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For Prelims and Mains

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1. Supreme Court's Methods for Addressing Errant Judges

Overview

The Supreme Court (SC) faces challenges when dealing with misconduct by judges due to constitutional protections. While impeachment is the only formal route, the SC has developed alternative methods to influence or discipline judges within these constraints.

Judicial Misconduct: A Recent Case

In September 2024, the SC expressed concern over comments made by Karnataka High Court Justice V Srishananda, including referring to a Bengaluru locality as being "in Pakistan" and making an inappropriate remark toward a female lawyer. Although the judge apologized, the case highlighted the difficulty of disciplining judges in constitutional courts.



Impeachment as the Sole Formal Mechanism

Judges of the Supreme Court and High Courts have significant protections to ensure their independence. The only constitutional process to remove a judge is impeachment, which is detailed in Article 124(4). This process requires a high level of political consensus and has been triggered only five times in India's history.

None of these impeachment attempts resulted in a judge's removal, though one judge, Justice Soumitra Sen, resigned after being impeached by the Rajya Sabha.

Judicial Action as an Alternative

When impeachment is not feasible, the SC has taken judicial action. In 2017, Calcutta High Court Justice C S Karnan was found guilty of contempt of court and sentenced to six months in prison. His case raised concerns about the SC disciplining a fellow judge, which set an uneasy precedent.

Transfer Policy and the Role of the Collegium

Another method the SC uses to influence judges is the transfer policy, managed by the Collegium. The Collegium, consisting of five senior-most SC judges, can recommend the transfer of High Court judges. This practice has been used to discipline judges by moving them to different courts, as seen in the 2010 case of Justice P D Dinakaran, who faced corruption allegations. However, critics argue that transferring judges does not address underlying issues and merely relocates the problem.

Conclusion

While impeachment is the only formal method for dealing with judicial misconduct, its high threshold makes it rare. The SC has therefore developed informal methods, such as judicial reprimands and transfers, to manage errant judges while working within constitutional limitations.

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

2. What changes the Armed Forces are considering to shed colonial influences, and why

Overview



To do away with colonial vestiges in the Indian military and its traditions, the Armed Forces are considering several changes.

These include officers studying Indian strategists in their career courses instead of Western experts, reducing the number of Scottish-origin pipe bands in the Army, and giving a more pan-India character to

certain arms of the Army.

Drafting a tri-service Act instead of three individual service Acts is also being considered.

What changes are being considered?

As part of efforts to inculcate an indigenous strategic thought in young military minds, texts written by ancient Indian strategists are being increasingly included in career courses instead of literature written by western military thinkers and writers.

For instance, the Secunderabad-based College of Defence Management (CDM) is drafting a syllabus in consultation with the Indic Studies department of Gujarat university, which will be made a mandatory part of mid-career courses to be attended by officers of the three services. It could include land campaign studies of Indian forces like the INA, Marathas and Sikhs; maritime strategies of rulers like Raja Raja Chola I and his son Rajendra Chola, King Marthand Varma, Kunjali Marakkar IV, among others; and the governance model of ancient Indian emperor Chandragupta Maurya.

The Armed Forces are in the process of identifying obsolete laws and rules that can be weeded out.

Also, at present, the Army, the Navy, and the Air Force have a different service Act governing each. Work is on to bring in a consolidated tri-services Act, which will reduce redundancies and promote smoother operations.

The Army is discussing whether Scottish-origin pipe bands can be reduced to one at each regional command headquarters—from one in almost every unit—and be kept for purely ceremonial purposes.

There may also be a study to assess if the Army's infantry regiments can be given a more pan-India character, like the artillery and armoured divisions, instead of the current system of a Jat regiment, Bihar regiment, etc.

What changes have already been made by the Armed Forces?

Several colonial-era military customs and practices have been done away with in the last few years, by changing several Army unit crests, the naval ensign, and giving out Indian names to military platforms and weapon systems.

Most joint exercises with other nations as well as operations and seminar halls in military complexes are being given Indian names.

More Indian tunes and instruments have been used in the Republic Day and the Beating Retreat ceremonies in the last few years. The Christian hymn Abide With Me was replaced by the patriotic Hindi song Ae Mere Watan Ke Logon after the Beating Retreat ceremony of 2022. Earlier this year, the Indian Navy permitted wearing the traditional kurta-pyjama attire into its naval messes.

Professional military education institutes are conducting regular seminars by Indology authorities to propagate indigenous ethics, law and warfare concepts.

Why the changes?

The idea is to "Indianise" the Indian military further, doing away with colonial influences.

This process has been on since India gained freedom from British rule in 1947, but there was an upswing in the efforts after Prime Minister Narendra Modi, while speaking at the Combined Commanders Conference in Gujarat's Kevadia in 2021, talked about increasing indigenisation in the national security system, including in the doctrines, procedures and customs of the Armed Forces.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

3. Status of Classical Language to Marathi, Pali, Prakrit, Assamese and Bengali languages

Introduction

The Union Cabinet has approved to confer the status of Classical Language to Marathi, Pali, Prakrit, Assamese and Bengali languages. The Classical Languages serve as a custodian of Bharat's profound and ancient cultural heritage, embodying the essence of each community's historical and cultural milestone.

Point Wise Detail & Background

The Government of India decided to create a new category of languages as "Classical Languages" on 12th October 2004 declaring Tamil as Classical Language and setting following as criteria for the status of Classical Language:

- A. High Antiquity of its early texts/ recorded history over a thousand years.
- B. A body of ancient literature/ texts, which is considered a valuable heritage by generation of speakers.
- C. The literary tradition must be original and not borrowed from another speech community.

A Linguistic Experts Committee (LEC) was constituted by the Ministry of Culture under Sahitya Akademi in Nov 2004 to examine the proposed languages for the status of Classical Language. The criteria were revised in Nov 2005 as following, and Sanskrit was declared as Classical Language:

- 1. High antiquity of its early texts/recorded history over a period of 1500-2000 years.
- 2. A body of ancient literature/texts, which is considered a valuable heritage by generations of speakers.
- 3. The literary tradition be original and not borrowed from another speech community.
- 4. The classical language and literature being distinct from modern, there may also be a discontinuity between the classical language and its later forms or its offshoots.

The Government of India, has conferred status of Classical Languages to following languages so far:

Language	Date of Notification
Tamil	12/10/2004
Sanskrit	25/11/2005
Telugu	31/10/2008
Kannada	31/10/2008
Malayalam	08/08/2013
Odia	01/03/2014

A proposal from the Maharashtra Government in 2013 was received in the Ministry requesting Classical Language status to Marathi, which was forwarded to the LEC. The LEC recommended Marathi for Classical Language. During the inter-ministerial consultations on the draft note for cabinet in 2017 for conferring classical status to the Marathi language, MHA advised to revise

the criteria and make it stricter. PMO vide its comment stated that the Ministry may conduct an exercise to find out how many other languages are likely to become eligible.

In the meantime, proposal from Bihar, Assam, West Bengal was also received for conferring status of Classical Language to Pali, Prakrit, Assamese and Bengali.

Accordingly, Linguistics Experts Committee (under Sahitya Akademi) in a meeting on 25.07.2024, unanimously revised the criteria as below. Sahitya Akademi has been appointed as nodal agency for the LEC:

1. High antiquity of (its) is early texts/recorded history over a period of 1500- 2000 years.
2. A body of ancient literature/texts, which is considered a heritage by generations of speakers.
3. Knowledge texts, especially prose texts in addition to poetry, epigraphical and inscriptional evidence.
4. The Classical Languages and literature could be distinct from its current form or could be discontinuous with later forms of its offshoots.

The committee also recommended following languages to be fulfilling revised criteria to be considered as a Classical Language.

1. Marathi
2. Pali
3. Prakrit
4. Assamese
5. Bengali

Implementation strategy and targets

The Ministry of Education has taken various steps to promote Classical Languages. Three Central Universities were established in 2020 through an Act of Parliament for promotion of Sanskrit language. The Central Institute of Classical Tamil was set up to facilitate the translation of ancient Tamil texts, promote research and offer courses for University students and language scholars of Tamil.

To further enhance the study and preservation of Classical Languages, the Centres for Excellence for studies in Classical Kannada, Telugu, Malayalam, and Odia were established under the auspices of the Central Institute of Indian Languages in Mysuru. In addition to these initiatives, several national and international awards have been instituted to recognize and encourage achievements in the field of Classical Languages. Benefits extended to Classical Languages by the Ministry of Education include National Awards for Classical Languages, Chairs in Universities, and Centers for promotion of Classical Languages.

Major impact, including employment generation

The inclusion of languages as Classical Language will create significant employment opportunities, particularly in academic and research fields. Additionally, the preservation, documentation, and digitization of ancient texts of these languages will generate jobs in archiving, translation, publishing, and digital media.

States/districts covered

The primary states involved are Maharashtra (Marathi), Bihar, Uttar Pradesh and Madhya Pradesh (Pali and Prakrit), West Bengal (Bengali), and Assam (Assamese). The broader cultural and academic impact will extend nationally and internationally.

Relevance: GS Prelims & Mains Paper II; Governance

Source: PIB

4. Mithun Chakraborty to Receive Dadasaheb Phalke Award

Recognition at the 70th National Film Awards

Veteran actor Mithun Chakraborty will be honored with the prestigious Dadasaheb Phalke Award for 2022. The award will be presented during the 70th National Film Awards ceremony on October 8, as announced by Union Minister Ashwini Vaishnaw.

DADASAHEB PHALKE AWARD FOR MITHUN CHAKRABORTY



Prime Minister's Tribute

Prime Minister Narendra Modi congratulated the actor, calling him a "cultural icon" admired across generations. "Delighted that Shri Mithun Chakraborty Ji has been conferred the prestigious Dadasaheb Phalke Award, recognising his unparalleled contributions to Indian cinema," Mr. Modi posted.

Career Highlights

Mithun Chakraborty received the National Film Award for Best Actor in his debut film, Mrigayaa (1976), directed by Mrinal Sen. His role as a Santhal rebel earned him national acclaim.

Popular Icon of the 1980s

He rose to stardom with the film Disco Dancer (1982), which became a huge success both in India and abroad, making him a dancing sensation of the era.

Awards and Accolades

Throughout his career, Mithun has won multiple awards:

- Filmfare Award for Best Supporting Actor for Agneepath (1990)
- Two more National Film Awards for Tahader Katha (1992) and Swami Vivekananda (1998)

Diverse Filmography

Mithun Chakraborty has acted in over 350 films across various Indian languages, including Hindi, Bengali, Odia, Bhojpuri, and Telugu. He is known for his versatility in action, drama, and comedy roles.

Commitment to Social Causes

Beyond cinema, Mithun has been actively involved in charitable initiatives focused on education, healthcare, and supporting underprivileged communities. His dedication to social causes reflects his commitment to giving back to society.

Recent Recognition

In addition to the Dadasaheb Phalke Award, Mithun was recently honored with the Padma Bhushan for his contributions to Indian cinema and society.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

5. Preparing for the next pandemic: what NITI Aayog report says

Introduction

Four years after the outbreak of Covid, an expert group constituted by NITI Aayog has recommended setting up a comprehensive framework to effectively manage future public health emergencies or pandemics.



The Pandemic Preparedness and Emergency Response (PPER) framework has called for a new Public Health Emergency Management Act (PHEMA), and the implementation of other measures to ensure a swift and effective response within the first 100 days of the outbreak.

The expert group, which was formed in June 2023, based its recommendations on the learnings and challenges of the Covid-19 pandemic and other public health crises. A government

statement noted that Covid-19 was “undoubtedly not the last pandemic”, and “given the unpredictably, changing planetary ecology, climate and human-animal-plant dynamics, new potentially, large-scale infectious threats to human health are inevitable”.

Here are some of the key recommendations made by the expert group in its report, Future Pandemic Preparedness and Emergency Response: A Framework for Action, which was published on September 11.

Enactment of PHEMA

Public health emergencies require governments to exercise special powers such as mandatory screening of people and putting restrictions on free movement. During the Covid-19 pandemic, provisions of the Epidemic Diseases Act (EDA), 1897, and the National Disaster Management Act (NDMA), 2005, were invoked.

But these laws were not entirely satisfactory, the report said. “The EDA 1897 does not define “dangerous”, “infectious”, or “contagious diseases”, or “epidemic”. It contains no provisions for the processes required for dissemination of drugs/ vaccines, and the quarantine measures and other preventive steps that need to be taken,” it said.

The NDMA was likewise not designed to cater to health emergencies. “It does not specifically define public health emergencies or epidemics. It focuses on managing several types of disasters, including natural disasters,” the report said.

These gaps can be filled by enacting PHEMA, the report said. The new law can empower central and state governments to effectively respond to not just pandemics, but also other kinds of health emergencies arising from non-communicable diseases, disasters or bioterrorism.

This special provision Act would empower public health agencies to take urgent action. It would create public health cadres at national and state levels who would be trained and fully prepared to be the first responder.

Empowered panel of Secys

The report proposed creating an Empowered Group of Secretaries (EGoS) — a committee of officials which will be headed by Cabinet Secretary to prepare for public health emergencies and monitor preparedness during peace times. It will “guide on governance, finance, R&D, surveillance, partnerships and collaborations, and other necessary functions that can be ramped up for immediate response” in case of an emergency.

EGoS will develop Standard Operating Procedures (SOP) for pandemics, and establish sub-committees for aforementioned functions, the report said.

Strengthen surveillance

The report made several recommendations for strengthening the disease surveillance network.

It noted that several epidemics and pandemics, including Covid-19, in the past 50 years were caused by viruses linked to various bat species. Therefore, constant monitoring of the human-bat interfaces was crucial.

The report proposed the creation of a national biosecurity and biosafety network, involving leading research institutions, biosafety containment facilities (labs that use specific safety equipment, practices, and building design to protect people and the environment from biological hazards), and genome sequencing centres.

Swarup said, "All components of this system should be strengthened and connected to work in a harmonised, autopilot mode that gets ignited as soon as the first warning sign is received." The report also recommended setting up an emergency vaccine bank, which would source vaccines from within or outside the country.

Network for early warning

The report proposed building an epidemiology forecasting and modelling network that can predict transmission dynamics of infectious diseases, and monitor the effectiveness of countermeasures, including vaccination, in different scenarios.

A network of centres of excellence (CoE) for research on priority pathogens is also required. Diagnostics, therapeutics, and vaccines for such priority pathogens, identified from the list maintained by the World Health Organisation, can be developed in advance, the report said.

Independent drug regulator

India needs a well-developed clinical trial network accepted by international regulatory authorities to ensure speedy access to innovative products to tackle public health emergencies. The Central Drugs Standards Control Organisation (CDSCO), which is responsible for regulating the import, sale, manufacture and distribution of drugs, needs to be independent, and needs to have special powers, the report said. The CDSCO is currently under the Ministry of Health.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

6. How India's temples are run

Introduction

As the Supreme Court hears petitions seeking a court-monitored probe into the alleged adulteration of the ghee in Lord Venkateswara's laddu prasadam, Hindu organisations have revived their demand to free temples from government control.

The Vishwa Hindu Parishad (VHP) has announced a nationwide campaign, and Andhra Pradesh Deputy Chief Minister Pawan Kalyan has called for a "Sanatana Dharma Rakshana Board" to look into all issues relating to temples.

How are religious places run in India?



Muslims and Christians manage their places of worship and religious institutions through boards or trusts run by the community. In the case of many Hindu, Sikh, Jain, and Buddhist places of worship, however, the government exercises considerable control. Hindu temples form the majority of the around 30 lakh places of worship in India (2011 census).

Temples in Tamil Nadu are managed by the state's Hindu Religious and Charitable Endowments (HR&CE) department. The AP government controls and appoints the head of the Tirumala Tirupati Devasthanams (TTD), which runs the Tirupati Temple.

States use a part of the income from offerings and donations at large temples for the administration and upkeep of those and smaller temples, and for welfare activities that may or may not be connected to the temple — such as running hospitals, orphanages, or schools/colleges that provide secular education.

Several states — including Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Kerala, Maharashtra, Odisha, Himachal Pradesh, Bihar, Madhya Pradesh, and Rajasthan — have enacted laws that give the government the power to administer temples, their incomes and expenditures.

The erstwhile state of Jammu and Kashmir enacted The Jammu and Kashmir Shri Mata Vaishno Devi Shrine Act, 1988, to manage, specifically, the Vaishno Devi Mata Shrine in Katra, Jammu.

States draw their power to enact such legislation from Article 25(2) of the Constitution, under which a government can make laws “regulating or restricting any economic, financial, political or other secular activity which may be associated with religious practice”, and “providing for social welfare and reform or the throwing open of Hindu religious institutions of a public character to all classes and sections of Hindus”.

Religious endowments and institutions are in List III (Concurrent List) of the Seventh Schedule, which means both the Centre and states can legislate on the subject.

How did Hindu temples come under government control?

The historical evidence for the construction of monumental temples dates back to the Mauryan period (321-185 BCE). Throughout Indian history, kings and nobles have donated land and riches to temples, which emerged as centres of culture and economy. The larger temples often promoted agriculture and irrigation, and were significant economic drivers.

In the medieval period, invaders repeatedly attacked and pillaged India's fabulously wealthy temples. The colonial rulers sought to control them — and between 1810 and 1817, the East India Company enacted a series of laws in the presidencies of Bengal, Madras, and Bombay, giving themselves the right to interfere in the administration of temples, purportedly to prevent the misappropriation of their income and endowments.

In 1863, the British enacted the Religious Endowments Act, which handed over control of temples to committees set up under the Act. However, the government retained considerable influence through judicial jurisdiction, the extension of the Civil Procedure Code and Official Trustees Act to temples, and the Charitable and Religious Trusts Act, 1920. In 1925, the Madras Hindu Religious Endowments Act empowered provincial governments to legislate on matters of endowments — over the years, this law gave enormous powers of oversight to a board of commissioners, which could even take over the management of a temple.

After Independence, the 1925 Act became the blueprint for various states to enact their own laws to administer temples. The first such Act was the Madras Hindu Religious and Charitable Endowments Act, passed by the State of Madras in 1951, which paved the way for the supervision of temples by the HR&CE department, and provided for the appointment of an Executive Officer.

Around the same time, a similar law was passed in Bihar. The Madras law was struck down in court, but a new one was enacted in 1959 with a few modifications.

Today, most states in South India follow similar legal structures to control temples. It has been argued that government intervention is necessary to ensure that all castes are allowed entry into Hindu places of worship.

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

7. 10 years of Swachh Bharat Mission: Its aims and status on key targets

Introduction

Swachh Bharat Mission, one of the first programmes announced by Prime Minister Narendra Modi after he took office in 2014, completes 10 years on October 2. While announcing the "Clean India campaign", the PM had said: "A clean India would be the best tribute India could pay to Mahatma Gandhi on his 150th birth anniversary in 2019."



The mission was divided into SBM-Gramin for villages, and SBM-Urban for cities, executed by the Ministry of Drinking Water and Sanitation, and the Ministry of Housing and Urban Affairs respectively.

SBM's focus areas were building individual toilets, community toilets, solid waste management, and leading awareness campaigns aimed at behavioural changes.



Targets of SBM

The PM announced that the SBM's main goal was to make India "Open defecation-free" (ODF) by October 2, 2019, for which crores of household and community toilets had to be constructed. The definition of ODF under the mission is as follows: "A city/ ward can be notified/ declared as an ODF city/ ODF ward if, at any point of the day, not a single person

is found defecating in the open."

The aim was to equip all households with individual toilets, ensure communities have cluster toilets, and that school and anganwadi toilets have waste management systems. Solid waste includes organic and inorganic materials (kitchen waste, plastics, metals, etc.), while liquid waste management deals with wastewater that is no longer fit for human consumption.

To achieve this, the government's assistance was increased from Rs 10,000 per toilet (under the Nirmal Bharat Abhiyan of the previous UPA government) to Rs 12,000 under SBM. When the mission completed five years in 2021, the government launched SBM 2.0, with a focus on garbage-free cities, faecal sludge, plastic waste, and greywater management.

Achievements so far

- With over 10 crore toilets constructed, PM Modi declared 6 lakh villages open defecation-free on October 2, 2019. Urban India, except for cities in West Bengal, was announced as ODF in December 2019 by the Housing and Urban Affairs Ministry.
- 66 lakh individual toilets were constructed against the target of 59 lakh, the Ministry said. The Centre also said it released Rs 57,469.22 crore to states and UTs for SBM-G between 2014-2015 and 2018-2019. The Budget for SBM-U was Rs 62,009 crore.
- 5.54 lakh villages and 3,913 cities have been declared as ODF+ under the second iterations of SBM-G and SBM-U from 2020-21. ODF+ means that besides being ODF, these villages have arrangements for liquid waste management as well.
- For SBM-G 2.0, the Cabinet had cleared spending of Rs 1.40 lakh crore from 2020-21 to 2024-2025, of which Rs 52,497 crore was from the Drinking Water and Sanitation Department. SBM-U 2.0 was approved in 2021, with allocation of Rs 1.41 lakh crore.
- All 2,400 legacy landfills in cities were to be cleared by 2025-2026. So far, only 30% of the target has been achieved in terms of the area to be cleared, while 41% of the waste

remediation goal has been met. The SBM-U dashboard shows 97% of municipal wards have door-to-door collection of waste and 90% of them have 100% segregation at source.

Impact of the mission

In 2018, the World Health Organisation estimated that 3 lakh deaths due to diarrhoea and protein-energy malnutrition would be averted due to the SBM-G from 2014 to October 2019. "Unsafe sanitation caused an estimated 199 million cases of diarrhoea annually before the start of the SBM in 2014. These have been gradually reducing, and will almost be eliminated when universal use of safe sanitation facilities is achieved by October 2019," the WHO said.

A recent study has found a link between reduction in infant deaths and SBM. The report, published in Nature on September 2, said the mission may have led to 60,000 to 70,000 fewer infant deaths annually from 2014 to 2020. The study noted that there had been a decline in infant mortality from 2003 to 2020, but the decrease was more after 2015.

According to the 2011 Census, 53.1% of households, both rural and urban, lacked any kind of latrines. How much this number has changed remains to be seen — Census 2021 has been delayed.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

8. Dadasaheb Phalke for Mithun Chakraborty: How Jimmy spurred Bollywood's disco fever

Recognition at the 70th National Film Awards

Actor and former Rajya Sabha MP Mithun Chakraborty will be honored with the prestigious Dadasaheb Phalke Award for 2024. The award will be presented at the 70th National Film Awards ceremony on October 8, 2024. Chakraborty is best known for his role as Jimmy in the iconic film Disco Dancer (1982), which catapulted him to stardom and became the first Indian film to gross over ₹100 crore globally.



The Rise of Disco Dancer and Bollywood's Disco Fever

By the 1970s, discos had started making their mark in cities like Delhi, Mumbai, and Kolkata, though they remained part of a niche counterculture. Bollywood embraced this trend with the hit song "Aap Jaisa Koi" from Qurbani (1980), featuring 15-year-old Pakistani singer Nazia Hassan and produced

by British-Indian music producer Biddu Appaiah.

Mithun Chakraborty, who had already gained recognition with his debut in Mrinal Sen's *Mrigaya* (1976), stood apart from the typical "angry young man" image popularized by actors like Amitabh Bachchan. His unique style was a fresh contrast to the established Bollywood heroes.

Disco Dancer: Bollywood's Saturday Night Fever Moment

The release of *Disco Dancer* in December 1982 marked a turning point for Bollywood, similar to the impact of *Saturday Night Fever* in Hollywood. The film's success was driven by its rags-to-riches storyline, Bappi Lahiri's memorable disco tracks such as "I Am a Disco Dancer" and "Jimmy Aaja," and Mithun Chakraborty's distinctive dance moves.

Bollywood's Disco Era

Disco Dancer sparked widespread interest in disco music in Bollywood, leading to a new era characterized by flamboyant fashion—shimmering outfits, bell-bottoms, and headbands—and music dominated by synthesizers, drum machines, and captivating vocals. Bappi Lahiri's experiments with the genre became a defining sound for Bollywood in the 1980s.

International Success, Especially in the Soviet Union

The film was especially popular in the Soviet Union, where it became the highest-grossing foreign film. In her book, *Leave Disco Dancer Alone: Indian Cinema and Soviet Movie-going after Stalin*, Sudha Rajagopalan noted how the film, with its energetic disco music and charismatic hero, won over Soviet audiences. Its release even led to a stampede in Tajikistan, resulting in the tragic death of one person.

Relevance: GS Prelims; Governance

Source: Indian Express

9. The Need for Reform in the UPSC Selection Process

Introduction

The Union Public Service Commission (UPSC) and the Indian Administrative Service (IAS) have recently faced scrutiny, particularly after the Puja Khedkar episode. This incident exposed significant flaws in the system. When seen alongside controversies like the NEET fiasco, it becomes evident that India must urgently restore the credibility of its civil services, higher education institutions, and national-level selection bodies.



Key Issues in the Selection Process

1. Opaque Income Certification for OBC and EWS Categories

A significant issue lies in the income certification process for Other Backward Classes (OBC) and Economically Weaker Sections (EWS) reservations. Income certificates, typically issued by Tehsildars, lack

proper verification mechanisms, creating opportunities for fraud. There is also confusion about whether the candidate's income or their family's income should be considered for eligibility, especially when a candidate's financial situation changes over time.

2. Gaming the Reservation System

Unlike Scheduled Caste and Scheduled Tribe categories, which can be verified through community checks, the OBC, EWS, and disability categories are prone to manipulation. There are cases where candidates, after failing once, secure admission by presenting questionable EWS certificates. Tehsildars, tasked with issuing income certificates, often lack the capacity to thoroughly assess an applicant's financial standing.

3. Outdated Rules and Lack of Scrutiny

Despite the evident flaws, there has been no attempt to revise the rules around income or disability certification. Without a proactive system for verifying credentials, scrutiny only occurs when complaints are filed. This passive oversight has allowed questionable practices to flourish, not only in the civil services but also in higher education institutions.

The Role of Technology and Transparency

One potential solution is enhancing transparency through technology. Had better systems been in place, it would have been impossible for Ms. Khedkar to sit for the UPSC exam 12 times. However, even sophisticated systems like Aadhaar have been compromised in the past, with fake biometric data being used to fraudulently claim benefits.

Proposed Solutions for Reform

1. Clear Guidelines on Income and Disability

The government needs to establish unambiguous rules on income and disability criteria that are uniformly applied across all states and sectors. If necessary, expert bodies should be formed to help develop these standards.

2. Robust Verification Systems

A strong verification system is crucial, particularly in categories prone to manipulation like disability and income-based reservations. Advanced technology should be utilized to reduce the scope for fraud.

3. Reevaluate Disability Criteria

The inclusion of mental disability within the civil services disability quota raises concerns, as these roles demand consistent mental acuity. Additionally, introducing an aptitude test for civil services, similar to the Defence Services, may help assess candidates better.

4. Accountability and Penalties

Serious penalties should be imposed on officials and medical professionals who issue false certificates. Courts play a critical role in ensuring that deserving candidates are not deprived of opportunities due to fraudulent selections.

Conclusion: Time for Structural Changes

The civil services are meant for those committed to serving the nation, not individuals seeking personal benefits. It is crucial to address the procedural and structural flaws in the UPSC selection process to safeguard the integrity of India's public institutions.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

10. Food safety laws in states

Introduction

The Uttar Pradesh government last week made it mandatory for food establishments to "prominently" display to customers the names of "the operator, proprietor, manager, and other relevant personnel".



On July 22, the Supreme Court stayed similar orders passed by police in UP and Uttarakhand for this year's kanwar yatra. The court said that the "competent authority" under the Food Safety and Standards Act, 2006 (FSSA) could indeed issue such orders, but police could not "usurp" this power.

What are the regulations for selling food in India?

Anyone who intends to operate a food business is required to either register or license their business from the Food Safety and Standards Authority of India (FSSAI), a body established under the FSSA to monitor and create regulations for how food should be processed, distributed, sold, and imported to ensure "safe and wholesome" food.

Under the Food Safety and Standards (Licensing and Registration of Food Businesses) Rules, 2011 (enacted under the FSSA), "Petty Food Manufacturers" such as small-scale food businesses, hawkers, vendors, and stall holders, are required to register with the FSSAI.

If the registration is approved, the Petty Food Manufacturer receives a registration certificate and a photo identity card "which shall be displayed at a prominent place at all times within the premises or vehicle or cart".

Under the same Rules, operators of relatively large businesses have to obtain a licence from the food authority. The licence, too, must be "displayed at a prominent place at all times within the premises where the Food Business Operator carries on the food business".

In both situations, therefore, the owner's identity and the establishment's location are already required to be displayed (through the photo ID and the licence issued by FSSAI). Under Section 63 of the FSSA, any operator carrying on a food business without a licence can be punished with up to six months in prison and a fine of up to Rs 5 lakh.

Do states have the power to make rules under the FSSA?

Section 94(1) of the FSSA states: "Subject to the powers of the Central Government and the Food Authority to make rules and regulations respectively, the State Government may, after previous publication and with the previous approval of the Food Authority... make rules to carry out the functions and duties assigned to the State Government and the State Commissioner of Food Safety under this Act and the rules and regulations made thereunder".

Matters on which state governments can make rules are detailed in Section 94(2). Under Section 94(2)(a), states can make rules on matters that come under "other functions of the Commissioner of Food Safety under clause (f) of sub-section (2) of section 30".

The Commissioner of Food Safety is appointed by the state government under Section 30 to ensure "efficient implementation" of the FSSA and its accompanying rules and regulations. Sections 30(2)(a) to (e) cover specific functions of the Commissioner of Food Safety (carrying out surveys, training programmes, and approving prosecution for offences, etc.); Section 30(2)(f) gives the Commissioner a broad mandate — "such other functions as the State Government may, in consultation with the Food Authority, prescribe".

In addition, Section 94(2)(c) allows the state government to make rules for "any other matter which is required to be, or may be prescribed or in respect of which provision is to be made by rules by the State Government".

Section 94(3) requires that the rule must be placed before the state legislature for approval "as soon as may be".

The UP government statement issued on September 24 said "necessary amendments should be made to the Food Safety and Standards Act to ensure compliance".

What can happen if any provisions, rules, and regulations under the FSSA are violated?

If a Food Business Operator fails to comply with any provision of the FSSA or its accompanying regulations, the food authority can serve an 'Improvement Notice' upon them under Section 31 of the Act. The notice will include the grounds for believing that the food business has failed to comply with the FSSA, the measures it must take, and the time period for compliance (minimum 14 days).

A business that fails to comply with this notice may have their licence suspended or, in case of further non-compliance, even cancelled.

The UP directives do not specify the penalty for non-compliance. Section 58 deals with "Penalty for contraventions for which no specific penalty is provided" — "which may extend to two lakh rupees". A food business operator who is convicted twice for the same offence (including one under Section 58), may be required to pay double the penalty for the first conviction, with a further fine "on daily basis" which can extend up to Rs 1 lakh, and also lose their licence (Section 64).

Can a state government's directives under FSSA be challenged in court?

One of the grounds on which the earlier UP and Uttarakhand police directives were challenged was that the orders effectively forced individuals to reveal their religious and caste identities.

During the hearing in the SC on July 22, the petitioners argued that the orders discriminated against individuals on the grounds of religion, violating Article 15(1) of the Constitution, which states "The State shall not discriminate against any citizen on grounds only of religion, race, caste, sex, place of birth or any of them."

The petitioners also argued that the order "created conditions for the complete economic boycott of Muslim minorities", which they said violates the right to practise any profession under Article 19(1)(g), and supports the practice of untouchability, which was abolished and forbidden under Article 17 of the Constitution.

Last week, the Uttar Pradesh government said that its latest directives — which also include the installation of CCTV cameras at food establishments and a "state-wide verification campaign" — are aimed at securing public health.

"...Incidents of adulterating food items like juice, dal, and roti with human waste, inedible, or dirty substances have been reported from various parts of the country," the UP government said, and added that "to prevent such occurrences in Uttar Pradesh, concrete measures must be put in place to ensure food safety and protect the health of the common man."

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

11. Cabinet approves the PM Rashtriya Krishi Vikas Yojana (PM-RKVY) to promote sustainable agriculture and Krishonnati Yojana (KY) to achieve food security for self sufficiency

Rationalisation of Schemes

The Union Cabinet approved the proposal of the Department of Agriculture & Farmers Welfare (DA&FW) for rationalization of all Centrally Sponsored Schemes (CSS) operating under Ministry of Agriculture and Farmer's into two-umbrella Schemes viz. Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY), a cafeteria scheme and Krishonnati Yojana (KY). PM-RKVY will promote sustainable agriculture, while KY will address food security & agricultural self-sufficiency. All components shall leverage technology to ensure efficient and effective implementation of the various components.

The PM Rashtriya Krishi Vikas Yojana (PM-RKVY) and Krishonnati Yojana (KY) will be implemented with total proposed expenditure of Rs.1,01,321.61 crore. These Schemes are implemented through the State Governments.

This exercise ensures that all the existing schemes are being continued. Wherever it was considered necessary to give fillip to any area for farmer's welfare, the scheme has been taken up in Mission mode, for example National Mission for Edible Oil-Oil Palm [NMEO-OP], Clean Plant Program, Digital Agriculture & National Mission for Edible Oil-Oil Seeds [NMEO-OS].

The scheme Mission Organic Value Chain Development for North Eastern Region (MOVCDNER), a component under the KY, is being modified by adding an additional component namely MOVCDNER- Detailed Project Report (MOVCDNER-DPR), which will provide flexibility to the North Eastern states to address critical challenges.

PM Rashtriya Krishi Vikas Yojana (PM-RKVY) and Krishonnati Yojana (KY)

- Cabinet approves rationalization of all Centrally Sponsored Schemes (CSS) operating under Ministry of Agriculture and Farmer's into **two-umbrella Schemes**

PM RKVY will promote sustainable agriculture



tober, 2024

Purpose behind rationalisation

By rationalization of the schemes, the States are given an opportunity to prepare a Comprehensive Strategic Document on Agriculture Sector of the State in a holistic manner. The Strategic Document focuses not only the production and productivity of the crops but also tackles the emerging issues of Climate Resilient Agriculture and development of Value Chain approach for agricultural commodities. These plans are envisaged to articulate the overall strategy and the schemes/programs, linked with the objectives flowing from the strategic framework.

The rationalisation of Various Schemes has been undertaken to:

- To avoid duplication, ensure convergence and provide flexibility to States.
- Focus on emergent challenges of Agriculture - Nutrition security, Sustainability, Climate resilience, value chain development & private sector participation.
- State governments will be able to draw a comprehensive strategic plan suiting their requirements for agriculture sector.
- Annual Action Plan (AAP) of States can be approved in one go rather approving individual scheme-wise AAPs.

One important change is to provide, in PM-RKVY, the state governments be given flexibility to re-allocate funds from one component to other based on their state specific requirements.

Out of the total proposed expenditure of Rs.1,01,321.61 crore the projected expenditure towards central share of DA&FW is Rs.69,088.98 crore and states share is Rs.32,232.63 crore. This includes Rs.57,074.72 crore for RKVY and Rs.44,246.89 crore for KY.

The PM-RKVY comprises of the following schemes:

1. Soil Health Management
2. Rainfed Area Development
3. Agro Forestry
4. Paramparagat Krishi Vikas Yojana
5. Agricultural Mechanization including Crop Residue Management
6. Per Drop More Crop
7. Crop Diversification Programme
8. RKVY DPR component
9. Accelerator Fund for Agri Startups

Relevance: GS Prelims & Mains Paper II; Governance

Source: PIB

12. Cabinet Approves National Mission on Edible Oils – Oilseeds (NMEO-Oilseeds)

Introduction

The Union Cabinet, chaired by Prime Minister Narendra Modi, has approved the National Mission on Edible Oils – Oilseeds (NMEO-Oilseeds). This initiative aims to boost domestic oilseed production and reduce dependence on edible oil imports, advancing the goal of

Atmanirbhar Bharat (self-reliant India). The mission will run from 2024-25 to 2030-31, with a financial outlay of Rs 10,103 crore.

CABINET DECISION 03-10-2024

NATIONAL MISSION ON EDIBLE OILS – OILSEEDS (NMEO-OILSEEDS)

- Mission will be implemented over a seven-year period, from 2024-25 to 2030-31
- Total financial outlay of ₹ 10,103 crore
- It aims to increase primary oilseed production from 39 million tonnes (2022-23) to 69.7 million tonnes by 2030-31
- It will introduce **SATHI Portal** enabling States to coordinate with stakeholders for timely availability of quality seeds
- It seeks to expand oilseed cultivation by an additional 40 lakh hectares

Key Objectives

- **Increase Oilseed Production:** The mission focuses on increasing the production of primary oilseed crops such as Rapeseed-Mustard, Groundnut, Soybean, Sunflower, and Sesamum. It also aims to improve oil extraction from secondary sources like Cottonseed, Rice Bran, and Tree-Borne Oils.
- **Production Targets:** By 2030-31, primary oilseed production is targeted to rise from 39 million tonnes (2022-23) to 69.7 million tonnes. Along with the National Mission on Edible Oils – Oil Palm (NMEO-OP), the goal is to produce 25.45 million tonnes of edible oil domestically, meeting about 72% of projected demand.

Strategies for Implementation

1. **Adoption of Advanced Technologies:** The mission will promote the use of high-yielding, high oil content seed varieties and cutting-edge global technologies like genome editing to boost productivity.
2. **Seed Infrastructure and Availability:** An Online 5-year rolling seed plan will be introduced through the SATHI Portal to ensure timely access to quality seeds. 65 new seed hubs and 50 seed storage units will be established to improve seed production.

3. Value Chain Clusters: Over 600 Value Chain Clusters will be set up in 347 districts, covering more than 10 lakh hectares annually. Farmers in these clusters will receive access to high-quality seeds, training on Good Agricultural Practices (GAP), and advisory services.

4. Expansion of Cultivation Areas: The mission will expand oilseed cultivation by 40 lakh hectares, targeting fallow lands in rice and potato-growing areas, and encouraging intercropping and crop diversification.

5. Support for Post-Harvest Units: Financial support will be extended to Farmer Producer Organizations (FPOs), cooperatives, and industry players to establish or upgrade post-harvest units, improving oil extraction from sources like cottonseed, rice bran, and Tree-Borne Oils (TBOs).

Public Awareness and Environmental Benefits

The mission will launch an Information, Education, and Communication (IEC) campaign to promote awareness of dietary guidelines for edible oils. It will also generate environmental benefits through low water usage and improved soil health by making productive use of crop fallow areas.

Background

India currently imports 57% of its edible oil demand. The government has been taking steps to reduce this reliance, including launching the National Mission on Edible Oils – Oil Palm (NMEO-OP) in 2021, with an outlay of Rs 11,040 crore, to boost oil palm cultivation.

Additionally, the government has increased the Minimum Support Price (MSP) for oilseeds, ensuring fair prices for farmers, and imposed a 20% import duty on edible oils to protect domestic producers.

Relevance: GS Prelims & Mains Paper II; Governance
Source: PIB

13. Which are India's 5 new 'classical languages', what does the tag mean?

Introduction

The Union Cabinet extended the "classical language" tag to Marathi, Pali, Prakrit, Assamese, and Bengali. Tamil, Sanskrit, Telugu, Kannada, Malayalam, and Odia already enjoy this status.

When and how did the concept of "classical language" arise?

Following demands from various states, the UPA-1 government decided to create a category of Indian languages known as "classical languages", and lay down various criteria for this status.

On October 12, 2004, Tamil became the first Indian language to receive "classical" status due to its high antiquity and rich literary tradition.

In the following month, the Ministry of Culture set up a Linguistic Experts Committee (LEC) under the Sahitya Akademi to examine proposals for “classical language” status from various states and bodies.

On November 25, Sanskrit was declared a classical language. Subsequently, this status was conferred upon Telugu (2008), Kannada (2008), Malayalam (2013), and Odia (2014).

