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Time: 45 Min

Date: 14-09-2024

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CBI AS A 'CAGED PARROT': SUPREME COURT

Context

- Recently, the Supreme Court of India has invoked the expression 'Caged Parrot' for the Central Bureau of Investigation (CBI) in a case over the alleged liquor policy 'scam' in Delhi.

About

- Judges, while granting bail to Chief Minister of Delhi in a corruption case related to the excise policy 'scam,' **reiterated the importance of the CBI** shedding its caged image.
- The term "Caged Parrot" was **first coined by the Supreme Court of India in 2013** during the infamous **coal block allocation scam**. At that time, the CBI was criticised for its perceived lack of independence and susceptibility to political influence.
- A bench led by **Justice R. M. Lodha** made the scathing observation that the CBI was akin to a 'caged parrot speaking in the master's voice'. It highlighted concerns about the **agency's autonomy and its tendency to act** at the behest of those in power.
- The "Caged Parrot" aptly captured the idea that the CBI, despite being a premier investigative agency, was constrained and controlled, much like a parrot confined within a cage.

Central Bureau of Investigation (CBI)

- Origins and Purpose:** It traces its roots back to the **Special Police Establishment (SPE)**, established in 1941 during World War II to investigate bribery and corruption cases.
 - In **1963**, acting on the recommendations of the **Santhanam Committee**, the CBI was formally **set up by a resolution of the Ministry of Home Affairs**.
- Legal Framework:** CBI operates under the **Delhi Special Police Establishment (DSPE) Act 1946**, which grants it the authority to investigate cases related not only to corruption but also to major criminal offences.
 - However, interestingly, the term "CBI" itself doesn't explicitly appear in the DSPE Act. It is **not a statutory body**.

Functions

- It functions under the **Ministry of Personnel, Public Grievances and Pensions** of the central government, and is **exempted from the purview of the Right to Information (RTI) Act**.

- Investigating Corruption:** The CBI handles cases related to corruption, bribery, and economic offences.
- Economic Crimes:** It tackles financial frauds, narcotics, smuggling, and other economic crimes.
- Special Crimes:** Terrorism, kidnapping, and other serious offences fall within its purview.
- It is also the **nodal police agency** in India that coordinates investigations on behalf of **Interpol member countries**.

Jurisdiction

- Section 6 of the DPSE Act** authorises the central government to direct CBI to probe a case within the jurisdiction of any state on the recommendation of the concerned state government.
- The courts can also order a CBI probe, and even monitor the progress of investigation.
- CBI can suo-moto take up investigation of offences **only in the Union Territories**.

Autonomy and Superintendence of CBI

- The CBI is often referred to as an '**autonomous body**'.
- The **Central Vigilance Commission (CVC)** plays a critical role in **overseeing the CBI by CVC Act (2003)** that ensures that **there is no interference** in the agency's investigations.
- Even the CVC cannot meddle with the manner of investigation; its superintendence is limited to broader oversight.

Challenges and Criticisms

- Administrative Autonomy:** The CBI's senior officer appointments often depend on deputation from state or other central forces. It can impact its independence.
 - An **ordinance** passed in 2021 **extended the tenures of CBI directors from two to five years, with annual extensions**. It was argued that extension of tenure **undermines institutional checks and balances**.
- Financial Dependence:** The CBI lacks full financial autonomy, as its administrative and financial control rests with the Ministry of Personnel.
- Lack of Resources:** The lack of modern infrastructure, forensic labs, and technical experts hampers the quality and speed of investigations.

- **Coordination Issue:** There are coordination issues with state police and other investigative agencies, leading to gaps in intelligence sharing and joint operations.

Way Ahead & Conclusion

- As the CBI continues its crucial role in investigating high-profile cases, it must strive to be more than a mere “parrot” repeating others’ words.
- Granting the Central Bureau of Investigation (CBI) statutory status through a dedicated legislation, rather than relying on the **Delhi Special Police Establishment Act, 1946**, will provide clarity and independence.
- The **Second Administrative Reforms Commission (ARC)** recommended the CBI’s structural independence to shield it from executive influence.
- The **CBI must invest in modern technology, training, and infrastructure** to enhance its efficiency in handling complex investigations and cases involving economic offenses, cybercrimes, and corruption.
- **Court-monitored investigations and setting up** a mechanism for suo moto investigations could ensure independence in sensitive cases.

