdoot Theatre Complex, Rabindra Bhawan, and Abhimanch Theatre at the National School of Drama. The event celebrates India's cultural heritage and fosters creativity by providing a platform for emerging talent, reinforcing the Sangeet Natak Akademi's role in promoting the arts.

Mr. Ashish Khanna

The seventh session of the International Solar Alliance (ISA) Assembly took place in New Delhi on November 5, 2024, where Mr. Ashish Khanna from India was appointed as the new Director General, succeeding Dr. Ajay Mathur, who led the Alliance since 2021. The ISA aims to promote solar energy globally and tackle common challenges faced by its member countries. As Director General, Mr. Khanna will play a crucial role in advancing the organization's mission, focusing on supporting solar energy deployment and fostering collaboration among nations. Three candidates vied for the position, with Mr. Khanna emphasizing the importance of shifting from "what" to "how" in addressing solar energy challenges. ISA's work includes advocacy, capacity building, and producing key reports like "Easing of Doing Solar" and the "World Solar Reports," which explore solar energy's potential to promote economic and social equity while driving innovation and knowledge sharing across the global solar community.

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Current Affairs MCQ's

1. Airbus has collaborated with which Indian company to manufacture C 295 in India?
   (A) Reliance
   (B) Adani Defence Systems
   (C) Tata
   (D) HAL
   Ans. (C)
2. 95 in C 295 stands for which of the following?
   (A) The year in which C 295 was launched. (1995)
   (B) The weight of the aircraft. (95 tonnes)
   (C) The weight it can carry (95 tonnes)
   (D) None of the above
   Ans. (D)
3. Consider the following statements and mark the correct one:
   1. India has a trade deficit with Spain.
   2. The year 2026 is declared to be the year of Culture, Tourism & AI for India & Spain.
   (A) Only 1 (B) Only 2
   (C) Both 1 & 2 (D) Neither 1 nor 2
   Ans. (B)
4. Consider the following statements wrt appointment of CJI & mark the correct one:
   1. The CJI is appointed by the President on the basis of recommendations given by the collegium.
   2. The recommendations for appointment of any judge of SC made by the collegium are binding on the government.
   (A) Only 1 (B) Only 2
   (C) Both 1 & 2 (D) Neither 1 nor 2
   Ans. (B)
5. Which of these conventions were adopted in the Rio Earth Summit?
   1. United Nations Convention to combat desertification
   2. United Nations Convention for Biodiversity
   3. United Nations Convention to combat desertification.
   (A) Only 1 & 2 (B) Only 3
   (C) Only 2 & 3 (D) All of these
   Ans. (D)
6. Consider the following statement and mark the correct one:
   1. The Aichi Biodiversity targets had to be met till 2020.
   2. The Aichi Biodiversity targets were adopted in CoP 10 of CBD.
   (A) Only 1 (B) Only 2
   (C) Both 1 & 2 (D) Neither 1 nor 2
   Ans. (C)
7. Which country has signed the UN Convention on Biodiversity (UN CBD) but not ratified it?
   (A) USA (B) Egypt
   (C) Japan (D) France
   Ans. (A)
8. Consider the following statements wrt CoP 16 of UN CBD and mark the correct one:
   1. Global Tax on Genetic Data from Nature has been approved.
   2. Indigenous and Local Communities' Permanent Role in Decision-Making has been enabled.
   (A) Only 1 (B) Only 2
   (C) Both 1 & 2 (D) Neither 1 nor 2
   Ans. (C)
9. Consider the following statements and mark the correct one:
   1. The Global Tuberculosis Report is released by WHO.
   2. India has increased the gap in the missed TB cases since 2015 as per the report.
   (A) Only 1 (B) Only 2
   (C) Both 1 & 2 (D) Neither 1 nor 2
   Ans. (A)
10. Which of these microbes cause Tuberculosis?
   (A) Virus (B) Protozoa
   (C) Bacteria (D) Fungus
   Ans. (C)

11. Which of the following can be considered as the objectives of PM NI-KSHAY Poshan Program?
    1. Better Nutritional Outcome for the notified TB Patients.
    2. Reducing Out of Pocket Expenditure.
    3. Better Treatment outcome.

    (A) Only 1 (B) Only 1 & 3
    (C) Only 1 & 2 (D) All of the above.