Cabinet approves conferring status of Classical Language to 5 more languages

5 more Classical languages

- Linguistic Experts Committee: criteria for “Classical language”

- (i) High antiquity of its early texts/recorded history over a period of 1500-2000 years
- (ii) A body of ancient literature/texts, which is considered a heritage by generations of speakers
- (iii) Knowledge texts, especially prose texts in addition to poetry, epigraphical and inscriptional evidence
- (iv) The classical languages and literature could be distinct from its current form or could be discontinuous with its later forms of its offshoots

5 more Classical languages: Marathi, Pali, Prakrit, Assamese and Bengali

In addition to already notified: Tamil, Sanskrit, Telugu, Kannada, Malayalam, Odia

What are the latest criteria for “classical languages”?

On July 25 this year, the LEC unanimously revised the criteria for classical status. The criteria now includes:

- High antiquity of early texts, and recorded history over a period of 1500- 2000 years;
 - A body of ancient literature/ texts, which is considered a heritage by generations of speakers;
 - Epigraphic and inscriptional evidence;
 - Knowledge texts, especially prose texts in addition to poetry; and
 - That classical languages and literature could be distinct from its current form or could be discontinuous with later forms of its offshoots.
- Following this, the committee recommended the addition of the five new classical languages, the proposals for which had been with the Centre for some years. This was approved by the Union Cabinet recently.

What is behind the recent additions?

Marathi: With the state Assembly elections just weeks away, the inclusion of Marathi comes over a decade after the state government first forwarded the proposal to the Centre in 2013.

Modern Marathi descends from Maharashtri Prakrit, a Prakrit dialect used in western India which was the official language of the Satvahanas. Some Marathi scholars have claimed that this was the first among Prakrit languages, but this claim is contested. The oldest evidence of Maharashtri Prakrit can be found in a stone inscription in Pune district, dated to the 1st century BCE. The earliest evidence of the more modern Marathi can be traced to a copper-plate inscription found in Satara, dated to 739 CE.

Bengali & Assamese: The West Bengal and Assam state governments had also sought "classical" status for their respective languages.

Both these languages can find their origin in Magadhi Prakrit, a form of Prakrit popular in East India, and the official language of the Magadha court. The exact date in which they emerged is contested, with scholars putting forward dates of origin ranging from the 6th to the 12th centuries. They took on a form which may be recognisable today well into the second millennium CE. The legendary linguist Suniti Kumar Chatterji suggested that the Indo-Aryan vernacular likely differentiated itself in Assam before Bengal.

Prakrit & Pali: There is no single Prakrit language. Rather, the term refers to a group of closely-related Indo-Aryan languages, whose defining feature was that they were the language of the masses as opposed to Sanskrit, which was restricted to the elites and high literature. Historian A L Basham wrote in *The Wonder that was India* (1954): "By the time of the Buddha the masses were speaking languages which were much simpler than Sanskrit. These were the Prakrits, of which several dialects have been attested."

These vernaculars were thus also the language of popular heterodox religions that emerged in the first millennium BCE.

Jain agamas and the Gatha Saptashati are in Ardhamagadhi, a Prakrit dialect which some scholars consider to be its definitive form. This Prakrit thus continues to have resonance among the Jain community, and still sees use in the religion's ritual practices.

Pali, likely a form of somewhat Sanskritised Magadhi Prakrit, was the language of the Theravada Buddhist Canon — the Tipitakas. Considered to be the language of the Buddha himself, Pali survived in places like Sri Lanka, Myanmar, Thailand, Laos, and Cambodia, where the Theravada school prospered.

What will the 'classical' tag mean for these languages?

Officials say that the broader cultural and academic impact of this designation will extend nationally and internationally.

The Ministry of Education takes steps to promote classical languages. Three Central Universities were established in 2020 for the promotion of Sanskrit. The Central Institute of Classical Tamil was set up in 2008 to facilitate the translation of ancient Tamil texts, and offer

courses in Tamil. Similar Centres of Excellence have also been set up for the study of Kannada, Telugu, Malayalam, and Odia.

Officials told The Indian Express that the newly added classical languages will be promoted in a similar fashion.

The National Education Policy also calls for the inclusion of classical languages in school education. The Ministry of Culture (through the various academies), the Ministry of Education, and respective state governments, will come together for greater knowledge-sharing and research in these languages. Besides, manuscripts in these languages will be digitised for greater access to scholars, the officials said.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

14. What is the National Agriculture Code, currently being formulated by Bureau of Indian Standards

Introduction

The Bureau of Indian Standards (BIS) has begun the process of formulating a National Agriculture Code (NAC), on the lines of the existing National Building Code and National Electrical Code. What is the NAC, and why is it needed?

What is the National Agriculture Code?



The BIS is the national body which sets standards for different products across various economic sectors. In agriculture, it has already set standards for machinery (tractors, harvesters, etc.) and various inputs (fertilisers, pesticides, etc.)

However, there are still many areas not covered by the BIS standards. For example, there is no standard for agriculture practices like preparation of fields, micro irrigation and water use. Thus, for a long time, policymakers have felt a need for a comprehensive standards framework, like the one now being formulated by the BIS.

The NAC will cover the entire agriculture cycle, and will also contain a guidance note for future standardisation. The code will have two parts. The first will contain general principles for all crops, and the second will deal with crop-specific standards for the likes of paddy, wheat, oilseeds, and pulses. The NAC will serve as a guide for farmers, agriculture universities, and officials involved in the field.

What will the NAC cover?

In addition to standards for agriculture machinery, the NAC will cover all agriculture processes and post-harvest operations, such as crop selection, land preparation, sowing/transplanting, irrigation/drainage, soil health management, plant health management, harvesting/threshing, primary processing, post-harvest, sustainability, and record maintenance. It will also include standards for input management, like use of chemical fertilisers, pesticides, and weedicides, as well as standards for crop storage and traceability.

Crucially, the NAC will cover all new and emerging areas like natural farming and organic farming, as well as the use of Internet-of-Things in the field of agriculture.

What are the stated objects of the National Agriculture Code?

According to the BIS, the objectives are:

- To create an implementable national code covering recommendations for agriculture practices taking agroclimatic zones, crop type, socio economic diversity of the country and all aspects of agrifood value chain into consideration;
- To act as an enabler of quality culture in Indian agriculture by providing the required reference to policy makers, agriculture departments and regulators for incorporating the provisions of NAC in their schemes, policies, or regulations;
- To create a comprehensive guide for the farming community to ensure effective decision making in agricultural practices;
- To integrate relevant Indian Standards with recommended agricultural practices.
- To address the horizontal aspects of agriculture such as SMART farming, sustainability, traceability and documentation; and
- To aid in the capacity building program organized by agriculture extension services and civil society organisations.

What is the proposed timeline for this project?

The BIS has already formulated a strategy to standardise practices. It has formed working panels for 12-14 specifically identified areas, which will include university professors and R&D organisations. These panels will draft the code, with a tentative deadline for the NAC set as October 2025.

After this, the BIS plans to provide training to farmers on the NAC and its standards.

What are Standardized Agriculture Demonstration Farms? How are they important?

Apart from drafting the NAC, the BIS has also taken an initiative for setting up of 'Standardized Agriculture Demonstration Farm' (SADF) in selected agriculture institutes in the country. These farms will serve as experimental sites for testing and implementing various agricultural practices and new technologies in accordance with Indian Standards, according to the BIS.

For the development of these specialised farms, the BIS plans to sign Memorandum of Understanding (MoUs) with premier agricultural institutes. "We have identified 10 prominent agricultural institutes, and will sign MoUs with them for the development of SADFs... These MoUs have been shared, and are currently being finalised. Two MoUs have already been signed," Tiwari said. One of these two institutes is the Pantnagar-based Govind Ballabh Pant University of Agriculture and Technology (GBPUAT).

According to the officials, the BIS will provide financial assistance to these institutes for setting up the SADFs, where anyone including officials responsible for extension activities, farmers or industry people can come and learn. Tiwari said that China has already successfully demonstrated the working of such SADFs.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

15. Why did Supreme Court strike down discriminatory rules across state prison manuals?

Introduction

The Supreme Court recently struck down a series of rules in several state prison manuals which "reinforce caste differences" and target members of marginalised communities, especially those dubbed "criminal tribes" in the colonial era for violating the fundamental rights of the prisoners.



Why did SC strike down these rules now?

The decision follows a plea filed by journalist Sukanya Shantha, highlighting a series of rules and provisions in prison manuals from states including Uttar Pradesh, West Bengal, Andhra Pradesh, Madhya Pradesh, Odisha, Kerala, Tamil Nadu, Maharashtra, Karnataka, Rajasthan and Himachal Pradesh. The rules deal with the classification of prisoners and the assignment of work based on such classifications.

According to the 148-page decision authored by Chief Justice of India D Y Chandrachud, these manuals assigned prison work in ways that "perpetuate(s) caste-based labour divisions and reinforce social hierarchies", violating the fundamental rights of prisoners.

For instance, under the Madhya Pradesh Jail Manual, 1987, prisoners from the 'Mehtar' caste — a Scheduled Caste community — are specifically assigned latrine cleaning work. They are required to "empty the contents of the small receptacle into large iron drums and replace the receptacles in the latrine after having cleaning them" during routinely conducted 'latrine parades'.

Similarly, under the West Bengal Jail Code Rules, 1967, some work is explicitly divided based on caste. Rule 741 dealing with 'Sickness in cells' states, among other things, that "Food shall be cooked and carried to the cells by prisoner-cooks of suitable caste, under the superintendence of a jail officer".

The Supreme Court has declared all the provisions and rules in question unconstitutional, and directed states and union territories to revise their prison manuals within three months. It has also directed the Centre to make necessary changes to address caste discrimination in the Model Prison Manual 2016 and the draft Model Prisons and Correctional Services Act, 2023 within the same period.

How do the prison manuals reinforce caste and colonial stereotypes?

The Criminal Tribes Act of 1871 allowed the British Raj to declare any community as a "criminal tribe" if they were deemed "addicted to systematic commission of non-bailable offences". With this declaration, these tribes were forced to settle in designated locations, subjected to constant checks and the threat of arrest without a warrant, and more draconian restrictions "based on a stereotype which considered several marginalized communities as born criminals". After multiple amendments and iterations, the Act was repealed in 1952 and the former 'criminal tribes' became known as 'denotified tribes'. However, according to the apex court, "The manuals/rules also reinforce stereotypes against denotified tribes" through the classification between habitual and non-habitual criminals.

The court uses the example of Madhya Pradesh, where "any member of a denotified tribe may be treated as a habitual criminal, subject to the discretion of the State Government" (Rule 411). It also mentions rules in Andhra Pradesh, Tamil Nadu and Kerala where a person can be designated as a 'habitual criminal' if they "are by 'habit' a 'robber, housebreaker, dacoit, thief or receiver of stolen property'... even if 'no previous conviction has been proved, that he is by habit a member of a gang of dacoits, or of thieves or a dealer in stolen property'".

The West Bengal Jail Code Rules classify prisoners into 'B' or 'A' classes based on whether they are 'habitual' criminals or not respectively.

Upholding the fundamental rights of prisoners

The apex court detailed how the rules flagged by Shantha violate a host of fundamental rights under the Constitution of India:

RIGHT TO EQUALITY (Article 14): The court held that caste can only be used as a ground for classification "...as long as it is used to grant benefits to the victims of caste discrimination". It also stated that "Segregating prisoners on the basis of caste would reinforce caste differences or animosity that ought to be prevented at the first place" and that such classification "deprives some of them of equal opportunity to be assessed for their correctional needs, and consequently, opportunity to reform."

RIGHT AGAINST DISCRIMINATION (Article 15): The court held that the manuals both directly and indirectly discriminate against marginalised communities. "By assigning cleaning and sweeping work to the marginalized castes, while allowing the high castes to do cooking, the Manuals directly discriminate" it held. Further, "By assigning specific types of work to marginalized castes based on their supposed "customary" roles, the Manuals perpetuate the stereotype that people from these communities are either incapable of or unfit for more skilled, dignified, or intellectual work" which the court held results in indirect discrimination.

ABOLITION OF UNTOUCHABILITY (Article 17): The court reproduced a series of rules and held that they were representative of untouchability being practised in prisons. In Uttar Pradesh, a convict "shall not be called upon to perform duties of a degrading or menial character unless he belongs to a class or community accustomed to perform such duties". To this, the court held that "The notion that an occupation is considered as "degrading or menial" is an aspect of the caste system and untouchability".

RIGHT TO LIFE WITH DIGNITY (Article 21): The court held that the right to life with dignity under Article 21 "envisages the growth of individual personality" and "provides for the right to overcome caste barriers as a part of the right to life of individuals from marginalized communities". These rules in prison manuals, it held, "restrict the reformation of prisoners from marginalised communities" and "deprive(s) prisoners from marginalized groups of a sense of dignity and the expectation that they should be treated equally", violating this right.

PROHIBITION OF FORCED LABOUR (Article 23): Referring to how work is distributed such that some communities perform 'honourable' work while marginalised communities are relegated to 'undesirable' work, the court held "Imposing labour or work, which is considered impure or low-grade, upon the members of marginalized communities amounts to "forced labour" under Article 23".

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

16. PM Internship Scheme: Eligibility, application process and how to apply at pminternship.mca.gov.in

Background

The Ministry of Corporate Affairs has launched the Prime Minister's Internship Scheme in a pilot phase for the country's youth. The scheme aims to provide students with internship opportunities to address youth unemployment. Through this scheme, PM envisions to provide internships to 1 crore young people over the next five years.

As of now, the portal is open for partner companies, not for youth, to register for the internship. Candidates who will meet the eligibility requirements of a company can apply online through the official portal — pminternship.mca.gov.in — to benefit from the Prime Minister Internship Scheme.

PM Internship Scheme: Eligibility

Applicants for the internship programme must have completed their higher secondary education or high school, as well as have a certificate from an ITI, a diploma from a Polytechnic Institute, or a degree such as a BA, BSc, BCom, BCA, BBA, or BPharma. Candidates should be between 21 and 24 years old as of the application deadline.

The screenshot shows the official website for the PM Internship Scheme. At the top, there's a header with the Ministry of Corporate Affairs logo and the text 'PM INTERNSHIP SCHEME'. Below this, there are navigation links for 'GUIDELINES', 'FAQS', and 'PARTNER COMPANIES'. A central circular graphic titled 'Am I Eligible?' features a woman's portrait and lists four criteria: Age (21-24 years), Education (Not enrolled full-time), Job Status (Not employed full-time), and Family (Self/Spouse/Parents). The family criteria include: 'No member is earning more than ₹8 Lakhs per annum' and 'No member has a Govt. job'. To the right, under 'PM Internship offers', the benefits are listed: '12 months real-life experience in India's top companies', 'Monthly assistance of ₹4500 by Government of India and ₹500 by Industry', 'One-time Grant of ₹6000 for incidentals', and 'Insurance coverage for every intern under Pradhan Mantri Jeevan Jyoti Bima Yojana and Pradhan Mantri Suraksha Bima Yojana by Government of India'. At the bottom right, there are buttons for 'Register Now' and 'Know More'.

To be eligible, candidates should be Indian and should not work a full-time job or full-time school. Applicants may apply if they are enrolled in online or distance learning courses.

PM Internship Scheme: Offerings

As an assistant, candidates will receive Rs 5,000 per month for the full 12-month internship. From the company's CSR funding, each intern will get Rs 500 from the company, while the government will contribute Rs 4500.

Applicants will receive a one-time financial support of Rs 6,000 to cover incidental expenses in addition to the monthly stipend. Additionally, via initiatives like PM Jeevan Jyoti Bima Yojana and PM Suraksha Bima Yojana, the government will guarantee that interns are insured, with the government paying the premiums.

PM Internship Scheme: How to apply

Step 1: Visit the official website — pminternship.mca.gov.in.

Step 2: On the homepage, scroll down and you will see a register option. Select the link and a new page will open.

Step 3: Fill in the registration details and required documents, and select the submit button. Based on the details shared by the candidate, a resume will be generated automatically and a student can apply to at least five opportunities based on his or her preferences.

PM Internship Scheme: Which companies are part of the scheme?

Companies that have taken part in the programme have been chosen based on the CSR money they have spent in the last three years. More businesses, banks, and financial institutions may choose to participate in the programme, if the Ministry of Corporate Affairs (MCA) gives its approval.

However, participation is entirely voluntary. Companies that are unable to offer internships internally may work with vendors, clients, or other partners in their value chain to generate possibilities.

On the official portal, there are a few companies that are featured and some of them are Adani, HP, Tata Steel, Cognizant, Vedanta, Lanco, Kotak, Microsoft, and Pataka.

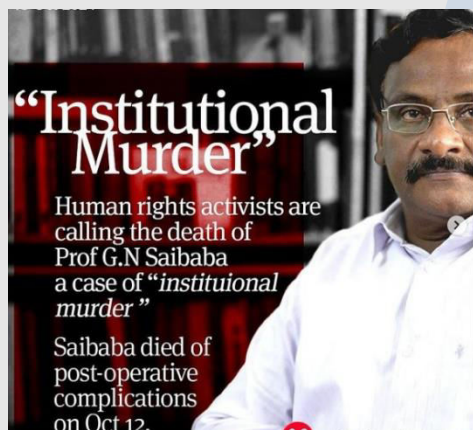
Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

17. Saibaba passes away: His decade-long trials, acquittal

Introduction

Seven months after he was cleared of all charges of alleged Maoist links and released from jail after nearly a decade, former Delhi University professor in a Hyderabad hospital, where he was undergoing treatment.



The 57-year-old had a 90 per cent disability due to a polio infection contracted during his childhood, leaving him paralysed from the waist down. Upon his release from Nagpur jail on March 7, he spoke about the health complications he faced while incarcerated. During that period, Saibaba's family and lawyers often raised concerns and made applications in court about his deteriorating health and the delays in treatment.

The case and conviction

On September 12, 2013, a team of Maharashtra police raided Saibaba's residence in Delhi, where he was an assistant professor at Ram Lal Anand College. Police arrested him on May 9, 2014, claiming he was an active member of the banned organisation Communist Party of India (Maoist) (CPI-M). Five others were arrested as well.

The police claimed they were all CPI-M members who hatched a criminal conspiracy to wage war against the Government of India through unlawful activities by use of violence. It alleged that Saibaba was found to possess documents and electronic gadgets, containing Maoist literature, correspondence between members, and video clips of their meetings.

On March 7, 2017, Saibaba and five others were found guilty by the sessions court under various charges, including the anti-terror law Unlawful Activities (Prevention) Act (UAPA). He was sentenced to life imprisonment.

The court said that though the wheelchair-bound Saibaba was disabled, there was no ground to show him leniency as he was “mentally fit” and a “think tank and high-profile leader” of CPI-M. His lawyers argued that the entire trial was vitiated, as the mandatory sanction necessary to prosecute an accused under UAPA was only granted after trial began. However, the court did not consider this valid. An appeal was then filed before the Bombay High Court.

The first acquittal

On October 14, 2022, Saibaba and his co-accused were cleared of all charges by the Nagpur bench of the Bombay High Court.

The court noted various faults in the procedure followed by the investigating agency concerning the grant of sanction under UAPA. It held that the proceedings before the trial court were “null and void”, as there was no valid sanction. Even as the police argued that the invalidity or absence of the sanction is a “curable defect”, the court held that every legislatively provided safeguard, however minuscule, must be “zealously protected”.

The court held that the sanction to prosecute Saibaba was received on April 6, 2015. By this time, the court had already framed charges against the accused and examined the first witness. Section 45(1) of UAPA states that no court shall take cognizance of any offence under UAPA without the previous sanction of the central or state government or any officer authorised by it.

The Act also states that an authority appointed by the government shall make an independent review of the evidence, before recommending if a sanction can be granted. The high court dealt in detail with the legislature’s intent in inserting the requirement of a sanction, and the necessity of an independent review.

“The siren song that the end justifies the means, and that the procedural safeguards are subservient to the overwhelming need to ensure that the accused is prosecuted and punished, must be muzzled by the voice of Rule of Law,” the division bench of Justices Rohit Deo and Anil Pansare said. The court said it was also conscious of the death of one accused person, named Pandu Narote, during the pendency of the appeal while in judicial custody in 2022, after he contracted swine flu. His appeal was also allowed.

Long wait for release

After the high court order was pronounced on October 14, 2022, on a Friday morning, the Maharashtra government immediately moved an urgent appeal before the Supreme Court by that evening, mentioned by the Solicitor General of India. By then, family members of those cleared of the charges, including Saibaba, had begun with the release formalities at Nagpur jail.

Arrangements for an unprecedented special sitting were made and the matter was listed on Saturday, a non-working day. A bench comprising Justice M R Shah and Justice Bela Trivedi suspended the high court order, stating that the decision to clear the accused on the grounds of invalid sanction needed to be considered in detail.

Saibaba's lawyers argued that even as the court suspended the order, it could have granted him bail pending proceedings, considering his medical condition. However, the court refused. Six months later, on April 19, 2023, the Supreme Court sent back the case to the high court to consider all issues raised in the appeal and decide the case on merits. The state had argued that the high court did not consider merits in its previous order.

The second acquittal

Nearly a year later, the high court again acquitted Saibaba and others on March 5, 2024, observing that holding a trial under UAPA without adhering to procedural requirements would amount to a "failure to justice".

While holding the sanction as invalid, the court said that the independent authority, the Directorate of Prosecution, had only given a "half-page communication" to justify the recommendation to grant sanction. On Saibaba, it said, "In sum and substance, the prosecution against accused No.6 G.N. Saibaba for want of valid sanction is also totally vitiated."

The court also questioned the credibility of his house being searched. It noted that the police chose an illiterate person to be an independent 'panch' — a witness mandated to be present during search procedures — though many "highly educated witnesses" would have been available, his residence being on a university campus. Further, the police had not proved any conspiracy to commit a terrorist act. He was then released.

Pleas on health grounds

As early as a year after his arrest, Saibaba's lawyers submitted that he had faced health complications, including in his kidney and gallbladder. He was granted temporary bail by the High Court in June 2015 on medical grounds, saying that if not released, there was a chance that his life would be at risk. In December, he was directed to surrender himself to Nagpur jail. In 2016, the SC granted bail again, considering his medical condition, and said that the state opposing his bail was "extremely unfair" as he had never misused his bail previously. Following his conviction under UAPA, Saibaba was arrested again.

Relevance: GS Prelims & Mains Paper II; Governance

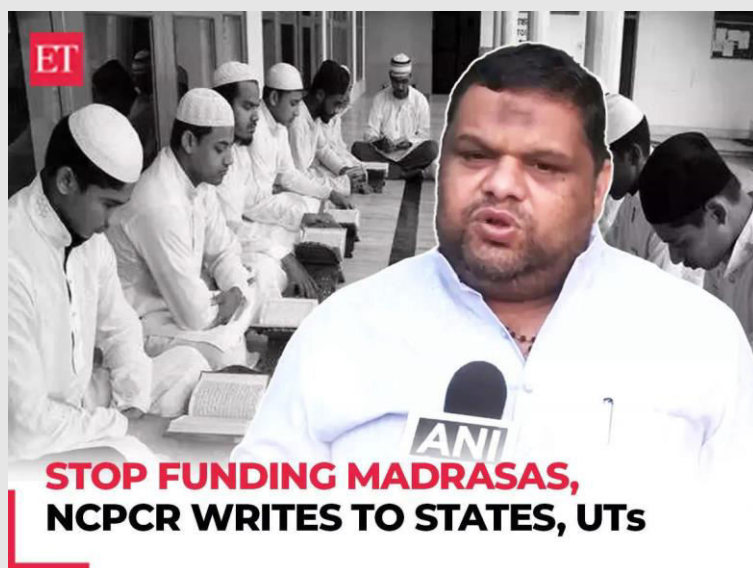
Source: Indian Express

18. NCPCR wants states to stop funding madrasas: how Kerala's system is different

Introduction

The National Commission for Protection of Child Rights (NCPCR) last week wrote to chief secretaries of all states and Union territories, recommending that madrasa boards be "closed

down", state funding to madrasas and madrasa boards be stopped, and children attending madrasas be enrolled in "formal schools."



In Kerala, leaders across the political divide criticised the NCPCR move, but pointed out that even if implemented, the recommendations would have little impact in the state, as madrasas here do not receive government funding and madrasa education does not interfere with regular schooling.

Madrasa education boards

In Kerala, madrasa education is managed by bodies affiliated to various Muslim groups such as

Sunni factions and Mujahid. Prominent among these are the Samastha Kerala Islam Matha Vidyabyasa Board and Samastha Kerala Sunni Vidyabhyasa Board. These boards have several madrasas under their aegis, and supervise functions like preparing the syllabus and textbooks, teaching, conducting examinations, issuing certificates, etc. Transfer of students is also through the boards.

Hours don't affect regular schooling

Running from Class 1 to 12, madrasas are generally attached to a mosque. Classes are held in the morning hours, up to 9 am, after which students go to nearby schools for their regular classes. Some madrasas have evening shifts.

Madrasa education in Kerala is limited to religious and moral teaching. Certain CBSE schools under Muslim managements have madrasa education within the school before regular school hours. A section of English medium schools are running English-medium madrasas, which are also affiliated to any of the madrasa education boards.

To cater to expatriate children, madrasas offer an e-learning facility too.

Kerala boards have affiliated madrasas in other states, like Tamil Nadu, Karnataka and Maharashtra.

Teachers' salary

It is estimated that Kerala has 2.25 lakh madrasa teachers. They are qualified in religious education and appointed by local mosque/mahallu committees as per the guidelines of the boards to which the madrasas are affiliated. Their salary is paid by the respective mahallu/masjid committees, which mobilise the funds mainly from parents.

Government involvement

State government is not involved in running of madrasas, but government has a madrasa teachers welfare fund. In 2010, the government formed a welfare fund for madrasa teachers following the suggestions of a committee headed by Paloli Muhammed Kutty, which was constituted to implement the recommendation of the Sachar Committee report.

The state government, madrasa teachers, and their management are the stakeholders in the fund. In 2018-19, a welfare fund board was formed. The board has a chairman appointed by the government, and a chief operating officer who is a government servant on deputation. The board has 18 members, including representatives of teachers and various madrasa board managements.

In 2010, the state allotted a corpus of Rs 10 crore for the welfare fund. The contribution from the madrasa teacher and management was fixed as Rs 50 each a month. In 2012, the deposits were shifted from banks to the state treasury to make them interest-free, as demanded by various Muslim organisations.

In 2015-16, the state government allotted Rs 3.75 crore as incentive for interest-free deposit in the state treasury. Then in 2021, the board got another sum of Rs 4.16 crore as incentive for interest-free deposit from the state. At present, the board has a deposit of Rs 12 crore in the treasury to meet the existing payment demands.

What teachers make as pension

At present, 1,800 madrasa teachers are given pensions ranging from Rs 1,500 to 2,700 a month. The pension for a teacher who paid the Rs 50 fee for five years is Rs 1,500, and Rs 2,250 for 10 years.

Kerala has 2.25 lakh madras teachers, but only 28,000 have joined the contributory pension scheme. The board gives housing loans, and other assistance such as for marriage and medical treatment, to members.

Relevance: GS Prelims & Mains Paper II; Governance

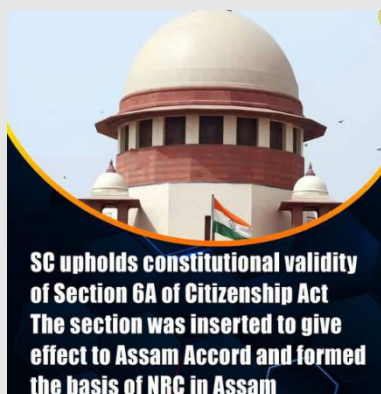
Source: Indian Express

19. SC upholds Section 6A of Citizenship Act: what is the provision, why it was challenged

Introduction

Assam accord 1985 SC Verdict: In a landmark verdict, the Supreme Court on Thursday (October 17), upheld the constitutional validity of Section 6A of the Citizenship Act, 1955, which granted citizenship to immigrants who entered Assam before March 24, 1971.

A five-judge Bench headed by Chief Justice of India DY Chandrachud delivered the judgement. While reading out the verdict, the CJI said that while four judges, including himself, formed part of the majority verdict, Justice JB Pardiwala penned a dissent.



Section 6A was added to the statute in 1985 following the signing of the Assam Accord between the Rajiv Gandhi government at the Centre and the All Assam Students' Union (AASU), after a six-year-long agitation against the entry of migrants from Bangladesh into Assam.

The petitioners include the NGO Assam Public Works, the Assam Sanmilita Mahasangha, and others who claim that setting a different cut-off date for citizenship in Assam is a discriminatory practice.

What does Section 6A of the Citizenship Act provide?

A key element of the Assam Accord was determining who is a foreigner in the state. Clause 5 of the Assam Accord states that January 1, 1966 shall serve as the base cut-off date for the detection and deletion of "foreigners" but it also contains provisions for the regularisation of those who arrived in the state after that date and up till March 24, 1971.

Section 6A was inserted into the Citizenship Act to facilitate this. All persons of "Indian origin" who entered the state before January 1, 1966 and have been "ordinarily resident" in Assam ever since "shall be deemed to be citizens of India". Additionally, it provides that anyone who entered and resided in Assam after January 1, 1966 but before March 24, 1971 who has been "detected to be a foreigner" would have the opportunity to register themselves according to rules made by the Central Government.

Following such registration, they would be granted the rights of citizens except that they would not be included in electoral rolls for the purposes of voting in elections for a period of 10 years. Those entering after March 24, 1971, would be considered illegal immigrants.

The verdict may also have an effect on the National Register for Citizens (NRC) in Assam. In 2019 a two-judge bench led by then CJI Ranjan Gogoi passed an order stating "We make it clear that subject to orders as may be passed by the Constitution Bench in Writ Petition (C) No.562 of 2012 and Writ Petition (C) No.311 of 2015, National Register of Citizens (NRC) will be updated."

What did the court decide?

The majority opinion delivered by Justice Surya Kant (signed by Justices M M Sundresh and Manoj Misra) held that Parliament has the power to grant citizenship under different conditions so long as the differentiation is reasonable.

As the migrant situation in Assam was unique in comparison to the rest of India at the time, it was justified to create a law to specifically address it and doing so would not violate the right to equality under Article 14 of the Constitution. CJI Chandrachud pointed out in his separate but concurring opinion that the impact of immigration in Assam was higher in comparison to other states so "singling out" the state is based on "rational considerations."

Both the majority and CJI Chandrachud also held that the petitioners did not provide any proof to show that the influx of migrants affected the cultural rights of citizens already residing in Assam. Article 29(1) gives citizens the right to 'conserve' their language and culture. CJI Chandrachud stated that "Mere presence of different ethnic groups in a state is not sufficient to infringe the right guaranteed by Article 29(1)".

The majority also held that the cut-off dates of January 1, 1966 and March 24, 1971 were constitutional as Section 6A and the Citizenship Rules, 2009 provide 'legible' conditions for the grant of citizenship and a reasonable process.

Justice Pardiwala on the other hand, in his dissenting opinion, held that the provision was unconstitutional and suffered from "temporal unreasonableness" as it does not prescribe a time limit for detecting foreigners and determining whether they were citizens. This, he held, relieves the government of the burden of identifying immigrants and deleting them from the electoral rolls which goes against the objective of providing citizenship while protecting the cultural and political rights of the people of Assam.

Further, he noted that there is no process for an immigrant to voluntarily be detected so if they fall in the timeframe provided under Section 6A. They must wait for the government to identify them as a "suspicious immigrant" before being referred to a foreigner tribunal for a decision, which Justice Pardiwala called "illogically unique".

Why was Section 6A challenged?

The petitioner claim that the cut-off date provided in Section 6A is discriminatory and violates the right to equality (Article 14 of the Constitution) as it provides a different standard for citizenship for immigrants entering Assam than the rest of India — which is July 1948. The Assam Sanmilita Mahasangha (ASM), one of the lead petitioners in the case, argued that the provision is "discriminatory, arbitrary and illegal".

They also claim that the provision violates the rights of "indigenous" people from Assam. Their petition, which was filed in 2012, states that "the application of Section 6A to the State of Assam alone has led to a perceptible change in the demographic pattern of the State and has reduced the people of Assam to a minority in their own State. The same is detrimental to the economic and political well-being of the State and acts as a potent force against the cultural survival, political control and employment opportunities of the people."

During the hearings, the petitioners argued that changing demographics in the state will affect the rights of "indigenous" Assamese people to conserve their culture under Article 29 of the Constitution of India.

What were the arguments in defence of Section 6A?

The Centre on the other hand has relied on Article 11 of the Constitution which gives Parliament the power "to make any provision with respect to the acquisition and termination of citizenship and all other matters relating to citizenship". It argued that this gives Parliament

the power to make laws on citizenship including for a “particular object” without violating the right to equality.

Other respondents, including the NGO Citizens for Justice and Peace, argued that if Section 6A is struck down a large swathe of current residents will be rendered “stateless” and be considered foreigners after enjoying citizenship rights for over 50 years. They also argued that the demographic pattern of the state changed in response to geo-political events even before Section 6A was introduced and that Assam has long since been a multi-lingual and diverse state.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

20. Story of Lady Justice, from Greek origins to today

Introduction

The Supreme Court has unveiled a new statue of “Lady Justice”, reimagining the image — typically a blindfolded woman holding a set of scales in one hand and a sword in the other — that is synonymous with legal practice around the world.

The new, six-foot-tall statue in the judges’ library is of a saree-clad woman with no blindfold, holding scales and, instead of the sword, a copy of the Constitution of India.

The blindfold in the classic rendition has been popularly understood to represent the impartiality of justice, whereas the new statue with unimpeded vision is meant to signify that “Law is not blind; it sees everyone equally,” Chief Justice of India D Y Chandrachud, who commissioned the statue, said.

The new take on the statue, which has been designed by Vinod Goswami, a muralist who teaches at the College of Art in Delhi, comes in the wake of legal reforms such as the new criminal codes, and the stated aim of “decolonising” the legal framework in India.



Changing meaning

The imagery of Lady Justice can be traced back to Greek and Roman mythology. Themis, one of the 12 Titans born to Gaea and Uranus according to works of the Greek poet Hesiod who lived circa 700 BCE, is known as the goddess of justice, wisdom, and good counsel — and is often depicted as a woman holding scales in one hand and a sword in the other.

Along with the common law legal system that continues to serve as the basis for how India's judiciary functions, the British Raj also introduced the iconography of Lady Justice. This image still survives in courthouses around the country.

At the Calcutta High Court — first constructed in 1872 — images of Lady Justice were carved into the pillars supporting the building. The depictions show Lady Justice blindfolded in some cases, and with her eyes open in others. The Bombay High Court too, features a statue of Lady Justice at the top of one of its buildings, once again without a blindfold.

The new statue at the Supreme Court is very similar to another piece of art featured on the premises. A mural close to the judges' entrance shows Mahatma Gandhi and Lady Justice on either side of a chakra; Lady Justice in this depiction is wearing a sari, and holding scales and a book instead of a sword.

Protests in Bangladesh

In December 2016, a large statue of the goddess Themis was erected in the front plaza of Bangladesh's Supreme Court. The statue wore a sari and a blindfold, and held scales and a sword.

The statue led to protests from the Muslim orthodoxy who objected to what they claimed was idol worship. In May 2017, the statue was removed to a location on the Supreme Court premises that was away from the public eye. In August 2024, after the fall of the Sheikh Hasina government, the statue was demolished.

Relevance: GS Prelims; Governance

Source: Indian Express

21. How do SGPC elections work? Why have they not been held in 13 years?

Introduction

Of the 170 Shiromani Gurdwara Parbandhak Committee (SGPC) members elected in 2011, at least 30 have died in the last 13 years. Although elections for the committee are supposed to be held every five years, none have taken place for well over a decade.



The Shiromani Akali Dal (Badal), which won the SGPC elections in 2011, has lost two Assembly elections in Punjab in the same period. Critics say that the only reason why the party still holds a majority in the SGPC house is due to the lack of fresh elections being held.

Here is how the SGPC elections work, and why they have not been held since 2011.

First, what is the SGPC?

The SGPC is the apex governing body of all Sikh gurdwaras in the states of Punjab and Himachal Pradesh, and the Union Territory of Chandigarh. It was established on November 15, 1920 in Amritsar, originally to administer the Darbar Sahib gurdwara and other historically important gurdwaras.

In the 19th century, Punjab, now under British control, saw a rise of Christian missionary activity and the formation of Arya Samaj, a Hindu reform movement. It is in this context that the Singh Sabha movement began among Sikhs to arrest what was termed as the "degradation of Sikh thought and principles" in daily life.

But the control of Darbar Sahib and other gurdwaras remained in the hands of powerful mahants (priests) who enjoyed tacit support from the British. These mahants treated gurdwaras as their personal fiefdoms. They encouraged practices in violation of the tenets of Sikhism, such as idol worship and discrimination against Dalit Sikhs.

The SGPC was created to replace the unpopular mahants, and govern Sikh gurdwaras as per the tenets of Sikhism. In the years after its creation, the SGPC managed to seize control of many gurdwaras, although things would often turn violent. Finally, the British passed the

Gurdwaras Act, 1925 which gave the SGPC legal recognition and turned it into a democratic body to govern gurdwaras.

How do SGPC elections work?

There are a total of 170 elected members of the SGPC. In addition, there are 15 nominated members, 5 heads of the Takhts (Sikh temporal seats), and the head granthi (chief priest) of the Golden Temple.

The Gurdwara Election Commission is a statutory body under the 1925 Act that is responsible for holding the SGPC elections. The Gurdwara Election Commission Chairman is appointed by the Union Home Ministry to oversee the elections. This person has the authority to hold elections in coordination with the Punjab government, which provides security and other resources.

The Centre appointed Justice S S Saron (retired), formerly of the Punjab and Haryana High Court, as the chairman of the Gurdwara Election Commission in October 2020. However, Saron began the process of preparing electoral rolls only in May this year. SGPC voters are registered in the same manner as voters in general elections, and the elections also take place on similar lines. Any eligible person can approach appointed election officials to register themselves as voters.

Who can become a voter in SGPC elections?

There are four main conditions to become a voter in SGPC elections. At the time of enrolment, a person must sign a declaration saying that:

- They maintain unshorn hair;
- They do not drink alcohol;
- They do not consume halal meat; and
- They do not consume tobacco.

Moreover, voters must be Sikhs of the age of 21 and above. This time, Sikhs from Punjab, Himachal Pradesh, and Chandigarh will be allowed to cast their vote. Voters from Haryana will not participate, as the state now has its own Haryana Sikh Gurdwara Management Committee. So far, more than 5 million voters have been registered for the SGPC elections since last October. The 2011 elections had 5.6 million registered voters, most of whom were from Punjab (5.27 million), followed by Haryana (337,000), Himachal Pradesh (23,011), and Chandigarh (11,932).

Why were elections delayed?

Many Sikh groups have demanded fresh elections be held since 2016. Still, the house elected in 2011 is still functioning.

A legal issue was behind the initial delay of SGPC elections. In December 2011, the Punjab and Haryana High Court nullified the SGPC polls held in September that year, and restored the voting rights of Sehajdhari Sikhs (Sikhs with shorn hair) by quashing the 2003 notification by the Centre. This notification had barred Sehajdhari Sikhs from casting their vote in 2011. During

the hearings of the so-called Sehajdhari voting rights case, the court made it clear that the poll results in 2011 would be subject to the verdict in the matter.

In February 2012, the SGPC moved the Supreme Court challenging the order of the Punjab and Haryana High Court. The Supreme Court, however, too as long as 2016 — the year fresh elections were to be held — to reinstate the SGPC house from 2011.

That said, even this reinstated house completed its five-year term in 2021. After coming to power in Punjab in 2022, the Aam Aadmi Party government recommended to the Centre that the SGPC elections be conducted as soon as possible.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

22. Vijaya Kishore Rahatkar to be new NCW chairperson

Vijaya Kishore Rahatkar



Vijaya Kishore Rahatkar has been appointed the ninth Chairperson of the National Commission for Women (NCW), succeeding Rekha Sharma, an official order said.

Appointment process

The appointment made under Section 3 of the National Commission for Women Act, 1990, will be for a period of three years or until she reaches the age of 65, whichever comes first, as per the government notification issued.

The announcement will also be published in the Gazette of India.