Source: IE

NITI AAYOG ON FUTURE PANDEMIC PREPAREDNESS

Context

- Recently, the **NITI Aayog** released an Expert Group report titled ‘Future Pandemic Preparedness and Emergency Response — A Framework for Action’, focusing on public health emergencies or pandemics.

Background: Blueprint for Preparedness

- The expert group behind the ‘Future Pandemic Preparedness and Emergency Response (PPER) — A Framework for Action’ recognised that **COVID-19 wouldn’t be the last pandemic** we face.
- Given the ever-changing planetary dynamics—ecology, climate, and interactions between humans, animals, and plants—there is a need to be **ready for new infectious threats**.
- In fact, the World Health Organization (WHO) has warned that **75% of future public health threats are likely to be zoonotic (originating from animals)**.

Key Objectives of Report

- NITI Aayog formed an Expert Group with a clear mission: create a robust framework for future pandemic preparedness and emergency response, to address the above emergencies.
- Their **task was to examine how COVID-19 was managed** both nationally and globally, learn from successes and challenges, and **identify key gaps** to enhance our readiness for any health crisis.

Key Recommendations (Four Pillars of Preparedness)

- **Governance, Legislation, Finance and Management:** Effective governance structures, legal frameworks, financial mechanisms, and management strategies are crucial.
 - ♦ A **well-defined SOP** manual for rapid response to be prepared **Setting up** of a special PPER Fund for all activities of surveillance, data management, forecasting and modelling, research, innovation and manufacture, development of countermeasures, infrastructure and capacity building.
- **Data Management, Surveillance and Early Predictive Warning, Forecasting and Modelling:** Timely data collection, surveillance systems, and predictive models allow us to detect outbreaks early. This information is vital for swift decision-making.
- **Research and Innovation, Manufacturing, Infrastructure, Capacity building/Skilling:** Investing in research, innovation, and domestic manufacturing capacities is essential. We need to develop diagnostic tools, treatments, and vaccines swiftly.
- **Partnership, Community engagement including risk communication, Private sector partnerships, and international collaborations:** Strengthening healthcare capacity, training healthcare workers, and engaging communities are vital. International collaboration ensures knowledge sharing and resource pooling.

Other Recommendations

- A separate **Public Health Emergency Management Act (PHEMA)** is proposed to facilitate the management of **any public health crisis beyond epidemics**, including non-communicable diseases, disasters, and bioterrorism, and should be in place for a developed country.
- **Indian Regulatory System:** There is a need for global harmonisation of regulatory norms to allow acceptance of regulatory data across the world’s

recognised regulatory authorities and a common framework for innovative technologies and accelerated response for emergency approval.

- The **regulatory authority in India (CDSCO)** needs special powers through legislation and requires technical competence strengthening and autonomy in functioning to meet these requirements.

100-Day Action Plan

- The report emphasises that the first 100 days of an outbreak are critical. During this window, there is a need to have **strategies and countermeasures ready**.
- The report provides a detailed roadmap for preparedness, including how to track, test, treat, and manage outbreaks effectively.



India's Efforts and Lessons Learned

- India's response to the SARS-CoV-2 pandemic involved several key initiatives, like:
- **Novel Counter-Measures:** Funding for industry and researchers, shared resources, and policy guidelines.
- **Digital Tools:** Investments in pandemic response tools and vaccination data management.
- **Global Collaborations:** Partnerships with other countries and organisations.

Event/Outbreak and Their Learning

SARS in 2003

- Need for International legally binding rules/ regulations.
- Detection of infection among exposed persons is a challenge during the initial phase.
- Need for core capacities for screening, sample collection and quarantine facilities at international airports.

Avian Flu (H5N1)

- An effective strategy of surveillance of at-risk populations and culling sick birds was developed as a coordinated surveillance and response plan for both human and animal sectors.
- A standing committee on zoonosis was established following avian influenza

H1N1 Pandemic (pandemic declared as Public Health Emergency of International Concern)

- Countries were developing core capacities as per **International Health Regulations (IHR) 2005** at points of entry and inside the country for surveillance and response.
 - ♦ **IHR (2005)**, a **legally binding regulation**, was in place.
- Countries adopted **public health measures** like screening at POEs, early detection of suspects, quarantine, contact tracing of suspect surveillance and management of cases in isolation in dedicated wards.
 - ♦ Public health measures were helpful in mitigating and delaying the entry of infection.
- Need for coordinated surveillance between Points of entry and in country surveillance systems.