    Ans. (D)

12. Consider the following statements wrt Iron Beam missile defence systems and mark the correct one:
    1. It is being developed by Rafael & Elbit Defence Systems.
    2. It is a more expensive & reliable missile defence system than Iron Dome.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

13. Which one of the following is a key feature of Exercise VINBAX?
    1. Develop Interoperability
    2. Focus on UN Peacekeeping Operations
    3. Disaster Relief

    (A) Only 1 & 2 (B) Only 2 & 3
    (C) Only 1 & 3 (D) All of these

    Ans. (D)

14. Consider the following statements and mark the correct one:
    1. All the ASEAN countries are part of Regional Comprehensive Economic Partnership (RCEP)
    2. RCEP came into force in 2022

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

15. Consider the following statements and mark how many of them is/are correct?
    1. India initially joined RCEP but backed out due to dumping threats from China.
    2. India, in order to uphold the interest of its domestic farmers, is not part of RCEP.
    3. Joining RCEP could increase the trade deficit for India wrt ASEAN countries.

    (A) Only 1 statement is correct
    (B) Only 2 statements are correct
    (C) All the statements are correct
    (D) None of the statements are correct.

    Ans. (B)

16. Which of these countries is not part of RCEP?

    (A) Vietnam (B) New Zealand
    (C) Fiji (D) Japan

    Ans. (C)

17. Which of the following countries share a boundary with Guyana?
    1. Venezuela 2. Brazil
    3. Suriname 4. Ecuador

    (A) Only 1 & 2 (B) Only 1 & 3
    (C) Only 1 2 & 3 (D) All of these

    Ans. (C)

18. Consider the following statements and mark the correct one:
    1. One Sun One World One Grid was announced by the Indian PM IN CoP 24 of UNFCCC in 2018.
    2. It aims to achieve a global interconnected grid by 2050.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

19. With which country, India has established grid connections?

    (A) Sri Lanka (B) Saudi Arabia
    (C) Nepal (D) Maldives

    Ans. (C)

20. Consider the following statements and mark the correct ones:
    1. India is the fourth largest producer of renewable energy.
    2. India aims to be net zero by 2050.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

21. According to the QS World rankings,2024, which college is the best ranking in India?

    (A) IIT Bombay (B) IIT Guwahati
    (C) IISc, Bangalore (D) IIT Delhi

    Ans. (D)

22. Consider the following statements and mark the correct one:
    1. The Shettihalli Wildlife Sanctuary is located in the southern Western Ghats.
    2. It was established in 1974.
    3. It is Karnataka's largest wildlife sanctuary

    (A) Only 1 & 3 (B) Only 1 & 2
    (C) Only 2 & 3 (D) Only 2

    Ans. (C)

23. Consider the following statements wrt Toto tribe & mark the correct one:
    1. Toto tribes live alongside the Indo-Bhutan border.
    2. Toto tribes live on the banks of Mahananda river.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

24. Which of these threats are being faced by the Toto tribes?
    1. Low Birth Rate
    2. Out Migration
    3. Excessive pollution in their habitat

    (A) Only 1 (B) Only 1 & 2
    (C) Only 1 & 3 (D) All of these

    Ans. (B)

25. Consider the following statements about PVTGs and mark the correct one:
    1. There are 75 tribal groups classified as PVTG currently.
    2. Low level of literacy & economic backwardness are criterias to classify tribals as PVTGs.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

26. Consider the following statements wrt river Sutlej and mark how many of them is/are correct?
    1. River Sutlej originates in China and merges with the Ravi river in India.
    2. Bhakra Nangal Dam is built on Sutlej river.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

27. Which of these rivers is classified as Western river according to Indus Water Treaty

    (A) Jhelum (B) Ravi
    (C) Beas (D) Sutle

    Ans. (A)

28. Consider the following statements and mark the correct one:
    1. Aligarh Muslim University is established by a statute.
    2. The Azeez Basha case gave the status of a minority institute to AMU.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

29. Which of the following was a reason cited in the Azeez Basha case for AMU not being declared as a minority institution?