About NCW

The NCW, a statutory body, is empowered to work towards the advancement of women's rights. Its mandate includes reviewing the constitutional and legal safeguards provided for women.

Relevance: GS Prelims; Governance

Source: The Hindu

23. What are the stress factors for Indian Railways?

Introduction



On October 17, eight coaches of the Agartala-Lokmanya Tilak Express derailed in Assam with no casualties. On October 11, a passenger train rear-ended a stationary goods train near Chennai, also with no casualties. Indian trains have been involved in multiple accidents of late. The Balasore accident on June 2, 2023, had the greatest death toll, more than 275, yet pressure on the Railways to improve safety competes with pressures straining its subsistence.

How common are accidents?

The number of railway accidents dropped from 1,390 per year in the 1960s to 80 per year in the last

decade. There were still 34 consequential accidents in 2021-2022, 48 in 2022-23, and 40 in 2023-2024. A consequential accident injures and/or kills people, damages railway infrastructure, and disrupts rail traffic.

According to public records, 55.8% of all accidents involving trains have been due to the failure of Railway staff and another 28.4% due to failures on the part of non-staff people. Equipment failure accounted for 6.2%. In both the Balasore and the Kavaraipeitai accidents, officials blamed the signalling system.

What is 'Kavach'?

The 'Kavach' automatic train protection system is designed to prevent collisions using devices that allow pilots to track the relative location of their vehicles and which can actuate alarms and automated braking protocols.

By February 2024, the Railways had installed 'Kavach' on 1,465 route km, or 2% of its total route length. After the Balasore accident, Union Railway Minister Ashwini Vaishnaw said 'Kavach' would be implemented in "mission mode". It costs ₹50 lakh per kilometre and ₹70 lakh per locomotive. An analysis by The Hindu found the all-inclusive cost of implementation over a decade to be less than 2% of the Railways' annual capex. When faced with criticism of the slow implementation, officials have deferred to declines in accident incidence and mortality over the years. But experts have said comparing current and past accident rates is misguided because advanced safety technologies didn't exist earlier and that the government has the means today to eliminate collisions.

Since 1990-1991, the Railways has classified nearly 70% of all major accidents as derailments, but only 2% of them were due to collisions. 'Kavach' also may not have prevented the

Kavaraipettai accident because the relevant error happened beyond the minimum margins 'Kavach' requires to assist.

What is the operating ratio?

The operating ratio (OR) — the amount the Railways spends to earn ₹100 — in 2024-2025 is estimated to be ₹98.2, a small improvement from 2023-2024 (₹98.7) but a decline from ₹97.8 in 2016. A higher OR leaves less for capex and the Railways more dependent on budgetary support and Extra-Budgetary Resources (EBRs). In 2016-2017, the BJP government brought the railway budget under the regular budget after nine decades of separation. One outcome was easier access for the Railways to gross budgetary support. As for EBRs: the Railways' dues have ballooned to 17% of its revenue receipts today from 10% in 2015-2016.

How are freight services faring?

The Railways' two main internal revenue sources are passenger services and freight. The latter accounts for 65%. While revenue from both sources is increasing, freight rates increased more than thrice as fast as passenger rates in 2009-2019, NITI Aayog has estimated.

According to the draft National Rail Plan, nearly 30% of the railway network is utilised to more than 100% capacity. This has translated to slow freight movement — around 26 km/hr in 2016 — and slower revenue growth. Of the Dedicated Freight Corridors (DFCs) the government mooted in 2005, only the eastern DFC is fully operational. The western DFC is partly ready; the east coast, east-west sub-corridor, and north-south sub-corridor DFCs, amounting to 3,958 km, are still in planning. Freight revenue also depends on the freight basket. Coal accounted for half of the freight revenue and 45% of volume in the 2024-2025 budget estimate. However, the government has been adding more renewable energy sources while pushing industries to reduce their dependence on fossil fuels, including coal.

The Railways also needs to keep up existing equipment, including replacing tracks and wagons and maintaining trackside infrastructure. But in the 2023-2024 budget, capital outlay for track renewal dropped to 7.2%. Appropriations to the Depreciation Reserve Fund also fell 96% in the BJP's first term; the government had moved these resources to the Rashtriya Rail Sanraksha Kosh safety fund created in 2017-2018. The Standing Committee on Railways said then the latter wouldn't be able to pay to repair or replace depreciating assets.

What about passenger services' revenue?

The Railways' freight profit is offset significantly by passenger losses. In 2019-2020, the revenue from passenger services was a little over ₹50,000 crore and loss, ₹63,364 crore. In 2021-2022 — a pandemic year in which many trains had to be cancelled — passenger services incurred a loss of ₹68,269 crore. In a July 2024 analysis, PRL Legislative Research estimated the revenue from passenger services was ₹80,000 crore in 2024-2025.

PRL also estimated the Railways had a passenger traffic of 11 lakh passenger km, expected to increase to 12.4 lakh in 2024-2025 thanks to the addition of new trains — including the Vande Bharats — on high-traffic routes. The Railways has also replaced many of the more affordably

ticketed sleeper and second-class coaches with the more expensive AC coaches, all to increase passenger revenue. However, it last rationalised passenger fares in 2020.

How is safety affected?

For a long time now, the Railways has been caught between two aspirations: providing an affordable travelling option to the Indian people versus being a profitable business.

The Railways' losses are compounded by growing wage and pension bills and fuel costs. Locomotive pilots have also reported stressful working conditions, including 12-hour shifts, especially in zones with large freight volumes, and shifting standard operating procedures.

The high network congestion is likewise exemplified by the limited utility of 'Kavach' as well as the failure of a homegrown system, based on walkie-talkies, to alert trackside workers to oncoming trains. "The system does not work fully ... where a number of trains ply in a single block section at close intervals and signals are placed 1 km apart," Mr. Vaishnaw told the Rajya Sabha in 2023. In sum, the Railways' inability to generate revenue to plug gaps in the gross budgetary support, burgeoning demands on its revenue receipts, and growing pressure to ease congestion and improve physical capacity mean it's constantly playing catch-up.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

24. On Railways decision to shrink advance booking period

Introduction

One could book railway tickets four months in advance for long journeys. Now passengers will only be able to book tickets on Indian Railways two months in advance, a circular released by the Railway Board earlier this month stated.



When will the Advance Reservation Period (ARP) be effective?

The circular states that the new ARP rules will kick in from November 1, 2024 onwards, and that the booking window for passengers to reserve their tickets will open 60 days in advance (excluding the actual day of journey). However, if a passenger

has booked any tickets up to October 31 (under the earlier 120-day period rule), all those bookings will remain intact, and the passenger also has the facility to cancel those tickets at will.

By shortening the reservation period to 60 days, the Railways has reversed its 16-year old policy of reserving tickets 120 days in advance, which had kicked in from May 1, 2008. Before this, from 1995 to 2007, the booking window was restricted to 60 days. Interestingly, between 1988 to 1993, Railways had experimented with shortening the advance booking window to as less as only 45 days. Before this, once between 1981 to 1985, the Railways had opened the ARP for a 90-day window.

Why was such a decision taken?

Railways officials observed that 120 days was too long a period for planning journeys, and that it led to a high amount of ticket cancellations. "Currently, up to 21% passengers who book their tickets end up cancelling them," a senior official stated. While allotting seats/berths, officials also observed that there was a wastage of seats/berths because of passengers who would not turn up for journeys and at the same time would not bother to cancel their tickets. "4% to 5% passengers don't turn up (which is considered as no show)," the official further said. "Another trend Railways noticed is that between 88% to 90% rail reservations occur in the period of 60 days, hence it was thought prudent to reduce the ARP," another senior official told The Hindu.

Do longer booking windows increase frauds?

The rationale given by the officials to reduce ARP is that when passengers do not cancel their tickets and do not turn up for journeys, it opens up possibilities for fraud. "We observed frauds such as impersonation, railway officials taking money illegally to allot empty berths etc. With shortening reservation period this could be prevented," the official said.

Secondly, there is an immense challenge of curtailing touts that operate on the railway network. "When reservation periods are longer, there is a greater chance that touts end up blocking a substantial tranche of tickets. Shortening the period of ARP will encourage purchase of more tickets by genuine passengers," the official added.

Parallely, Railway officials state that the decision to either reduce or increase the ARP window is open for debate. "There are two opposing camps that debate how to fix the ARP window. There is one camp in the Ministry that believes in opening up advance reservation for the entire year, and that passengers should be allowed to book and cancel tickets round the year during the period of 365 days. This camp believes that opening up the reservation window year-long will fetch railways revenues in advance. However this facility is currently only available for foreign tourists, who avail of a certain quota to plan their train journeys across India," the official added.

Which groups of passengers are exempt from ARP rule?

Apart from foreign tourists, the Union Railway Ministry had stated that there is no impact on General class tickets as they are purchased just before the journey. It has also stated that for certain trains like Taj Express and Gomti Express it was noticed that tickets are booked almost immediately by passengers who wish to travel in these sitting trains. "They are exempt from ARP rule as passengers who wish to travel in these trains book tickets almost immediately a day or two in advance," the first official added.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

25. SC says states have power to make laws on industrial alcohol: What was the case

Introduction

A nine-judge Bench of the Supreme Court, in a 8:1 ruling held that states have the power to tax 'industrial' alcohol. In doing so, the court overruled a 7-judge Bench decision from 1989, which stated that states' powers were limited to taxing alcohol for human consumption.



The key interpretative question before the Court was whether "intoxicating liquor" can be defined to include "industrial alcohol."

Tax levied on alcohol is a key component of a state's revenue, with governments often adding an additional excise duty on alcohol consumption to drive their income up. For example, in 2023, Karnataka hiked the Additional Excise Duty (AED) on Indian Made Liquor (IML) by 20%. In the current case, the majority opinion was authored by Chief Justice of India D Y Chandrachud for himself and seven other judges. Justice Nagarathna authored a dissenting opinion.

What was the case about industrial alcohol before the SC?

The Bench began hearing arguments on April 2 on whether state governments have the power to regulate and control the sale, distribution, pricing and other factors relating to 'industrial'

alcohol. Industrial alcohol is used as a raw material to create other products, and is not meant for human consumption.

Entry 8 in the State List under the Seventh Schedule gives states the power to legislate on the production, manufacture, possession, transport, purchase and sale of “intoxicating liquors”. At the same time, Entry 52 of the Union List, and Entry 33 of the Concurrent List mention industries, whose control is “declared by Parliament by law to be expedient in public interest”. Notably, subjects in the Concurrent List can be legislated upon by both states and the Centre, but where a central law exists, the state law cannot be repugnant to it. Industrial alcohol is listed in the Industries (Development and Regulation) Act, 1951 (IDRA).

Essentially, the question before the apex court was whether states can regulate industrial alcohol or whether the Centre exercises exclusive control on the subject.

What was the earlier case?

In 1989, a 7-judge Constitution Bench in *Synthetics & Chemicals Ltd v. State of Uttar Pradesh* held that states’ powers, as per Entry 8 of the State List, were limited to regulating “intoxicating liquors” that are different from industrial alcohol.

The SC acknowledged that states’ power to regulate consumable alcohol must include the power to “prevent and/ or check industrial alcohol being used as intoxicating or drinkable alcohol”. But the court found that the taxes and levies in question were designed primarily to increase the revenue collected by the state, not as measures to regulate the use of industrial alcohol, or prevent its conversion to drinkable alcohol.

Essentially, the SC said that only the Centre can impose levies or taxes on industrial alcohol. However, in a point that would be brought up decades later, the SC did not consider its prior Constitution Bench decision in *Ch Tika Ramji v State of UP* (1956), where five judges upheld a legislation enacted in UP to regulate the supply and purchase of sugarcane. This Act was challenged on the grounds that under Section 18-G of the IDRA, the Centre had exclusive jurisdiction over regulation of the sugar industry.

In contrast to its *Synthetic & Chemicals Ltd* decision, the court held that Section 18-G is not meant to “cover the entire field” and the state still had power to legislate on matters relating to the sugar industry under Entry 33 of the Concurrent List.

How did this lead to the case now before the SC?

In 1999, the UP government issued a notification introducing a 15% fee for any sale made to licence holders under the UP Excise Act, 1910 for “alcohol used directly or...as solvent for vehicles and appear[ing] in the final product to some extent”. This was challenged by a motor oil and diesel distributor, who claimed that the Centre exercised exclusive jurisdiction over industrial alcohol as per Section 18-G of the IDRA.

In February 2004, the Allahabad High Court struck down the 1999 notification, holding that the state legislature did not exercise power over the general regulation of denatured spirits,

but only over drinkable alcohol. It directed the state to refund any fee collected with a 10% per annum interest from the date the fee was deposited. This decision was challenged in the SC, which then stayed the Allahabad HC judgment in August that same year.

In 2007, the court referred the case to a larger Bench, noting that the Tika Ramji case "had not been brought to the notice of the seven-Judge Bench which decided the Synthetics and Chemicals case".

What were the state's arguments?

Senior Advocate Dinesh Dwivedi, appearing for the State of UP, said that the phrase "intoxicating liquors" in Entry 8 of the State List includes "all liquids containing alcohol". He said that 'liquor', 'spirit', and 'intoxicant' were used in excise laws before the Constitution came into force.

He also argued that the Union's power under Entry 52 of the Union List does not include control over "finished products" (such as industrial alcohol after the denaturation process), as that is specifically covered by Entry 33 of the Concurrent List. In order to exercise exclusive control over regulation of industrial alcohol, the Centre would first have to issue an order to that effect under Section 18-G of the IDRA.

Dwivedi also cautioned against adopting an approach that would reduce states' powers, relying on Justice Ruma Pal's concurring opinion in ITC Ltd v Agricultural Produce Market Committee (2002). The SC had held that states are not "mere appendages of the Centre... The Centre cannot tamper with their powers. More particularly, the courts should not adopt an approach, an interpretation, which has the effect of or tends to have the effect of whittling down the powers reserved to the States".

What was the Centre's response?

Attorney General R Venkataramani and Solicitor General Tushar Mehta appeared for the Centre. The AG argued that 'intoxicating liquors' under Entry 8 is limited to alcohol meant for human consumption, stating that the framers of the Constitution were aware that there was a difference between alcohol under Entry 8 and alcohol which was not 'intoxicating' or consumable.

The SG focused on showing how the apex court's 1956 judgment in Tika Ramji was incorrect, arguing that it had limited the Centre's power over industries to issues concerning 'manufacture' and 'production' of goods, which is contradictory to what he said the Constitution framers intended.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

26. Ladakh activist Sonam Wangchuk ends fast: What is Schedule 6 of the Indian Constitution?

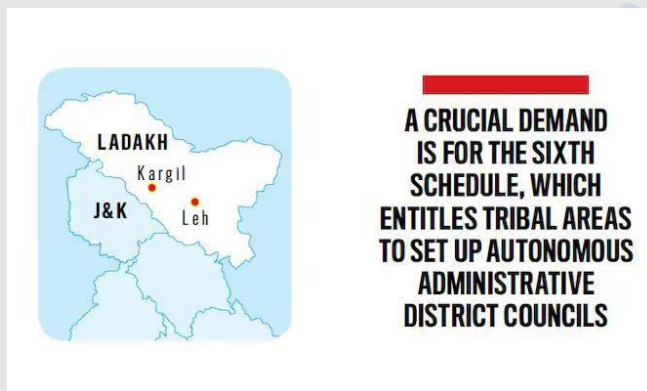
Introduction

Ladakh-based activist Sonam Wangchuk ended his indefinite fast on Monday evening (October 21), after receiving a letter from the Union Ministry of Home Affairs on future talks about the Union Territory's administration.

Wangchuk and other activists began marching from Ladakh to Delhi in September to discuss demands for greater autonomy in Ladakh's administration with the Central government. Specifically, they wanted Schedule 6 of the Indian Constitution to be made applicable to Ladakh. Here is a brief recall of their demands and the larger issues.

Why were activists from Ladakh marching to Delhi?

Wangchuk is an engineer and a renowned innovator of sustainable products. In recent years, he has flagged issues related to Ladakh's administration. He wrote a letter to then Union Tribal Affairs Minister Arjun Munda around 2019, on granting Scheduled Area status to Ladakh under the Sixth Schedule of the Indian Constitution.



Munda responded that his ministry was "seized of the matter" and had communicated a proposal to the MHA. However, there was no subsequent discussion on the subject with the leaders of Ladakh, Wangchuk said in 2023.

The demand also gained salience post the repeal of Article 370 of the Constitution in August 2019 and the

subsequent enactment of the Jammu and Kashmir Reorganisation Act, 2019, with Ladakh getting recognised as a separate Union Territory.

Students-led protests for the demand in 2019 saw support from former MP Thupstan Chhewang, who then created the Leh Apex Body (ABL). Organisations in Kargil also came together to form the Kargil Democratic Alliance (KDA). These groups have been at the forefront of the protests. Wangchuk has been repeating that protections under the Sixth Schedule were an election promise that the BJP made in 2019, and the Government of India has to keep its word.

What's the demand for the Sixth Schedule in Ladakh?

The Sixth Schedule under Article 244 of the Indian Constitution provides for the formation of tribal administrative regions called Autonomous District Councils (ADCs), as well as Autonomous Regional Councils (ARCs). A majority of the population in Ladakh belongs to Scheduled Tribes.

ADCs have up to 30 members with a term of five years and can make laws, rules and regulations on land, forest, water, agriculture, village councils, health, sanitation, village- and

town-level policing, etc. Currently, there are 10 ADCs in the Northeast, with three each in Assam, Meghalaya and Mizoram, and one in Tripura.

Wangchuk said the people of Ladakh have demanded the decentralisation of power as they believe that "lower levels of bureaucracy" may have been "influenced by industrial powers and business houses", who wanted "mining to take place in every valley here".

What are the other reasons for the protest?

Talks between the Union Ministry of Home Affairs, the ABL and KDA reached an impasse in March this year. At the meeting, Union Home Minister Amit Shah offered to extend Article 371-like protections to the region. Shah is learnt to have said the concerns related to jobs, land, and culture would be taken care of, but the government would not go as far as to include Ladakh in the Sixth Schedule.

Wangchuk and others then began a fast in Leh, where he survived only on water and salt and slept outdoors in below-freezing-point temperatures for 21 days.

Subsequently, a planned 'Pashmina march' to the China border was cancelled, with Wangchuk claiming the administration told them Section 144 of the IPC would be imposed. According to Wangchuk, shepherds who have traditionally reared the famed pashmina goats for their highly sought-after wool faced problems. He said the loss of land to corporations (he did not name any) for setting up large industrial units or solar plants; and two, the activities of the Chinese along the Line of Actual Control (LAC) had impacted them.

He also flagged issues related to unemployment in the region post-2019.

What happens now?

The latest 'Delhi Chalo Padyatra' was organised by the ALB, with a four-point agenda for the support of Ladakh's statehood, extension of the Sixth Schedule, early recruitment process along with a public service commission for Ladakh and separate Lok Sabha seats for Leh and Kargil districts.

Prashant Lokhande, the Joint Secretary of Jammu and Kashmir and Ladakh, met the activists at Ladakh Bhavan in New Delhi and handed them the letter from the ministry on Monday. It said the high-powered committee that previously held talks with Ladakh's representatives will meet them on December 3.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

27. Why India is building a cloud chamber as part of Mission Mausam

Introduction

Mission Mausam, launched by the government last month, aims to not just improve weather forecasting in the country but also 'manage' certain weather events, and on demand, enhance or suppress rainfall, hail, fog and, later, lightning strikes.

For effective weather modification, one of the most important areas is cloud physics, in which India will have to strengthen research. Towards this end, India is establishing a first-of-its-kind cloud chamber at the Indian Institute of Tropical Meteorology (IITM), Pune.

Cloud chamber as part of Mission Mausam

Mission Mausam aims to **improve weather forecasting** and manage events like enhancing or suppressing rainfall, hail, fog, and later, lightning strikes.

- A cloud chamber resembles a **closed cylindrical or tubular drum**, inside which water vapour, aerosols, etc. are injected.

What is a cloud chamber?

A cloud chamber resembles a closed cylindrical or tubular drum, inside which water vapour, aerosols, etc. are injected. Under the desired humidity and temperature inside this chamber, a cloud can develop.

The Pune facility will allow scientists to study the seed particles that form cloud droplets or ice particles in a sustained manner.

Many countries have basic cloud chambers, which have limited functionalities and scope to perform specific studies.

With Mission Mausam, however, India is building a cloud chamber with convection properties, as required to study Indian monsoon clouds. Globally, there are only a handful of convective cloud chambers.

Why is India building a convective cloud chamber?

Cloud physics basically involves the study of cloud behaviour during normal and extreme conditions; intra-particle interactions inside a cloud; the formation of rain droplets and ice particles; the influence of moisture added into the atmosphere due to cyclones or low pressure systems; and interactions between different cloud layers, among others.

The objective of establishing a convective cloud chamber is to gain a better understanding of cloud physics under conditions commonly affecting Indian weather systems. Thereafter, this knowledge can be used for strategic planning of weather modification.

How are scientists planning to use the cloud chamber?

With the establishment of a convective cloud chamber, scientists will have the flexibility to tailor physical and atmospheric parameters to suit environmental requirements that influence the Indian weather and climate.

"We have certain new ideas and we wish to test them. Within a controlled-environment, wherein we can apply various temperature, humidity, convective conditions and other parameters, we plan to monitor and understand clouds to arrive at high-level scientific findings on how monsoon clouds behave," said Thara Prabhakaran, senior IITM scientist and expert in the physics of clouds.

Over the next 18-24 months, the Indian team will mainly focus on developing complex and highly advanced instrumentation and probes that will be deployed when the chamber is ready. The civil construction of the chamber will take place in the coming months.

"We will need highly advanced instrumentation backup, capable of monitoring the minute properties of the conditions under investigation. We will also have to perform seed particle injection into the chamber, which will offer us a scenario to look at different environmental conditions," Prabhakaran added.

How has India's experience with cloud seeding been?

One such dedicated experiment was the Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) programme, which was conducted in four phases lasting more than a decade.

In the last phase, experiments were performed over a limited geographical area along the rain-shadow regions of Maharashtra's Solapur district from 2016-2018. Analysis of the experiments reaffirmed that under suitable conditions, cloud seeding was an effective strategy for enhancing rainfall over a region. Rainfall could be enhanced by up to 46 per cent (± 13 percent at some locations and on average), and about 18 per cent (± 2.6 percent) in a 100 square kilometre area in the downwind of seeding location over this rain shadow region.

However, it has been widely recognised that cloud seeding is not a silver bullet to address rainfall problems.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

28. Justice Sanjiv Khanna to be next CJI: How are Chief Justices of India appointed?

Introduction



The Centre recently appointed Justice Sanjiv Khanna as the next Chief Justice of India (CJI), formally approving the recommendation made by CJI D Y Chandrachud a week ago.

Justice Khanna, the seniormost judge in the apex court, will succeed CJI Chandrachud a day after the latter's retirement on November 10. He will hold the post for a little over six months until his retirement on May 13, 2025. CJI Chandrachud's two-year term is

among the longest in recent years.

What is the process for appointing the CJI?

By convention, the seniormost judge of the SC (based on years of experience as a judge in the apex court) becomes the CJI. This process has now been put down in the 'Memorandum of Procedure for the appointment of Supreme Court Judges' (henceforth, referred to as the MoP).

BASIS OF APPOINTMENT: The MoP says that the "appointment to the office of the Chief Justice of India should be of the seniormost Judge of the Supreme Court considered fit to hold the office". Even before the MoP was agreed upon in 1999, the seniormost judge of the Supreme Court after the CJI was by convention elevated to the top post.

HOW THE PROCESS BEGINS: According to the MoP, the appointment process begins when "The Union Minister of Law, Justice and Company Affairs would, at the appropriate time, seek the recommendation of the outgoing Chief Justice of India for the appointment of the next Chief Justice of India". By convention, the "appropriate time" for the process to begin is a month before the date of retirement of the incumbent CJI. CJI Chandrachud sent his letter of recommendation to the Centre on October 17.

CENTRAL GOVERNMENT APPROVAL: As per the process laid down in the MoP, "after receipt of the recommendation of the Chief Justice of India, the Union Minister of Law, Justice...will put up the recommendation to the Prime Minister who will advise the President in the matter of appointment". Though the final word on appointing the next CJI technically lies with the Centre, by convention the Centre tends to appoint whoever the presiding CJI recommends as her successor.

Table: The next in line to be Chief Justice of India

Since all SC judges have to retire at the age of 65, the length of a CJI's tenure depends on how old they are at the time of their predecessor's retirement. Here is a list of judges slated to be the CJI in the near future.

Judge	Date of assuming office (DD/MM/YY)	Retirement Date (DD/MM/YY)	Length of Tenure
Justice Sanjiv Khanna	11.11.2024	13.05.2025	184 days
Justice B R Gavai	14.05.2025	23.11.2025	194 days
Justice Surya Kant	24.11.2025	09.02.2027	443 days

Note: The dates in the table above work on the assumption that each of these judges will be the seniormost judge in the SC when they assume the office of CJI. The above information may change based on any changes in convention, early resignation, or loss of life.

Has there ever been a departure from the convention of appointing the seniormost SC judge as the CJI?

Yes. This convention was famously discarded by former Prime Minister Indira Gandhi, whose government recommended the appointment of Justice A N Ray as CJI in 1973, superseding three more senior judges, Justices J M Shelat, K S Hegde, and A N Grover.

Justice Ray was considered to be more favourably disposed towards the Indira government than his more senior colleagues. His appointment was announced the day after the Supreme Court pronounced a landmark order in the Kesavananda Bharati case, which laid down the "basic structure" doctrine. Justice Ray was part of the minority in the 7-6 verdict of the 13-judge Bench.

Indira's government, in January 1977, once again ignored the convention by superseding Justice H R Khanna to appoint Justice M H Beg as the CJI. Justice Khanna had been the lone dissenter in the ADM Jabalpur vs Shiv Kant Shukla order, in which the majority comprising Justices A N Ray, P N Bhagwati, Y V Chandrachud, and M H Beg agreed with the government that fundamental rights including the right to life and liberty stood abrogated during a period of national Emergency.

How did the MoP come into existence?

Following the apex court's decisions in the First Judges Case (1981), Second Judges Case (1993), and the Third Judges Case (1998), a peer selection process for the appointment of High Court and SC judges was put in place by establishing what we now know as the Supreme Court Collegium. This Collegium comprises the seniormost judges of the SC, and the Centre is technically bound to accept its recommendations.

The MoP — first drawn up in 1999 — provides the procedure for appointment and obligations of the Centre, the SC, and the High Courts when it comes to the appointment process. This document is crucial as the Collegium system of appointing judges is a judicial innovation that is not mandated through legislation, or text of the Constitution.

In 2015, the SC struck down the constitutional amendment that brought in the National Judicial Appointments Commission (NJAC). This would have allowed the Centre to have greater influences in the process of recommending judges. Following this decision, the MoP was renegotiated in 2016, although the government maintained until last year that it was still being finalised.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

29. Aadhaar Cannot Be Used as Proof of Date of Birth, Rules Supreme Court

Introduction

The Supreme Court has ruled that Aadhaar cards cannot be used as proof of age. It emphasized that other official documents, like the School Leaving Certificate, should be used for this purpose. This decision has raised concerns about the role of Aadhaar, which is

described as a "universal identity infrastructure" by the Unique Identification Authority of India (UIDAI).

Case Background: Compensation for Motor Accident

The case involved a motorcycle accident victim, Sika Ram, whose family sought compensation under the Motor Vehicles Act, 1988. Compensation is determined by factors like income, age, and dependants of the deceased. The age is crucial as it determines the "multiplier," which affects the amount of compensation.

In the original ruling, the High Court reduced the compensation based on the age on Sika Ram's Aadhaar card (47 years). However, the family argued that according to his School Leaving Certificate, he was 45 years old, which would result in a higher multiplier and compensation.

Juvenile Justice Act and Aadhaar's Limited Role

The Supreme Court criticized the High Court for relying on Aadhaar to determine age. It referred to the Juvenile Justice Act, 2015, which specifies that documents like the School Leaving Certificate are valid for determining age. Aadhaar, as noted by the court and previous rulings, is primarily a proof of identity, not a proof of date of birth.

Ultimately, the Court ruled in favor of using the School Leaving Certificate, awarding the family Rs 15 lakh in compensation.

Aadhaar's Expanding Mandate Over the Years

Aadhaar was initially introduced to provide a unique ID for below-poverty-line families to access government schemes. Despite early opposition and challenges, including security concerns and legal battles, its role has grown over time.

In 2016, after the BJP came to power, the Aadhaar Bill was passed as a money bill, allowing its mandatory use for certain government services. In 2018, the Supreme Court ruled that Aadhaar could not be made mandatory for services like bank accounts, mobile connections, or education. However, it upheld its mandatory linking with PAN cards for tax purposes.

Despite being 'voluntary,' Aadhaar is now required for various government schemes and services. In 2024, it became mandatory for rural workers seeking employment under the Mahatma Gandhi National Rural Employment Guarantee Scheme.

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

1. Israel-Hezbollah Conflict- History and Present

Introduction

The Displacement of Palestinians (1948)

The conflict between Israel and Hezbollah has its origins in the creation of the state of Israel in 1948, which led to the displacement of over 750,000 Palestinian Arabs. Many of these displaced Palestinians settled in southern Lebanon, creating tensions in the region.

Early Conflicts (1970s-1980s)

Throughout the 1960s and 70s, the Palestine Liberation Organisation (PLO) used southern Lebanon as a base to launch attacks on Israel. In response, Israel invaded southern Lebanon twice—first in 1978 and again in 1982, in an attempt to push back the PLO. This led to Israel establishing a security zone in southern Lebanon, patrolled by a Christian militia allied with Israel.

The Rise of Hezbollah

Formation and Objectives

Hezbollah was formed in the early 1980s as a response to Israel's occupation of southern Lebanon. Backed by Iran, Hezbollah initially sought to resist Israeli forces but gradually expanded its goals to include creating a theocratic state in Lebanon and opposing Western influence in the region.

Hezbollah's Role in Lebanese Society

Apart from its military activities, Hezbollah gained substantial support by providing social services such as healthcare and education, particularly to Lebanon's marginalized Shiite population.

Key Conflicts and Developments

Operation Grapes of Wrath (1996)

In 1996, Israel launched a 17-day military campaign called Operation Grapes of Wrath against Hezbollah, which resulted in significant civilian casualties. A notable incident occurred in Qana, where over 100 Lebanese civilians were killed, increasing Hezbollah's popularity.

Israeli Withdrawal (2000)

By 2000, Israel's continued presence in southern Lebanon became untenable due to Hezbollah's persistent attacks. Israel unilaterally withdrew from Lebanon after a costly 18-year occupation.

The 2006 War

In 2006, after Hezbollah captured two Israeli soldiers, Israel launched a full-scale attack. The conflict resulted in the deaths of 1,200 Lebanese and 159 Israelis. Despite Israel's military advantage, Hezbollah's resilience proved difficult to overcome, and the war ended without Hezbollah's defeat.



Current Situation

Continued Hostilities

Tensions between Israel and Hezbollah have persisted, and recent escalations following the October 7, 2023, Hamas attacks have once again led to clashes. As of now, Israel is preparing for a potential ground invasion of southern Lebanon, as Prime Minister Benjamin Netanyahu vows to continue striking Hezbollah targets.

Legacy of the Conflict

Influence on Regional Dynamics

Hezbollah's successful resistance against Israel has cemented its role as a dominant political and military force in Lebanon. It has also inspired other militant groups in the region, becoming a key player in Iran's

broader strategy in the Middle East.

Israeli Military Strategy

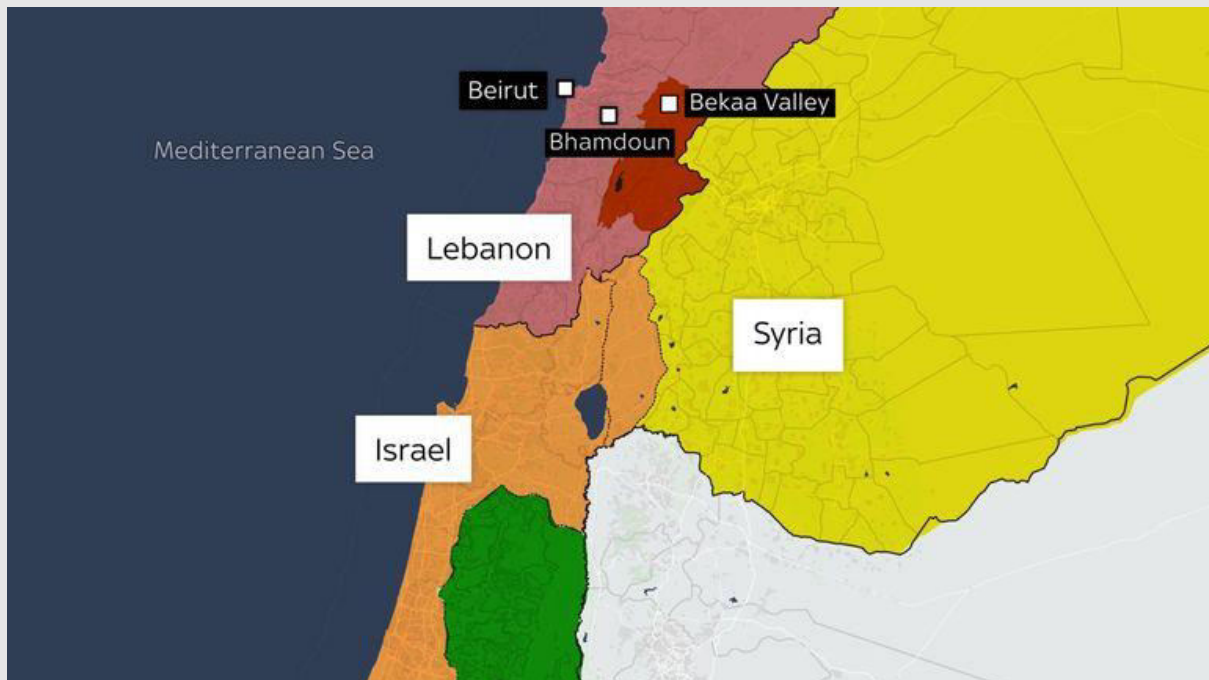
Israel's experience with Hezbollah has shaped its military tactics, leading to a preference for airstrikes and short incursions rather than prolonged ground occupations. However, the current situation may signal a shift in this strategy.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

2. After Nasrallah's assassination: Key points from Israel's attack on Hezbollah's leader

1. Nasrallah's Assassination: Hasan Nasrallah, Hezbollah's leader for over 30 years, was killed in an Israeli airstrike in Beirut. This is seen as a major victory for Israel, comparable to the killing of Osama bin Laden.



Recent days have seen Israel launch strikes in Lebanon in Beirut, the Bekaa Valley, and Bhamdoun

Recent days have seen Israel launch strikes in Beirut, the Bekaa Valley, and Bhamdoun

2. Impact on Hezbollah: Nasrallah's death weakens Hezbollah significantly, especially after Israel already targeted many of its senior leaders, damaging its command and control structures.

3. Iran's Role: Hezbollah, Iran's strongest proxy in the region, has been hit hard. Its future depends largely on Iran's next steps and how it supports the group moving forward.

4. Lebanon's Situation: Hezbollah's influence in Lebanon may weaken as the group faces internal challenges, including declining support from the Lebanese public.

5. Regional Dynamics: Nasrallah's killing could either escalate the conflict or lead to a reduction in tensions, depending on Iran's response. Saudi Arabia, UAE, and Qatar are monitoring the situation closely.

6. India's Concerns: India wants stability in the region to ensure the safety of its citizens and secure energy supplies, as two-thirds of its energy needs come from West Asia.

7. Uncertain Future: The conflict could continue depending on Iran's actions and the status of ongoing issues, like the release of hostages held by Hamas.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

3. Why Chagos Islands matter, why UK keeps Diego Garcia base

Introduction

The UK recently said it would cede sovereignty of the strategically important Chagos Islands to Mauritius.

British Foreign Minister David Lammy said the deal settled the contested sovereignty of Britain's last overseas territory in Africa, while securing the long-term future of the Diego Garcia military base, jointly operated by the UK and the US.

The archipelago



The Chagos archipelago, comprising 58 islands, lies roughly 500 km to the south of the Maldives archipelago in the Indian Ocean. These islands were uninhabited until the late 18th century, when the French brought in slave labour from Africa and India to work in newly-established coconut plantations. In 1814, France ceded the islands to the British.

In 1965, the UK constituted the British Indian Ocean Territory (BIOT), of which the Chagos Islands were a central part. Chagos was attached to Mauritius, another British colony in the Indian Ocean, for administrative purposes.

When Mauritius gained independence in 1968, Chagos remained with Britain. The UK government gave the newly-independent country a grant of 3 million pounds over the "detachment"

of the Chagos archipelago.

Strategic military base

Behind Britain retaining sovereignty over the Chagos Islands was its strategic location. In 1966, Britain signed an agreement with the US which made the BIOT available for the two countries' defence needs. Land was acquired in 1967, and four years later, the plantation on Diego Garcia — the largest in the archipelago — was shut down.

The BIOT administration then enacted an Immigration Ordinance, which made it unlawful for a person to enter or remain in Diego Garcia without a permit, and enabled the removal of

those who remained on the island. Around 2,000 civilians were subsequently kicked out — an issue that has been central to the dispute between the UK and Mauritius.

Diego Garcia became a fully operational military base in 1986. According to an article in the Foreign Policy magazine, “Thanks to its vital location, the island houses a military base that served as a critical node for American air operations during the Gulf War and the wars in Iraq and Afghanistan. Post-9/11, it has also been allegedly used as a detention centre by the [US intelligence agency] CIA.”

Given the ongoing tensions in West Asia, maintaining a presence in the Indian Ocean remains critical for US interests. Diego Garcia also gives the Americans an outpost to monitor the Malacca Strait, a chokepoint for world trade that is especially vital to China.

Treaty’s significance

Mauritius has long claimed that the UK illegally occupies Chagos, and has raised the matter many times in international fora.

In 2017, the UN General Assembly voted to ask the International Court of Justice to examine the legal status of the Chagos archipelago. Two years later, the UNGA adopted a resolution welcoming an ICJ advisory opinion, demanding that the United Kingdom “unconditionally withdraw its colonial administration from the area within six months”.

Then ICJ President Abdulqawi Ahmed Yusuf had said the detachment of the Chagos archipelago in 1965 from Mauritius was not based on a “free and genuine expression of the people concerned”.

The agreement between the UK and Mauritius strikes a balance. The UK has ceded claims over the islands, and Mauritius is now “free to implement a programme of resettlement on the islands of the Chagos Archipelago, other than Diego Garcia”. The UK has also promised to create a new trust fund “for the benefit of Chagossians”.

However, the agreement allows the Diego Garcia base to remain operational for an “initial period” of 99 years. The UK will continue to exercise sovereign rights over the island.

The resolution of the dispute has broader implications. As the Foreign Policy article noted: “If left unresolved... the issue could drive countries such as Mauritius to seek redress with alternative partners like China.”

As a nation formerly colonised by Britain, India has maintained steadfast support to Mauritius’ claims over the Chagos Islands. It voted in favour of the island country at the UNGA in 2019. In recent years, India has attempted to deepen its ties with Mauritius amidst China’s ever increasing assertiveness in the Indian Ocean. Earlier this year, an India-built airstrip and a jetty was inaugurated at Agaléga, a two-island dependency of Mauritius in the Western Indian Ocean.

4. Cabinet approves India to Join International Energy Efficiency Hub

Background

The Union Cabinet has approved the signing of 'Letter of Intent' thus enabling India to join the 'Energy Efficiency Hub'.

India will join the International Energy Efficiency Hub (Hub), a global platform dedicated to fostering collaboration and promoting energy efficiency worldwide. This move solidifies India's commitment to sustainable development and aligns with its efforts to reduce greenhouse gas emissions.