Ebola Outbreaks (2014-16) and (2018-21)

- Efforts to control these outbreaks involved screening, surveillance of exposed, contact tracing, data management, laboratory testing, and health education, including use of PPEs.
- Public health efforts were much more effective, limiting entry into the country.

MERS-CoV

- Zoonotic diseases, particularly highly infectious diseases that spread via respiratory/ droplets route could be challenging to prevent.
- Most of the threats leading to pandemics were due to novel viruses of zoonotic origin, possibly transmitted through the human animal interface.
- Infectious diseases having a respiratory mode of transmission are dangerous.

Zika Virus Disease

- It is a disease with **over 80% asymptomatic cases** and mild clinical symptoms with full recovery cannot be prevented using public health measures directed towards travellers.
- Effective vector surveillance and control is essential to prevent entry and transmission of vector-transmitted diseases.
- Need for multi-sectoral collaborative surveillance

Conclusion

- In a world where pandemics are no longer rare events, 'Future Pandemic Preparedness and Emergency Response (PPER) — A Framework for Action' serves as a beacon—a roadmap to navigate the challenges ahead.
- It's a reminder that preparedness isn't just about reacting; it's about **proactive planning, collaboration, and resilience**.

Source: News On AIR

DELAY IN APPOINTMENT OF NHRC CHAIRPERSON

In News

- The National Human Rights Commission (NHRC) has been without a full-time chairperson since June 1, 2024, following the retirement of former Supreme Court Justice Arun Mishra.

About Current Leadership

- Vijayabharathi Sayani is the only full-time member and acting chairperson, handling all responsibilities.
 - ♦ The NHRC should have a chairperson and five other full-time members. It is currently operating with only one full-time member out of six required positions and seven ex-officio members.

About National Human Rights Commission (NHRC)

- It was established on October 12, 1993, under the Protection of Human Rights Act (PHRA), 1993, amended by the **Protection of Human Rights (Amendment) Act, 2006**.
- It aligns with the **Paris Principles**, which were endorsed by the UN General Assembly in 1993.
- The **Protection of Human Rights Act, 1993** was amended in 2019 to allow **any Supreme Court judge** to head the **NHRC**, not just retired Chief Justices of India.

Functions and Mandate

- Enquire into complaints of human rights violations or negligence by public servants.
- Study human rights treaties and international instruments.
- Make recommendations for effective implementation of these treaties to the Government.
- Promote human rights awareness among the public.
- Encourage human rights literacy at both national and international levels.

Importance

- It represents India's commitment to **promoting and protecting human rights**, defined in Section 2(1)(d) of the PHRA as rights related to life, liberty, equality, and dignity, guaranteed by the Constitution and enforceable by Indian courts.
- It plays an **active role in coordinating with other NHRIs** of the world to enhance awareness from the perspective of human rights.
- It has also **hosted delegations from UN Bodies** and other National Human Rights Commissions as well as members of civil society, lawyers and political and social activists from many countries.

Issues and Concerns

- The Global Alliance of National Human Rights Institutions (GANHRI) has **deferred NHRC's accreditation** for the second consecutive year, **citing lack of transparency and poor representation**.
- It fails to cooperate with civil society, involves police personnel in investigations creating "conflict(s) of interest," and is unable to respond to escalating human rights violations.
- There have been **recurring delays in appointing NHRC chairpersons**, with significant gaps between the terms of the last four chairs.
- The Supreme Court is reviewing the Union government's delay in filling these vacancies, with recent hearings highlighting ongoing concerns about the NHRC's **diminished effectiveness and independence**.

Conclusion and Way Forward

- The National Human Rights Commission of India remains a vital institution in the country's human rights landscape.
- Its establishment was a significant step towards reinforcing India's commitment to human rights and justice.

- However, to effectively fulfill its mandate, the NHRC must overcome existing challenges and continue to evolve in response to the dynamic human rights environment.
- By addressing these issues, the NHRC can strengthen its role in protecting human rights and contribute to a more just and equitable society in India.