    (A) AMU was offering reservation to SC/ST which it should not be doing.
    (B) It was established before the Constitution was adopted.
    (C) It was established by a law.
    (D) None of the above

    Ans. (C)

30. Consider the following statements and mark the correct one:
    1. Minority institutions can be regulated by the state.
    2. Minority institutions can offer religious education.

    (A) Only 1 (B) Only 2
    (C) both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

31. Which of these organisations did not participate in Antariksh Abhyas?

    (A) Defence Cyber Agency
    (B) Armed Forces
    (C) Defence Intelligence Agency
    (D) Central Armed Police Forces

    Ans. (D)

32. Consider the following statements and mark the correct one:
    1. Antariksh Abhyas is the first ever space exercise conducted by India.
    2. Antariksh Abhyas aims to secure India's defence assets.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

33. Consider the following statements and mark the correct ones:
    1. The HAWK missile systems was developed in the 1960s by USA.
    2. The HAWK missile system is capable of intercepting aerial targets at low altitude.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

34. Consider the following statements and mark how many of them are correct?
    1. The FCRA was pass during the emergency era to restrict foreign funding to NGOs.
    2. The FCRA amendment of 2010 reduced the validity of registration from permanent earlier to 5 years.
    3. The FCRA amendment of 2020 made Aadhaar mandatory of key functionaries.

    (A) Only 1 statement is correct
    (B) Only 2 statements are correct
    (C) All the statements are correct.
    (D) None of the statements are correct

    Ans. (B)

35. Consider the following statements wrt NGOs receiving foreign funds and mark the correct one:
    1. Foreign funds can only be used for activities that serve social, educational, cultural, or economic purposes.
    2. NRIs donating funds will not be counted as Foreign Contributions.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

36. Which of the following statements is/are correct about the Long Range Land Attack Cruise Missile?
    1. India has tested its maiden flight in November 2024.
    2. The flight test took place from Integrated Test Range in Odisha.
    3. Bharat Dynamics Ltd & Bharat Electronics Ltd served as the Development-Cum-Production Partners

    (A) Only 1 & 2 (B) Only 2 & 3
    (C) Only 1 (D) All of these

    Ans. (D)

37. Consider the following statements and mark the correct one:
    1. For FY 24, Russia is India's largest supplier of oil & defence equipments.
    2. India Russia trade is balanced.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) neither 1 nor 2

    Ans. (A)

38. Which of the following route is the shortest from Mumbai to St. Petersberg?
    (A) Mumbai-Suez Canal-Mediterranean Sea-North Sea-Baltic Sea-St. Petersberg.
    (B) Mumbai-Bandar Abbas- Baku- St. Petersberg
    (C) Mumbai- Vladivostok-St. Petersberg
    (D) Mumbai-Cape of Good Hope- North Sea- Baltic Sea- St. Petersberg

    Ans. (B)

39. Which of these countries is not part of Eurasian Economic Union?
    (A) Russia (B) Azerbaijan
    (C) Armenia (D) Belarus

    Ans. (B)

40. Consider the following statements wrt Janjatiya Gaurav Divas & mark the correct one:
    1. It is celebrated every year on 15 November since 2022.
    2. It was introduced to recognize the significant contributions of tribal freedom fighters.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

41. Consider the following statements wrt Birsa Munda.
    1. Birsa Munda was born in Chota Nagpur Plateau in 1875.
    2. He established the Birsait sect against the oppression of the Zamindars.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

42. Consider the following statements and mark the correct one:
    1. The Solomon Islands are located south of equator.
    2. It is west of Vanuatu & east of Papua New Guinea.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

43. Consider the following and mark how many of the following can be the reasons for coral bleaching?
    1. Low Tides
    2. Global Warming
    3. Marine Pollution including oil spills.

    (A) Only 1 of the above can be the reason for coral bleaching.
    (B) Only 2 of the above can be the reasons for coral bleaching.
    (C) All of the above can be the reasons for coral bleaching.
    (D) None of the above can be the reasons for coral bleaching.