Bharat joins the Energy Efficiency Hub under IEA

- ✓ Bharat will join the "Energy Efficiency Hub" (under International Energy Agency)
- ✓ Existing members include: United States, United Kingdom, China, France, Germany, Japan, Korea, Russia, Saudi Arabia
- ✓ Objectives of the Energy efficiency Hub:
 - Foster collaboration and enhance global energy efficiency efforts.
 - Facilitate knowledge sharing between countries, international organisations and private sector.
 - Increase visibility of energy efficiency issues on the global stage.
- ✓ Bureau of Energy Efficiency will be the implementing agency for the Hub

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International Partnership for Energy Efficiency Cooperation

Established in 2020 as the successor to the International Partnership for Energy Efficiency Cooperation (IPEEC), in which India was a member, the Hub brings together governments, international organizations, and private sector entities to share knowledge, best practices, and innovative solutions. By joining the Hub, India will gain access to a vast network of experts and resources, enabling it to enhance its domestic energy efficiency initiatives. As of July, 2024, sixteen countries (Argentina, Australia, Brazil, Canada, China, Denmark, European Commission, France, Germany, Japan, Korea, Luxembourg, Russia, Saudi Arabia, United States and United Kingdom) have joined the Hub.

India's membership

As a member of the Hub, India will benefit from opportunities for collaboration with other member states, sharing its own expertise and learning from international best practices. The country will also contribute to global efforts to address climate change by promoting energy-efficient technologies and practices.

Bureau of Energy Efficiency (BEE), the statutory agency, has been designated as the implementing agency for the Hub on behalf of India. BEE will play a crucial role in facilitating India's participation in the Hub's activities and ensuring that India's contributions align with its national energy efficiency goals.

By joining the Hub, India is taking a significant step towards more sustainable future. The country's participation in this global platform will help to accelerate the transition to a low-carbon economy and improve energy security.

Relevance: GS Prelims; International Organisations

Source: PIB

5. Why has Israel invaded Lebanon — and what to make of the war so far

Introduction

Early on October 1, the Israel Defense Forces (IDF) launched "limited, localized, targeted ground raids" against Hezbollah infrastructure in South Lebanon. Many of the personnel involved in the raid were incrementally re-deployed from Gaza to the Israel-Lebanon border over this year.

Since then, Israel has expanded its operation, repeatedly bombing the capital Beirut, and targeting a possible successor to Hassan Nasrallah, the leader of Hezbollah who was killed last week. Lebanon's Health Ministry said on Saturday morning that more than 2,000 people have died in Israeli attacks across the country.

Hours after the IDF began its offensive, Iran fired a barrage of ballistic missiles at Israel. As Israel considers its response to Iran, the Lebanon gambit is crucial for its strategic interests.

Why did Israel choose to invade now?

For Israel, there has never been a larger geopolitical window to press against Hezbollah, the Iran-backed Shia military and political group, than now. Through Israel's year-long war in Gaza, the United States has provided steady tailwinds in the form of sustained arms supplies, despite some political dithering. In the region, Israel's new Arab partners have restricted themselves to rhetorical criticism and diplomatic efforts for a ceasefire. This did not change as Israel expanded its target profile across states, with the Arab nations offering no punitive threats, whether economic or political.



With Iran's new moderate government focused on economic recovery and sanctions relief by engaging the West, Israel's first major gambit was to kill Ismail Haniyeh, the political leader of Hamas, in the heart of Tehran. The harsh punishment that Supreme Leader Ayatollah Ali Khamenei promised in response never came, with Iran choosing "strategic patience" instead. To Israel, it confirmed that a window for escalation indeed exists, as it expanded air strikes to eliminate top leaders of the so-called "axis of resistance" — Iranian overseas proxies Hezbollah, Hamas, and the Houthis — leading to Nasrallah's assassination. This hunt has not stopped, as the IDF's air strikes on Beirut show.

Hezbollah has long been the biggest and most proximate manifestation of the Iranian threat,

located in the north at Israel's jugular. Israel's long-time objective has been to push Hezbollah to the north of the Litani river in Lebanon, where the UN Security Council's Resolution 1701 mandates it to be. Defence Minister Yoav Gallant had underlined this objective as early as on December 6, 2023 — and having destroyed Hezbollah's senior leadership, the IDF now looks to decimate its rank and file.

Where does Hezbollah stand in the current situation?

While Israel holds the geopolitical and military advantage, Hezbollah too has evolved significantly since its last war with Israel in 2006. The group has gained crucial combat experience in Syria and Iraq over the past decade, fighting an array of rebel and jihadist forces. Fighting alongside the Russians and Syrian government forces, Hezbollah was credibly viewed as the most effective fighting force in Syria, exhibiting strong discipline and training. It has stockpiled a very large arsenal of rockets and missiles, and the IDF estimates it has 25,000 active fighters, with tens of thousands in reserve.

Hezbollah is also the only force that has effectively forced an Israeli withdrawal from any Arab territory in this century, by fighting the IDF to a stalemate in 2006, and bogging down Israeli military units in urban guerrilla warfare. That Hezbollah retains its battlefield effectiveness despite the loss of senior command was evident when the IDF lost eight soldiers on October 2, its biggest single-day setback since the two sides began exchanging fire a year ago.

What does each side — Israel and Hezbollah — aim to achieve in this war?

Each side sees 'victory' differently.

Israel's casus belli is the "return of (displaced) citizens of Northern Israel to their homes". The military necessities to service this are vague enough for Israel to withdraw whenever it

determines Hezbollah to have been degraded enough in South Lebanon. However, the IDF's widening evacuation calls signal an intent to exploit the window for escalation toward the "decisive victory" it has long sought (as David Daoud, a Senior Fellow on Israel, Hezbollah, and Lebanon at the Foundation for Defense of Democracies, noted in 2016).

For Hezbollah, the threshold for 'victory' is far lower — it is merely survival. As Nasrallah once asserted, "as long as there is one fighter who fires...the resistance (muqawamah) still exists". If Israel looks to push further north into Lebanon to exploit its window of opportunity, the likelihood of a protracted war of attrition will increase. Also, "decisively" eliminating Hezbollah is a far more difficult proposition than doing the same with Hamas in Gaza (where Israel's military objectives are being increasingly questioned).

Hezbollah has integrated itself within Lebanese society and government, outpacing the state's ability to deliver public goods, even though its image has been dented by economic mismanagement and the Beirut port explosion of 2020. With both the UN Interim Force in Lebanon (which includes a 900-strong Indian battalion) and the Lebanese government harshly criticising the Israeli invasion, the IDF also risks providing Hezbollah a fresh plank to consolidate domestic support. The provenance of its popularity was precisely this — to eject Israeli troops from Lebanon.

As the death toll in Lebanon balloons (it is officially 41,000-plus in Gaza), the IDF campaign faces new costs. Thus far, as Hamas sporadically retaliated in Gaza, the cost for Israel was defined in indirect, geopolitical terms — that is, the degree to which Arab states and other allies would tolerate the destruction.

In Lebanon, however, the cost is defined in direct, military terms. Perhaps most significantly, the Lebanese Army has now actively joined the war, fighting the IDF directly — the first military force-on-force engagement in the region in years.

A new phase of the war in the Middle East is playing out in Lebanon, again.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

6. What's behind Israel's ban on the UN chief?

Background

On October 2, Israeli Foreign Minister Israel Katz announced that Israel had banned United Nations Secretary-General (UNSG) António Guterres from entering the country, accusing him of "backing" Hamas, Hezbollah, the Houthis, and Iran.



Why did Israel ban the UN chief?

According to Mr. Katz, the decision to declare Mr. Guterres “PNG” (persona non grata) was taken because he hadn’t “unequivocally condemned” Iran’s missile strikes on Israel earlier in the week, and thus the UNSG does not “deserve to set foot on Israeli soil”. Mr. Katz also claimed that the UNSG had not denounced the terror attack by Hamas on October 7 last year, which left about 1,200 Israelis dead, and 250 taken hostage. The UNSG and UN bodies have, in fact, condemned the attack a number of times. In a statement in April, Mr. Guterres had condemned the use of “sexual violence, torture and kidnapping of civilians”, calling the “horror unleashed by Hamas” unjustifiable. In the context of the latest escalation, which included Israel’s strikes on Lebanon that killed hundreds and took out the top leadership of Hezbollah, as well as Iran’s launch of 200 missiles targeting Israeli bases, Mr. Guterres named neither country, saying in a statement that he “condemned” the broadening of the West Asia conflict, calling for a ceasefire. A day after the Israeli ban was announced, the UNSG issued a clarification, saying that he “strongly condemned” the “massive missile attack by Iran on Israel.” However, Israel has not withdrawn the ban.

Is there a history to Israel-UN tensions?

The ban on Mr. Guterres is part of a larger Israeli argument against the UN, which it claims is run by the “anti-Israel” bloc of Arab and Islamic countries and affiliated organisations like UNRWA that it alleges are involved with Hamas. At the UN General Assembly last week, angry at a number of UN resolutions backed by a big majority of countries that called for a ceasefire and criticised Israel, Israeli Prime Minister Benjamin Netanyahu called the UN an “anti-Semitic swamp”. Israel has in the past banned UN Special Rapporteurs and other senior officials accusing them of “bias” against Israel and in favour of the Palestinian side. Last year, outraged at Mr. Guterres’ remarks to the UNSC that the October 7 attacks had not occurred “in a vacuum” and that they followed “56 years of suffocating occupation” of Palestinian areas, Israel

banned then-UN Under-Secretary General Martin Griffiths. Alongside his comments on Hamas, Mr. Guterres has also been consistently critical of Israeli bombardment of Gaza. More than 40,000 Palestinians have been killed thus far, including 15,000 minors, and a record number of 135 UN personnel working with Palestinian refugees, which the UNSG called a "moral stain", referring to Gaza as a "graveyard for children."

Has such a ban happened before?

According to former Indian Permanent Representative to the UN, Asoke Mukerji, the ban on the UNSG is "unprecedented", recalling that the closest a country came to such an action was in 1950, when the then-USSR accused UNSG Trygve Lie of bias on the Korean crisis and threatened to veto his re-election. Citing the UN charter (Article 100, para 2), which says "each Member of the United Nations undertakes to respect the exclusively international character of the responsibilities of the Secretary-General and the staff and not to seek to influence him in the discharge of their responsibilities," Mr. Mukerji told The Hindu, "we all need the Secretary-General for substantive and logistical reasons." In 1987, the U.S. had banned Kurt Waldheim who had earlier been UNSG (1972-1981) and Austrian President (1986-1992), when it emerged that he had been complicit in Nazi war crimes during his time in the Austrian Army in the Second World War.

How has the world reacted to Israel's ban?

A day after the ban was announced, the UN Security Council issued a statement, which is only possible with the concurrence of all P-5 members, that said "any decision not to engage with the UN Secretary-General or the United Nations is counterproductive, especially in the context of escalating tensions in the Middle East." The U.S. State Department called it "not productive to improving [Israel's] standing in the world." Even the Ministry of External Affairs, that has taken care not to be over-critical of Israel, was dismissive. "Mr. Guterres is the UNSG for us. What somebody else says about it, what third person says is not our area of outlook or a matter to comment on," said spokesperson Randhir Jaiswal on Friday.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: The Hindu

7. Bilateral Investment Treaty between India and the United Arab Emirates, giving continuity of investment protection to investors of both the countries, comes into effect

Introduction

The Bilateral Investment Treaty (BIT) signed on 13th February, 2024 at Abu Dhabi, UAE between the Government of the Republic of India and the Government of the United Arab Emirates (UAE), entered into force with effect from 31st August, 2024. The enforcement of this new BIT with UAE gives continuity of investment protection to investors of both the countries, as the earlier Bilateral Investment Promotion and Protection Agreement (BIPPA) between India and UAE signed in December 2013 expired on 12th September, 2024.



Bilateral Investment

UAE is the seventh largest with a share of 3% in the total Foreign Direct Investment (FDI) received in India, with cumulative investment of approximately \$19 Billion from April 2000-June 2024. India also makes 5% of its total Overseas Direct Investments in UAE to the tune of \$15.26 Billion from April 2000 - August 2024. India – UAE BIT 2024 is expected to increase the comfort level and boost the confidence of the investors by assuring minimum standard of treatment and non-discrimination while providing for an independent forum for dispute settlement by arbitration. However, while providing investor and investment protection, balance has been maintained with regard to State's right to regulate and thereby provides adequate policy space.

Purpose of BIT

The signing and enforcement of the BIT reflects both nations' shared commitment towards enhancing economic cooperation and creating a more robust and resilient investment environment. The Treaty is expected to pave the way for increased bilateral investments, benefiting businesses and economies in both countries.

Some of the key features of the India-UAE BIT 2024 are: -

1. Closed asset-based definition of Investment with coverage of Portfolio Investment
2. Treatment of Investment with obligation for no denial of justice, no fundamental breach of due process, no targeted discrimination and no manifestly abusive or arbitrary treatment
3. Scope carve out for measures such as those related to taxation, local government, government procurement, subsidies or grants and Compulsory license.
4. Investor-State Dispute Settlement (ISDS) through arbitration with mandatory exhaustion of Local remedies for 3 years
5. General and Security Exceptions

6. Right to Regulate for State
7. No investor claim in case investments is involved with corruption, fraud, round tripping etc.
8. Provision on National Treatment,
9. Treaty provides for protection to investments from Expropriation, provides for Transparency, Transfers and Compensation for losses.

Relevance: GS Prelims & Mains Paper II; International Relations

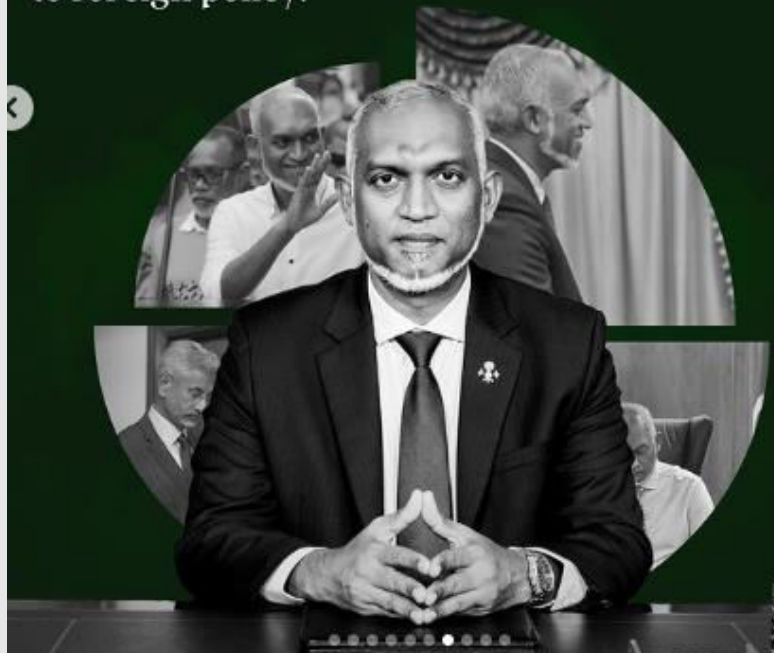
Source: PIB

8. Muizzu in New Delhi: Significance of Maldives President visit, after a loud 'India Out' campaign

Introduction

While India's ties with Maldives seemed under unprecedented strain just months ago, the country's President, Dr Mohamed Muizzu, is now here on a state visit.

Thus, despite President Muizzu's initial preference for China, his visit to India at such a crucial juncture indicates a clear acknowledgement of the need for India's continued backing in rebuilding the nation and the President's strong belief in India's human-centric approach to foreign policy.



Muizzu assumed office in November last year. His election campaign had centered on the 'India Out' movement, and soon after coming to power, he had insisted India's troops leave the island.

Why Muizzu's visit to India is important

India and Maldives have traditionally enjoyed strong bilateral ties, and India is a major aid provider to the island nation.

Muizzu, however, was perceived as being closer to China and less warm towards India. Weeks after he assumed office, Muizzu traveled on official visits to Turkey and China. His visit to China was considered an intentional diplomatic snub to New Delhi, because traditionally, Muizzu's predecessors had made their

first official visits to India, in a nod to New Delhi's importance in bilateral relations.

It did not help that days before Muizzu's visit to China, a few deputy ministers used social media to call Prime Minister Narendra Modi derogatory names, and mocked his social media posts promoting tourism in Lakshadweep islands. That set off a larger battle on social media between Maldivians and Indians, to the extent that it required intervention on a diplomatic level.

The row between the two countries only increased when Muizzu indirectly took a jibe at India, saying no one had "the licence to bully" the small country. He also set a March 15 deadline for India to withdraw its military personnel from the country.

Indian soldiers had been sent to the Maldives at various points for training Maldivian troops, in combat, reconnaissance, and rescue-aid operations. But there was a strong fear among sections in the Maldives about Indian soldiers spreading across the island, which also played out as part of the 'India Out' campaign.

Earlier this year, India removed its 80-odd soldiers from the country. Since then, Muizzu has softened his approach on the subject, and has said he disapproved of the presence of foreign military in the Maldives regardless of the country.

Good relations with Maldives are strategically important for India, and Muizzu's apparent preference for China could have been a worry for New Delhi.

Context to Muizzu's changed approach

Muizzu's changed approach to bilateral relations should not come as a surprise. Experts say during the Maldives presidential elections that rhetoric politicians employ during electoral campaigns don't always translate to official policy decisions.

Domestic priorities and pressing socio-economic concerns mean that Muizzu would not want to alienate India. He had earlier said that "Maldives would never do anything that undermines the security of India. India is a valued partner and friend of the Maldives, and our relationship is built on mutual respect and shared interests. While we enhance our cooperation with other countries in various sectors, we remain committed to ensuring that our actions don't compromise the security and stability of our region".

For now, Muizzu is staring at a looming economic crisis and an imminent debt repayment on his hands. Just before his visit to India, Muizzu flagged the need for financial aid to his country, saying Delhi is "fully cognisant" of the island nation's fiscal situation and will always be ready to "ease the burden" as one of Male's biggest development partners. Analysts believe that Muizzu is expected to request a currency swap arrangement and debt support during bilateral talks at India's Hyderabad House in New Delhi.

Last month, global agency Moody's downgraded Maldives' credit rating, saying that "default risks have risen materially". Maldives is looking at a debt default as its foreign exchange

reserves have dropped to \$440 million, an amount that is just enough for one-and-a-half months of imports. India has already offered financial support worth \$1.4 billion to the Maldives for various infrastructure and development projects.

In January, following the spat between Indians and Maldivians on social media, there was a call for a boycott of tourism to the Maldives. During this State visit, Muizzu said he hoped to welcome more Indian tourists to the island. According to Maldivian news publication Ashadha, the numbers of Indian tourists visiting the Maldives has dropped by 50,000, resulting in a loss of some \$150 million. Indians have consistently been among the top-five nationalities to contribute to the Maldives' tourism industry.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

9. Elon Musk-owned X to resume ops in Brazil: why did Brazil Supreme Court order shutdown?

Introduction

A protest of a Brazilian Supreme Court decision that banned the social network X from operating in the country, in São Paulo, Sept. 7, 2024. Brazil's Supreme Court said that Elon Musk's social network could return in the country after a monthlong ban because the company had complied with the court's orders.

Brazil's Supreme Court Orders X to Pay Fines for Service Resumption



Brazil's Supreme Court recently revoked a ban on X (formerly Twitter) after the Elon Musk-owned company agreed to comply with its order. This comes over a month after X services were suspended in Brazil following the apex court's order on August 30.

Justice Alexandre de Moraes, in his order, authorised the "immediate return" of X to the country after the site paid fines totalling 28 million reais (\$5.1m) and agreed to appoint a local representative, as required by Brazilian law. This development follows a months-long feud between Musk and Moraes.

Musk's beef with the judge

The order to ban X in Brazil came after a 24-hour deadline imposed by the Supreme Court on X to name a representative in Brazil passed on August 29. This came weeks after X claimed Justice Alexandre de Moraes had threatened its former legal representative with arrest if the platform did not comply with orders to block some accounts. The representative later resigned.

Earlier this year, Justice Moraes ordered X to block accounts allegedly spreading disinformation. This has been a longstanding concern in Brazil.

However, on April 7, X's Global Government Affairs complained of being forced to block "certain popular accounts in Brazil" for unknown reasons, and Musk called for the impeachment of Justice Moraes. He has since targeted the judge repeatedly, and called him "the dictator of Brazil".

On August 30, the GGA account said it "would not comply with his (Justice Moraes') illegal orders to censor his political opponents...we will publish all of Judge de Moraes' illegal demands and all related court filings in the interest of transparency".

Musk has claimed to be a "free speech absolutist", saying governments instructing the blocking of accounts infringes on people's free speech rights. But X has complied with some government requests earlier, like in the case of India. Musk was also accused of hypocrisy and silencing his critics when the X accounts of several journalists were suspended in January.

Justice Alexandre de Moraes said on April 7 that Musk was waging a "disinformation campaign". He referenced Musk's actions in his order, saying, "The flagrant conduct of obstruction of Brazilian justice, incitement of crime, the public threat of disobedience of court orders and future lack of cooperation from the platform are facts that disrespect the sovereignty of Brazil."

Who is Justice Alexandre de Moraes?

Justice Moraes oversaw the case against former right-wing Brazilian President Jair Bolsonaro (2019-2022), over the January 8, 2023 riots in Brasilia. Bolsonaro's supporters entered and attacked government buildings, a week after socialist President Luiz Inacio Lula da Silva was sworn in after winning the 2022 elections. Musk has been a great supporter of Bolsonaro, who called him a "true legend of freedom".

Many right-wing Brazilians see de Moraes as a biased judge. In 2022, he ordered a temporary ban on the messaging app Telegram for not complying with an investigation into neo-Nazi chat groups. However, a federal court later lifted the restriction, saying a ban was "not reasonable" for the freedom of communication for other users.

The judge's recent orders have come under wider scrutiny. For instance, he set a daily fine of 50,000 reais (\$8,900) for people or companies using virtual private networks or VPNs to access X. According to The New York Times, Justice de Moraes also imposed a fine of \$3 million on Musk and froze the assets of Starlink, Musk's satellite internet service. In defiance, Musk told Brazil's telecom agency that Starlink would not block access to X.

The ban on X followed the French government's arrest of Telegram CEO Pavel Durov, over crimes like child pornography on the app. Telegram said it was "absurd" to hold Durov responsible, bringing forth the tensions between governments and tech giants over regulations on speech.

President da Silva's government has supported the judge. Solicitor General Jorge Messias earlier said in a post on X, "We cannot live in a society in which billionaires domiciled abroad have control of social networks and put themselves in a position to violate the rule of law, failing to comply with court orders and threatening our authorities."

Relevance: GS Prelims & Mains Paper II; International Issues

Source: Indian Express

10. India's Absence from Letter Supporting UN Secretary-General

Introduction

India was notably absent from a letter signed by 104 countries, including many from Europe, Africa, and the Global South. The letter condemned Israel for banning United Nations Secretary-General António Guterres from entering Israeli territory. The ban came after Israeli officials criticized Guterres for not strongly condemning Iranian missile strikes on Israel.

India's Consistent Position on Israel

India has abstained from several UN resolutions that are critical of Israel in recent years. However, not signing this letter is seen as more significant because it was viewed as a defense of the UN Secretary-General and the United Nations as a whole, rather than supporting one side of the Israeli-Palestinian conflict.

International Response

Most countries from South Asia, West Asia, South America, and Africa signed the letter. The signatories expressed "deep concern and condemnation" of Israel's decision to declare Guterres persona non grata (PNG). The letter emphasized that such actions undermine the UN's ability to mediate conflicts and provide humanitarian aid.

Israel's Stance

Israel issued the PNG order against Guterres on October 2. Israeli Foreign Minister Israel Katz said that Guterres did not deserve to visit Israel because he failed to strongly condemn Iranian missile strikes on Israel. Although Guterres had commented on the strikes before and after the ban, Israel accused him of not being firm enough in his criticism.

No Official Comment from India

India's Ministry of External Affairs (MEA) has not provided a reason for why the country chose not to sign the letter, maintaining its silence on the issue.

Relevance: GS Prelims & Mains Paper II; International Issues

Source: The Hindu

11. All about ASEAN and East Asia Summits, to be attended by PM Modi

Introduction

Prime Minister Narendra attended the Association of Southeast Asian Nations (ASEAN) in Vientiane, the capital of Lao PDR, as part of this two-day visit to the country.

In a statement, the PM said, "This year we are marking a decade of our Act East Policy. I will join the ASEAN leaders to review progress in our Comprehensive Strategic Partnership and chart the future direction of our cooperation."



PM Modi also attended the East Asia Summit, adding it will "provide an opportunity to deliberate on the challenges to peace, stability and prosperity in the Indo-Pacific region."

The ASEAN grouping is one of the more successful examples of multinational organisations globally, with the 10 neighbouring countries leveraging their cultural and historical links for

successful economic and political ties. Why is it a significant aspect of India's foreign policy in the region, especially in the backdrop of China's recent assertions here?

First, what is ASEAN?

On August 8, 1967, five Southeast Asian leaders – the Foreign Ministers of Indonesia, Malaysia, the Philippines, Singapore and Thailand – came together in Bangkok. Thailand was brokering some disputes among Malaysia, Indonesia and the Philippines, and the event eventually led to the signing of a document.

"The five Foreign Ministers who signed it – Adam Malik of Indonesia, Narciso R. Ramos of the Philippines, Tun Abdul Razak of Malaysia, S. Rajaratnam of Singapore, and Thanat Khoman of Thailand – would subsequently be hailed as the Founding Fathers of probably the most successful inter-governmental organisation in the developing world today. And the document that they signed would be known as the ASEAN Declaration," the ASEAN website states.

The ASEAN Declaration conveyed the aspiration to further regional cooperation in economic, social, cultural, technical, educational and other fields. Promoting regional peace and stability was another major goal. It stipulated that the Association would be open for participation by all States in the Southeast Asian region subscribing to its aims, principles and purposes.

Over the next few decades, five others joined – Brunei Darussalam, Lao PDR, Cambodia, Myanmar and Vietnam. The 10-nation grouping has an anthem, a flag and biannual summits (twice a year) with a rotating chairmanship. An example of the focus on unity, its official motto is "One Vision, One Identity, One Community". Its major pillars are Political-Security Community (APSC), Economic Community (AEC) and Socio-Cultural Community (ASCC).

What is India's link with ASEAN?

ASEAN is central to India's 'Act East' policy, which focuses on the extended neighbourhood in the Asia-Pacific region. It was formulated as the next step to the 'Look East' Policy which originated in the 1990s.

In a world without the USSR, which India had close historical ties with, India sought to deepen its relations with other countries, like those in Southeast Asia. Northeast Indian states, due to their proximity to Southeast Asia, were to be instrumental in this.

The policy was originally conceived as an economic initiative, with many Southeast Asian countries having seen rapid economic growth in the last few decades. For instance, Brunei, which PM Modi visited earlier this year, is one of the largest oil and gas producers in the region. The India-ASEAN relationship subsequently gained political, strategic and cultural dimensions, including the establishment of institutional mechanisms for dialogue and cooperation. India is part of the ASEAN Plus Six grouping, which includes China, Japan, South Korea, New Zealand and Australia.

In 2010, a Free Trade Agreement was also signed and entered into force between India and ASEAN. While India was part of negotiations to join the Regional Comprehensive Economic

Partnership (RCEP) in 2020, it ultimately decided not to do so. In recent years, trade has grown in terms of value, barring the pandemic years of 2020 and 2021.

And what is the East Asia Summit?

The East Asia Summit (EAS) process was initiated in 2005 with 16 participating countries, namely the ASEAN Member States, Australia, China, India, Japan, New Zealand, and the Republic of Korea. The United States and the Russian Federation joined later on.

It refers to the Meeting of Heads of State/Governments of these countries and is convened annually.

What is ASEAN's significance with the rise of China?

Speaking at the 20th ASEAN-India summit in Jakarta, Indonesia's capital, the Prime Minister said in 2023 that ASEAN was the "central pillar" of India's Act East Policy and India fully supported the group's centrality and outlook on the Indo-Pacific.

India's emphasis on the region's geopolitics matters in the context of China's ascendancy in world affairs in recent years. Under President Xi Jinping, it has also taken a more authoritarian turn. China's economic stature gives it heft, allowing it to fund several infrastructure projects and provide loans to other countries. These projects have been viewed with some suspicion for leading to "debt traps", where a failure to repay the loans leads to Chinese control over strategic national assets.

Further, cooperation has also been affected by China's claims over the South China Sea (many of which compete with claims of ASEAN members like the Philippines and Brunei) and the issue of military conflict in its member country, Myanmar.

ASEAN has attempted to remain separate from the larger geopolitical rivalry in the Indo-Pacific at times. After the 2023 summit, India's Former Ambassador to ASEAN, Ambassador Gurjit Singh, wrote "China remains the major challenge for ASEAN, in particular, with regard to big-power rivalry in the region. Its (ASEAN's) call for peace and prosperity is a muted way of saying that the US and China will not exhibit their rivalry in the region."

In this context, India has attempted to provide an alternative and deepen its relationship. PM Modi also said in a statement, "We share close cultural and civilisational ties with the region, including with Lao PDR, which are enriched by shared heritage of Buddhism and Ramayana. I look forward to my meetings with the Lao PDR leadership to further strengthen our bilateral ties. I am confident that this visit will further deepen our engagement with ASEAN countries."

Relevance: GS Prelims & Mains Paper II; International Organisations

Source: Indian Express

12. Han Kang Wins 2024 Nobel Prize in Literature

Introduction

South Korean author Han Kang won the 2024 Nobel Prize in literature, marking a significant achievement for Korean literature on the global stage. Though not among the favorites, her win aligns with a broader global recognition of South Korean culture. Han's international breakthrough came in 2016 when she won the Man Booker International Prize for her novel *The Vegetarian*. Since then, her literary success has continued with several prestigious European awards.

Rising Popularity of Korean Authors

Alongside Han Kang, other South Korean authors have made a strong impact internationally. For example:

- **Bora Chung:** Her collection *Cursed Bunny* was shortlisted for the 2022 International Booker Prize.
- **Kim Young-ha:** Won the Deutscher Krimi Preis in 2020 for *Diary of a Murderer*.
- **Cho Nam-joo:** Gained widespread recognition for *Kim Ji-young, Born 1982*, which has been translated into over 18 languages.

South Korean Pop Culture's Global Influence

While Korean literature is gaining recognition, South Korea's most visible cultural exports are in music, films, and TV series. The global success of Netflix's *Squid Game*, K-pop groups like BTS and Blackpink, and Bong Joon-ho's Oscar-winning *Parasite* have brought Korean pop culture to the forefront in the West.

The Spread of the Korean Wave ("Hallyu")

The term Hallyu, or "Korean Wave," was coined in the mid-1990s to describe the growing popularity of South Korean culture. It first gained traction in East and Southeast Asia before spreading globally. By 2008, South Korea's cultural exports exceeded the economic value of its imports, signaling the international demand for Korean entertainment.

A Breakthrough Moment with "Gangnam Style"

The global breakthrough for South Korean music came in 2012 with Psy's viral hit "Gangnam Style," which amassed over a billion views on YouTube. Psy's success demonstrated that language was no longer a barrier for global recognition of K-pop.

Social Media and K-pop's Rise

Social media platforms like YouTube played a crucial role in the rise of K-pop. Fans could directly engage with their favorite artists online, fostering a sense of connection and community. The polished production quality of K-pop music and videos, combined with the relatable yet fresh appeal, made it highly attractive to global audiences.

Social Commentary in South Korean Media

South Korean TV shows and films often carry deep social messages. For instance, *Squid Game* explores themes like poverty and social inequality, which resonate universally. Similarly, *Parasite* offers a critique of economic disparity, depicting the harsh realities of life in modern South Korea.



South Korean author Han Kang wins 2024 Nobel Prize in Literature

The 2024 Nobel Prize in Literature is awarded to the South Korean author Han Kang "for her intense poetic prose that confronts historical traumas and exposes the fragility of human life."

Han Kang's Exploration of Violence and Oppression

Han Kang's novels delve into the complexities of human violence and oppression. In *The Vegetarian*, the protagonist resists patriarchal oppression through an extreme transformation. Her novel *Human Acts* reflects on the brutal history of the 1980 Gwangju Uprising. Han views her writing as a form of resistance to violence, aiming to question human nature and societal injustices.

Conclusion

Han Kang's Nobel Prize win is a testament to South Korea's growing influence in global culture. Whether

through literature, music, or film, South Korean creators are leaving an indelible mark on the world.

Relevance: GS Prelims; International Organisations

Source: Indian Express

13. What are 'dragon drones', the latest weapon being used in Russia-Ukraine war?

Introduction

A deadly new weapon has taken to the skies in the Russia-Ukraine war. Both sides have posted visuals of drones appearing to rain down fire — earning this weapon the moniker of "dragon drone".

What these drones are spewing, however, is a molten metal that burns at 2,427 degrees Celsius.

What are 'dragon drones'?

Dragon drones essentially release a substance called thermite — a mixture of aluminium and iron oxide — developed a century ago to weld railroad tracks.

When ignited (usually with the help of an electrical fuse), thermite triggers a self-sustaining reaction that is quite difficult to extinguish. It can burn through almost anything, from clothes to trees to military-grade vehicles, and can even burn underwater. On humans, it causes severe, possibly fatal, burns and bone damage.



Combining thermite with high-precision drones that can bypass traditional defences makes dragon drones 'highly effective' and 'dangerous'. Dragon drones are believed to have been first deployed in the Russia-Ukraine war around September. Ukrainian forces used them to "ignite the vegetation that Russian troops use for cover and burn it out, exposing them and their equipment to direct attack." Soon, the Russians too began to produce and deploy their dragon drones.

Has thermite been used in weapons before?

Yes. Thermite was used in both world wars. During World War I, German zeppelins dropped thermite-laden bombs which were considered an innovation at the time.

By World War II, thermite-laden high incendiary explosives became a part and parcel of both the Allies and Axis forces' aerial bombing campaigns. According to some estimates, the

Allies dropped some 30 million 4-pound thermite bombs on Germany and another 10 million on Japan during World War II. Thermite hand grenades were also used during the war to disable artillery pieces, without an explosion.

In modern conflict, thermite is most often used by espionage agents, or special operations teams due to its ability to burn intensely but without a bang.

Is it legal to use thermite in weapons?

The use of thermite in war is not prohibited under international law. However, the use of such incendiary weapons against civilian targets is barred under the Convention on Certain Conventional Weapons — Cold War-era guidance issued under the auspices of the United Nations.

The problem with thermite is that it is rather indiscriminate. Therefore, while it is not banned per se, Protocol III of the Convention on Certain Conventional Weapons actually limits its use to strictly military targets, given the fact that this munition can produce severe burns and respiratory injuries."

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

14. What is THAAD, which US is sending to Israel; why this is significant

Introduction

US to send THAAD defence battery system to Israel: Even as Israel faces increasing criticism for targetting UN peacekeepers in Lebanon, the US, underlining its "ironclad commitment to

the defence of Israel”, has announced it will send its advanced missile defence system THAAD, along with troops to operate it, to the West Asian nation.

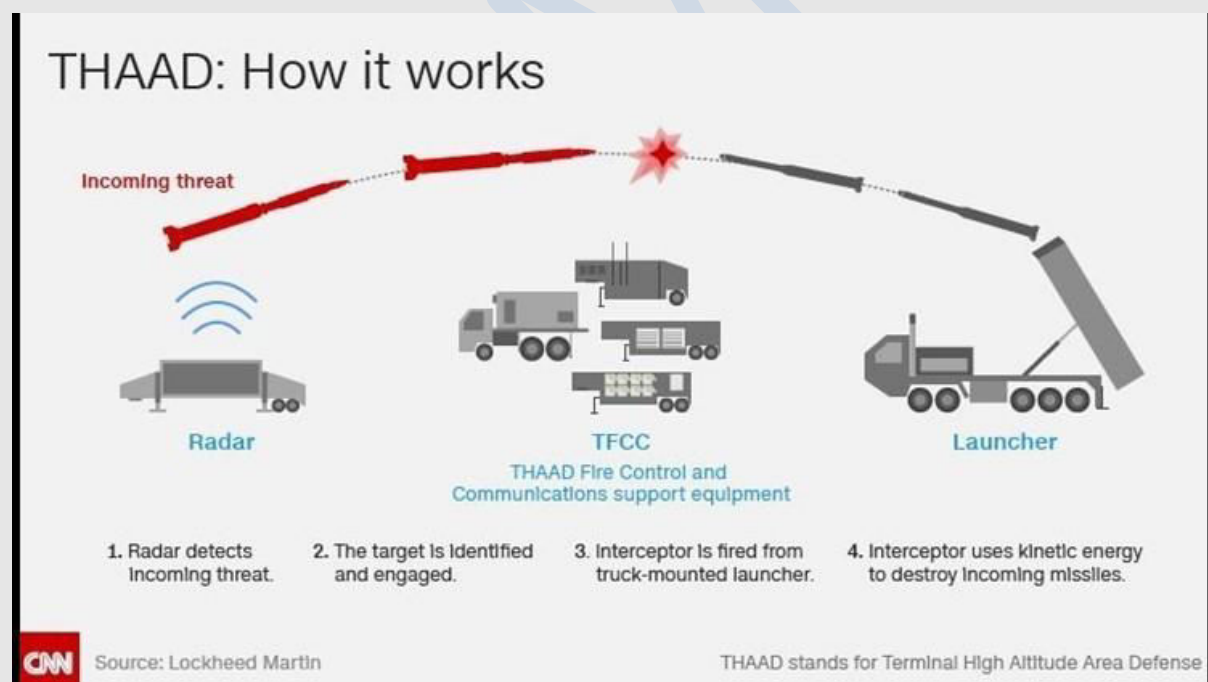
THAAD stands for Terminal High-Altitude Area Defence, and the battery is used to intercept and destroy enemy missiles.

What is THAAD?

A THAAD battery consists of 95 soldiers, six truck-mounted launchers, 48 interceptors (eight per launcher), radar surveillance and radar, and a tactical fire component, according to a paper by the US Congressional Research Service.

THAAD provides a “rapidly deployable capability against short-range (up to 1,000 km), medium-range (1,000–3,000 km), and limited intermediate-range (3,000–5,000 km) ballistic missile threats inside or outside the atmosphere during their final (terminal) phase of flight,” the paper says.

Employing “hit-to-kill” technology to destroy threat missiles, the THAAD can defend a larger area than the older Patriot Air and Missile Defense System. It has been developed by Lockheed Martin Corporation.



Why is THAAD being sent to Israel significant?

According to the US defence department press release, the latest decision is “part of the broader adjustments the US military has made in recent months, to support the defense of Israel and protect Americans from attacks by Iran and Iranian-aligned militias.”

In effect, this means that a highly advanced American defence system, along with an "associated crew of US military personnel" will be directly stationed in Israel, at a time when the situation in West Asia is already highly tense.

Israel is readying a revenge plan for the missile attack by Iran on October 1, and the US is learnt to have urged restraint. The presence of its missile defence system is likely to serve as a deterrent to Iran, and reassurance to Israel.

Iran has fired missiles on Israel twice since the Gaza war began October last year, and the US along with its allies has helped defend the Jewish nation.

The THAAD being stationed in Israel, however, is a more significant step. Notably, Ukraine has been requesting a THAAD battery for a long time to defend itself against Russia, but has been refused.

THAAD is not only very expensive to use, it requires trained US personnel to operate it. According to an article in European Security and Defence, "While the export model of PATRIOT is estimated to cost nearly USD 1 billion, THAAD's price tag for a single battery is estimated at approximately USD 2.5 billion."

Israel already has an advanced, multi-tiered air defence system, and the THAAD significantly bolsters it. Iran does have one advantage, however — it spends much less on firing missiles than Israel and the US do on intercepting them.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

15. India-Canada row over Nijjar killing: Timeline of a year of strained diplomatic relations

Introduction

The strain in the India-Canada relationship spiked dramatically on October 14 after the Canadian government said that Indian diplomats including the High Commissioner were "persons of interest" in the Hardeep Singh Nijjar murder investigation. New Delhi responded by withdrawing these diplomats, and expelling six Canadian diplomats from the country.

Subsequently, Canadian police accused the Indian government of using gangster Lawrence Bishnoi to carry out criminal operations in that country, and Prime Minister Justin Trudeau said India had "repeatedly refused" to cooperate in the investigation.