Source: TH

MODIFICATION OF SCHEME OF BUDGETARY SUPPORT FOR HYDRO ELECTRIC PROJECTS

Context

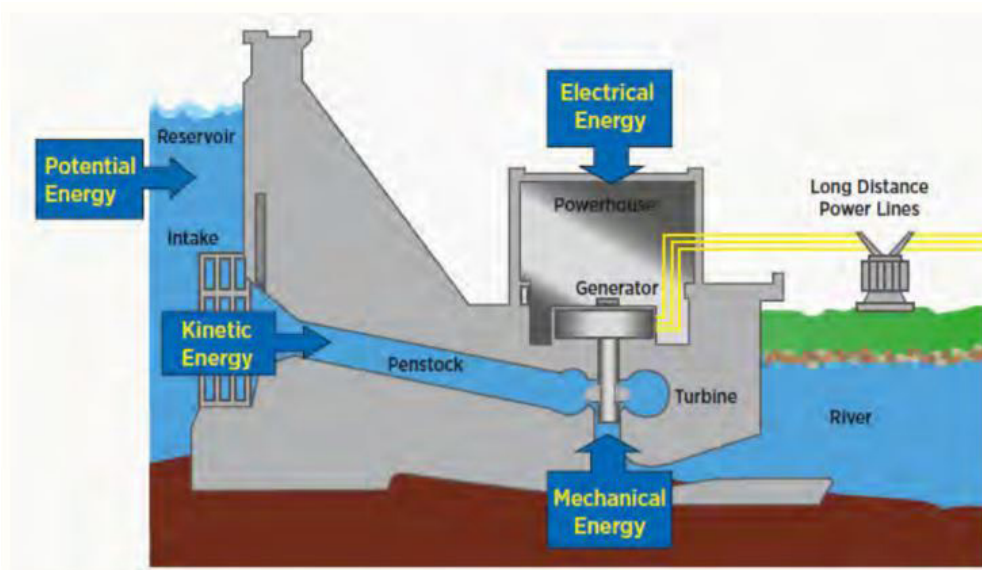
- The Union Cabinet has approved the proposal of the Ministry of Power for modification of the scheme of budgetary support for the cost of **Enabling Infrastructure for Hydro Electric Projects (HEP)**.

About

- The scheme would be implemented from **FY 2024-25 to FY 2031-32**.
- The Government of India has been taking several policy initiatives to address the **issues impeding Hydro Power development, viz., remote locations, hilly areas, lack of infrastructure etc.**
- The scheme will be applicable to **all Hydro Power Projects of more than 25 MW capacity** including the private sector projects which have been allotted on a transparent basis.
- This scheme will also be applicable to all Pumped Storage Projects (PSPs).
- **Benefits:**
 - ◆ This revised scheme would help in **faster development of hydro electric projects**, improve infrastructure in the remote and hilly project locations and would provide a large number of direct employment to the local people.
 - ◆ It would encourage fresh investments into the hydro power sector and incentivize timely completion of new projects.

What is Hydropower?

- Hydropower, or hydroelectric power, is one of the oldest and largest sources of renewable energy, which uses the **natural flow of moving water to generate electricity**.



- Hydropower currently generates more electricity than all other renewable technologies combined and is expected to remain the **world's largest source of renewable electricity generation into the 2030s**.
- Classification of Hydro Projects based on Installed Capacity:**
 - Micro:** Upto 100 KW
 - Mini:** 101KW to 2 MW
 - Small:** 2 MW to 25 MW
 - Mega:** Hydro projects with installed capacity ≥ 500 MW
- India:** In 2022-23, hydropower accounted for **12.5 percent** of power generation in India. India had about 4745.6 MW pumped storage capacity in operation in 2023.
 - The **hilly States of India** mainly Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir and Uttarakhand constitute around half of this potential.
 - Other potential States are **Maharashtra, Chhattisgarh, Karnataka and Kerala**.
- Clean Energy:** Hydropower produces minimal greenhouse gas emissions compared to fossil fuels, making it an environmentally friendly option for generating electricity.
- Reliable and Predictable:** Unlike solar and wind energy, which are intermittent and dependent on weather conditions, hydropower provides a consistent and reliable source of electricity.
- Flexible and Controllable:** Hydropower plants can quickly adjust their output to match changes in electricity demand.
- Multipurpose Use:** Hydropower projects often serve multiple purposes beyond electricity generation.
 - They can provide flood control by regulating water flow, irrigation for agriculture, water supply for communities, and recreational opportunities such as boating and fishing.
- Long Lifespan:** Hydropower infrastructure, such as dams and turbines, can have long lifespans, often exceeding 50 years with proper maintenance. This longevity ensures a stable and enduring source of energy for a longer period of time.

Do you Know?

- Three Gorges Dam in China on Yangtze River** is the largest hydro power station in the world.
- In India, the oldest Hydropower power plant is in **Darjeeling District in West Bengal**.
 - Its installed capacity is 130KW and was commissioned in the year **1897**.