    Ans. (C)

44. Consider the following statements wrt MATES scheme and mark the correct one:
    1. This scheme is between India & Australia only.
    2. It aims to provide temporary employment to young professionals from India.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

45. Recently launched SVASTIK Initiative is related to which of the following?
    (A) Scientific Assessment of Ayurveda
    (B) Scientific Validation of Siddha
    (C) Scientific Validation of Traditional Knowledge.
    (D) None of the above

    Ans. (C)

46. Consider the following statements about CSIR and mark the correct one:
    1. The Union Minister of Science is the ex officio President of CSIR.
    2. It is headquartered in New Delhi.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

47. Consider the following statements wrt India & Nigeria and mark the correct one:
    1. India & Nigeria established Strategic Partnership in 2024.
    2. Nigeria is Africa's largest economy.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

48. Which of these statements about Grand Commander of the Order of the Niger (GCON) is/ are true?
    1. It is the highest national honour of Nigeria.
    2. Queen Elizabeth was the first foreign national to receive this award.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

49. Recently the debt brake rule of Germany was in news. What does it mean?
    (A) It means the government cannot take loan during emergency years.
    (B) It means the government cannot take loans beyond 0.35% of the GDP.
    (C) It means the govt. Cannot take loans beyond 35% of the GDP.
    (D) None of the above.

    Ans. (B)

50. Consider the following statements wrt Bodoland Mahotsav and mark the correct one:
    1. In 2024, the first ever Bodoland Mahotsav was celebrated.
    2. It aims to promote peace & harmony on one side and cultural & linguistic integration on the other side.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

51. Consider the following statements and mark the correct one:
    1. Epilepsy is a brain disorder.
    2. Epilepsy is not curable.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

52. Which of these are symptoms of Epilepsy?
    1. Loss of Appetite
    2. Loss of Awareness
    3. Uncontrollable movements

    (A) Only 1 & 2 (B) Only 2 & 3
    (C) Only 1 & 3 (D) Only 2

    Ans. (B)

53. Consider the following statements wrt G20 summit in Brazil, 2024 and mark how many of them are correct?
    1. The 2024 summit was the first ever summit in Brazil.
    2. African Union joined as a full time member for the first time.
    3. Social Inclusion & fight against hunger was one of the priority areas.

    (A) Only 1 statement is correct
    (B) Only 2 statements are correct
    (C) All the statements are correct
    (D) None of the statements are correct.

    Ans. (C)

54. Which of the following countries is not part of G20?

    (A) Italy (B) South Africa
    (C) Indonesia (D) UAE

    Ans. (D)

55. Which of the following is the objective of Global Hunger Alliance formed during Brazil's G20 presidency?

    (A) Eliminate Hunger by 2050
    (B) Eliminate Hunger by 2030
    (C) To reduce hunger for half a billion people by 2030.
    (D) None of the above

    Ans. (C)

56. Which of these countries do not share a boundary with Sudan?

    (A) Nigeria (B) Eritrea
    (C) Chad (D) Libya

    Ans. (A)

57. Consider the following statements wrt the resolution tabled in UNSC and mark the correct one:
    1. The resolutions have to be passed by consensus.
    2. Consensus has to be achieved among the permanent members only of UNSC.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

58. Which of these ports are not involved in Chennai Vladivostok Maritime Corridor?

    (A) Paradip (B) Chennai
    (C) Kochi (D) Vizag

    Ans. (C)

59. Which of these are components of India's Maritime Vision?
    1. Increase Port Capacity
    2. Increase port connectivity
    3. Reducing carbon footprint.

    (A) Only 1 & 2 (B) Only 1 & 3
    (C) Only 1 (D) All of these

    Ans. (D)

60. The National Maritime Heritage Complex is being constructed in which place?

    (A) Great Nicobar Island
    (B) Kochi
    (C) Mumbai
    (D) None of the above

    Ans. (D)

61. Which of these elements can be used for cloud seeding?
    1. Silver Iodide
    2. Potassium Iodide
    3. Dry Ice
    (A) Only 1 & 2 (B) Only 1
    (C) Only 1 & 3 (D) All of these
    Ans. (D)

62. Consider the following statements and mark the correct one:
    1. Cloud Seeding can tackle the main cause of air pollution.
    2. Cloud Seeding is more effective on a clear sky.
    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2
    Ans. (D)

63. Which of these countries do not operate Army Tactical Missile Systems (ATACMS)?
    (A) UAE (B) Bahrain
    (C) Greece (D) Turkey
    Ans. (D)