Relations between India and Canada have been under a severe strain since September last year, when Trudeau told parliament that there was evidence linking Indian agents to the assassination of Nijjar, a Sikh separatist who was shot dead in Surrey, Canada in June 2023. India rejected the allegations, calling them motivated.



This is a timeline of the main events in this extraordinary diplomatic and political situation over the last year between India and Canada.

SEPT 10: Prime Minister Narendra Modi conveyed concerns about protests by Sikh separatist in Canada to Prime Minister Trudeau on the sidelines of a G20 summit in

New Delhi. A few days earlier, Ottawa had paused discussions on the Early Progress Trade Agreement (EPTA) with New Delhi.

SEPT 18: In a statement to Canada's parliament, Trudeau accused the Indian government of involvement in the assassination of Sikh separatist Nijjar, who was shot dead outside a gurdwara in Surrey on June 18. Trudeau said Canada has reason to believe that "agents of the Indian government" carried out the killing.

SEPT 19: India dismissed Trudeau's claims as "absurd and motivated". The Ministry of External Affairs said the "unsubstantiated allegations" sought to shift focus away from "Khalistani terrorists and extremists who have been provided shelter in Canada". Hours later, Canadian envoy Cameron MacKay was summoned to South Block and informed of the government's decision to expel a senior Canadian diplomat.

SEPT 22: India suspended issuing new visas for Canadians and asked Ottawa to reduce its diplomatic presence in India, seeking diplomatic parity between the two countries.

OCT 20: Canada's Foreign Minister Melanie Joly announced that 41 Canadian diplomats and their 42 family members had been withdrawn from India since they were "in danger of having immunity stripped on an arbitrary date" and that would have "put their personal safety at risk". Canada halted its visa and consular services in Chandigarh, Mumbai, and Bengaluru.

NOV 29: The United States Department of Justice (DoJ) charged Indian national Nikhil Gupta for his involvement in a thwarted plot to murder US-based Khalistani separatist Gurpatwant Singh Pannun, at the behest of an Indian government official who was identified as "CC1".

NOV 30: The MEA instituted a "high-level enquiry committee" to look into inputs from the US government on reports of the alleged involvement of Indians in a plot to target Pannun.

2024

MAY 3: Canadian police charged three people in the Nijjar's murder case — Karan Brar (22), Kamalpreet Singh (22), and Karanpreet Singh (28).

MAY 11: A fourth Indian national was arrested by Canadian authorities in connection with the killing of Nijjar.

JUNE 15: India and Canada agreed to "work together" to deal with some "very important issues", Trudeau said after meeting Modi on the sidelines of the G-7 Outreach Summit in Italy.

JUNE 16: Indian national Nikhil Gupta, accused of being involved in murder-for-hire plot against Pannun, was extradited to the US from the Czech Republic. In the US court, he pleaded not guilty. On June 30, 2023, as Gupta travelled from India to the Czech Republic, he had been arrested by Czech law enforcement authorities at the request of the US, pursuant to the bilateral extradition treaty between the two countries.

OCT 11: Prime Minister Modi and his Canadian counterpart Trudeau had a brief exchange in Vientiane where Modi attended the ASEAN Summit and the East Asia Summit. While India said nothing substantive was discussed, Trudeau said he had a "brief exchange" with Modi, where he spoke of the "work that we need to do".

OCT 13: India received a diplomatic communication from Canada suggesting that the Indian High Commissioner Sanjay Verma and other diplomats were "persons of interest" in a matter related to an investigation in that country. Nijjar was not mentioned, but the reference was obvious.

OCT 14: India ordered the expulsion of six Canadian diplomats, and announced its decision to withdraw the Indian High Commissioner to Canada and "other targeted diplomats", citing security concerns.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

16. What does the Global Hunger Index 2024 state about India?

Introduction

The Global Hunger Index for 2024 states that a 'serious' level of hunger is prevalent in India. It ranks India 105th among 127 countries, giving it a score of 27.3. A score below 9.9 indicates low levels of hunger, 10-19.9 moderate, 20-29.9 alarming and above 30 extremely alarming.

What does it state about India?

The score is based on four broad parameters, that is, child stunting (share of children under five with lower height proportional to their age, reflecting chronic undernutrition), undernourishment (share of population with insufficient caloric intake), child wasting (share of children under five with lower weight proportional to their height) and child mortality (share of children who die before their fifth birthday). The report traced 13.7% of the population to

be undernourished, 35.5% of children as stunted, 18.7% of children wasted and 2.9% of children dying before their fifth birthday. As per the survey, India has the highest child wasting rate globally.

India ranked 105th out of 127 countries in Global Hunger Index 2024

The report notes a slight increase in the prevalence of undernourishment in India in recent years.



However, the analysis states that India has demonstrated “significant political will” to transform the food and nutrition landscape — pointing to the National Food Security Act, Poshan Abhiyan (National Nutrition Mission), PM Garib Kalyan Yojna (PMGKAY) and National Mission for Natural Farming. But the report argues there exists room for improvement. To illustrate a solution, the report points to the co-relation between the poor nutritional status of mothers being transferred onto their children. There exists an ‘intergenerational pattern of undernutrition’ where the factors driving India’s high child wasting rate entail mothers inflicted with insufficient weight gain during pregnancy and low birth weight

among infants.

What about India’s GDP growth?

The report states that the relationship between per capita GDP growth and low levels of hunger is “not always direct or guaranteed”. In other words, GDP growth alone does not result in improved food and nutritional security for the entire populace. Thus, the report puts forth the imperative for policies to emphasise pro-poor development alongside addressing social/economic inequalities.

What solutions does it propose?

Broadly, the report proposes a multifaceted approach such as improved access to social safety nets, addressing complementary factors relating to well-being and nutrition, alongside dedicated approaches to assessing and provisioning nutritional needs. The first of the proposed measures entail improved access to safety nets and cash transfers. These, the report states, involve improving access to programs such as the Public Distribution Scheme (PDS), PMGKAY and Integrated Child Development Services (ICDS). Other than this, it proposes investments in agriculture and a holistic food systems approach which promotes diversified, nutritious and ecological food production including nutri-cereals such as millets.

Other dedicated approaches include making effective investments in mother and child health. It recommends a set of factors such as improved water, sanitation and hygiene, among other things. Finally, the report also seeks interventions to consider links between food and nutrition, gender and climate change.

What is the debate about data collection methodology?

The previous year, the Ministry of Women and Child Development had expressed concerns about the data not being accessed from their ICT application ‘Poshan Tracker’. The Ministry pointed out that UNICEF, WHO and the World Bank have acknowledged the tracker as a

"game-changer". It observed child wasting being consistently below 7.2% on a month-on-month basis as compared to the 18.7% stated in the 2023 index. However, researchers have maintained that they use survey estimates that have been vetted for inclusion in the Joint Malnutrition Estimates and/or the WHO Global Database on Child Growth and Malnutrition. It argues that using the same data source ensures that the numbers are produced using comparable methodologies. "Introducing exceptions to this process for any country would compromise the comparability of the results and the ranking," it states.

Relevance: GS Prelims & Mains Paper II; International Organisations

Source: The Hindu

17. Bangladesh tribunal issues arrest warrant against Sheikh Hasina: Can she be extradited from India?

Introduction

Bangladesh's International Crimes Tribunal recently issued an arrest warrant against former Prime Minister Sheikh Hasina for her alleged involvement in "crimes against humanity" that took place during recent mass protests which led to her ouster.



In total, the ICT issued arrest warrants for 46 persons, including top Awami leaders who have since fled the country, for "committed massacres, killings and crimes against humanity in July to August". According to Bangladesh's interim health ministry, more than 1,000 people were killed in the violence this summer.

The last official whereabouts of Hasina, 77, was the Hindon airbase near New Delhi. While she was initially expected to stay in

India only for a brief while, her attempts to get asylum elsewhere have thus far failed. Now that an arrest warrant has been issued, can Dhaka seek Hasina's extradition?

Do India and Bangladesh have an extradition treaty?

Yes. India and Bangladesh signed an extradition treaty in 2013, which was then amended in 2016 to ease and hasten the exchange of fugitives between the two countries.

The treaty came into being in the context of several Indian fugitives, particularly those belonging to insurgent groups in the North East, hiding in and operating out of Bangladesh. At the same time, Bangladesh had been facing trouble from outfits such as Jamaat-ul-Mujahideen Bangladesh (JMB), whose operatives were found to be hiding in states like West Bengal and Assam in India.

The treaty allowed India to successfully extradite Anup Chetia, a top United Liberation Front of Assam (ULFA) leader, from Bangladesh to India in 2015. Since then, one more fugitive has been handed over to India by Bangladesh through the extradition route. According to sources, India too has handed over a couple of Bangladesh fugitives to its neighbour through this treaty.

What does the treaty say?

According to the treaty, India and Bangladesh are supposed to extradite individuals “who have been proceeded against... or have been charged with or have been found guilty of, or are wanted for... committing an extraditable offence” by a court of the requesting country.

An extraditable offence, the treaty says, is one which carries a minimum punishment of one year imprisonment. This includes financial offences. Crucially, for an offence to be extraditable, the principle of dual criminality must apply, meaning that the offence must be punishable in both countries.

The treaty says that extradition shall also be granted if there is an “attempt to commit or aiding, abetting, inciting or participating as an accomplice in the commission of an extraditable offence”.

Are there exceptions to these rules?

Yes. The treaty says that extradition may be refused if the offence is of “political nature”. But this is limited by the nature of offence. And the list of offences which cannot be deemed as “political” is rather long.

These include murder; manslaughter or culpable homicide; assault; causing of an explosion; the making or possession of an explosive substance or weapons by a person intending to endanger life; the use of a firearm with intent to resist or prevent arrest; damaging property with intent to endanger life; kidnapping or taking of a hostage; incitement to murder; and any other offence related to terrorism.

So, can Hasina be extradited by Bangladesh?

Hasina is a political player, and she can claim to seek political asylum in India. However, some of the offences for which she has been booked are excluded from the definition of political crimes in the treaty. This includes cases of murder, enforced disappearance, and torture.

On August 13, Hasina was booked for the murder of a grocery store owner who had died in police firing last month. The very next day, a case of enforced disappearance was filed against her on the charge of kidnapping a lawyer in 2015. On August 15, Hasina was slapped with charges of murder, torture and genocide in a third case.

Things are further complicated by the fact that a 2016 amendment to Article 10 (3) of the treaty did away with the requirement for the requesting country to provide evidence of the offence committed. Now, merely an arrest warrant by a competent court of the requesting country is needed to process an extradition.

Given a request, will India have to send Hasina back?

Not necessarily. There are grounds spelt out for refusal of extradition requests in the treaty. Article 7 of the treaty says that "the request for extradition may be refused by the Requested State if the person whose extradition is sought may be tried for the extradition offence in the courts of that State." This is not applicable in Hasina's case.

That said, Article 8 lists out multiple grounds for refusal including cases in which an accusation has not been "made in good faith in the interests of justice" or in case of military offences which are not "an offence under the general criminal law".

India has the option of refusing Hasina's extradition on the ground that the accusations made against her are not "in good faith in the interests of justice". But this has the potential to adversely impact New Delhi's relations with Dhaka's new ruling dispensation.

So, what should India do?

India has to look to build relations with whoever comes to power in Dhaka, and secure its long term strategic and economic interests in Bangladesh. At the same time, it must also be seen to be standing by Sheikh Hasina, a long time friend and ally to New Delhi.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

18. SCO Summit 2024 Pakistan attended by Jaishankar: Key takeaways

SCO Summit, S Jaishankar Pakistan Visit

The heads of government meeting of the Shanghai Cooperation Organisation (SCO) was attended by India, Pakistan, China, Russia and six other member countries October 17. External Affairs Minister S Jaishankar travelled to Islamabad for the meeting, the first such visit in nine years.



The meeting saw some cautious movement on India-Pakistan ties, while India remained the only SCO member to not endorse China's Belt and Road Initiative. Jaishankar also flagged India's concerns about China and Pakistan in veiled references.

The SCO's member countries are India, China, Pakistan, Russia, Iran,

Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Belarus.

Cricket back on table for India and Pakistan?

Jaishankar and his Pakistani counterpart Muhammad Ishaq Dar, who is also the Deputy Prime Minister, spoke twice in less than 24 hours, and there were indications that these talks explored the idea of resuming some form of cricketing ties between the two countries. Sources underlined that these conversations are preliminary, but the talks open a window and a possible first step could be the Champions Trophy being hosted by Pakistan next February.

Message to Pakistan

In his address, Jaishankar listed the key challenges that the SCO was committed to combating — terrorism, separatism and extremism.

The SCO Charter lists among its “main goals and tasks” the strengthening of “mutual trust, friendship and good neighborliness between the member States” and also “combating terrorism, separatism and extremism”.

In a reference to Pakistan, Jaishankar said, “If activities across borders are characterised by terrorism, extremism and separatism, they are hardly likely to encourage trade, energy flows, connectivity and people-to-people exchanges in parallel.”

Reference to China

In what is being seen as a reference to China and its Belt and Road Initiative (BRI), he said, “Cooperation must be based on mutual respect and sovereign equality. It should recognise territorial integrity and sovereignty. It must be built on genuine partnerships, not unilateral agendas. It cannot progress if we cherry-pick global practices, especially of trade and transit.”

The Belt and Road Initiative

China’s President Xi Jinping announced the ‘Belt’ during his visits to Kazakhstan in 2013. The ‘Belt’ plan was to revitalise a series of trading and infrastructure routes between Asia and Europe. Connectivity through Central Asia was a key element of the initiative. Subsequently, Xi announced a sea trade infrastructure called ‘Road’. This maritime ‘Road’ would connect China with Southeast Asia, Europe and Africa. The major focus has been to build ports, bridges, industry corridors and other infrastructure throughout South East Asia and the Indian Ocean. India has always opposed the BRI on grounds of territorial integrity and sovereignty, as it passes through Pakistan-occupied Kashmir. New Delhi has also highlighted that countries in which BRI projects are built risk falling into China’s debt trap.

Pakistan, meanwhile, is an enthusiastic supporter of BRI, as the China Pakistan Economic Corridor (CPEC), a key part of BRI, envisages significant infrastructure development in the country.

Sanctions, trade protectionism raised

The SCO meeting saw criticism of “unilateral sanctions” that Western nations have imposed on members like Russia and Iran.

“The heads of delegations emphasised that the unilateral application of sanctions is incompatible with the principles of international law and has a negative impact on third countries and international economic relations,” the communique said, according to Dawn.

Sanctions on Iran and China affect the capabilities of smaller, needier nations to trade with them, as they fear a backlash from the US and other western countries. Pakistan is a prime example.

China criticised the high tariffs countries like the US and Canada have imposed on its goods, though it has responded with retaliatory tariff hikes of its own.

Relevance: GS Prelims & Mains Paper II; International Organisations

Source: Indian Express

19. What the killing of Yahya Sinwar means for Hamas and the war in Gaza

Introduction

The killing of Yahya Sinwar by Israel recently might well be the most significant development in the year-long war in Gaza.

Sinwar had been de facto chief of Hamas since 2017, and its man on the ground in Gaza. He was also in-charge of Hamas's military operations, and the alleged mastermind of the October 7, 2023 terrorist attacks on Israel.



First, why was Sinwar important for Hamas?

At the time of his death, Sinwar was the most powerful figure in Hamas. After Israel eliminated other power centres such as Ismail Haniyeh, the chief of Hamas's political bureau, and military commander Mohammed Deif, "Sinwar became the sole decision maker, and grew stronger and stronger as Israel killed more and more important figures".

Despite being at the top of Israel's list of targets, Sinwar had stayed in Gaza, personally coordinating military operations, and he was ultimately killed in combat overground, not in the tunnels where the Hamas leadership has typically hidden.

Sinwar had been freed from Israeli prison in 2011 after more than 22 years of incarceration, as part of a large prisoner-swap deal. He had been serving four life sentences for allegedly massacring two Israeli soldiers and 12 Palestinian collaborators in the 1980s, and was the most high-profile Hamas figure to have been released.

In 2017, he became the political chief of Hamas in Gaza. He worked to restore ties with Egypt, which was crucial to Hamas's vast smuggling network in Gaza, and improve relations with Iran, which patronised Hamas as part of its "axis of resistance" against Israel.

So, does Sinwar's death signal the end of the road for Hamas?

Yes and no.

Given Sinwar's stature, his death leaves a massive power vacuum in Hamas. Khaled Mashal, the man billed to replace him, has a strong public profile, but does not command the loyalty that Sinwar did on the ground. Hamas is in disarray, possibly the weakest and most demoralised it has ever been, and any attempt at rebuilding will face massive challenges.

That said, Hamas is yet to be wiped "off the face of the Earth", as Israel's Prime Minister Benjamin Netanyahu has promised to do.

Does Sinwar's death mean victory for Israel?

Killing Sinwar was among the foremost objectives of Israel's campaign, and is a very significant milestone achieved, even if Hamas manages to fight on.

Sinwar's killing could potentially pave the way for a ceasefire deal, and the return of the Israeli hostages who are still alive. He was seen as the biggest obstacle to negotiations on the Hamas side — he was Israel's top target, and had little personal incentive to negotiate.

Bringing back the hostages is crucial for Netanyahu politically. He has faced constant protests and demonstrations in the Israeli street from supporters of the families of the hostages. Most experts believe that Israel will use the window offered by Sinwar's death to negotiate the release of hostages.

Does this mean that the conflict will likely be over soon?

Netanyahu declared that "the war, my dear ones, is not yet over". Many believe that even if Hamas were to agree to a hostage deal, he would like to continue fighting only to ensure his own political survival. He may use the vague goal of "total victory" to press on, and his far right allies will support this policy.

What the US does is important. President Joe Biden recently said he hoped Sinwar's death would present "an opportunity to seek a path to peace — a better future in Gaza without

Hamas". But the presidential election is now less than three weeks away, and Netanyahu may well decide to stay the course at least until then.

Relevance: GS Prelims; International Issues

Source: Indian Express

20. On sanctions and shadow fleets

Introduction

While covering the Russia-Ukraine conflict, many western media outlets have used the term 'shadow fleet' to describe tanker ships that carry Russian crude oil or oil products to other countries. The term conjures up images of pirate-like vessels and phantom owners trading in illegal, contraband substances. India has been painted as a host of a shadow fleet that is 'laundering' Russian crude.



How are sanctions implemented?

When the U.S. sanctions a country, as is the case with Russia, it launches investigations into entities, companies and individuals who violate the sanctions. Their assets in the U.S. are seized, bank accounts accessible to the western banking system are frozen and, sometimes, criminal prosecutions are launched against them. U.S. sanctions against Russian oil mandate that Russia can only sell its crude oil at \$60 a barrel. Current market prices are at least \$15 more. This is to ensure Russia doesn't profit much from oil sales and use that to fund its war effort in Ukraine.

What is structure of global shipping?

The global shipping industry is highly diversified. Greeks own 20% of the global merchant shipping fleet with China now crossing Japan to become the second leading nation in terms of merchant shipping fleet ownership. Most ships are built and repaired in China, Japan and South Korea. Yet, marine insurance, ship finance as well as global shipping regulations revolve around the U.K. and rest of Europe. U.S. sanctions are sought to be enforced through these levers.

Each ship is associated with different stakeholders at various nations and locations. Although tracking systems allow authorities to access previous ports of call, some companies do succeed

in hiding the original source of their cargo. Ships are registered in particular nations called flag states as they fly that country's flag. Flag states were meant to indicate the origins of the ship. To beat sanctions, ships often hop between flags. There are Flags of Convenience (FoCs), such as Panama and Liberia, which started out as tax avoidance entities, and to avoid too rigorous a scrutiny or inspection of a ship. FoCs obscure the ownership of ships. Then there are classification societies (class, in shipping parlance) that certify ship structures and machinery for safety of life at sea and marine pollution, facilitating insurance cover for these. An insurance type called Protection and Indemnity (P&I) covers loss of life and damage to property. These P&I insurance firms form 'clubs' to pool the risk.

How do ships keep their insurance?

Turkey, a member of the NATO, has been found to be extensively trading in Russian oil. A Turkish-owned ship found to be trading in Russian oil at more than \$60 a barrel may lose its P&I club, since clubs are controlled from London and the U.S. has leverage there. However, the owner can divest the management of the vessel and contract with a European manager that has P&I cover. And the ship will be back in business with the same owner but with a new European manager. Corporations with large fleets often set up shell companies that own just one or two ships. Such complex ownership structures hide the true identity of a ship and its owner. Yet, another phenomenon is registering the ships within jurisdictions that are not compliant with regulatory agencies such as the International Maritime Organization (IMO). Eswatini, a country in southern Africa, is not a signatory to the IMO charter. It has therefore emerged as a FoC.

What is the accusation against India?

Soon after sanction enforcements, many Russian ships struck alliances with Indian firms. Many switched their base to Dubai where Indians have a presence in shipping. The Indian Register of Shipping (IRS), a classification society, did see an increase in the ships it was certifying, bolstering charges of Indian involvement in shadow fleets. Noting that it has been linked to Russian shipping entities, the IRS said its primary responsibility is to the safety of a vessel and that it will not be compromised. IRS reported that it has indeed been asked to provide safety-related classification services to a number of vessels by Dubai-based entities. These vessels were registered under the flag administrations of Liberia and Cyprus and none flew the Russian flag, the IRS reported.

In 2015, when Iran was sanctioned, some 160 ships, many with trade links to Iranian oil, switched their classification society to the Korean Register of shipping — Korea is a U.S. ally. Sometimes renaming a vessel can help to erase association with sanctions.

Can U.S. sanctions be enforced?

Many agencies and shipping experts acknowledge that sanctions on Russian oil cannot be rigorously enforced because of its potential impact on world economy, the complex ways in which the shipping industry is structured, and because ownerships and origins of stakeholders are obscure and often based on voluntary disclosure.

More recently, the BBC reported that the U.K. had taken action only mild action against some 35 U.K. companies found to have violated the price cap set by sanctions. Industry voices there say that taking strong action would be bad for U.K. businesses.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: The Hindu

21. What role UNIFIL plays in Lebanon, India's contribution to it

Introduction



Recently, the UN force in Lebanon issued a statement saying the Israel Defense Forces (IDF) had used a bulldozer to "deliberately demolish an observation tower and perimeter fence of a UN position in Marwahin" (close to the border with Israel).

The statement by the United Nations Interim Force in Lebanon (UNIFIL) "reminded the IDF and all actors of their obligations to ensure the safety and security of UN personnel and property and to respect the inviolability of UN premises at all times".

It noted that breaching a UN position and damaging UN assets is a "flagrant violation of international law and [UN] Security Council resolution 1701", and "it endangers the safety and security of our peacekeepers in violation of international humanitarian law".

Israel has demanded that UNIFIL should vacate its positions along the Blue Line, a 120-km-long "line of withdrawal" set by the United Nations in 2000 along Lebanon's southern border in order to confirm the withdrawal of Israeli forces from Lebanese territory. UNIFIL has reaffirmed that "despite the pressure being exerted on the mission, peacekeepers remain in all positions and will continue to undertake their mandated tasks".

First, why are UN peacekeepers present in Lebanon?

The United Nations Interim Force in Lebanon (UNIFIL) was established by a resolution of the UN Security Council in 1978, in response to Israel's invasion of southern Lebanon. Israel had said it was acting to expel armed Palestinian elements operating from Lebanon.

According to UN Security Council resolutions 425 and 426, adopted in March 1978, the UNIFIL was established to confirm the withdrawal of Israeli forces from southern Lebanon, restore peace and security, and to help the Lebanese government in restoring its control and authority. Southern Lebanon, which shares a border with Israel, has been the site of repeated conflicts between the IDF and Hezbollah. Israel vacated its occupation of Southern Lebanon in 2000, but a fresh conflict broke out in July 2006. On August 11, the UN Security Council unanimously adopted Resolution 1701, which called for Israel and Lebanon to support a permanent ceasefire and significantly expanded UNIFIL's mandate.

The resolution stated that there would be no ammunition and armaments in Southern Lebanon except those possessed by the Lebanese armed forces. UNIFIL's strength was augmented to 15,000 uniformed personnel, and it was assigned duties to assist the Lebanese forces in monitoring and supervisory roles, along with providing humanitarian aid.

Are Israel's actions against international law?

Attacks on UN peacekeepers are in contravention of international law. However, despite condemnation, Israel's Prime Minister Benjamin Netanyahu has not backed down, and instead asked the UNIFIL to "move out of harm's way". In a way, he is asking them to cease performing the responsibilities given to them by the UN Security Council. This is a violation of the sanctity and the mandate of the UN.

UN peacekeepers have come under attack in various parts of the world in the past, but these were by non-state actors. Many of Israel's actions do not behave the dignity, stature, and obligations of any UN member state. Earlier this month, the Israeli government declared UN Secretary General António Guterres persona non grata and barred him from entering the country. Last year, Israel had called for Guterres' resignation. Respect for the office of the Secretary General is a part of the UN Charter. Israel has also repeatedly attacked the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), alleging it has links with anti-Israel militant organisations, and called for it to be disbanded. UNRWA has rejected these allegations. More than 220 UNRWA officials have been killed in Gaza — the highest death toll in the history of the UN.

Are Indian troops part of UNIFIL?

India is one of the largest contributors of troops to UNIFIL. Indonesia sends the largest number of personnel, and India, Italy, and Ghana are among the other big contributors. As of October 20, 2024, India had 903 personnel in UNIFIL, after Indonesia's 1,230 and Italy's 1,043.

India has had a presence in UNIFIL since 1998. INDBATT, as the Indian battalion is called, has been renowned for its utmost professionalism, valour, and local outreach. They have also undertaken some quick-impact projects. For example, in 1999, INDBATT built a public park in a town called Ebel el Saqi in southern Lebanon. It has a statue of Mahatma Gandhi and is called the Mahatma Gandhi Park. It was renovated in 2020. INDBATT also built a stadium named after Sardar Patel at a village called Kawkaba.

In addition, INDBATT has helped local communities with IT equipment, diesel generators, etc. Our medical mission, which is a component of the Indian battalion, has always been highly sought-after in the region.

Israel alleges UNIFIL has not done its job in Southern Lebanon, which has forced Israel to eliminate Hezbollah itself.

To blame UNIFIL would not be fair. The mandate of UN peacekeeping missions is not to engage in armed action except in self-defence. As per UN Security Council Resolution 1701, it

is the Lebanese armed forces who are in control of that area, with assistance from the UNIFIL. Assistance does not mean that UNIFIL will take armed action.

An important part of the UNIFIL's mandate has been to render humanitarian assistance, which it has been discharging admirably. In the face of Israeli hostilities, the UNIFIL has made it clear that it will not vacate its positions.

As far as Hezbollah is concerned, its reality in Lebanon is multifaceted and multidimensional. It is also a political and cultural force that enjoys legitimacy in Lebanon, with Hezbollah and its allies having 62 of the 128 democratically elected seats in Lebanon's Parliament. If you were to ask average Lebanese about Hezbollah's armed wing, they would probably say that Hezbollah is the country's de facto defence force. However, this is not at all to say that the Lebanese defence forces have abdicated their responsibilities.

So where is the Lebanese army in all of this? Are they fighting against Israeli forces?

This is not an Israel-Lebanon war. This is Israel's aggression in Lebanon, and Lebanon is in self-defence mode, repeatedly calling for a ceasefire.

The Lebanese armed forces are highly professional, but given the tempestuous history of the country and the economic troubles it is currently facing, the army does have a severe resource crunch. It does not have a large budget, and its technology and armaments are very meagre compared with the far more powerful and technically advanced Israeli military.

Relevance: GS Prelims & Mains Paper II; International Organisations

Source: Indian Express

22. PM Modi attends BRICS Summit in Russia: What is the group, its significance for India

Introduction

BRICS Summit 2024: Prime Minister Narendra Modi left for Kazan in Russia recently to attend the 16th BRICS Summit. The summit is the first after the grouping's expansion last year. For India, it is especially significant as Prime Minister Narendra Modi could meet China's President Xi Jinping here, soon after the two countries agreed on a disengagement along the LAC.

What is BRICS?

List of Countries attending BRICS Summit: BRICS stands for Brazil, Russia, India, China and South Africa, the original five members who were large, non-Western economies. On January 1 this year, BRICS admitted four new members: Egypt, Ethiopia, Iran and the United Arab Emirates. The organisation now represents almost half the world's population and almost one quarter of the world's economy.

Essentially, BRICS has been envisaged as a grouping of non-Western countries, which can act as a counterweight to institutions like the World Bank and the International Monetary Fund, dominated by the Global North.

The acronym BRIC was first used in 2001 by Goldman Sachs in their Global Economics Paper, 'The World Needs Better Economic BRICs'. The paper projected that Brazil, Russia, India, and China would be among the world's largest economies in the next 50 years or so.

As a formal grouping, BRIC started after the meeting of the leaders of Russia, India and China in St. Petersburg on the margins of the G8 Outreach Summit in 2006. The grouping was formalised during the first meeting of BRIC Foreign Ministers on the margins of the UNGA in New York in 2006.

The first BRIC Summit was held in Yekaterinburg, Russia, in 2009. It was decided to include South Africa at the BRIC Foreign Ministers' meeting in New York in 2010, and accordingly, South Africa attended the 3rd BRICS Summit in Sanya, China, in 2011.

The next wave of expansion came after the summit in South Africa last year. Invitations were extended to Argentina, Egypt, Ethiopia, Iran, Saudi Arabia and the United Arab Emirates (UAE). While four of the above joined in January this year, Saudi Arabia has accepted the invitation but delayed formal joining. Argentina, whose new President Javier Milei is more pro-West, declined.

What is the significance of BRICS Summit 2024?



PM Modi is meeting Russian President Vladimir Putin again, after the two leaders met in July. As Russia faces increased pressure from the West, the meetings underline the importance New Delhi gives to traditionally strong India-Russia ties. For Putin, the gathering of so many world

leaders in Russia is a message to the West that its attempts to isolate Moscow amid the Ukraine war have not succeeded.

Modi could possibly also meet Xi. While the Ministry of External Affairs (MEA) has not confirmed the meeting yet, Foreign Secretary Vikram Misri on Monday said Modi is expected to have "a few bilaterals during his visit, which are presently being worked out". The last Modi-Xi meeting had also come about on the sidelines of a BRICS Summit, in South Africa in August last year.

President Masoud Pezeshkian of Iran, the major player in the other war raging at present — the devastating conflict in West Asia — will also attend the summit.

The BRICS membership is in line with India's policy of multilateralism and seeking to give a stronger voice to the Global South.

"India values the close cooperation within BRICS which has emerged as an important platform for dialogue and discussion on issues concerning the global developmental agenda, reformed multilateralism, climate change, economic cooperation, building resilient supply chains, promoting cultural and people to people connect, among others. The expansion of BRICS with the addition of new members last year has added to its inclusivity and agenda for the global good," PM Modi said in a statement ahead of his departure for Russia.

India will also seek to boost trade, security, economic and climate cooperation at the summit. Many analysts believe that BRICS has so far not lived up to its potential, because of the internal differences amid members — the India-China border dispute, for example — and because not all members share Russia's and China's antipathy to the West.

Relevance: GS Prelims & Mains Paper II; International Organisations

Source: Indian Express

23. China's Opposition to Taiwan's New Centre in India

Introduction

China has strongly opposed the opening of Taiwan's Taipei Economic and Cultural Centre (TECC) in Mumbai. Beijing stated it "lodged solemn representations" to India, referring to India's commitment to the "One-China Principle," which serves as the foundation of China-India relations.



Taiwan's Economic and Cultural Centres in India

The Mumbai TECC is Taiwan's third office in India, following New Delhi (opened in 1995) and Chennai (opened in 2012). These offices facilitate cultural, economic, and visa services in the absence of formal diplomatic ties.

China's "One-China Principle" Explained

China's "One-China Principle" asserts that:

1. There is only one China.
2. Taiwan is an inalienable part of China.
3. The People's Republic of China (PRC) is the sole legal government representing China.

This position stems from China's history. After the Chinese Civil War, the Communist Party under Mao Zedong established the PRC on the mainland, while the defeated Nationalists, led by Chiang Kai-shek, fled to Taiwan and claimed to represent "real China." Over time, countries seeking diplomatic ties with China were required to accept this principle.

India's Stance on the One-China Principle

India was one of the first countries to recognize the PRC in 1950. Though it had earlier ties with Nationalist leaders, India cut off relations with Taiwan after the Communists took power. However, in 1995, as part of its post-Cold War foreign policy, India resumed engagement with Taiwan but kept it limited due to sensitivities with China.

Why India Has Taiwan's Economic and Cultural Centres

India and Taiwan established representation in each other's capitals in 1993, with the India-Taipei Association in Taiwan and Taiwan's TECC in India. These offices promote economic, cultural, and technology ties, especially as Taiwan has emerged as a major global technology hub and semiconductor manufacturer.

The TECC in Mumbai aims to deepen ties between India and Taiwan, particularly in sectors like manufacturing. For instance, Taiwanese tech giant Foxconn has already set up a facility in Tamil Nadu, and the new TECC could boost Taiwanese investments in western India.

Broader Context: Taiwan-China Relations and India's Position

Taiwan has increasingly asserted its independence, especially under the Democratic Progressive Party (DPP), which China sees as separatist. China, under President Xi Jinping, has repeatedly stressed its territorial claims on Taiwan and hinted at the possibility of forceful reunification.

Amid India's own border tensions with China since 2020, some experts argue that India should adopt a tougher stance on Taiwan. However, India has been cautious not to escalate tensions with China. Nonetheless, there are concerns that China may not show similar restraint when it comes to India's territorial concerns, such as in Kashmir.

Relevance: GS Prelims & Mains Paper II; Bilateral Relations

Source: Indian Express

24. India-China LAC Agreement: What this means, why experts are advising caution

Introduction

Indian and Chinese negotiators have arrived at an agreement on "patrolling arrangements" along the Line of Actual Control (LAC), leading to disengagement and a resolution of the issues that had arisen in these areas in 2020, India has said.

This announcement on Monday was followed by a bilateral meeting on Wednesday between Prime Minister Narendra Modi and China's President Xi Jinping on the sidelines of the BRICS leaders' summit in Kazan, Russia.

Significantly, Chinese statements through this week have not referred to the agreement on patrolling.

Road to agreement

* In April 2024, Prime Minister Modi told Newsweek magazine that "For India, the relationship with China is important and significant", and "It is my belief that we need to urgently address the prolonged situation on our borders so that the abnormality in our bilateral interactions can be put behind us."

* The Chinese government reacted positively to Modi's remarks. The Chinese Foreign Ministry spokesperson said that the relationship between India and China was "about more than the boundary situation" — and that "China and India maintain close communication through diplomatic and military channels on handling issues related to the border situation and have made positive progress".

* In May, External Affairs Minister S Jaishankar, in an interview to PTI, expressed hope for the resolution of the remaining issues with China amid the border standoff in Ladakh. Importantly, he said that the outstanding issues primarily revolved around "patrolling rights" and "patrolling abilities".

Question of patrolling

The patrolling pact announced by Foreign Secretary Vikram Misri on Monday is the key pillar of the agreement.

Patrolling is one of the key elements of border management between India and China. Since there is no physical line on the ground that corresponds to maps, Indian troops are expected to go up to the Indian perception of the border before returning to base.

Typically, soldiers either walk or drive up to the patrolling points and leave behind a sign of their presence there. This could be anything Indian — perhaps an empty packet of cigarettes or a matchbox made in India.



Article 4 of the 2005 border pact codifies the conduct of the troops in case of a face-off. Some of the stipulated guidelines are as follows:

- * If the border personnel of the two sides come to a face-to-face situation due to differences in the alignment of the LAC or any other reason, they shall exercise self-restraint and take all necessary steps to avoid an escalation of the situation.
- * Throughout the face-to-face situation, neither side shall use force or threaten to use force against the other.
- * Both sides shall treat each other with courtesy and refrain from any provocative actions.
- * Neither side shall put up marks or signs on the spots.

Contours of agreement

It is learnt that the two sides have agreed to restore patrolling rights to each other in the Depsang Plains and Demchok region — these are areas where the problems are called legacy issues, predating the 2020 Chinese incursions. This means that Indian troops can patrol up to patrolling point (PP) 10 to 13 in the Depsang Plains, and in Charding nullah of Demchok.

The agreement on patrolling arrangements is expected to lead to disengagement, de-escalation and de-militarisation in areas where 50,000 to 60,000 troops are stationed on each side. Officials have said this process is expected to begin in the next week to 10 days.

In press conferences held this week, the Foreign Secretary has shared details of the pact on “patrolling arrangements”.

* In Demchok and Depsang, patrolling and grazing activities will resume as it was pre-May 2020. “...In the pending areas under discussion, patrolling and indeed grazing activities, wherever applicable, will revert to the situation as it obtained in 2020,” Misri said in Kazan on Tuesday.

* The previous disengagement at friction points such as Galwan Valley, north and south banks of Pangong Tso, Gogra-Hot Springs area have not been reopened for negotiations.

* Misri said he hoped the arrangements can “prevent the kind of clashes that occurred earlier in some areas near the LAC”, referring to the Galwan clashes of 2020, in which 20 Indian troops including a Colonel-rank officer and at least four Chinese soldiers were killed. He stressed on close monitoring so that the clashes don’t recur.

* He clarified the sequence of the “three Ds”: “We are focused on disengagement first, and discussions on de-escalation and de-induction will happen at the appropriate time.”

* On Wednesday, he said that the "endorsement" of the agreement by Modi and Xi "should certainly lead to an easing of the situation along the LAC". These steps have "set the process in motion" for bringing relations back to a normal path, and it is necessary for both sides to continue on this path, Misri said.

Caution: 'trust, but verify'

After the Modi-Xi meeting, however, a few divergences emerged.

* The Indian readout said the PM welcomed "the recent agreement for complete disengagement and resolution of issues that arose in 2020 in the India-China border areas". The Chinese statement only said the two leaders "commended the important progress the two sides had...made...on resolving the relevant issues in the border areas".

India has maintained that until the border standoff is resolved, there cannot be business as usual with China. Beijing's position has been that the border issue should not impact bilateral ties.

* About the next steps after the leaders' meetings, the Indian readout specifically said that "the Special Representatives on the India-China boundary question will meet at an early date...to explore a fair, reasonable and mutually acceptable solution to the boundary question."

The Chinese readout said the two sides had "agreed on holding talks between their foreign ministers and officials at various levels to bring the relationship back to sound and steady development at an early date".

As such, there is a fair bit of caution in India's strategic circles about the next steps going forward.

The border pact has set a process of trust-building in motion, and if both sides keep their word, it will be at least a couple of years before the entire three-step process of disengagement, de-escalation, and de-induction of troops is completed, and ties return to normal.

Whether it will be a parallel or a sequential process remains to be seen.

Relevance: GS Prelims & Mains Paper II; Bilateral Relations

Source: Indian Express

25. Israel attack on Iran: what this means for war in West Asia

Introduction

Israel launched what it described as "precise and targeted" airstrikes on Iran on October 26 in retaliation to an Iranian attack on Israel earlier this month, in what appears to be a major escalation between the two enemy countries.

Here is what we know about the attack so far, and whether it can trigger a larger conflagration in West Asia as some observers fear.

Israel strikes military bases in Iran



How did the attacks unfold?

Iranian media reported explosions around the capital Tehran shortly after 2 am local time (4 am in India). Videos uploaded on social media show projectiles (Israeli missiles) raining down on the city and its surrounding areas, as well as intercepting fire by Iranian air defence system.

The Israel Defense Forces (IDF) confirmed that it is carrying out "precise" airstrikes on Iranian "military targets" at around 2.30 am local time. The strikes were concluded by 6.00 am. According to Israel's military, three waves of airstrikes were conducted

by scores of Israeli fighter-bombers.

What was the extent of damage done?

The IDF has claimed that it hit around 20 targets including Iran's missile manufacturing facilities, surface-to-air missile storage sites, and other sites of military importance. Notably, it seems that Israeli targets did not include Iran's sensitive nuclear installations and oil manufacturing facilities.