Significance of Hydro Power

- Renewable Energy Source:** Hydropower is a renewable energy source because it relies on the

water cycle, which is continuously replenished by rainfall and snowmelt.

- Environmental Impact:** Large-scale hydropower projects often require damming rivers, which alter ecosystems, disrupt fish habitats, and impact local biodiversity.
 - It also leads to issues like sediment buildup and water temperature changes downstream, affecting aquatic life.

- **Social Impacts:** Building dams and reservoirs displace communities and disrupt livelihoods, especially those relying on the affected rivers for fishing or agriculture.
- **High Initial Costs:** Constructing hydropower facilities involves significant upfront investment costs.
- **Climate Change Vulnerability:** Hydropower generation relies on consistent water flow, which can be affected by climate change-induced variations in **precipitation patterns and glacial melt**.
 - ♦ A UK based thinktank found that the drought — likely exacerbated by climate change — **drove an 8.5% drop in hydroelectricity** around the world over the last two decades.
- **Sedimentation:** Dams trap sediment flowing downstream, leading to reservoirs gradually filling up with sediment over time.
 - ♦ This reduces the reservoir's capacity and impacts the efficiency and lifespan of the hydropower facility.
- **Maintenance Challenges:** Hydropower infrastructure requires regular maintenance to ensure safe and efficient operation.

Way Ahead

- The solution for the countries is to **diversify their power sources** by incorporating other renewable technologies — such as wind and solar — into their energy mix.
- **Innovations around placing floating solar panels** on the water's surface in hydropower plants — as countries such **China and Brazil** are exploring — have significant potential.
- **Building more medium scale plants**, rather than the mega dams of the past, would help mitigate the climate-risks associated with **overdependence on one big piece of infrastructure**.
- **Without major policy changes**, global hydropower expansion is expected to slow down this decade.

Source: PIB

ISSUE OF MANPOWER SHORTAGES IN INDIAN RAILWAYS

Context

- Chief Executive Officer of the Railway Board, has raised concerns about the **critical issue of manpower shortages in Indian Railways** and sought additional staff “urgently” to ensure the safe operation of trains.

- ♦ He highlighted the **exponential growth in railway infrastructure**, particularly the increase in new lines and trains, and emphasised the **need for the creation of new posts**.

Concerns

- For effective monitoring and execution of various projects, maintenance of new assets, and the smooth and safe operation of trains, there is an **urgent requirement for additional manpower in Indian Railways**.
- Concerns are set against a **backdrop of a series of major accidents** resulting in multiple fatalities across the railway network over the past two years.
- Filling the large number of vacancies across various departments, especially in safety-related roles, has been a **longstanding demand of trade unions**.

Indian Railways

- India has one of the **world's largest rail networks in terms of passenger traffic**.
- India has the **4th largest railway system** in the world, behind only the US, Russia and China.
- The Indian Railways consists of a total track length of 126,366 km with 7,335 stations. **5100 km of track length was achieved during 2023-24**.
- **The Railways Board**, which has a monopoly over the provision of rail services in India, oversees the whole infrastructure.

Challenges Faced by the Sector

- **Infrastructure Modernization:** Much of the rail infrastructure, including tracks, bridges, and stations, is outdated and in need of modernization.
- **Financial Strain:** Revenue from passenger and freight operations sometimes falls short of meeting the operational costs and investment needs.
- **Limited Scope for Outsourcing:** Given that compliance with safety norms is of paramount in train operations, outsourcing critical activities like maintenance of tracks, bridges, locomotives, coaches, wagons, and signaling equipment is not feasible.
- **Safety Concerns:** Ensuring safety across such a vast network is a significant challenge.
 - ♦ This includes preventing accidents, managing the condition of tracks and rolling stock, and ensuring passenger safety.
- **Maintenance Issues:** Regular maintenance of rolling stock and infrastructure is essential but often insufficient due to budget constraints and logistical issues.

- **Technological Integration:** Modernizing with new technologies, such as advanced signaling systems, automatic train protection, and real-time tracking, is essential for improving efficiency and safety.
- **Land Acquisition and Project Delays:** Acquiring land for new projects and managing the associated legal and logistical issues cause delays and increase costs.