64. Exercise Sanyukt Vimochan is related to which of the following?
    (A) Establishing Interoperability
    (B) Enhancing combat skills in urban warfare.
    (C) Humanitarian Assistance & Disaster Relief
    (D) Enhancing cooperation in UN Peacekeeping missions.
    Ans. (C)

65. The GRAI is released by which Ministry in GoI?
    (A) Ministry of Home Affairs
    (B) Ministry of Personnel & Grievance Redressal
    (C) Ministry of Culture
    (D) None of the above
    Ans. (B)

66. Consider the following statements wrt GRAI & mark the correct one:
    1. The GRAI report aims to highlight & resolve the root cause for delay in grievance redressal.
    2. It is using AI in its formulation and advisory.
    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2
    Ans. (C)

67. Which state of India has the jurisdiction of APJ Abdul Kalam Island?
    (A) Tamil Nadu (B) Kerala
    (C) Andhra Pradesh (D) Odisha
    Ans. (D)

68. Which of these is a feature of the Hypersonic cruise missile successfully tested by India?
    1. It travels at a speed more than 5 Mach.
    2. It is maneuverable once it is launched.
    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2
    Ans. (C)

69. Which country hosted the CoP 28 of UNFCCC?
    (A) Azerbaijan (B) UAE
    (C) China (D) Egypt
    Ans. (B)

70. Consider the following statements and mark the correct one:
    1. Energy Efficiency includes eliminating energy waste.
    2. Energy efficiency can lead to reduced carbon emissions.
    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2
    Ans. (C)

71. Which of the following is a feature of Global Energy Efficiency Alliance launched by UAE in CoP 29 of UNFCCC?
    1. It will foster Public Private Partnership.
    2. It aims at building Global Standards for energy efficiency.
    3. It includes an element of equity.
    (A) Only 1 & 2 (B) Only 1
    (C) Only 2 (D) All of these
    Ans. (D)

72. Which of these countries is not part of International Criminal Court?
    (A) USA (B) Canada
    (C) South Africa (D) Bangladesh
    Ans. (A)

73. Consider the following statements and mark the correct one:
    1. ICC can prosecute individuals from member states only.
    2. It is Headquartered in The Hague, Netherlands.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (B)

74. Which ministry has launched Artificial Intelligence (AI) Data Bank, aimed at promoting innovation and strengthening the country's national security?
    (A) Ministry of Home Affairs
    (B) Ministry of Defence
    (C) Ministry of Science & Technology
    (D) None of the above

    Ans. (C)

75. Consider the following statements and mark the correct one:
    1. India is world's third largest emitter.
    2. The per capita carbon emissions from India are above the world average.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (A)

76. Which country was the worst performer on Climate Change Performance Index?
    (A) Azerbaijan (B) UAE
    (C) Iran (D) Saudi Arabia

    Ans. (C)

77. What was the theme of International Cooperative Alliance (ICA) Global Conference 2024?
    (A) Cooperatives for Sustainable Development
    (B) Cooperatives for Inclusive development
    (C) Cooperatives Build Prosperity for All
    (D) None of the above

    Ans. (C)

78. Consider the following statements and mark the correct one:
    1. The year 2024 is United Nations International Year of Cooperatives.
    2. Cooperatives can have a positive impact on poverty reduction.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (b)

79. Which of the following countries is/are not part of ASEAN Defence Ministers Meeting Plus?
    (A) China (B) USA
    (C) Russia (D) Papua New Guinea

    Ans. (D)

80. Consider the following statements and mark the correct one:
    1. ADMM+ has all the East Asia Summit members as participants.
    2. ADMM+ is an annual meeting aiming to create stability & peace in the region.

    (A) Only 1 (B) Only 2
    (C) Both 1 & 2 (D) Neither 1 nor 2

    Ans. (C)

81. With which country has India signed Security of Supplies Agreement (SOSA)?
    (A) Philippines (B) Vietnam
    (C) Russia (D) None of these

    Ans. (D)

82. Which of the following statements about Solar Energy Corporation of India is/are true?
    1. It is a government owned entity.
    2. It was established in 2011.
    3. It buys solar energy from the producers and sells it to DISCOMs.

    (A) Only 1 & 2 (B) Only 2
    (C) Only 1 & 3 (D) 1,2 & 3

    Ans. (D)

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