Iranian authorities said that sites in Tehran, Khuzestan, and Ilam provinces were targeted, adding that the country's air defences had "successfully intercepted" the attacks even though "some areas sustained limited damage". Two Iranian soldiers were reportedly killed in the attacks.

By all early accounts, it seems that Israel's strikes were more limited than previously feared.

Why did Israel attack Iran?

Iran and Israel have long been at loggerheads. Iran does not acknowledge Israel's right to exist, and backs a multitude of groups in West Asia that are fighting Israel and its occupation of Palestine. Most notable among these are Hamas and Hezbollah, who Israel is currently at war with.

The Israel-Iran relationship has gone downhill following the October 7 Hamas attacks last year. On April 1, Israel struck the Iranian consulate in Syria, killing 16 persons including several top commanders from Iran's Revolutionary Guard Corps (IRGC). On April 13, Iran responded with a direct attack on Israeli soil, utilising as many as 300 missiles and drones. Israel further retaliated with a "limited" strike on an Iranian missile defence system in the region of Isfahan.

Things further heated up on July 31, when Hamas politburo chief Ismail Haniyeh was killed in an explosion in Tehran, likely orchestrated by Mossad agents. Israel has not officially claimed responsibility for the assassination. Israel further assassinated Hezbollah leader Hassan Nasrallah in Beirut on September 27, in an attack which also claimed the life of high ranking Iranian official Brigadier General Abbas Nilforoushan.

Iran launched 200 ballistic missiles at Israel, in response to the deaths of Haniyeh, Nasrallah, and Nilforoushan. This attack inflicted next to no damage.

The latest Israeli airstrikes are in response to this. A senior American administration official said that the US worked with Israel to encourage a "targeted and proportional" response, according to the BBC. The White House has officially deemed the attack to be an "exercise in self-defence".

What happens now?

Everything rests on how Iran responds. "There is no doubt that Israel will face a proportional reaction for any action it takes," Iran's Tasnim news agency said on Saturday, citing sources.

What a proportional response means, however, is unclear. If Iran's previous actions are anything to go by, it is likely to exercise a degree of restraint, especially in the immediate aftermath of the attack. This is more so because for all the show, the attack seems to have done very little actual damage.

As per the BBC, Iran's foreign ministry said it was "entitled and obligated to defend itself" but added that Tehran recognises its "responsibilities towards regional peace and security".

Israel's attack, too, appears to have been restrained enough to serve as warning but not outright provocation. Israel has targeted Iran's air defence and missile capabilities, instead of vital infrastructure or the country's nuclear facilities.

Relevance: GS Prelims & Mains Paper II; International Issues

Source: Indian Express

26. Why are swing States critical in this U.S. election?

Introduction

Around 24.4 crore people are eligible to vote for the U.S. presidential election slated for November 5. In 2020, two-thirds of the eligible voters voted. The next President of the U.S. will be decided less by these national numbers than by a few thousand voters in some key places, which are called battleground or swing States, thanks to the unique features of the country's electoral system.

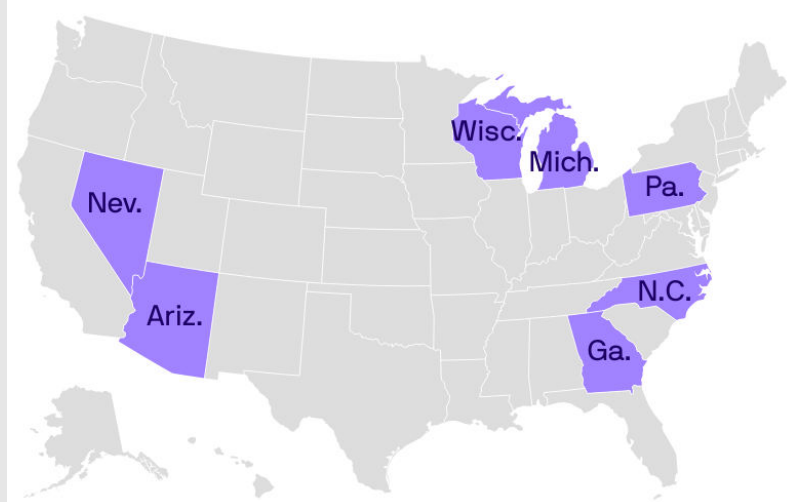
What transpired in the last two elections?

The last two elections of 2016 and 2020 demonstrated the outsize impact of the swing factor in several States, even as the country became more polarised. In 2020, President Joe Biden had

a national lead of around 70 lakh votes over Donald Trump, but what mattered more were the small margins with which he won key States. Of around 67 lakh votes cast in Pennsylvania, Mr. Biden led over Mr. Trump by 81,660; in Michigan, he had 1.54 lakh more, of the total 54 lakh polled; in Wisconsin, Mr. Biden led by just 20,682 votes in a total of more than 32 lakh votes.

In 2016, Mr. Trump had trailed his Democratic opponent Hillary Clinton by two percentage points, which was in excess of 20 lakh votes, but he could still emerge as the winner because he won key swing States. For instance, he won Pennsylvania by 44,292 votes of the total 61.7 lakh votes polled; Wisconsin by 22,748 of the 30 lakh votes; and Michigan, by 10,704 of the 48 lakh votes polled.

Swing states that are expected to decide the 2024 presidential election



How is the winner chosen?

The winner of the U.S. presidential contest is selected not by a majority of national popular votes, but by a majority in the electoral college of 538, which is 270. Members of the electoral college are apportioned between the States. Most U.S. States have a “winner-takes-it-all” system that allots all electors to the candidate who gets more popular votes. So, whether a candidate has one or one million votes more than their opponent in California,

for instance, all 54 electoral college votes of the State, will be awarded to him or her.

Similarly, all 19 electoral college votes of Pennsylvania will be awarded to the winner of the popular votes within that State, regardless of the margin. This system could create the anomaly of a candidate winning the election, without winning more popular votes than the opponent, nationally. That is also why the main opponents this time, Mr. Trump and Democrat Kamala Harris, are trying to turn the battleground States in their favour in the last lap of campaigning ahead of election day.

Which are the key States that will play a role in picking the winner?

Pennsylvania, Michigan, Wisconsin, Georgia, Nevada, Arizona, and North Carolina are the battleground States of 2024; and the contest between Mr. Trump and Ms. Harris is a dead heat, going by all opinion polls. The average polling error for more than five decades in the U.S. is 3.4%. In all the seven swing States, in nearly all the polls, the leading candidate has a lead well within this margin. Like the last two elections, the margins could be very narrow and these States will decide who will be the President for the next four years. It is also possible that

most of these States could swing to either side, as it happened in the last two elections, rather than being evenly divided between the two.

Even a minor swing among significant voting blocs in these States could turn the tide either way. Both candidates are trying to tailor their messages, particularly targeting these States. For instance, Latinos make up nearly a quarter of Arizona's voters. That possibly explains Mr. Trump's recent attempts to portray his opponent as being disrespectful of the Catholic church. In Georgia, Black votes count considerably, and Mr. Trump has been trying to mobilise them behind his anti-immigration politics. Latest polling figures show Mr. Trump gaining more ground among Latinos and Blacks. Michigan, a State that turned Republican in 2016 and Democrat in 2020, has around two lakh Muslim voters. Democrats, and Ms. Harris, face a crisis of credibility among them, against the backdrop of the conflict in West Asia. They may not vote for Mr. Trump but could turn indifferent towards Ms. Harris. Mr. Trump had won North Carolina in 2016 and 2020, but Ms. Harris is making some new inroads, according to polls.

In the last stretch, there will be further concentration of firepower by both sides on the small numbers that count as big in the elections. Catching the swing voters in these States is what both candidates are focussing on now.

Relevance: GS Prelims & Mains Paper II; International Issues

Source: The Hindu

1. India rises to 39th position among 133 global economies in the Global Innovation Index 2024

Introduction

India has achieved a significant milestone in the Global Innovation Index (GII) 2024, securing the 39th position among 133 global economies. This leap in ranking reflects India's commitment to fostering a robust innovation ecosystem that is underpinned by strong policies, investment in research and development (R&D), and a collaborative environment for startups and industries. The country's growing innovation potential has been supported by government initiatives that prioritize technological advancement, ease of doing business, and entrepreneurship. This impressive achievement is a clear indication of India's emergence as a global innovation leader, a feat that also underscores its rapid transformation from a developing economy into a hub of cutting-edge technological and scientific breakthroughs.



India's Innovation Journey: A Steady Ascent

In a span of nearly a decade, India has made tremendous strides in the GI rankings, rising from the 81st position in 2015 to 39th in 2024. This steady climb reflects the country's focused

approach towards nurturing innovation across various sectors, driven by strong governmental support and a robust intellectual property framework.

This achievement highlights India's growing leadership in innovation, especially as the country ranks 1st among 10 economies in Central and Southern Asia and 1st among lower-middle-income economies. Furthermore, India ranks 4th globally in the World Intellectual Property Organization's (WIPO) Science & Technology (S&T) Cluster Ranking, with key cities like Mumbai, Delhi, Bengaluru, and Chennai listed among the World's Top 100 S&T clusters. Additionally, India stands 7th globally in intangible asset intensity and excels in innovation outputs, ranking 33rd, marking a notable improvement from the previous year. This recognition underscores India's continued dominance and leadership in innovation across multiple sectors.



In the 2024 edition of the GII, Switzerland, Sweden, the United States, Singapore, and the United Kingdom have emerged as the world's most innovative economies. However, India,

along with China, Turkey, Vietnam, and the Philippines, has been recognized as one of the fastest-rising economies in terms of innovation over the past decade.

The Global Innovation Index (GII) was launched in 2007 through a collaboration between INSEAD, a prominent business school, and World Business, a British magazine. It offers a comprehensive evaluation of global innovation by tracking the performance of 133 economies worldwide. The Global Innovation Index serves as a benchmark resource that charts global innovation trends, guiding policymakers, business leaders, and others in unleashing human ingenuity to improve lives and address shared challenges, including climate change.

Important Initiatives

India's rise in the Global Innovation Index (GII) reflects not only the country's remarkable progress but also its growing potential to emerge as a global hub for innovation. Through initiatives like Start-Up India, Digital India, and the Atal Innovation Mission, the Indian government has continuously fostered entrepreneurship, research, and technological advancement. Startup India was launched on January 16, 2016, with the goal of nurturing entrepreneurship, building a strong startup ecosystem, and transforming India into a nation of job creators rather than job seekers. This initiative includes a variety of programs designed to support emerging entrepreneurs. These efforts are coordinated by the Startup India Team, which reports to the Department for Promotion of Industry and Internal Trade (DPIIT). As of September 30, 2024, DPIIT has officially recognized 1,49,414 entities as startups.

Digital India is a key government initiative aimed at transforming India into a digitally empowered society and knowledge-based economy. The Digital India programme is centred on three key vision areas: digital infrastructure as a core utility to every citizen, governance & services on demand, digital empowerment of citizens.

Initiatives and measures to promote technology led startup-innovation ecosystem

Atal Innovation Mission (AIM), established in 2016, is a flagship initiative of the Government of India to promote a culture of innovation and entrepreneurship across the country. AIM adopts a comprehensive approach to foster problem-solving and innovative thinking in schools, while also creating an entrepreneurial ecosystem in universities, research institutions, and the private and MSME sectors. Till date, AIM has established 10,000 Atal Tinkering Labs in Schools across the country, more than 3500 startups are incubated at Atal Incubation Centres and have created more than 32000 jobs in the ecosystem.

These programs, along with sustained efforts in boosting innovation infrastructure and enhancing collaboration between academia and industry, have been key drivers of this growth. As India continues its upward trajectory in innovation, the focus remains on scaling up infrastructure, promoting intellectual property rights protection, and encouraging public-private collaboration. These actions will solidify India's competitiveness in the global innovation landscape, fuelling both economic growth and societal advancement.



Conclusion

India's stellar performance in the Global Innovation Index 2024 underscores its strategic focus on leveraging innovation as a key driver for economic growth and global competitiveness. The nation's ability to rapidly climb the rankings reflects its concerted efforts to foster a robust ecosystem that encourages technological advancements, research and development, and entrepreneurship. Looking ahead, India's sustained focus on innovation will be vital as the country seeks to capitalize on emerging technologies, expand its influence in the global tech industry, and foster inclusive growth. With continued policy support and an evolving talent pool, India is not just poised to maintain its leadership among lower-middle-income economies but also to emerge as a global powerhouse of innovation, driving advancements that could shape the future of industries worldwide.

Relevance: GS Prelims; Economics

Source: Indian Express

2. Export ban on Non-Basmati White Rice lifted: why, what is the likely impact

Introduction

The Centre recently lifted the ban on export of Non-Basmati White Rice. It has, however, imposed a minimum export price (MEP) of \$490 per tonne.

A day before, the government had removed the 20% export duty on Non-Basmati White rice, and halved export duty on three other categories of rice. The duty on 'rice in the husk (paddy

or rough)', 'husked (brown) rice', and 'parboiled rice' was reduced from 20 per cent to 10 per cent.

Why the decision now?

The export ban had come amid a marginal dip in rice production and the looming threat of an erratic monsoon last year.



This year, sowing of paddy during the ongoing kharif season has been higher, the crop is normal, and a bumper output is expected. Wholesale prices are down, while the Central pool is well-stocked. Factors behind this are:

Higher sowing: Though paddy is grown in all three seasons in India, most of it is planted in kharif. With a good monsoon, farmers have planted more paddy than last year. As per the agriculture ministry, the area under paddy was reported at 413.50 lakh hectare as on September 20 this year, 2.2 per cent higher than last year (404.50 lakh hectares) and 3 per cent higher than the normal area (401.55 lakh hectares during five years from 2018-19 to 2022-23).

The increase has been reported from Uttar Pradesh, Madhya Pradesh, West Bengal, Haryana, Jharkhand, Bihar and Chhattisgarh.

Record production: The agriculture ministry said on September 25 that India's total rice production (kharif, rabi and summer) is estimated to reach 137.82 million tonnes during 2023-24, 1.5 per cent higher than last year. This is due to a higher output during the kharif season, which increased to 113.26 million tonnes from 110.51 million tonnes during 2022-23.

Declining wholesale prices, stable retail inflation: Data on the Centre's UPAg portal show that the wholesale price of rice was recorded at Rs 3,324.99 per quintal on September 27, lower than Rs 3,597.09 per quintal a week ago, and Rs 3,502.91 per quintal a month ago.

However, the Consumer Price Index-based retail inflation of rice has been hovering in double digits for the past two years. It started rising from June 2022 and reached its peak in July 2023 (13.09 per cent), when the government banned exports. It remained in double digits for 18 months, before coming down to 9.52 per cent in August.

Surplus stocks: Food Corporation of India data show that rice stock in the Central pool was 323.11 lakh tonnes on September 1. Along with unmilled paddy, the rice stock would be 423 lakh tonnes, much higher than the buffer stock norms. The Centre is required to maintain a stock of 135.40 LMT of rice as on the first day of July and 102.50 lakh tonnes on the first day of October.

Who will be impacted by the move?

Along with easing export restrictions, the Centre has also allowed state governments to buy rice for their welfare schemes, and distilleries for ethanol making.

Before its export was banned, Non-Basmati White rice constituted about 25 per cent of the total rice exported from the country. The lifting of the ban will help traders, who, if they were at all exporting, were paying a 20% duty. It will boost export sentiment and may benefit farmers who grow non-Basmati premium varieties like Sona Masoori (mainly grown in Karnataka, Andhra Pradesh and Telangana), which was hit by the ban.

For domestic consumers, retail prices, which are already elevated, may further go up.

Was any export taking place during the ban?

The Centre had allowed exports "on the basis of permission granted" to meet the food security needs of other countries, based on the request of their governments.

Thus, the rice was being exported, through the newly formed National Cooperative Export Limited (NCEL), to United Arab Emirates (UAE), Bhutan, Mauritius, Singapore, Nepal, Cameroon, Cote d' Ivore, Republic of Guinea, Malaysia, Philippines, and Seychelles, among others.

What is India's status as a rice exporter?

India is the second largest producer and the biggest exporter of rice. India, along with China, accounts for over half of the world's rice production. China, however, is also the biggest consumer of rice, leaving little for exports.

According to the United States Department of Agriculture (USDA), India accounted for 33 per cent (17 million tonnes) of the world's total rice exports (53 million tonnes) during the calendar year 2023. In 2022, before the ban on Non-Basmati White Rice shipments, India accounted for about 40 per cent of the total rice exports (56 million tonnes) in the world.

Who are India's competitors?

Two east Asian countries—Thailand and Vietnam—are the two main competitors of India in the global rice market. In 2023, the combined rice export of these two countries was almost equal to Indian exports. Besides, Pakistan, Cambodia and the United States are also in the list of rice exporters.

Philippines, Indonesia, Vietnam, China, European Union, Nigeria, Iraq, Saudi Arabia and Malaysia are the top rice importers.

What does India's export breakup look like?

India's rice exports are broadly categorised into basmati and non-basmati rice. The non-basmati rice category includes six subcategories— rice in husk of seed quality; other rice in husk; husked (brown) rice; rice parboiled; non-basmati white rice; and broken rice.

Basmati accounts for almost one third of India's total rice export. In the financial year 2023-24, Basmati export was recorded at 52.42 lakh tonnes.

In the non-Basmati category, rice in husk of seed quality saw exports of only 19,788 tonnes in 2023-24. This was shipped mainly to the Philippines, Bangladesh and Nepal. Other rice in husk goes mainly to Nepal and Bhutan. India exported 3.19 lakh tonnes of this rice during 2023-24. Husked (brown) rice saw a jump in exports last year. The main buyers were Vietnam, Malaysia and the Netherlands. India exported a quantity of 3.01 lakh tonnes of husked (brown) rice during 2023-24. Parboiled rice exports stood at 75.70 lakh tonnes during 2023-24. Main importers were Benin, Guinea, Togo, Somalia, Cote D' Ivoire, Djibouti and Liberia.

Non-basmati white rice went to Kenya, Mozambique, Cameroon, Vietnam, Malaysia, Togo, Madagascar, Cote D' Ivoire, and Benin in the biggest quantities. India exported 23.59 lakh tonnes of this rice during 2023-24.

Broken rice, meanwhile, was imported mainly by Senegal, Gambia, Vietnam, Indonesia, Cote D' Ivoire, Djibouti, Netherlands and Mali. India exported 5.45 lakh tonnes of broken rice last year.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

3. New SEBI rules to curb F&O frenzy, aim to protect small investors

Introduction

The regulator has increased the 'tail risk' coverage by levying an additional 'Extreme Loss Margin' (ELM) of 2% for short options contracts. ELM is the margin that exchanges charge over and above the normal margin requirement. Tail risk is the chance of a loss due to a rare event. Markets regulator Securities and Exchange Board of India (SEBI) has released a set of six measures to strengthen the equity index derivatives — also known as equity futures & options (F&O) — framework.



The F&O segment has been witnessing an exponential jump in trading volumes, with the majority of investors incurring losses. The increased activity in the derivatives market has become a cause of concern for the government and regulators, as surging F&O volumes have started to impinge on capital formation and pose a systemic risk to the country's economic growth.

Market experts believe that tighter F&O rules could help limit speculation in the derivatives market, protect the interest of retail investors, increase constructive participation, and improve market stability.

1. Contract size for index derivatives recalibrated

The minimum contract size at the time of its introduction in the market has been recalibrated to Rs 15 lakh from the existing stipulation of Rs 5-10 lakh. The regulator has said that the contract size should be fixed in such a way that the contract value of the derivative on the day of review is Rs 15-20 lakh.

This will apply to all new index derivatives contracts introduced after November 20 this year. This step raises the entry barrier, and seeks to ensure that participants in the derivatives market take on appropriate risks.

IMPLICATION: V K Vijayakumar, Chief Investment Strategist at Geojit Financial Services, said the increase in contract size can curb speculation by small traders who have been hyperactive in the F&O segment.

Kunal Sanghavi, Chief Strategy and Transformation Officer, HDFC Securities, said small investors and retail participants end up taking undue risks and make losses in the F&O segment. "Retail players in tier 2 and tier 3 cities will need to re-strategise on account of the increase in the minimum index derivatives contract value from Rs 5 lakh to Rs 15 lakh at the time of introduction," Sanghavi said.

2. Upfront collection of options premium

To deny undue intra-day leverage to the end client, and discourage the practice of allowing positions beyond the collateral at the end client-level, SEBI has mandated the collection of options premium upfront from options buyers by the trading member (TM) or the clearing member (CM). The new rule will be applicable from February 1, 2025.

IMPLICATION: This is primarily to ensure prudent risk management at the investor level, Puneet Sharma, CEO and Fund Manager at Whitespace Alpha, a multi-asset class asset management firm, said.

"Options carry inherent leverage, which can amplify gains or losses. By mandating upfront collection, SEBI aims to minimise undue intraday leverage, ensuring that positions are taken only against adequate collateral," he said.

The aim is to instill discipline, reduce aggressive short-term speculation, and mitigate the risk of defaults due to overleveraged positions, Sharma said.

3. Rationalisation of weekly index derivatives products

SEBI has said that expiry-day trading in index options at a time when option premiums are low, is largely speculative. Stock exchanges offer short-tenure options contracts on indices which expire on every day of the week, leading to hyperactive trading in index options on expiry day.

SEBI has directed that "henceforth, each exchange may provide derivatives contracts for only one of its benchmark index with weekly expiry". This will be effective from November 20.

IMPLICATION: Sanghavi said this will limit the avenues for uncovered/ naked options selling. A naked position one that is not hedged.

Sharma said the hyperactive trading in multiple weekly expiring contracts leads to short holding periods and increased market volatility, particularly on expiry days. "By limiting the availability of these products, SEBI is focusing on reducing the volume of purely speculative trades, and thereby curbing the frequent price fluctuations that can destabilise the market," he said.

4. Intra-day monitoring of position limits

Amid large volumes of trading on expiry day, there is a possibility of undetected intra-day positions beyond permissible limits. "To address the risk of position creation beyond permissible limits...existing position limits for equity index derivatives shall henceforth also be monitored intra-day by exchanges," SEBI said. This will be effective from April 1, 2025.

IMPLICATION: Intra-day monitoring of position limits, rather than just end-of-day checks, reflects a commitment to ensuring real-time compliance with regulatory norms. "By implementing random intra-day snapshots, SEBI is trying to proactively prevent speculative excesses and maintain orderly market behaviour throughout the day," Sharma said.

5. Removal of 'calendar spread' treatment on expiry day

Expiry day can see significant 'basis' risk, where the value of a contract expiring on the day can move very differently from the value of similar contracts expiring in future. Given the large volumes on expiry day, from February 1, 2025, the benefit of offsetting positions across different expiries ('calendar spread') will not be available on the day of expiry for contracts expiring on that day, SEBI said.

IMPLICATION: "This will force players to do rollovers early and not wait until expiry day, easing expiry day 'basis' speculation," Sanghavi said. 'Basis' is the difference between the futures price and stock price, which is majorly impacted during rollovers — ultimately impacting the underlying asset price and leading to undesired movement in prices of all derivatives instruments of the underlying asset.

6. Increase in 'tail risk' coverage on day of expiry

The regulator has increased the 'tail risk' coverage by levying an additional 'Extreme Loss Margin' (ELM) of 2% for short options contracts. ELM is the margin that exchanges charge over and above the normal margin requirement. Tail risk is the chance of a loss due to a rare event. **IMPLICATION:** This will ensure that market participants have more skin in the game, particularly on days when volatility spikes, Sharma said. "It acts as a buffer against abrupt market moves driven by leveraged short options, protecting both investors and the broader market ecosystem from significant downside risk," he said.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

4. Why Tomato Prices Have Soared to Rs 100/kg

Introduction

Tomato prices have surged across India, with rates reaching Rs 120-130 per kg in some areas. In response, the National Cooperative Consumers' Federation of India has begun selling tomatoes at a subsidized rate of Rs 65 per kg in Delhi. Even so, most consumers are paying between Rs 80-90 per kg. Here's why tomato prices are skyrocketing and how long this situation might last.



Reasons for the Price Hike

1. Low Sowing Levels: The primary reason for the price spike is reduced sowing. As of September 20, only 1.98 lakh hectares (lh) of kharif tomatoes had been sown, significantly lower than the target of 2.89 lh and even less than the 2.20 lh sown by the same time last year.

2. Crop Damage: Heavy rains at the end of September caused damage to crops that were ready for market, further reducing supply.

3. Shift to Other Crops: Due to extreme heat last year, many farmers shifted from tomato cultivation to more resilient crops like maize. Maize cultivation has increased from 84.56 lh last year to 88.50 lh this year, thanks to its ability to withstand heat and increased demand for ethanol production.

4. Disease and High Input Costs: Many tomato farmers faced bacterial and viral disease outbreaks in last year's kharif season. Since tomato farming is capital intensive, requiring Rs 1-2 lakh per acre, rising disease-related costs have made it less profitable, causing farmers to avoid planting tomatoes this season.

When Will Prices Fall?

Current wholesale prices of tomatoes in key markets like Pimpalgaon Baswant, Nashik, range around Rs 52-55 per kg. Prices are expected to stay high or even increase further. While fresh supplies from Nashik and Telangana are expected after Dussehra, this relief will be short-lived, as another supply shortage could push prices up again. A significant drop in prices is unlikely before the next major crop arrives in March.

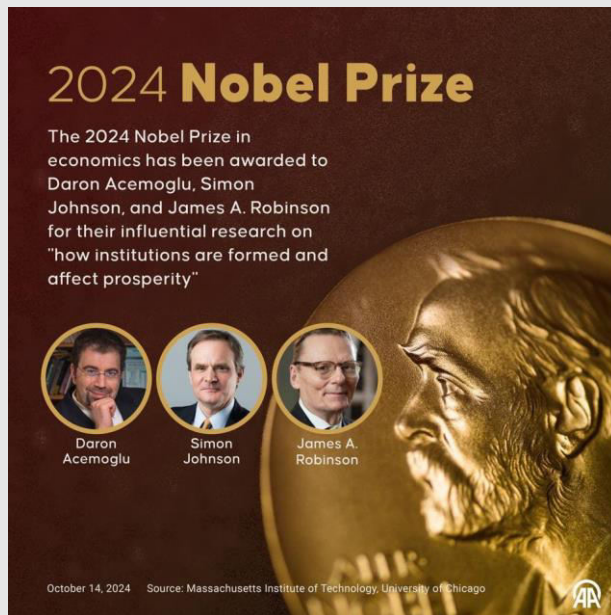
Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

5. A Nobel for explaining why nations fail

Introduction

The 2024 Economics Nobel prize was awarded to U.S. economists Daron Acemoglu, Simon Johnson and James A. Robinson on Monday "for studies of how institutions are formed and affect prosperity." The prize committee credited the winners for enhancing our understanding of the root causes of why countries fail or succeed.



What is their work's significance?

Why are some countries rich while others are poor is a question that has been debated by economists for a long time now. According to the Nobel committee, the richest 20% of countries in the world today are 30 times richer in terms of average income than the poorest 20%. Ever since the Industrial revolution led to the "Great Divergence" in living standards between the East and the West, various theories have been proposed to explain the huge difference in living standards in rich versus poor countries.

Some blame Western colonialism as the primary reason for the Western world's

prosperity even today. Other scholars have argued that disparities in natural resource endowment explains differences in economic prosperity across countries. Some others have argued that intelligence and even historical accidents could explain a nation's fate.

The 2024 Nobel laureates, however, have argued that differences in the quality of economic and political institutions is what best explains the divergence in the economic fates of countries. This thesis is most famously elaborated in the 2012 book *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* written by Daron Acemoglu and James A. Robinson, and also in the 2004 paper 'Institutions as a Fundamental Cause of Long-Run Growth', written together by all three of this year's Nobel laureates.

Why is the quality of institutions so important?

According to Douglass North, a Nobel laureate and a pioneer of New Institutional Economics, institutions are the "rules of the game" that define the incentives of human individuals. For example, institutions that stop the state from seizing the property of honest citizens would give ordinary citizens the incentive to work hard without the fear of expropriation and that in turn would lead to general economic prosperity. Institutions that legalise expropriation, on the other hand, would affect individual incentives negatively and cause economic stagnation.

Now, Acemoglu and Johnson argued in their book that institutions can either be "inclusive" or "extractive". Inclusive institutions are characterised by secure private property rights and democracy while extractive institutions are marked by insecure private property rights and the lack of political freedom. They tried to empirically demonstrate that inclusive institutions lead to long-run economic growth and higher living standards while extractive institutions lead to economic degradation and poverty.

To this end, they studied the kinds of institutions that colonists set up in different colonies and the impact that this had on the long-term economic fate of these colonies. When a colonial power did not want to settle in a certain country for various reasons (such as higher mortality

rates due to geography), it set up institutions that were extractive in nature and inimical to long-term economic growth. This may have been the case in India where the British set up institutions that were mostly devised to plunder resources within a short span of time rather than promote long-term economic growth. But in countries where colonists wanted to settle for the long-run, they set up inclusive institutions that encouraged investment and long-term economic growth over short-term plunder. This may have been the case in the U.S. where the British set up inclusive institutions that promoted long-term economic prosperity.

It should be noted that institutions can also include factors like culture, which influence the more explicit “rules of the game” expressed by political and economic institutions.

Why don't we have more inclusive institutions?

The Nobel laureates have also shed light on why inclusive institutions, which are found to be extremely important for long-term economic growth, have not been adopted by more countries in the world. They attribute this to the different choices that rulers face in their respective countries. When the rulers of a country are able to safely extract sufficient resources for their personal gains through extractive institutions, the laureates argue, they have little reason to bring in political and economic reforms (or inclusive institutions) that can benefit the wider population over the long run. In such cases, extractive institutions may prevail for a really long time as long as the masses do not revolt against the status quo. But if there is a real threat of a popular uprising against extractive institutions, at least some rulers may decide to yield to popular demand and reluctantly set up more inclusive institutions which aid economic growth.

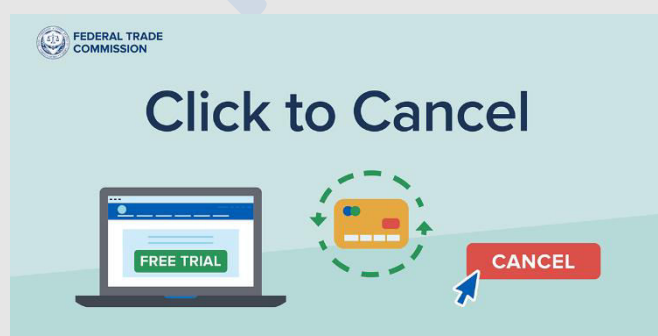
Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

6. What is the new 'click-to-cancel' rule in US?

Introduction

The United States' Federal Trade Commission (FTC) will soon implement a “click-to-cancel” rule, which will make it significantly easier for consumers to cancel their subscriptions and memberships, and make companies liable to face civil penalties for complicating the cancellation process.



What does the new rule say?

According to the FTC press release, sellers will be required to “make it as easy for consumers to cancel their enrollment as it was to sign up”. Notably, cancellations will have to be offered through the same medium (online, phone, etc.) people used to sign up, and it shouldn't be overly burdensome.

Some crucial guidelines are as follows:

- Companies cannot require people to talk to a live or virtual representative to cancel if they did not have to do that to sign up;
- Companies cannot charge extra for phone cancellation, and must answer the phone or take a message during normal business hours. If they take a message, companies have to respond promptly;
- For memberships/subscriptions that were originally offered in person, companies cannot mandate an in-person subscription, and have to offer options for cancellation online or on the phone;

To whom will the rule be applicable to? How?

It will apply to “almost all negative option programs in any media” including “prenotification and continuity plans, automatic renewals, and free trial offers, whether the offer appears online, on the phone, or in person.”

The FTC defines “negative option” programmes as “companies assuming a customer accepted a service unless they specifically rejected it”. This would include something like a consumer agreeing to a one-week trial, and not cancelling it before being billed for regular membership. The final rule will provide a legal framework preventing sellers from:

- Misrepresenting any material fact made while marketing goods or services with a negative option feature;
- Failing to clearly and conspicuously disclose material terms prior to obtaining a consumer’s billing information in connection with a negative option feature;
- Failing to obtain a consumer’s express informed consent to the negative option feature before charging the consumer; and
- Failing to provide a simple mechanism to cancel the negative option feature and immediately halt charges.

Why was this rule brought in?

The rule is part of the FTC’s ongoing review of its 1973 Negative Option Rule, which the agency is modernising to “to combat unfair or deceptive practices related to subscriptions, memberships, and other recurring-payment programs in an increasingly digital economy where it’s easier than ever for businesses to sign up consumers for their products and services”. According to the Commission, while negative option marketing programmes are convenient for sellers, the FTC receives thousands of complaints about negative option and recurring subscription practices each year, with the number of complaints steadily rising over the past five years. In 2024, the number of daily complaints rose to nearly 70, up from 42 in 2021.

According to Forbes, the heightened concern around hard-to-cancel subscriptions and memberships has materialised alongside a growing subscription economy, and a spike in subscription prices.

A study conducted in 2022 by Michigan-based C R Research found that 42% of consumers had forgotten they were paying for services they did not use, and that customers generally underestimated the monthly cost of their subscriptions by an average of \$133.

In the past, the FTC has gone after companies like Adobe, Amazon, Brigit, and Planet Fitness for allegedly making consumers' subscriptions hard to cancel.

Is there a similar regulation in India?

No. India does not have any such regulation at the moment.

Relevance: GS Prelims; Economics

Source: Indian Express

7. Did Google violate antitrust laws in Epic battle?

Introduction



Google Found in Violation of Antitrust Laws in Epic v. Google

On October 7, U.S. District Judge James Donato issued an injunction against Alphabet-owned Google, ordering the tech giant to open up its Play Store to third-party apps. The ruling prohibits Google from cutting exclusive deals with app developers and phone manufacturers, requiring them to pre-install the Play Store on their devices. Furthermore, Google is now required to allow app developers to offer alternative payment options within their apps.

What has been Google's response?

Google has already appealed the decision, and in a company blog post, it expressed concerns that the ruling could undermine consumer privacy and security, make it more difficult for developers to promote their apps, and reduce competition on mobile devices. But the court's decision is seen by many as a crucial turning point in the ongoing battle between developers and app store operators over market control.

What's the background to this injunction?

Legal tensions between app developers and major app store operators like Google and Apple have been escalating for several years. A major flashpoint came in August 2020, when Tencent-backed Epic Games —the maker of Fortnite — introduced a direct payment option in its app, bypassing both Google's and Apple's mandatory in-app billing systems. By doing so, Epic circumvented the hefty commissions that both platforms charge developers for in-app purchases and subscriptions. For Epic Games, these commissions typically range from 15-30%. Fortnite, which operates under a free-to-play model, generates revenue through in-app purchases and other gameplay-related items. Epic's CEO Tim Sweeney took issue with Google's cut from every transaction made through Android devices, believing it was unjust

and restrictive. In retaliation, both Google and Apple removed Fortnite from their respective app stores, leading Epic to file two separate antitrust lawsuits — one against Google and the other against Apple. This move was seen as a direct challenge to the tech giants' dominance in the app store economy and brought the issue of digital monopolies to the forefront.

The legal battle between Epic Games and Google has been drawn out over several years, with various pieces of evidence surfacing during the trial. A key argument from Epic was that Google's practices — such as making exclusive agreements with developers and enforcing the use of its own billing system — were inherently anti-competitive. Google had made deals with companies like Activision Blizzard and Nintendo, offering incentives such as lower commissions to get their apps and games onto the Play Store while requiring them to use Google's billing system.

The case was a jury trial, and in December 2023, the jury unanimously found that Google had engaged in anti-competitive practices that harmed Epic's business and stifled competition for other developers. This ruling ultimately led to Judge Donato's injunction.

How do Epic's lawsuits against Google and Apple differ?

While Epic filed similar antitrust lawsuits against both Google and Apple, the outcomes of these two cases have been quite different. Epic's lawsuit against Apple, which was a bench trial, resulted in a mixed ruling. U.S. District Judge Yvonne Gonzalez Rogers found that while Apple was not a monopoly in the app marketplace, it had still imposed some anti-competitive policies. The court ordered Apple to allow developers to offer payment options for in-app purchases, but Epic was required to pay damages for violating Apple's developer agreement. However, the injunction against Google presents a stark contrast. As the Google case was tried before a jury, Epic had a greater opportunity to present evidence of Google's exclusive agreements with other developers, which helped convince the jury that Google had violated antitrust laws. This difference in how the cases were handled — bench trial versus jury trial— had a significant impact on the outcomes.

How will it impact the app economy?

The implications of these rulings, especially the injunction against Google, could be profound for the app economy, which is valued at over \$250 billion and is largely controlled by Google Play Store and Apple's App Store. First, Google and Apple will need to revise their app store policies to accommodate more developer-friendly terms, such as allowing alternative payment methods and perhaps reducing the commissions they charge on in-app transactions.

Moreover, the injunction against Google could open the door for alternative app stores, which would reduce the near-total control Google and Apple have over app distribution. For consumers, this might mean lower prices for apps, subscriptions, and in-app purchases, as developers will no longer be forced to pay high commissions to app store operators. The knock-on effect could be significant, allowing smaller developers to pass on savings to consumers and potentially lowering the barrier to entry for new app makers.

However, one potential downside is app discoverability. Today, developers only need to create and promote their apps on two major platforms — Google’s Play Store and Apple’s App Store. But in a world with multiple app stores, smaller developers may find it harder to get noticed and attract customers across these fragmented marketplaces. Overall, these legal decisions mark a major shift in how the app economy may operate going forward. They reflect growing scrutiny of big tech companies and their influence over digital marketplaces, which could pave the way for more open competition and fairer terms for developers.

Relevance: GS Prelims; Economics

Source: The Hindu

8. More rural households now ‘agricultural’: what data says, what this means

Introduction

Is dependence on farming for livelihoods and incomes rising in India, reversing a decades-old trend of the rural countryside becoming increasingly less tethered to agriculture?

The All India Rural Financial Inclusion Survey for 2021-22, released earlier this month, found that 57% of rural households in the country — including households in semi-urban centres with a population of less than 50,000 — were “agricultural”. This was significantly higher than the 48% reported in the previous survey of 2016-17.

Findings

The survey, commissioned by the National Bank for Agriculture & Rural Development (NABARD), defined an “agricultural household” as one that (i) reported a total value of produce from farming exceeding Rs 6,500 (be it cultivation of field and horticulture crops, livestock and poultry rearing, or aquaculture, sericulture and apiculture); and (ii) had at least one member who was self-employed in such activities during the reference year (July 2021 to June 2022). In the 2016-17 survey, the threshold cut-off value of produce was Rs 5,000.

More krishi in Bharat

The share of rural households identified as agricultural, based on the above definitions, has gone up for nearly all states between 2016-17 and 2021-22. (see Table)

Also, the all-India average monthly income of agricultural households, at Rs 13,661 in 2021-22, was more than the Rs 11,438 for non-agricultural rural households. In the 2016-17 survey, too, agricultural households earned a higher average monthly income (Rs 8,931) compared with their non-agricultural rural counterparts (Rs 7,269).

Within agricultural households, the contribution of cultivation and animal husbandry to total income was over 45% in 2021-22, up from 43.1% in 2016-17. This increased share of income from farming activities was seen for agricultural households across most size classes of land possessed: from 23.5% to 26.8% for those with less than 0.01 hectare, from 38.2% to 42.2% for those with 0.01-1 hectare, from 52.5% to 63.9% for those with 1.01-2 hectares, and from 58.2% to 71.4% for those with more than 2 hectares.

% SHARE OF AGRICULTURAL TO RURAL HOUSEHOLDS

	2016-17	2021-22		2016-17	2021-22
J & K	*77	**73	Uttarakhand	41	57
Jharkhand	51	69	Karnataka	59	55
Assam	47	67	Telangana	47	55
Uttar Pradesh	63	66	Gujarat	58	54
Chhattisgarh	55	66	Andhra Pradesh	34	53
Rajasthan	63	66	West Bengal	35	49
Madhya Pradesh	58	64	Bihar	47	45
Himachal	70	63	Tripura	39	40
Odisha	58	60	Punjab	42	36
Maharashtra	36	59	Kerala	13	18
Haryana	34	58	Goa	3	18
Tamil Nadu	13	57	All- India	48	57

*Includes only Jammu; **Excludes Ladakh.