Government Initiatives

- **Dedicated Freight Corridors (DFCs):** The construction of Dedicated Freight Corridors, such as the **Western and Eastern Corridors**, is intended to separate freight traffic from passenger services, reducing congestion and increasing efficiency in both freight and passenger operations.
- **High-Speed Rail Projects:** The introduction of high-speed rail services, such as the Mumbai-Ahmedabad corridor, aims to modernize the rail network and provide faster, more efficient travel options.
- **Electrification:** The Indian Railways is working towards complete electrification of its rail network.
 - ♦ Electrification reduces dependency on diesel, lowers operational costs, and helps in reducing carbon emissions.
- **Station Redevelopment:** The government is investing in redeveloping major railway stations to improve facilities and services. This includes upgrading infrastructure, enhancing amenities, and making stations more passenger-friendly.
- **Digital Initiatives:** The introduction of digital platforms like IRCTC (Indian Railway Catering and Tourism Corporation) for ticket booking, real-time tracking of trains, and e-payment systems aim to make services more accessible and user-friendly.
- **Safety Measures:** The government is focusing on improving safety through initiatives such as the installation of advanced signaling systems, automatic train protection systems, and better maintenance practices.
- **Expansion of Regional Connectivity:** Projects aimed at expanding rail connectivity to underserved regions and remote areas help in promoting balanced regional development and improving access to transportation.

Way Ahead

- To meet the ambitious **targets set for 2030**, more trains would have to be operated, which required

increased manpower for both train operations and infrastructure maintenance.

- The creation and expansion of new assets and lines in the railways also **necessitated adherence to all safety parameters** for clearance by the Commissioner of Railway Safety.
- Indian Railways is **crucial** to India's transportation infrastructure and economic development.
- The sector is set to **embrace technologies like AI** for predictive maintenance, big data for operational efficiency, and advanced signaling systems.
- Continued focus is on **expanding network reach, improving speed, and enhancing passenger and freight services**.

Source: TH

NEWS IN SHORTS

PORT BLAIR TO BE RENAMED AS 'SRI VIJAYA PURAM'

In News

- The Indian government has decided to rename Port Blair in the Andaman and Nicobar Islands as **Sri Vijaya Puram** to remove colonial imprints and honor the islands' role in India's freedom struggle.

About

- Port Blair is the capital of Andaman and Nicobar Islands.
- It was originally named after **Archibald Blair**, a British naval surveyor who explored the area in the late 18th century.
- **Historical linkages** : Blair initially named the natural harbor Port Cornwallis before it was renamed Port Blair.
 - ♦ The East India Company (EIC) used the islands as a penal colony and strategic base.
 - ♦ Port Blair was established as a penal colony after the Revolt of 1857, with a significant cellular jail (Kaala Paani) built in 1906 housing freedom fighters like Veer Damodar Savarkar.
- **Chola Expeditions:** The Cholas were one of the longest ruling Tamil dynasties of southern India.
 - ♦ They reigned approximately from the 9th to the 13th century.

- ♦ A prominent king of the dynasty, **Rajendra Chola**, maintained the Nicobar Islands as a naval base to launch attacks on the Srivijaya kingdom based on the Sumatra islands of present-day Indonesia.
- ♦ This naval expedition was a unique event in Indian history and its legacy of peaceful relations with Southeast Asia.
- ♦ in 1014 AD and 1042 AD, the southern islands of this archipelago were used as a strategic naval base by the Chola Dynasty
- **Importance** : The islands, once a Chola naval base and the site of key events like the first Tiranga unfurling by Netaji Subhash Chandra Bose and the imprisonment of freedom fighters in the cellular jail, are now seen as **crucial for India's strategic and developmental goals**.

Source:IE

DROP IN JUTE PRODUCTION

In Context

- Jute production to be 20% lower this year on floods as per the National Jute Board.
 - ♦ The **National Jute Board (NJB)** was established under the National Jute Board Act, 2008. It functions under the Ministry of Textiles.

About Jute sector in India

- **Jute Crop Conditions:**
 - ♦ Temperature: Ideal range between 25-35°C.
 - ♦ Rainfall: Requires 150-250 cm of rainfall.
 - ♦ Soil Type: Grows well in well-drained alluvial soil.
- **Global Production:**
 - ♦ India is the largest producer of jute, followed by Bangladesh and China.
 - ♦ However, Bangladesh leads in acreage and trade, contributing to three-fourths of global jute exports.
- **Geographical Concentration:**
 - ♦ Jute cultivation is primarily concentrated in eastern India, particularly in the Ganga-Brahmaputra delta.
 - ♦ **Major producing states:** West Bengal, Bihar, Odisha, Assam, Andhra Pradesh, Meghalaya, Tripura.
 - ♦ West Bengal alone houses approximately 73% of India's jute industries.