Source: NABARD All India Rural Financial Inclusion Surveys, Data (In %)

AGRICULTURE SECTOR'S SHARE OF WORKFORCE (%)



Source: NSSO Employment & Unemployment Surveys (till 2011-12) and Periodic Labour Force Surveys (from 2017-18).

Percentage share of agricultural to rural households

Simply put, the proportion of households in rural India reliant on agriculture as a livelihood source has registered a sharp increase between 2016-17 and 2021-22. Even for agricultural households, the income from farming has gone up as a share of their overall income. There is correspondingly a smaller share of income coming from non-farm sources (such as government/private jobs, self-employment, wage labour, rent, deposits and investments), which applies to all land size categories.

The recent period, in other words, has witnessed more, not less, of krishi (agriculture) in rural India or Bharat. Not only is there a higher share of agricultural households, their incomes are less diversified than before, and they are earning more from farms.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

9. Overflowing Godowns, Unhappy Millers: Why Punjab's paddy procurement has been delayed

Introduction

The paddy procurement process in Punjab has been marred by significant delays and mismanagement this year.

Despite favourable weather conditions, the pace of harvesting has slowed down due to almost 90% of the procured crop being stuck in mandis, and private rice millers refusing to store government paddy. This situation, stemming from a combination of logistical, bureaucratic, and political factors, is likely to worsen without swift intervention.

FARMERS PROTEST IN PUNJAB OVER DELAYED PADDY PROCUREMENT



How does paddy procurement work?

The Centre, in consultation with state governments and the Food Corporation of India (FCI), finalises estimates for paddy procurement every year prior to the commencement of the kharif marketing season (October to September).

State government agencies and the FCI purchase paddy from farmers within a stipulated period for the central pool at the Minimum Support Price (MSP). This paddy is

milled, after which the procured rice is transported by the FCI to government storage facilities across the country. There it is stored for maintaining the buffer stock, or further distributed for consumption under the National Food Security Act (NFSA) and other welfare schemes.

What is the current status of paddy procurement in Punjab?

As of October 23, only 37.68 lakh tonnes of paddy has been procured by the FCI from Punjab, well below the 49 lakh tonne mark at the same time last year, and a far cry from the expected 185 lakh tonnes for the entire season. The peak procurement season ends in the first week of November.

The slow movement of procured paddy from the mandis (grain markets) is the biggest concern. While around half of the procured paddy had already been moved out of the mandis this time last year, this year a little more than a tenth of the procured paddy (10.55% or 8.7 lakh tonnes) has left the mandis. This is glut of paddy in the mandis is slowing down the entire procurement process.

What explains this situation in Punjab?

There are three primary factors at play.

Lack of storage space: Private rice millers are resisting taking in government paddy due to a space crunch in government go-downs. Millers are concerned that they would themselves have to store this paddy for an entire year — something not many are keen to do.

This problem emanates from a previous one. Punjab, this year, could move only 7 lakh tonnes of the roughly 124 lakh tonnes of milled rice in its government godowns. This has left very little space in these godowns to store milled rice from this year.

Controversy around hybrids: Adding to the problem are certain privately-developed hybrid varieties that have seemingly inundated the market this year. Millers claim that these non-recommended hybrids are responsible for a lower milling out-turn ratio (OTR) than FCI standards demand, making them a loss-making proposition.

OTR refers to the proportion of rice that is extracted from paddy after the milling process. Millers have to deliver an OTR of 67% per quintal. If the out-turn is lower, they must pay the government for the difference. Millers say that the hybrids in question have an OTR of only 60% to 62%, leading to a loss of roughly Rs 300 per quintal .

Troubles from labour, arhtiyas: Arhtiyas (commission agents) are the middlemen in the grain procurement process. They are now demanding a compensation of 2.5% on crop purchase as opposed to the current system of fixed remuneration of Rs 46 per quintal. Mandi labourers too are seeking higher wages, comparable to their counterparts in Haryana. Protests by these groups have further stalled the procurement process.

What is the impact of the delay in paddy procurement?

* Only 22% of the paddy crop has been harvested so far — roughly 20% less than last year. Farmers are deliberately slowing down the harvest process because mandis simply do not have space to store their crop. They hope this would mitigate the risk of distress sales caused by the grain spoiling in poor storage conditions.

However, the longer paddy stands on the field, the greater the risk of weight loss and overall quality deterioration, which too leads to a fall in prices. This means that a persistent delay in paddy procurement will lead to significant economic distress among farmers.

* With farmers typically sowing the winter wheat crop in November, a delay in harvesting paddy also threatens to throw off the state's agricultural cycle. This too can be very damaging for the state's agriculture sector.

Moreover, a smaller window between harvesting paddy and sowing wheat is also likely to lead to more stubble fires, which lead to air pollution across much of North India.

* A prolonged crisis could also spark unrest among farmers. This could quickly spiral into a law and order problem for the state, which would further compromise Punjab's ability to manage the situation.

How can this crisis be managed?

The government urgently needs to find temporary storage solutions. The most readily available such solution would be to store paddy in Punjab's 5,000 odd rice mills. But to do this,

the government must first address the millers' concerns which include OTR trials for hybrid varieties, and stricter regulation of seed certification.

Better coordination between procurement agencies, transportation networks, and storage facilities, as well as timely payment of arhtiya commissions, and addressing labour demands will also help in improving the procurement process.

In the long term, Punjab must diversify its crop base to avoid the problem of surplus which lies at the heart of the current crisis.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

10. What is the livestock census and why is it conducted?

Introduction

Rajiv Ranjan Singh, the Union Minister of Fisheries, Animal Husbandry and Dairying, recently launched the 21st Livestock Census in New Delhi.

What is the livestock census all about?

Conducted every five years, the census carries out a headcount of the number of domesticated animals, poultry, and stray animals in the country. The census takes into account information about the species, breed, age, sex, and ownership status of the animals in question.



Since 1919, a total of 20 livestock censuses have been carried out so far, with the last being conducted in 2019. The enumeration process for the 21st census will take place between October 2024 to February 2025.

Over the next few months, some 87,000 enumerators will visit each and every independent house, apartment, and enterprise, as well as institutions such as gaushalas (cattle sheds), dairy farms, poultry farms, veterinary colleges, and defence establishments, to gather information about livestock in India. The

census is expected to cover 30 crore households in India.

Which animals will be counted in the 21st census?

According to the Department of Animal Husbandry and Dairying, information on sixteen animal species will be collected in the 21st census. These include: cattle, buffalo, mithun, yak, sheep, goat, pig, camel, horse, ponies, mule, donkey, dog, rabbit, and elephant. In total, the

census will capture information on 219 indigenous breeds of these sixteen species recognised by ICAR-National Bureau of Animal Genetic Resources (NBAGR).

Besides these, the census will also carry out a headcount of poultry birds such as fowl, chicken, duck, turkey, geese, quail, ostrich, and emu.

What is the objective of the livestock census?

The livestock sector plays an important role in providing employment to people in rural areas. In terms of productivity, especially in the agriculture sector, poultry and animal husbandry contributes to roughly 30% of the Gross Value Added (GVA). In the economy overall, the livestock sector's GVA stands at roughly 4.7%. For comparison, the whole agriculture sector contributes to a GVA of roughly 15%. GVA refers to the total output of a sector minus the cost of intermediate consumption.

Among other things, the data of the census will be used to estimate GVA from the livestock sector. It will also help formulate and implement policies relating to the census. "Livestock Census shapes policies, ensures sustainable growth of India's Livestock Sector," Union Minister Singh said while launching the census exercise.

The data from the census will also be crucial to track progress of achieving Sustainable Development Goals (SDGs) of the United Nations. The Livestock Census will provide data pertaining to Goal 2 (Zero Hunger), and Target 2.5 (to maintain genetic diversity in food and nutrition), specifically Indicator 2.5.2 (The percentage of local livestock breeds that are at risk of extinction) of the SDGs.'

How will the 21st livestock census be different from the previous exercises?

The census this time will be fully digitised, like the last one in 2019. This will include "online data collection through a mobile application, monitoring at various levels through a digital dashboard, capturing the latitude and longitude of data collection location, and generation of livestock census report through software."

The 21st census will capture several new data points. These include:

- **Data on pastoral animals, pastoralists:** The census will, for the first time, collect data on the contribution of pastoralists to the livestock sector, their socio-economic status, and livestock holding.
- **More details, granular information:** The census will find out the proportion of households whose major income comes from the livestock sector. It will also contain data on the gender of stray cattle.

What did the 2019 Livestock Census find?

535.78 million was the total livestock population of India. This included:

- 192.9 million cattle
- 148.88 million goats
- 109.85 million buffaloes

- 74.26 million sheep
- 9.06 million pigs

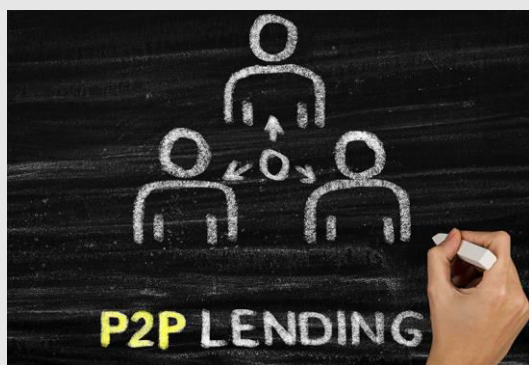
All other animals taken together contributed just 0.23% of the total livestock population in India.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

11. The rise and fall of P2P lending in India

Introduction



After the Reserve Bank of India's clampdown on peer-to-peer (P2P) exchanges in August this year, the industry's asset under management (AUM) plummeted by 35% — from an estimated ₹10,000 crore to ₹6,500 crore. No surprises there, since the RBI's restrictions targeted features that were most attractive to potential investors — tenure-linked assured minimum returns and liquidity options — apart from mandating T+1 settlement cycle. A P2P platform's role is limited to facilitating transactions

between lenders and borrowers without participating directly in the lending or borrowing process. While opinions differ on the industry's ability to comply with the new norms, businessline takes a look at the past, present and likely future of P2P lending in India.

Informal lending

Talk of regulating P2P lending first emerged in 2016, to curb informal money-lending. Citing the global pickup in P2P lending and newer entrants in India, the RBI floated a discussion paper on whether regulation was needed or not.

The arguments against included inadvertently lending credibility to P2P lending, with the stamp of regulation; stifling growth; and the absence of any immediate systemic risk from the nascent sector. After the feedback from stakeholders, the RBI in 2017 issued master directions on P2P lending in India, specifying the scope of activities for the lenders, eligibility criteria, and transparency and pricing disclosure requirement, among others.

What went wrong?

According to an RBI official, who requested anonymity, P2P exchanges began acting like a bank, drawing the ire of the regulator. They pocketed the spread between the borrowing rate and the interest that a lender charged on the platform. The RBI's restrictions soon followed. The regulator declared that P2P exchanges cannot utilise the funds of one lender to replace those of another, effectively killing the secondary market. It also stressed that P2P players must disclose their fees at the time of lending.

The RBI also disallowed the practice of matching and mapping participants within a closed user group, whether through an outsourcing agency or otherwise.

What lies ahead?

There are divergent views on the future of P2P lending in India. A large P2P exchange has stopped onboarding new customers since August 16, leading to 30-35 % loss in AUM, an official said. "RBI officials are visiting our offices to assess whether we are in compliance with the new norms. If some of the secondary market features are not revived, the industry may see a sharp fall in volumes. Large players like us are thinking of giving up the licence," a company official said.

But not all are pessimistic. Bhavin Patel, founder and CEO, LenDenClub, says in any regulated business some players will push boundaries till the industry reaches product-market fit. "Auto-lending were discontinued, as it needed flow change, but it did not affect customers," he said.

Relevance: GS Prelims & Mains Paper III; Economics

Source: The Hindu

12. What is the Hibox 'investment' scam, in which Indians have lost Rs 1,000 crore?

Introduction



A large number of Indians are estimated to have lost a cumulative Rs 1,000 crore after being cheated in the so-called Hibox application scam, in which they were offered high interest on their "investments". The app was promoted by popular influencers on social media and YouTube, some of whom have been summoned by investigators.

The alleged scam is being investigated by the Intelligence Fusion and Strategic Operations (IFSO) unit, a specialised wing of the Delhi Police focused on cyber crime, which is also looking into the role of digital payments platforms PhonePe and Easebuzz, on which the alleged scamsters operated merchant accounts.

Hundreds of complaints received by police have been clubbed with FIRs registered in all the police districts of Delhi.

What is the alleged Hibox mobile app scam?

The modus operandi was simple and well worn. Would-be victims were invited to "invest" money through the app with the promise of extremely high returns. Early "investors" were

rewarded with the promised amounts, which drew in more people, until one day the “returns” stopped coming and the individuals behind the app disappeared.

Police official explained how the alleged scam worked: “They (the alleged scamsters) lured victims with the help of social media influencers and YouTubers, convincing them to invest in their platform. The investors were promised guaranteed returns of 1 per cent to 5 per cent daily, amounting to 30 per cent to 90 per cent monthly.

“More than 30,000 people invested their hard-earned money in the Hibox app. However, the platform has since stopped releasing funds to the investors, and the companies have disappeared after closing their office in Noida,” he said.

When did the alleged scam come to light?

On August 16, police received complaints from 29 persons at the IFSO unit, who said they were promised guaranteed daily returns of 1 per cent to 5 per cent.

“One thing that all the complainants said was they had decided to invest in Hibox after they found that the app was promoted by many social media influencers and YouTubers.

After conducting an initial inquiry into the complaints, police registered an FIR on August 20, and subsequently discovered that a similar FIR had been registered at the cyber police station of North Delhi, where nine persons complained of being cheated in similar manner.

What did the investigation find?

After details of payment gateways and bank accounts involved were collected, it was found that payment gateways Easebuzz and PhonePe were used to transfer moneys.

What is the current status of the investigation?

A look-out circular has been issued against the directors of Hibox, who are currently abroad. Tiwari said the role of Easebuzz and PhonePe are under investigation. Several YouTubers and social media influencers have been asked to join the investigation.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

1. The Problem of Farm Fires in Punjab and Haryana

Introduction

Farm fires in Punjab and Haryana are caused by the narrow window between paddy harvesting and wheat sowing. Farmers often burn crop stubble to quickly prepare fields, contributing to severe air pollution in northern India. A long-duration rice variety, Pusa-44, is a major contributor to this issue due to its late harvest.



Pusa-44: A High-Yield but Problematic Variety

Pusa-44 is a popular rice variety due to its high yield of 35-36 quintals per acre, outperforming competitors like PR-126. However, Pusa-44 takes 155-160 days to mature, leaving farmers with little time to prepare for wheat sowing. As a result, many resort to burning stubble, which is quicker and cheaper than using expensive machines to clear the fields.

The Search for a Solution: Pusa-2090

To address this problem, the Indian Agricultural Research Institute (IARI) has developed a new rice variety, Pusa-2090, which matures in 120-125 days—much faster than Pusa-44. This early maturity reduces the need for stubble burning by giving farmers more time to prepare their fields for wheat or other crops.

Benefits of Pusa-2090

Pusa-2090 has several advantages:

- It yields 34-35 quintals per acre, almost as high as Pusa-44, but matures 35 days earlier.
- Early maturity leads to water savings, requiring 5-6 fewer irrigations compared to Pusa-44.
- The variety has a strong stem, making it resistant to lodging (bending over or falling due to wind or rain).
- It is highly responsive to nitrogen, similar to Pusa-44, which helps maintain high productivity.

Farmer Feedback

Farmers like Harpreet Singh have begun planting Pusa-2090 and are optimistic about its potential. Singh, who previously grew Pusa-44, has switched to Pusa-2090 on 10 acres, expecting a yield of 35 quintals. The earlier harvest gives him time to plant other crops like potatoes or wheat.

The Future of Pusa-2090

Farmers and seed entrepreneurs believe Pusa-2090 could replace Pusa-44, especially since the latter is banned due to its environmental impact. If Pusa-2090 can consistently deliver high

yields and meet milling quality standards, it could help reduce farm fires and improve air quality in northern India.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

2. How elephants are counted, why methods need a rethink

Background

The Environment Ministry has shelved its elephant census report, 'Status of Elephant in India 2022-23', citing a delay in the census in the Northeast. The report on the current status of the national heritage animal in the rest of India has been printed but its release is now on hold until at least June 2025.

ELEPHANT NUMBERS IN INDIA (2012-2023)

States	2012	2017	2022-23	Change
Tamil Nadu	4015	2761	3136	13.6%
Karnataka	6068	6049	6013	-0.6%
Kerala	6117	5706*	2785	-51.2%
Maha (W Ghat)	4	6	27	350%
Western Ghats	16204	14522	11961	-17.6%
WB (South)	0	194	31	-84%
Jharkhand	688	679	217	-68%
Odisha	1930	1976	912	-54%
Chhattisgarh	247	247	451	82.6%
Madhya Pradesh	0	7	97	1286%
Maha (Gadchiroli)	0	0	36	NA
Andhra Pradesh	41	65	120	84.6%
Central & Eastern	2906	3168	1864	-41%
Uttarakhand	1346	1839	1792	-2.6%
Uttar Pradesh	291	232	257	11%
Bihar	0	25	13	-48%
Shivalik-Gangetic	1637	2096	2062	-1.6%
Haryana	0	7	0	NA
Himachal Pradesh	0	7	0	NA
A&N	0	25	NA	NA
India (Except NE)	20747	19825	15887	-20%
Arunachal Pradesh	890	1614	Pending	NA
Assam	5620	5719	1031^	NA
Megalaya	1811	1754	Pending	NA
Nagaland	212	446	Pending	NA
Mizoram	0	7	Pending	NA
Manipur	0	9	Pending	NA
Tripura	59	102	Pending	NA
WB (North)	647	488	423^^	NA
North East	9239	10139	9866#	NA

* Revised count. Initial count was 3054

NE figures are extrapolated from 2017, count pending

^ Only in Manas TR | ^^ Only in Buxa TR

Data: MoEF/WII

Elephant numbers are down

Data from the unreleased report show a sharp decline in elephant populations in the east-central and southern landscapes. The slide in numbers is especially dramatic in Southern West Bengal (84%), Jharkhand (64%), Odisha (54%), and Kerala (51%).

The report identifies "mushrooming developmental projects" such as "unmitigated mining and linear infrastructure construction" as a significant threat to the species.

The Environment Ministry has pointed out that the elephant census employed refined methodologies, suggesting that these numbers may not be comparable with the outcomes of previous censuses that have been conducted every five years since the 1990s.

However, the new counting methods may not fully explain the fall in elephant numbers. "The new method based on DNA profiling has not brought down the numbers in the northern (Shivalik Hills and Gangetic Plain) landscape where the latest figure (2,062) closely aligns with the outcome of the previous census (2,096)," a wildlife biologist based in Bengaluru pointed out. "So, the drastic fall in numbers elsewhere can't be dismissed as a fallout of methodological variation," the biologist said.

Old counting methods

Until 2002, elephants were counted in India by the “total direct count” method, which means a simple head count of elephants that were sighted. This method has “limited or no scientific basis for large landscapes or populations”, the latest census report says.

In 2002, the “indirect dung count method” was introduced in the southern states. Enumerators walked in pre-designated straight lines through the forest and recorded elephant droppings and the “dung decay rate”. The data were extrapolated to estimate elephant density in an area by factoring in the “defecation rate” of elephants.

Around the same time, the “total direct count” method was modified to “sample block counts” — or a survey of limited areas of 5 sq km each to maximise the probability of detection and enumeration of all elephants in that block. Elephant densities in the surveyed blocks were then extrapolated to estimate populations in larger areas.

Elephants and tigers

On the occasion of World Elephant Day (August 12) in 2021, Environment Minister Bhupender Yadav announced that the government would “harmonise population estimation methods along more scientific lines” by “converging elephant and tiger population estimation” for the first time.

In this method, the entire forest area is broken down into similar-sized cells or blocks (say, A, B, C, and D) where ground surveys are conducted to look for tiger signs (pug marks, droppings, etc.) and identify tiger-occupied forest cells (say, A, B and D).

The survey also assesses a range of “co-variables” — common variable factors such as the quality of vegetation, availability of prey, distance from water/ nightlight, degree of human disturbance etc. — to determine the relative tiger-holding potential of these blocks. For example, if A has the highest tiger potential with a score of 100, the indexed score for B and D could be, say, 75 and 50.

Mark-recapture method

For logistics, camera traps are set up only in a limited area (say, B). After each round of photography, the tigers that are snapped are identified using their unique stripe patterns.

The next step employs the statistical method of “mark-recapture”, which relies on the number of common — recaptured — individual tigers photographed in two consecutive rounds. The bigger the population, the lesser the chances of a tiger being recaptured, and vice versa.

Based on this, estimators derive a tiger number and density (number per 100 sq km) for forest cell B, which is then extrapolated for forest cells A and D where no camera was set up. If, say, the tiger density estimated in B is 12, in A and D, using their co-variate scores, it would be 16 and 8.

The Synchronous All India Elephant Estimation 2022-23 (SAIEE 2023) differed from this tiger census method in only one aspect: it used a genetic mark-recapture model.

The elephant hide has no unique markings like tiger stripes. So elephant dung samples collected during ground surveys were analysed in the lab to identify unique elephants by differentiating individuals based on eleven microsatellite loci (genetic markers).

Why the delay hurts

Irrespective of the refinement in census methodology and the delay caused by logistical limitations, the results that are already available should not be held back, experts said. "This helps neither science nor governance. This is precious data obtained by spending public money. The five-year census cycle is overdue. There is no reason why available data should not be in the public domain and guide policies," a former member of the Environment Ministry's National Board for Wildlife said.

An elephant researcher familiar with the census efforts in Assam and Arunachal Pradesh said the Northeast numbers are unlikely to salvage the downward trend. "If modelled correctly, the results from the Northeast will also show a 20-25% fall or correction, whatever you call it. The government is only buying time," he said.

A retired forest officer from Odisha said the delay could prove costly for elephant populations in distress. "While habitat loss and conflict are common threats to elephants across India, certain risks are landscape-specific. In Odisha, for example, it is mining and low-hanging power lines. The drastic fall in our elephant numbers should have triggered intervention by now," he said.

Why the numbers matter

In 2023, Karnataka, Tamil Nadu, and Kerala used a protocol combining the block count and dung count methods, which, the unreleased report said, "finds corroboration through genetic mark-recapture methods used in SAIEE 2023" — suggesting its potential scalability for future large-scale adoption in combination with genetic mark-recapture in selected sites.

The 2017 elephant census report had underlined why it was "desirable to maintain some level of continuity with the previous population estimations to make a meaningful comparison with past figures to infer broad trends".

Absolute numbers for elephants or tigers have no meaning beyond news headlines, a senior forest officer from Karnataka said. "We estimate populations to know how a species is doing in the wild. So continuity is important for comparison. When we claim to have drastically improved the method, we have to accept the new baseline data as a reality check without worrying about the optics."

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

3. Why is salt pan land being used for homes?

Introduction

The Maharashtra government has issued a GR (Government Resolution) allocating 255.9 acres of salt pan land, distributed over three land parcels in Mumbai's eastern suburbs, for the construction of rental houses in the Dharavi Redevelopment Project through a lease agreement.

What are salt pans?

Salt pan lands are ecologically important salt marshlands. They are low-lying areas around the shore that are used for salt cultivation. They act as holding ponds and work as a sponge for the absorption of rain. They are a coastal area's natural defence against flooding. They help intertidal activity, and are home to diverse flora and fauna.



What does the decision entail?

The government has allocated 255.9 acres of salt pan land distributed over three land parcels — 120.5 acres of Arthur Salt Works land at Kanjur, 76.9 acres of Jenkins Salt Works land at Kanjur and Bhandup, and 58.5 acres of Jamasp Salt Works land at Mulund — to Dharavi residents. Maharashtra has almost 13,000 acres of salt pan land, of which over 5,000 acres are in Mumbai. The DCPR-2034 (Development Control and Promotion Regulations) document says 1,781 acres of that land can be developed. The land parcels allocated for rental housing for the Dharavi project are under the ownership of the Central government. After the Maharashtra government sought these parcels from the Centre, the Union Cabinet approved the proposal in September 2024.

What are the terms for allocation of land?

Four conditions have been put forth for the allocation of the land which will be given at a concessional rate of 25% of the prevailing rate. The State government will collect the land revenue from the Dharavi Redevelopment Project Private Limited (DRPPL), the special purpose vehicle (SPV), and pay it to the Central government. The DRPPL will bear the cost of resettlement of the labourers working on the land, and other incidental costs for the acquisition of the land. But the court cases and other legal matters will be handled through the Dharavi Redevelopment Project (DRP), a government body. The land will be used for rental housing, slum rehabilitation, and affordable housing for economically weaker sections. The DRPPL is an SPV in which an Adani Group entity holds 80% stake and the State government has a 20% stake. The land will be leased to the Maharashtra government for a period of 99 years, and it cannot be used for commercial activities.

What are the concerns?

Urban planners and environmentalists say that an impact assessment study needs to be done before opening up large packs of land for intensive activities like housing. They also say that the salt pan lands on the Eastern Express Highway have played an important role in keeping the eastern suburbs free from flooding. The most important demand with respect to the Dharavi project has been for in-situ rehabilitation. Urban planners point out that handing over land parcels in different parts of the city for a developer will lead to formation of ghettos. They also say that the impact of hyperactivity on ecologically sensitive areas needs to be studied.

What lies ahead?

The Centre will hand over the land to the State government, which will give permission to DRPPL to go ahead with the construction after their plans are approved. For that, the DRPPL will have to seek an approval from the Ministry of Environment, Forest and Climate Change. Environmentalists claim that the entire process from here on can be challenged in the court of law. As per the GR issued by the government of Maharashtra, the litigation will be taken care of by DRP, the government body. The Bureau of Indian Standards (BIS) has begun the process of formulating a National Agriculture Code (NAC), on the lines of the existing National Building Code and National Electrical Code. What is the NAC, and why is it needed?

Relevance: GS Prelims & Mains Paper III; Environment

Source: The Hindu

4. Greenwashing guidelines: How govt is tackling companies making dubious climate-friendly claims about products

Introduction

Seeking to restrain companies from making false or misleading claims about the environment-friendly nature of their products or services, the Centre recently released new guidelines that make it mandatory for companies to substantiate their claims with scientific evidence.



The Guidelines for Prevention and Regulation of Greenwashing or Misleading Environment Claims were issued by the Central Consumer Protection Authority (CCPA) which works under the Consumer Affairs Ministry. The move is part of the government's crackdown on misleading advertisements. The new norms would complement the existing Guidelines for Prevention of Misleading Advertisements and Endorsement for Misleading Advertisements, framed in 2022, which deal with false or exaggerated claims in advertisements in general.

What is greenwashing?

Although greenwashing as a term has been used in the limited context of advertising in these guidelines, it has a much broader scope. Greenwashing refers to the growing tendency of companies, organisations or even countries to make dubious or unverifiable claims about their activities, products or services being environment-friendly or climate-friendly. Due to heightened sensitivity to climate change, there is rising pressure on corporations and governments to carry out their activities in a way that causes the least damage to the environment. Many of them also have legal commitments, or targets, to adhere to in this regard.

As a result, companies and governments often make claims that are exaggerated, misleading, or, in some cases, wrong. The 2015 Volkswagen scandal, in which the German car company was found to have been cheating in emissions testing of its supposedly green diesel vehicles, is one of the headline-grabbing examples of greenwashing. Several other big corporations, including Shell, BP, and Coca Cola have faced accusations of greenwashing.

Countries too, are sometimes accused of greenwashing, for example, when they exaggerate their forests' potential to absorb carbon dioxide, and the impact of a new regulation on carbon emissions. Carbon trading mechanisms, an otherwise legitimate exercise, often come under

scrutiny because the processes followed in the generation of credits for trade might not be scientifically robust. Similarly, carbon offset practices, in which a carbon-intensive activity such as air travel is sought to be compensated with another activity like planting a certain number of trees, offer ample scope for greenwashing.

Sometimes companies do make genuine mistakes — overestimating the impact of their environment-friendly projects. However, very often they lie, or mislead, and these constitute the more serious cases of greenwashing.

Such unfair practices have become widespread enough that United Nations Secretary-General António Guterres had to call for a zero-tolerance policy for greenwashing a couple of years ago. The UN had also constituted a high-level expert group to suggest measures to curb greenwashing by non-state entities such as corporations, financial institutions, cities or regions that have net-zero commitments to meet.

The expert group gave several recommendations, including that corporations pursuing net-zero targets must not be allowed to make fresh investments in fossil fuels. It also suggested that corporations must be asked to present short-term emission reduction goals on the path to achieving net-zero, and must bring an end to all activities that lead to deforestation. In addition, the corporations were advised not to use offset mechanisms at the start of their journey to net-zero status.

What are the advertising guidelines for preventing greenwashing?

The mandate of CCPA is to protect consumer interest and therefore, its guidelines are limited to curbing greenwashing in advertisements of products or services. They define greenwashing as “any deceptive or misleading practice” that conceals, omits or hides relevant information, or exaggerates, or makes vague or unsubstantiated environmental claims about the product or service. Use of misleading words, symbols or imagery, emphasizing positive environmental attributes while downplaying or concealing negative aspects would constitute greenwashing, according to the guidelines.

However, they allow the use of “obvious hyperboles” or “puffery”, which is central to the advertising business, if these do not amount to deception or misleading practice.

If a company, for example, makes the statement that its growth is based on “sustainable principles”, it would not be treated as a misleading environmental claim for the purposes of these guidelines. But if the company claims that all its products are manufactured sustainably, then it would be examined for greenwashing, the guidelines said.

Thus, generic terms like “clean”, “green”, “eco-friendly”, “good for planet”, “cruelty-free”, “carbon neutral”, “natural”, “organic”, “sustainable”, or similar other descriptions for a product would be allowed only if the company is able to substantiate these with evidence. The company will also have to use “adequate and accurate” qualifiers and disclosures while advertising such descriptions.

When more technical terms such as “environment impact assessment”, “greenhouse gas emissions”, or “ecological footprint”, are used to advertise a product or service, the companies would be mandated to explain their meaning and implications in a “consumer-friendly” language.

“Specific environmental claims such as compostable, degradable, free-of, sustainability claims, non-toxic, 100 per cent natural, recyclable, refillable, renewable, plastics-free, plastic-positive, climate-positive, net-zero and similar claims must be supported by disclosure about credible certification, reliable scientific evidence, internal verifiable evidence, certificates from statutory or independent third-party verification,” the guidelines say.

The guidelines will apply to all environmental claims made by manufacturers, service providers or traders whose goods, products or services is the subject of an advertisement, or to an advertising agency or endorser whose service is availed for the advertisement of such goods, products or services.

“No person to whom these guidelines apply shall engage in greenwashing and misleading environmental claims,” the guidelines said.

The government began drafting these guidelines in November 2023 when it formed a committee. The committee held three meetings and submitted a draft earlier this year. The government released the draft guidelines, seeking public comments, after which it released the final guidelines.

Relevance: GS Prelims & Mains Paper III; Environment
Source: Indian Express

5. \$1 trillion over 30 years: the huge cost of pivoting away from coal

Introduction



The first-of-its-kind study, published last week, attempted to estimate the cost of phasing down coal mines and coal plants, along with the costs of ensuring socio-economic stability in coal-dependent regions.

For a just transition away from coal, India will require over \$1 trillion or Rs 84 lakh crore over the next 30 years, according to a study by environment and climate change research think-tank iForest (International Forum for Environment, Sustainability and Technology).

The first-of-its-kind study, published last week, attempted to estimate the cost of phasing down coal mines and coal plants, along with the costs of ensuring socio-economic stability in coal-dependent regions.

Coal will be central to India's energy mix for at least another decade, and moving away from it poses a massive challenge.

What will a 'just' energy transition look like?

The term "just" here refers to an equitable and inclusive shift towards a low-carbon economy, which will keep in mind the interests of fossil-fuel dependent workers and societies.

India is currently the second-largest producer of coal globally, with a vast number of people employed in the industry. According to a PIB press release from March this year, public sector coal-producing entities alone employ a workforce of 3,69,053 individuals. Many more individuals are employed in the private sector, thermal power plants that run on coal, transportation, logistics, etc.

As India grows its renewable energy capacity to achieve net zero emissions — amount of greenhouse gas emitted which are offset in the atmosphere and/or with technology — by 2070, it will be important to not leave behind those who depend on coal for their livelihoods. But such a transition will not be cheap.

What are the costs associated with a just transition?

Based on assessments of four heavily coal-dependent districts in India, and review of just transition economic plans in South Africa, Germany and Poland, the study arrived at eight broad cost components.

These include the cost of mine closures and repurposing, retirement of coal plants and repurposing of the sites for clean energy, labour skilling for green jobs, economic diversification in the form of new businesses, community support, investments for green energy, revenue substitution for covering loss to states, and planning costs.

Roughly 48% of the \$1 trillion that the study estimates will be required to meet these costs over the next 30 years will go towards green investments for building energy infrastructure, which will have to replace coal mines and coal-fired plants.

Where will the funds for a just transition come from?

A combination of public funding, through grants and subsidies, and private investments in green energy plants and infrastructure will be required to fund the costs. Most of the public funding, the study estimated, would be for "non-energy" costs such as supporting community resilience during the transition, skilling of coal workers for new green jobs, and providing economic support for new businesses that will replace old coal-based industries.

India has nearly \$4 billion in district mineral foundations funds, with monies collected from miners. This fund can be used as a resource, along with Corporate Social Responsibility (CSR) funds, for supporting new businesses in coal districts, and to support communities. Private investments, the study highlighted, will cover much of the 'energy costs' of transition, and fund most new clean energy projects.

How have other countries approached a just transition?

Both developed and developing countries have adopted legislation or opted for investment plans with international funding to phase-down coal use.

South Africa's Just Energy Transition Investment Plans (JET-IP), for instance, will see it getting financial support for phasing down coal from the UK, France, Germany, the US, the European Union, the Netherlands, and Denmark. A sum of \$98 billion will be required over the next two decades to support South Africa's 20-year energy transition, with \$8.5 billion to be supplied in the 2023-2027 period. A bulk of this will be for green energy investments. The finance will be provided in the form of concessional loans, grants, and public-private partnerships.

Germany, meanwhile, enacted laws to phase out coal power by 2038, and sanctioned an outlay of over \$55 billion to close coal mines and coal-powered plants, while supporting development of coal dependent regions.

What did the study of four coal-dependent districts in India find?

The districts identified were Korba in Chhattisgarh, Bokaro and Ramgarh in Jharkhand, and Angul in Odisha. These were studied to assess their economic dependence on coal and coal-based industries, and to estimate the costs of a just transition.

For instance, it was found that the coal-based economy of Bokaro, with its multiple coal plants and one integrated steel plant, contributes to about 54% of the district's domestic product. Around 1,39,000 workers were employed in coal mining, at coal plants, and in allied sectors, such as steel and cement.

A full phase-down of coal in the district, the study estimated, will begin after 2040. It will require an outlay of Rs 1.01 lakh crore over the next three decades to rehabilitate workers, repurpose mines, and start green energy production at locations where coal plants stand today.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

6. On climate finance to developing nations

Introduction

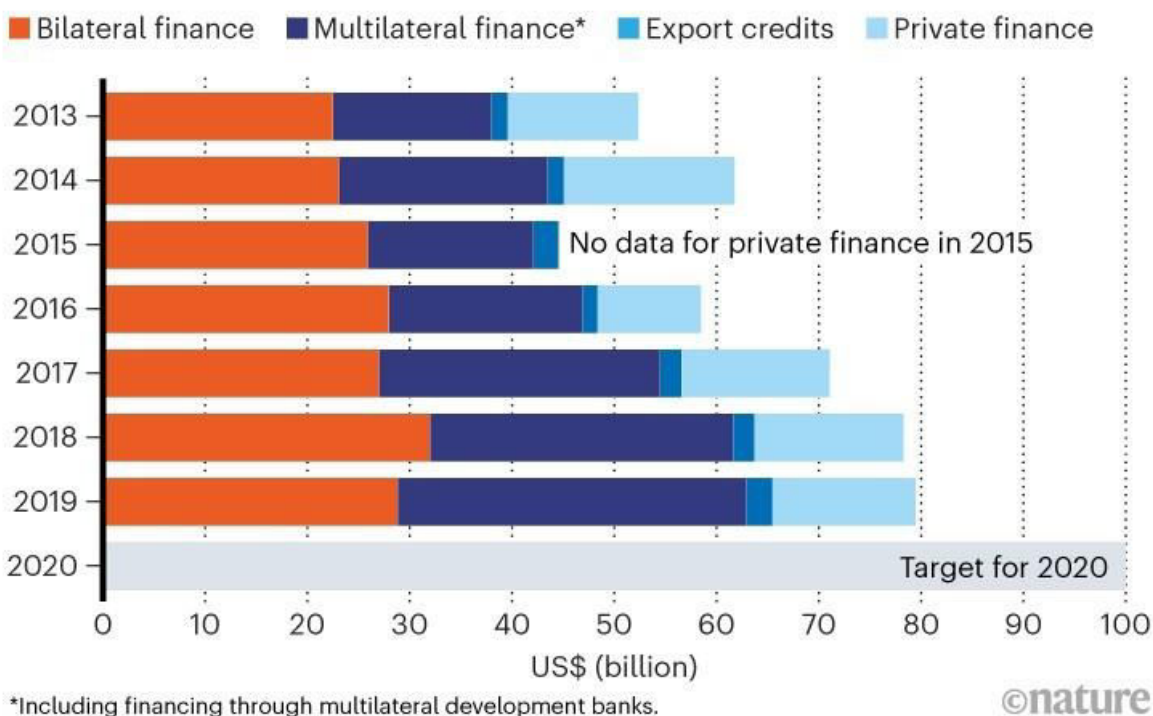
The 29th Conference of the Parties (COP29) of the UNFCCC to be held in Baku, Azerbaijan, from November 11 to 22 is expected to be a "finance COP" as key climate finance issues feature at the top of its agenda.

Are developing states more at risk?

Economically developing countries are among the most vulnerable to climate change's effects. This is because of geographical factors and, because their economies rely more on sectors like agriculture, which are particularly sensitive to climate change.

MISSED TARGET

Rich countries promised developing nations
US\$100 billion a year in climate finance by 2020.



Despite being among the most vulnerable, developing countries have contributed relatively little to the cumulative emissions that cause climate change. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, developed countries account for 57% of cumulative global emissions since 1850 despite hosting smaller populations than the developing world. Developing countries also face competing developmental needs, vexing their ability to take climate action by themselves. The 2009 Copenhagen Accord had developed countries commit to providing \$100 billion a year in climate finance to developing countries by 2020, later also made applicable through 2025. A new mobilisation target for the post-2025 period is on the agenda at COP29.

What is climate finance?

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate finance as “local, national, or transnational financing — drawn from public, private, and alternative sources — that seeks to support mitigation and adaptation actions addressing climate change.” This specifies two aspects of climate finance: sources (public or private, and flowing either domestically or across borders) and end-uses (climate mitigation or adaptation). The Organisation for Economic Co-operation and Development (OECD) publishes reports on climate finance flows from developed to developing countries. They cover flows from four sources, including international public finance and the private finance mobilised by it. International public climate finance is composed of commercial and concessional loans, grants,

equity and other instruments. Loans typically constitute the largest share (69.4% in 2022), followed by grants (28%). However, developing countries and observers such as Oxfam have noted several shortcomings with the OECD's reports. They have argued they should represent actual disbursements and not simply commitments to provide climate finance; that a flow should be new and additional and not simply a reclassification of existing aid; and that only grants, or grant-equivalents of concessional finance, should be counted, not finance provided on a commercial basis.

Who needs climate finance?

Developing countries require external financing for climate action. According to the International Energy Agency (IEA), 675 million people in the developing world didn't have access to electric power in 2021. Developing countries need to universalise access and increase electricity consumption.