Production and Employment:

- ♦ India produces 70% of the world's jute, and 90% of this production is consumed domestically.
- ♦ The sector employs over 3 lakh workers in jute manufacturing and related industries.

Uses:

- ♦ Known as the **"golden fibre"**, jute is used to make gunny bags, mats, ropes, yarn, carpets, and various other artefacts.

Source: TH

HELIUM & ITS USE IN ROCKET

In Context

- The recent frequency of helium leaks has highlighted the need for improved valve designs and more precise tightening mechanisms in space-related systems to mitigate these challenges.

Why is Helium Crucial in Spacecraft and Rocket Operations?

Properties of Helium:

- ♦ **Inert:** Helium does not react with other substances or combust, making it safe for use in highly reactive environments.
- ♦ **Lightweight:** It is the second lightest element after hydrogen, helping to reduce the overall weight of spacecraft.
- ♦ **Low Boiling Point:** With a boiling point of -268.9°C , helium remains gaseous in extremely cold conditions, making it ideal for rockets that use super-cooled fuels.

Uses in Spacecraft:

- ♦ **Pressurization of Fuel Tanks:** Helium ensures fuel flows smoothly to the engines by filling the empty space in fuel tanks as fuel is consumed, maintaining the necessary pressure.
- ♦ **Cooling Systems:** Its low boiling point allows it to function effectively in cooling rocket components and systems.

Challenges of Using Helium:

- ♦ **Prone to Leaks:** Due to its small atomic size and low molecular weight, helium is prone to leaking through small gaps or seals in fuel systems.
- ♦ **Detection:** While leaks are common, helium's rarity in Earth's atmosphere makes it easier to detect leaks, which can help identify system faults.

Source: IE

INDUS-X INITIATIVE

In News

- Recently, the third edition of **India-US Defence Acceleration Ecosystem (INDUS-X) Summit concluded** in the USA.

About INDUS-X Initiative

- The INDUS-X Initiative was launched in June 2023 by the U.S. Department of Defense (DoD) and Indian Ministry of Defense (MoD).
- The initiative aims to expand the strategic technology partnership and enhance defense industrial cooperation between India and the USA by fostering collaboration among governments, businesses, and academic institutions.
- It connects defense startups from India and the USA, encouraging innovation and technology sharing in defense sectors.
- Part of iCET: The INDUS-X initiative is aligned with the U.S.-India initiative on Critical and Emerging Technology (iCET).
- Steering Agencies:**
 - iDEX (India):** Innovation for Defence Excellence, representing India's Ministry of Defence.
 - DIU (USA):** Defense Innovation Unit, under the U.S. Department of Defense.

Source: PIB

INDIGENOUS LIGHT TANK 'ZORAWAR'

Context

- India has successfully conducted the field firing trials of its new indigenous **light tank 'Zorawar'**, a highly versatile platform capable of deployment in high-altitude areas.

About

- Zorawar has been developed by the **Combat Vehicles Research & Development Establishment (CVRDE)**, a unit of the Defence Research and Development Organisation (DRDO), in collaboration with Larsen & Toubro Ltd.
- It is named after the 19th century **Dogra General Zorawar Singh**, who led military expeditions to Ladakh and Western Tibet.
- The tank will be able to navigate steep mountains and cross water bodies like rivers far more easily than its forerunners such as the heavy-weight **T-72 and T-90 tanks**.

Source: PIB

ASSAM CASCADE FROGS

In News

- Scientists from the Wildlife Institute of India studied the **Assam Cascade Frog (Amolops formosus)** in two Himalayan streams of the Churdhar Wildlife Sanctuary.

About Assam Cascade Frog (Hill Stream Frog)

- Endemic to Himalayan regions** in India, Bangladesh, Bhutan, and Nepal.
- Found in hilly streams**, especially in the Churdhar Wildlife Sanctuary in Himachal Pradesh.
- It is studied to understand the correlation of **water parameters with the abundance and density of its population**.
- Serves as an indicator species** for monitoring the long-term health of hilly streams.

Source: TH

TARDIGRADES

In Context

- Recent research on amber-encased fossils has provided insights into when tardigrades first developed their ability to enter the tun state, which helped them survive past mass extinction events.

About Tardigrades

- Tardigrades** (also known as **water bears**) are tiny eight-legged animals found in almost every habitat on Earth, from hydrothermal vents to mountain peaks.
- Cryptobiosis:** Tardigrades can enter a state of extreme inactivity, known as cryptobiosis or tun state, where they halt metabolism to survive harsh environments, including:
 - Extreme dehydration
 - High and low temperatures
 - Radiation
 - The vacuum of space
- Tardigrades likely survived major events such as the "Great Dying" (around 250 million years ago), which wiped out 90% of Earth's species.

Source: TH

WORLD OZONE DAY

In News

- The Ministry of Environment, Forest and Climate Change held an event in New Delhi to celebrate the 30th World Ozone Day.

About Day

- World Ozone Day is celebrated on 16th September each year to commemorate the signing of the **Montreal Protocol**, an international environmental treaty for phasing out of production and consumption of Ozone Depleting Substances, that came into force on this day in 1987.
- Theme: The theme for 2024 was “**Montreal Protocol: Advancing Climate Actions**,” highlighting the Montreal Protocol’s dual role in protecting the ozone layer and driving global climate action.

India’s Participation :

- India is a Party to the Montreal Protocol since June 1992, has been successfully implementing the **Montreal Protocol** and its ozone-depleting substances phase-out projects and activities in line with the phase-out schedule of the Protocol.
 - ♦ India has phased out **Chlorofluorocarbons, Carbon tetrachloride, Halons, Methyl Bromide and Methyl Chloroform** for controlled uses as on 1 January 2010, in line with the Montreal Protocol phase-out schedule.
 - ♦ Currently, **Hydrochlorofluorocarbons (HCFCs)** are being phased out as per the accelerated schedule of the Montreal Protocol.

Do you know ?

- Ozone, with the chemical formula O_3 , differs from the breathable oxygen (O_2) essential for life.
- Although it makes up a small part of the atmosphere, ozone is crucial for human well-being.
- Most ozone is found in the stratosphere, 10 to 40 km above Earth’s surface, where it absorbs harmful ultraviolet radiation from the Sun, making it “good” ozone.
- In contrast, excess ozone at Earth’s surface, formed from pollutants, is “bad” ozone and can be harmful.
- Naturally occurring ozone near the surface also helps remove pollutants from the atmosphere.

Source: PIB

BIO-DECOMPOSER

Context

- The Delhi government has started **preparations to spray bio-decomposer**, billed as an **alternative to stubble burning**, free of cost over 5,000 acres of farmland in the national capital.

About

- Bio-decomposer is a **microbial liquid spray** which, when sprayed onto paddy stubble, breaks it down in a way that can be easily absorbed into the soil, whereby farmers then have **no need to burn the stubble**.
- It has been developed by the **Indian Agricultural Research Institute (IARI)**.
- The government has been spraying the bio-decomposer solution free of cost since 2020 over farmlands in outer Delhi.
- **Benefits:**
 - ♦ Easy to use.
 - ♦ Turns crop residue into organic manure in just 15-20 days.
 - ♦ Environmental friendly.
 - ♦ Helps in maintaining soil health.
 - ♦ Replenishes organic content in the soil.
 - ♦ Can be sprayed easily.
 - ♦ Effective and proven results.
 - ♦ Helps in reducing pollution by solving stubble burning problem.

Source: TH

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE

Context

- The **National Instructional Media Institute (NIMI)** has launched a series of YouTube channels.

About

- The primary focus of this digital initiative is to provide **high-quality training videos** to millions of learners across **India’s Industrial Training Institute (ITI) skill ecosystem**.
- The new channels will offer content in **English, Hindi, Tamil, Bengali, Marathi, Punjabi, Malayalam, Telugu, and Kannada**.
- The initiative aims to help learners **improve their technical skills through free, easy-to-access digital resources**.

The National Instructional Media Institute

- It was formerly known as **Central Instructional Media Institute (CIMI)**, and was established in **1986** under the Ministry of Labour & Employment.
 - Presently, NIMI is functioning as an **autonomous** institute under **Ministry of Skill Development & Entrepreneurship (MSDE)**, after gaining its Autonomous status in **1999**.
- It is one of the premier institutes for providing **content/instructional material for vocational ecosystem**.
 - Further, to reach the unreachable, NIMI also provide its **e-content through Bharat Skill portal** which is made readily available to the student with free download provision.

Source: AIR