Developing countries also have smaller domestic financial systems relative to their GDPs and face higher costs of capital. For instance, the cost of capital for solar photovoltaic and storage technologies is about twice as high in developing economies than in developed ones, according to the IEA. Therefore, if developing countries are to balance development and climate action, external finance should be made available.

How much does India need?

India has both short-term and long-term climate targets. By 2030, India aims to install 500 GW of generating capacity from non-fossil-fuel sources; five million metric tonnes per annum of green hydrogen (GH₂) production capacity; and differentiated levels of penetration for various Electric Vehicle (EV) categories. The authors have estimated (as part of a co-authored report) that achieving 450 GW of renewable energy by 2030 will require an additional ₹16.8 lakh crore investment. Per the National Green Hydrogen Mission, India's GH₂ target will need ₹8 lakh crore. Consumers will also need to spend around ₹16 lakh crore to purchase EVs to achieve this vision. A long-term perspective reveals a greater requirement: ₹850 lakh crore in investments between 2020 and 2070 to achieve net-zero emissions.

What should the NCQG quantum be?

Determining a new annual climate finance mobilisation target — called the New Collective Quantified Goal (NCQG) — is a top priority. The NCQG should include flows that are (i) actual disbursements, not just commitments; (ii) new and additional (iii) public capital in the form of direct grants; and (iv) private capital that is mobilised by public capital. However, organically flowing private finance to developing countries should not be counted. An independent high-level expert group constituted by the presidencies of COP26 and COP27 has already determined that developing countries (excluding China) will require around \$1 trillion in external finance by 2030.

Relevance: GS Prelims & Mains Paper III; Environment

Source: The Hindu

7. Spraying diamond dust to cool Earth: What a new study proposes, despite 'geoengineering' concerns

Introduction

A new study has argued that spraying millions of tonnes of diamond dust in the Earth's upper atmosphere every year could help cool down the Earth and combat global warming. It might appear to be a rather outlandish claim, but this is not the first time such a solution has been proposed.

Several other compounds, such as sulphur, calcium, aluminium, and silicon, have been suggested previously for doing the same job. The central idea here is to scatter material that can reflect solar radiation into Space and prevent it from reaching Earth, thereby cooling down the planet. The installation of space-based mirrors has also been proposed.

Such solutions, called geo-engineering (more specifically solar radiation management), have been under study for quite some time, though they have never been tried. The new study published in Geophysical Research Letters found that diamonds would be more effective in doing the job than any other material previously considered.



Scientists want to shower Earth with diamond dust to cool it down - Earth .com

Context for geoengineering: The problem of rising temperatures

The measures employed so far to halt global warming have proved inadequate. Global temperatures have continued to rise and emissions of greenhouse gases, the main reason for the warming, have not been curbed, maintaining an upward trend in 2022.

Scientists estimate that even if global emissions magically dropped to zero now, it would be decades before temperatures stabilise and come down.

Global temperatures are already about 1.2 degrees Celsius higher than pre-industrial times (between 1850-1900), with 2023 being around 1.45 degrees Celsius warmer. The world cannot restrict this rise below 1.5 degrees Celsius, one of the targets mentioned in the 2015 Paris Agreement, though some theoretical scenarios still allow for the possibility.

The bare minimum for achieving the target requires the world to cut its emissions by at least 43 per cent from the 2019 levels, by 2030. Ongoing and promised actions, however, will likely result in a reduction of just two per cent by 2030. As a result, scientists have been looking for radical technology solutions that achieve dramatic results within a short period, even if only temporarily. Geoengineering offers such options.

What is Geoengineering?

Geoengineering refers to any large-scale attempt to alter the Earth's natural climate system to counter the adverse impacts of global warming. Solar Radiation Management (SRM), in which materials are proposed to be deployed in Space to reflect incoming solar rays and prevent them from reaching Earth, is one of the two broad geoengineering options being explored.

Then there are Carbon Dioxide Removal (CDR) technologies, which include Carbon Capture and Sequestration (CCS). While they offer quick-fix solutions for reducing emissions or temperatures, they are not particularly viable.

The only method being tried out in practice is CCS. Carbon dioxide emitted, from industry or power plants, is "captured" at source and deposited deep below the Earth's surface in suitable geological formations for long-term storage. Since carbon dioxide is not released into the atmosphere, overall emissions are reduced.

Another option involves the captured carbon being used as an input for other industrial processes (known as Carbon Capture and Utilisation or CCU). In Carbon Capture, Utilisation and Storage (CCUS), some carbon dioxide is utilised and the rest is stored underground.

Under Direct Air Capture (DAC) methods, carbon dioxide is sucked out through large "artificial trees" from ambient air and directed towards storage sites or utilisation. Since these methods can potentially eliminate carbon dioxide accumulated over the years, the benefits are larger compared to CCS. But the challenges are bigger too. Some experimental projects are currently trying out these technologies.

Potential for Solar Radiation Management

The most ambitious and potentially rewarding form of geoengineering is SRM, which is still at the conceptual stage. It draws inspiration from the natural process of volcanic eruptions, in which large amounts of sulphur dioxide are released. These combine with water vapour to form sulphate particles that reflect sunlight into space, reducing the amount reaching Earth.

The Mount Pinatubo eruptions in the Philippines in 1991, one of the largest in the 20th century, are believed to have reduced the Earth's temperature by 0.5 degrees Celsius that year. Scientists are trying to artificially emulate the process and have explored the capabilities of several materials, including sulphur dioxide, calcium carbonate, and sodium chloride or common salt.

Diamonds have been discussed, too. The new study compared seven compounds and found diamonds the most effective in producing the desired results. But to achieve a temperature reduction of 1.6 degrees Celsius, about five million tonnes of diamonds would need to be sprayed into the upper atmosphere every year.

Challenges and concerns

Though theoretically possible, SRM options face huge technology and cost challenges in implementation. Besides, manipulating natural processes on a large scale can have unintended and unforeseen consequences. It can affect global and regional weather patterns and rainfall distribution. There are ethical concerns as well. Altering natural sunlight can affect agriculture, vegetation, and biodiversity, and might be detrimental to some life forms.

Even CCS technologies have flaws, as one study by researchers from Oxford University and Imperial College in London showed last year. Though it might be technically possible or desirable to deploy these technologies in some cases, heavy reliance on them to achieve climate objectives might not be feasible or practical, it said.

It further pointed out that mainly employing CCS to meet climate goals by 2050 would cost the world at least US\$ 30 trillion more than a route primarily focused on renewable energy and maintaining energy efficiency. Besides, an adequate number of safe underground sites for storing huge amounts of carbon dioxide might not be available.

Still, CCS options are considered almost inevitable now, given the already visible effects of global warming. There are no scenarios for the world to achieve the 1.5 degree or 2 degree Celsius targets that do not require contribution from CCS and CDR technologies.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

8. How the microscopic worm *C. elegans* won 4 Nobel Prizes

Introduction

While accepting the Nobel Prize in Physiology or Medicine this year, molecular biologist Gary Ruvkun spent a few minutes lauding his experimental subject: a tiny worm named *Caenorhabditis elegans*.

This is not this worm's first brush with international stardom nor is it the first time *C. elegans* has been thanked for aiding award-winning work. Ruvkun's award was actually the fourth Nobel Prize resulting from *C. elegans* research, cementing the lowly soil worm's outsize role in scientific discovery.



Four Nobels

The 1-millimeter nematode has helped scientists understand how healthy cells are instructed to kill themselves and how the process goes awry in AIDS, strokes and degenerative diseases. (That work was the subject of the 2002 Nobel Prize in physiology or medicine.) Self-proclaimed "worm people" were recognised by the Nobel committee in

2006 for discovering gene silencing, which became the basis for an entirely new class of drugs. Two years later, the chemistry prize went to scientists who used nematodes to help invent cellular "lanterns" that allowed biologists to see the inner workings of a cell.

For each prize, a laureate made sure to thank the worm for its contributions, though perhaps the most famous nod came from Sydney Brenner, who won the first "worm Nobel." "Without doubt, the fourth winner of the Nobel Prize this year is *Caenorhabditis elegans*," he said in his lecture in Stockholm.

'Experimental dream'

One of the *C. elegans*' virtues is its simplicity, which allows scientists to test hypotheses about fundamental biological concepts in a model that is easy to understand. The nematodes have just 959 cells — a remarkably manageable number, compared with our trillions of cells — each of which scientists have named and charted from fertilisation to death. The destiny of each cell is easy to map, since the worms become translucent under the light of a microscope and cycle through all developmental stages in about three days.

The nematode was the first animal to have its genome entirely deciphered — in 1998, years before scientists were able to do the same for flies and mice. The worm is inexpensive, easy to store and entirely self-sufficient when it comes to reproduction; female *C. elegans* have functional sperm that allow them to inseminate themselves.

"It's an experimental dream," said Judith Kimble, a nematode researcher at the University of Wisconsin, Madison.

Bonding over worms

Kimble attributes much of the research success to the fact that worm-bonded scientists tend to share their resources and cooperate. Ruvkun, of the Harvard Medical School, and his co-winner, Victor Ambros, a professor of molecular medicine at UMass Chan Medical School, shared their findings with each other, allowing them to piece together the mechanics of microRNA.

The *C. elegans* research community comes together every other year at the International Worm Convention.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

9. Weather forecasts at panchayat level: what will be known, and how it will help

Introduction

Five-day weather forecasts, updated every hour, are now available at the level of gram panchayats — the first major step towards localised forecasting across the country.

The initiative was formally launched by Panchayati Raj Minister Rajiv Ranjan Singh and MoS (Independent Charge), Ministry of Science & Technology and Ministry of Earth Sciences, Dr Jitendra Singh.



What is the initiative?

The initiative, Gram Panchayat-Level Weather Forecasting, is a joint program of the Panchayati Raj Ministry, India Meteorological Department (IMD), and the Ministry of Earth Sciences.

According to the Panchayati Raj Ministry, the initiative is aimed at “empowering rural communities and enhancing disaster preparedness at the grassroots, and will benefit farmers and villagers across the country”. It will “strengthen grassroots governance and promote sustainable agricultural practices, making rural populations more climate-resilient and better equipped to tackle environmental challenges”, the Ministry said.

What will be forecast, and where will the forecasts be available?

Hourly forecasts will be available on the e-GramSwaraj and Gram Manchitra portals, and the Meri Panchayat app. e-GramSwaraj is already operational.

Users can see data on the current temperature, wind speed, cloud cover (in percentage), rainfall, and relative humidity at the level of gram panchayats; five-day forecasts of minimum and maximum temperatures, rainfall, cloud cover, wind direction, and wind speed, and an overall weather forecast.

How will the public benefit from the forecasts?

In the most direct way, this information will help farmers to better plan activities including sowing, irrigation, harvesting, etc.

In a statement, the Panchayati Raj Ministry underlined the importance of microforecasts in the context of intensifying climate change.

"As weather patterns become increasingly unpredictable, the introduction of weather forecasting at the Gram Panchayat level will serve as a crucial tool in safeguarding agricultural livelihoods and enhancing rural preparedness against natural disasters," the Ministry said.

"Gram Panchayats will receive daily updates on temperature, rainfall, wind speed, and cloud cover, empowering them to make critical decisions in agriculture, such as planning sowing, irrigation, and harvesting activities," it said.

Why does localised forecasting matter?

The significant advances made in forecasting weather notwithstanding, the science of forecasting has inherent uncertainties.

The more precise a forecast — in terms of the spatial spread or time-window for the event — the greater the uncertainty. Also, the earlier the forecast, the less precise it is likely to be.

It is usually easier to predict large systems that are spread over large geographical areas — such as the Indian monsoon, or a cyclone that develops over the Bay of Bengal, or a heat wave covering several states. But sudden, localised events — like a cloudburst — are more difficult to predict.

Localised weather forecasts can help even small communities of farmers plan their economic activities with greater confidence. There are 2.55 lakh village panchayats across the country, with resident populations of a few thousands on average.

The IMD has developed the system of localised weather forecasting based on gram panchayat boundaries data provided by the Panchayati Raj Ministry.

How accurate are India's localised weather forecasting capabilities?

As of now, weather forecasting is available at the district and block levels.

Over the years, IMD has worked on focusing its forecasts more and more narrowly. It currently has the ability to forecast weather events over a 12 km x 12 km area, and has been trying out experimental forecasts for 3 km x 3 km grids, with the eventual objective of making hyper-local forecasts for 1 km x 1 km areas.

Localised forecasts are critical to deal with climate change-induced unpredictability in weather systems.

Officials said the Panchayati Raj Ministry is organising a training workshop on “Weather Forecasts at the Gram Panchayat Level”, which will be attended by more than 200 participants, including elected representatives of panchayati raj institutions and state panchayati raj officials.

The training session will equip panchayat representatives and functionaries with the knowledge and skills to effectively utilise weather forecasting tools and resources at the grassroots level, and thus empower them to make informed decisions and enhance climate resilience in their communities, the officials said.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

10. How mangroves in Odisha likely reduced Cyclone Dana's impact

Introduction

Cyclone Dana, which made landfall close to Bhitarkanika National Park and Dhamra Port in Odisha at 3.30 am on Friday, did not cause significant damage as many had feared. Although efforts by state authorities helped limit the devastation — for instance, Odisha evacuated one million people to cyclone shelters — there was one non-human factor that also played a crucial role. It was the rich mangrove forest cover of Bhitarkanika.



What are mangroves?

Mangroves are salt-tolerant trees and shrubs typical of estuarine and intertidal regions, meaning they grow in areas where freshwater and saltwater meet. Mangroves typically have aerial, breathing roots and waxy, succulent leaves, and are flowering plants. The Sundarbans (spread across India and Bangladesh) is the largest contiguous

mangrove forest in the world. Mangrove seedlings called propagules germinate on the parent tree before falling into the waters and growing into a mangrove tree again.

Red mangrove, *Avicennia marina*, grey mangrove, *rhizophora* etc. are some common mangrove trees. Abundant in swampy and marshy areas, mangroves represent a littoral forest ecosystem, which means they thrive in saline or brackish waters in coastal regions.

In India, many locations boast of mangroves. The Godavari Krishna delta in Andhra Pradesh, Bhitarkanika in Odisha, mangrove forests in Andamans, Kerala, Gujarat, Tamil Nadu, etc., are some examples.

How do mangroves protect against cyclones?

When cyclones strike, mangrove forests act as a barrier against storm surges — a change in sea level caused by a storm, usually leading to large waves — by obstructing the water flow with their roots, husks, and leaves, according to a report published by the World Bank Group. A different report by the group revealed that some of the mangrove species such as *Sonneratia apetala* “reduced the surge height from 4 cm to 16.5 cm with 50 m to 2 km wide mangrove strips, and reduced the water flow velocity from 29% to 92% with 50 m or 100 m wide mangrove forests”.

When mangroves are combined with built infrastructure, the impact of a cyclone can further be reduced. For instance, planting mangroves in front of an embankment can decrease water flow velocity, the report said.

How vast is Bhitarkanika’s mangrove forest cover?

Currently, Odisha has a reserve of a mangrove forest area of 231 square kilometres with a major chunk lying in Bhitarkanika. It stands second only to Sundarbans in West Bengal. Besides Bhitarkanika in Kendrapara, the districts of Balasore, Bhadrak, Jagatsinghpur and Puri are also home to mangroves, otherwise known as coastal woodland.

While 82 sq km area in Bhitarkanika is densely mangrove-infested, 95 sq km area has moderate mangrove forest. The coastal patches spread across 672 sq km were declared the Bhitarkanika Wildlife Sanctuary in 1975. The core area of the sanctuary, with an area of 145 km, got the National Park tag in September 1998.

The park has withstood the onslaught of several cyclones in the past including the Super Cyclone, which took place in October 1999.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

11. Villagers Clash with Police Over Hasdeo Arand Mining

Introduction

Earlier this month, clashes broke out between villagers and police in the Hasdeo Arand forest in Chhattisgarh. The conflict began when tree-cutting for coal mining resumed in the area, leading to injuries and arrests. Villagers and environmental activists have been protesting to protect the forest, known for its rich biodiversity.

What is the Hasdeo Arand Forest?

The Hasdeo Arand forest, often called the “lungs of Chhattisgarh,” is one of the largest unfragmented forests in Central India, home to a variety of flora and fauna. It spans 1,879.6 square kilometers and is rich in biodiversity, including elephants, leopards, and rare species. The forest also serves as a crucial wildlife habitat and corridor.

Coal Mining in Hasdeo Arand

A total of 23 coal blocks have been identified in the Hasdeo Arand region, covering 25% of the forest. Several coal blocks have been auctioned, with mining contracts primarily held by Adani Enterprises for the Rajasthan government's power generation company. Mining operations are ongoing in multiple blocks, leading to significant deforestation.

Why Is Mining Opposed?



Locals and environmental activists oppose mining because it threatens their villages, forest livelihoods, and the rich ecosystem. They also claim that fraudulent gram sabha (village council) resolutions were used to secure forest and environmental clearances for mining projects. Villagers have raised concerns about inadequate compensation and resettlement offers.

Protest Demands

Activists are demanding the cancellation of the Parsa coal block and assurance that the nearby Lemru Reserve Forest will remain untouched. They argue that mining activities violate the constitutional protections of tribal lands and have pushed for greater government accountability.

Status of Mining

Mining operations continue in several blocks, with large-scale tree-felling underway. Nearly 1 lakh trees have been cut for the PEKB coal block since 2012, and activists allege the actual number is even higher. The conflict escalated when 5,800 trees were cut for the Parsa coal block in October 2023, triggering protests.

Political Reactions

Both Congress and BJP have shifted positions on the issue. While Congress previously supported the mining project, it later passed a resolution in 2022 opposing coal mining in the region. BJP leaders have expressed the need for public consent before moving forward. Following the violence, political leaders, including Rahul Gandhi, condemned the use of force against the tribal community.

Reforestation Efforts

As of March 2024, around 11.65 lakh trees have been planted to compensate for the deforestation in the PEKB coal block. However, environmentalists argue that reforestation efforts cannot replace the ecological loss caused by large-scale tree-cutting.

Relevance: GS Prelims & Mains Paper III; Environment

Source: Indian Express

1. CERN's Ambitious Plan: Future Circular Collider (FCC)

Overview

CERN plans to build a 90 km-long particle accelerator, the Future Circular Collider (FCC), three times the size of the current Large Hadron Collider (LHC). It aims to further explore the Higgs boson and other fundamental particles.

Future Circular Collider

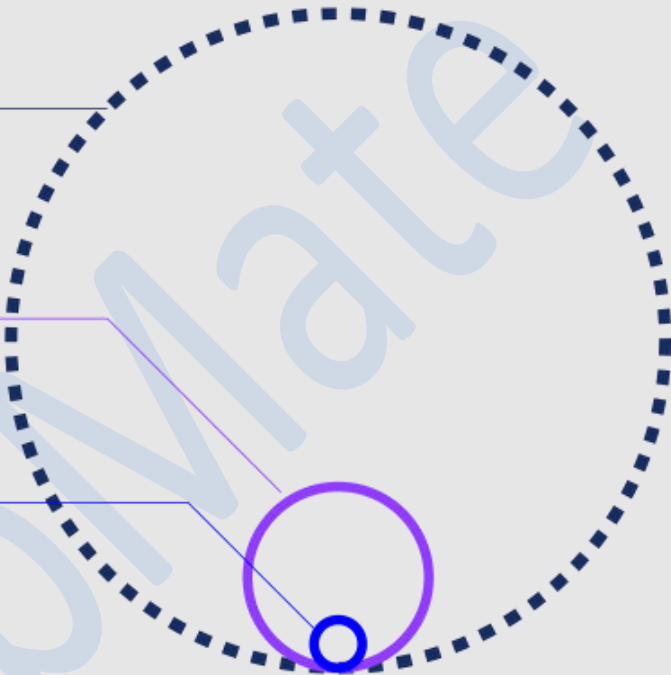
Circumference: 80 –100 km
Energy: 100 TeV (pp)
>350 GeV (e^+e^-)

Large Hadron Collider

Circumference: 27 km
Energy: 14 TeV (pp)
209 GeV (e^+e^-)

Tevatron (closed)

Circumference: 6,2 km
Energy: 2 TeV



Cost and Criticism

The estimated \$17 billion cost has sparked debate, with some arguing the money could be better spent on urgent global issues like malaria or climate change. Critics, like physicist Sabine Hossenfelder, see it as a high-risk, low-reward project.

Importance of the Higgs Boson

Discovered in 2012, the Higgs boson, often called the "God particle," explains why particles have mass and reveals insights into the universe's origins. Its study is key to understanding fundamental forces and dark matter.

Unanswered Questions

Despite the 2012 discovery, scientists believe the Higgs boson still holds secrets about the universe's formation, the nature of dark matter, and the imbalance between matter and antimatter.

Global Competition

CERN faces competition from China, which proposed a larger collider, while the U.S. and Japan have scaled back their own plans. CERN's research remains globally significant.

Environmental and Technical Challenges

If approved, the FCC will take decades to build and will generate large amounts of excavated materials. CERN is focused on minimizing environmental impact and exploring ways to reuse energy for local communities.

Broader Scientific Impact

CERN's research has driven advancements in fields like big data, quantum computing, and superconducting magnets. It also birthed the World Wide Web, showing the broader value of basic research.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

2. Why is Switzerland a popular destination for 'death tourism'? What is the case of the US woman's 'assisted dying', and how is that different from euthanasia?

Introduction

Switzerland police arrested at least four persons recently for their involvement in the death of a 64-year-old American woman by a 'suicide pod' on September 23. The woman, whose identity has not been disclosed, reportedly suffered from an autoimmune condition for years.



This incident has turned the spotlight on the contentious Sarco pod, engineered by Dr Philip Nitschke, an Australian physician who founded the pro-euthanasia group Exit International.

More crucially, it also raises questions about the ethics of assisted dying and euthanasia.

What are euthanasia and assisted dying?

Both euthanasia and assisted dying are ways in which a person may intentionally choose to end their life.

Euthanasia relies on the presence of a physician to address a lethal drug to the person. Euthanasia may be of two kinds — voluntary, where the patient gives their explicit consent, and involuntary, when they are unable to do so, possibly because they are in a coma.

Assisted dying, on the other hand, is understood to rely on self-administration of the lethal substance, with medical involvement restricted simply to the procurement of the drug.

Assisted suicide according means to intentionally help another person end their life, and does not stipulate that the person is terminally ill.

What is the Sarco pod?

Named after sarcophagus, the stone coffin used to bury ancient royalty, the Sarco is a coffin-sized, air-tight machine designed by Exit International.

First made in 2019, the Sarco pod consists of a 3D-printed detachable capsule placed on a stand with a canister of liquid nitrogen. A person lying inside it could press a button to initiate the dying process, flooding the air inside it with nitrogen gas.

The device was designed and built in the Netherlands by Nitschke and Dutch engineer Alex Bannink over 12 years and cost around €650,000 (\$725,000) to research and develop. Future pods are estimated to cost around €15,000 and to be reusable.

Writing in HuffPost in 2018, Nitschke emphasised that the pod is not available to just anyone, and interested candidates must clear an online mental fitness test first. "If they pass, they receive an access code to a Sarco device that works for 24 hours. After the code is entered and an additional confirmation given, liquid nitrogen in the generator is released, rapidly bringing down the oxygen level in the capsule. Within a minute, the user loses consciousness; death comes a short time later," he wrote.

The device is portable and can be transferred where one chooses.

Has the Sarco Pod violated Swiss laws on assisted dying?

Active euthanasia is banned in Switzerland. However, assisted dying and assisted suicide are legal as long as the person ends their life without any "external assistance" and those who help them do not have "any self-serving motive".

The country's laws on assisted dying and assisted suicide have made it a preferred destination for "death tourism," wherein people come there to end their lives.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

3. AVGC: The Future of Media & Entertainment Industry

Introduction

The AVGC (Animation, Visual Effects, Gaming, Comics) sector is set to be the future of the media and entertainment industry. Movies like Baahubali and RRR have introduced a new vision for portraying historic and fantasy themes in India, inspiring films like PS1 and Kalki. According to the FICCI-EY 2024 report, India now boasts the second-largest anime fan base globally and is projected to contribute 60% to the worldwide growth in anime interest in the coming years. In a significant step toward making India a global hub for AVGC, the Union Cabinet recently approved the establishment of a National Centre of Excellence (NCoE) for Animation, Visual Effects, Gaming, Comics, and Extended Reality (AVGC-XR) in Mumbai.



NCoE Background

NCoE will be set up as a Section 8 Company under the Companies Act, 2013 in India with Federation of Indian Chambers of Commerce & Industry and Confederation of Indian Industry representing the industry bodies as partners with the Government of India. The establishment of the NCoE follows the Union Minister of Finance and Corporate Affairs 2022-23 budget announcement, which proposed the creation of an AVGC task force in the country. NCoE AVGC aims at creating a world class talent pool in India to cater to the Indian as well as global entertainment industry. Provisionally named the Indian Institute for Immersive Creators (IIIC), this center aims to revolutionize the AVGC sector and foster innovation in immersive technologies. It will be modeled after renowned institutions like the Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs).

SALIENT FEATURES OF NCOE



- 1 **NCoE will also extensively focus on creation of India's IP for both domestic consumption and global outreach.**
- 2 **Will function as an incubation centre by providing resources for nurturing start ups and early stage companies in AVGC-XR field.**
- 3 **Will also position India as a content hub for providing state-of-the-art content.**
- 4 **Enhance India's soft power globally and attracting foreign investment into M&E sector.**
- 5 **To be set up in Mumbai, Maharashtra and FICCI and CII to represent industry bodies as partners with the Government of India**
- 6 **To act as pinnacle institution to anchor the AVGC-XR ecosystem in the country.**
- 7 **Will foster R&D and will bring together experts from various science & art fields that can lead to major breakthroughs in AVGC - XR**

Objective of NCoE (IIIC)

India's animation sector is witnessing remarkable growth, driven by increasing demand for films, visual effects (VFX), gaming animation and engaging mobile content. This surge presents exciting opportunities for skilled and enthusiastic animators. Boasting a growth rate of 25% and an estimated value of ₹46 billion by 2023 (FICCI-EY Report 2023), the animation industry in India is thriving and offers a promising future for passionate young talent.

With rapidly evolving technology and increasing internet penetration all across the country, coupled with one of the cheapest data rates, the usage of AVGC-XR globally is poised to grow at an exponential pace. This creates abundant opportunities, particularly through the National Centre of Excellence (NCoE). Below are some of the key objectives of the NCoE (IIIC):

- Focusing of creating Indian IP
- Leveraging our cultural heritage in new age
- Create a multiplier effect in the industry
- An industry led initiative, in partnership with state and academia
- Integrated focus on education, skilling industry, development, innovation
- Hub and spoke model of development to be followed
- IIC as the hub and several center's as its spokes dedicated innovation and research fund to promote start-up ecosystem



6 key things to know about NCoE

1. Films like RRR, Baahubali, The Lion King and Avatar have demonstrated the immense potential of animation and immersive technology! India's Animation, Visual Effects, Gaming and Comics (AVGC) sector is poised for explosive growth, with vast opportunities for employment and innovation.
2. Immersive technologies create lifelike, interactive experiences. This includes Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR) and 3D modeling & animation. Whether you're a 3D animator, VR/AR creator, game developer or comic artist - this is your playground.

3. The NCoE is your gateway to mastering immersive tech. The National Centre of Excellence will offer cutting-edge training and integrate India's rich cultural heritage with modern technology, fostering the creation of indigenous intellectual property (IP) and building the future of India's digital creative economy.

4. With an estimate to generate 5,00,000 jobs, the NCoE is modeled after premier institutions like IITs and IIMs. The center will provide world-class infrastructure, state-of-the-art technology and specialized skills to build a strong talent pool.

5. Hands-on learning and career pathways. Students will gain practical experience through industry-driven courses, ensuring they are job-ready upon graduation. You'll also have access to internships, mentorships for aspiring startups, and a curriculum focused on content creation - for India, for the world!

6. Collaboration and innovation. By fostering partnerships between the central and state governments, academia, and industry, the NCoE will create a dynamic ecosystem for research, development, and innovation in immersive technologies. This is where India's next-gen creators will thrive.

Conclusion

The Union Cabinet's approval of the National Centre of Excellence (NCoE) for AVGC marks a pivotal step in strengthening India's media and entertainment industry. This initiative is set to boost the economy while creating new job opportunities in the rapidly growing AVGC sector. As a global hub for filmmaking, India's advancements in technology and infrastructure will enable the production of high-quality content, positioning the country as a leader in technological innovation and creativity.

Relevance: GS Prelims; Science & Technology

Source: PIB

4. Why you should care about scientists mapping the fruit fly's brain

Introduction

Scientists recently said they have successfully mapped the entire brain of an adult fruit fly, marking the first time that researchers have been able to create such a detailed survey of an adult animal. The neurological milestone is a step toward one day making a detailed map of the human brain that will help in understanding and probably treating mental health conditions such as Parkinson's and depression.

Nine papers, describing the research in detail, were published in the journal Nature. Hundreds of scientists and citizen scientists worldwide contributed to the work.



Scientists Create First Complete Map Of Fruit Fly Brain, Revealing 139,000 Neurons Using AI

How was the adult fruit fly brain mapped?

Scientists began mapping in 2013 by dunking the brain of an adult fly in a chemical bath, hardening it into a solid block, according to a report by The New York Times. "They shaved an exquisitely thin layer off the top of the block and used a microscope to take pictures of it," the report said.

Researchers then shaved another layer and took a new picture — in total, 7,050 sections were imaged and 21 million photos were taken to map the entire brain. The first high-resolution picture of the brain was produced more than a decade after the work kicked off.

What did the work reveal?

Scientists were able to detail more than 50 million connections between more than 139,000 neurons — brain nerve cells. They also classified the cells into 8,453 distinct types, making it the biggest catalogue of cell types in any brain.

These achievements gave numerous insights into the brains of fruit flies. Scientists analysed what different types of cells do, how the fly's eyes process motion and colour information, and discovered a large assemblage of "hub neurons" that may speed up information flow.

Why is this significant?

The mapping of the fruit fly's brain can also give information about not just other animals but also humans. Although the human brain is far more complex than that of a fruit fly, the logic or "source code" at work when neurons communicate and interact with one another is similar.

The mapping has also raised the hope that someday scientists will be able to map the entire human brain as well. That is necessary to better understand how human brains work and how mental disorders come about. Scientists also hope it can help more philosophical questions — What is love? What are dreams?

Relevance: GS Prelims; Science & Technology

Source: Indian Express

5. India's mission to develop supercomputers

Introduction

Prime Minister Narendra Modi recently inaugurated three PARAM Rudra supercomputers worth Rs 130 crore.

Developed indigenously under the National Supercomputing Mission (NSM), the three new supercomputers are located in Pune, Delhi, and Kolkata, and make up a High-Performance Computing (HPC) system tailored for weather and climate research.

First, what is a supercomputer?

A supercomputer is a large computing system specifically designed to solve complex, scientific and industrial challenges, which tend to be time-consuming and computation-intensive.

They are used in quantum mechanics, weapons research, weather forecasting and climate research, oil and gas exploration, molecular dynamics and physical simulations, data analytics and big data — all of which require a high computing capacity which are unavailable with regular systems.

Supercomputers are expensive systems that take up a large room worth of space in the form of multiple rows with racks holding computer nodes with many cores (see adjoining image). A High Performance Computing (HPC) system is made up of several such supercomputers put together.

What is the National Supercomputing Mission?

Launched in 2015, the NSM aimed to build a grid of 70 powerful supercomputing systems for use in research and development centres, and higher education institutions. These supercomputers were later networked on the National Supercomputing Grid over the National Knowledge Network (NKN).

The seven-year mission, with an economic outlay of Rs 4,500 crores, is jointly spearheaded by the Department of Science and Technology (DST) and the Ministry of Electronics and Information Technology (MeitY). The Centre for Development of Advanced Computing (CDAC) and Indian Institute of Science (IISc), Bengaluru act as the nodal implementing agencies. Two phases of the NSM are complete, and the third phase is now underway.

Some of the broad applications of the NSM include climate modelling, weather prediction, aerospace engineering, computational biology, molecular dynamics, atomic energy simulations, national security and defence applications, seismic analysis, disaster simulations and management, computational chemistry, computational material science and nanomaterials, astrophysics, large complex systems simulations, cyber-physical systems, big data analytics, finance, and information repositories.

Why is the NSM significant?

India bore the brunt of technology-denial by Western nations on two significant occasions. The first delayed India's forays into space in the 1970s, and the second stopped it from building supercomputers in the 1990s. However, this further motivated India to develop pocket-friendly, indigenous technologies in the decades that followed.

The NSM is born out of this ambition to develop indigenous technologies, and gave a much needed boost to India's computational capacity — something that PM Modi likened to “a tool to be used as soft power” last week.

Since the launch of the programme, more than 20 supercomputing systems have been deployed nationwide (See Table). All these broadly support research in bioinformatics, engineering, disaster simulation and management, material modelling, quantum chemistry, weather, ocean and climate, astronomy, material science, energy, medical research and for the smooth operations of the Micro, Small and Medium Enterprises sector.

Supercomputer	Institute	Capacity and memory
PARAM Shivay	IIT BHU	837 teraFLOPS and a total memory of 54.5 TB
PARAM Shakti	IIT Kharagpur	1.66 petaFLOPS and a total memory of 103.125 TB
PARAM Brahma	Indian Institute of Science Education and Research, Pune	1.75 petaFLOPS and a total memory of 56.8 TB
PARAM Yukti	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	1.8 petaFLOPS and a total memory of 52.416 TB
PARAM Sanganak	IIT Kanpur	1.67 petaFLOPS and a total memory of 104.832 TB
PARAM Pravega	Indian Institute of Science, Bangalore	3.3 petaFLOPS and a total memory of 245.945 TB
PARAM Seva	IIT Hyderabad	838 teraFLOPS and a total memory of 52.416 TB
PARAM Smriti	National Agri-Food Biotechnology Institute, Mohali	838 teraFLOPS
PARAM Utkarsh	CDAC, Bangalore	838 teraFLOPS and a total memory of 52.416 TB

PARAM Ganga	IIT Roorkee	1.66 petaFLOPS and a total memory of 104.832 TB
PARAM Ananta	IIT Gandhinagar	838 teraFLOPS and a total memory of 52.416 TB
PARAM Porul	NIT, Trichy	838 teraFLOPS
PARAM Himalaya	IIT Mandi	838 teraFLOPS and a total memory of 52.416 TB
PARAM Kamrupa	IIT Guwahati	838 teraFLOPS and a total memory of 52.416 TB
PARAM Siddhi	AI CDAC, Pune	5.2 petaFLOPS and 210 petaFLOPS (AI)
PARAM Rudra	Giant Metrewave Radio Telescope, Pune	1 petaFLOPS
	Inter-University Accelerator Centre, Delhi	838 teraFLOPS
	SN Bose National Centre for Basic Sciences, Kolkata	838 teraFLOPS

Here are some notable facts about the NSM.

* During 2019-2023, a total capacity of 24.83 petaFLOPS HPC machines were commissioned.

* 1.75 lakh people were trained in HPCs, and 5,930 experts from over 100 institutes used the newly-developed facilities. Over 73.25 lakh high performance computational queries were executed.

* During this period, seven systems offering computing power of above one petaFLOPS, eight systems offering computing capacities ranging between 500 teraFLOPS-1 petaFLOPS and 13 systems with capacities ranging between 50 teraFLOPS-500 teraFLOPS were installed.

* R&D systems at various centres of CDAC: The SANGAM Testbed, PARAM Shrestha, PARAM Embryo, PARAM Neel, PARAM Spoorthi, PARAM Sampooran, Bioinformatics facility and system software lab are presently operational.

* Aimed at training personnel in high performance computational skills, the mission established dedicated learning centres functioning at IIT Kharagpur, Palakkad, Chennai, Goa and CDAC, Pune, which have been operating PARAM Vidya (1 to 5 versions).

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

6. What is Marburg virus, which has rocked Rwanda

Introduction

The deadly Marburg virus could overwhelm Rwanda's fragile healthcare system. Since the east African country reported the first Marburg case late last month, at least 46 individuals have been infected and 12 Marburg deaths reported.

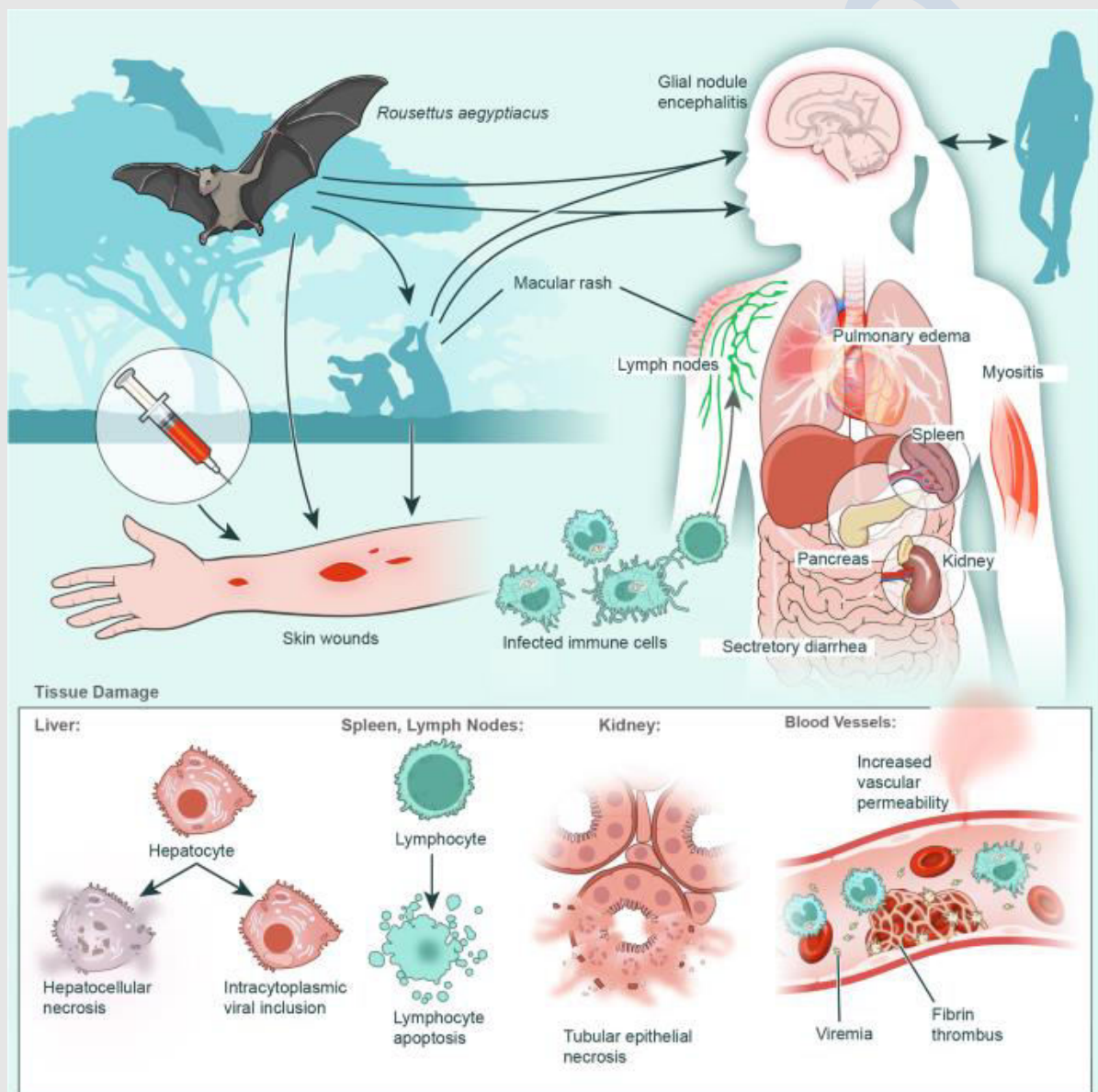
About 80% of infections are among medical workers. For a nation with only 1,500 doctors to cater to a population of over 13 million, the outbreak threatens to significantly strain the healthcare system.



What is Marburg virus?

Marburg is among the deadliest pathogens known to humans, with Marburg virus disease (MVD) case fatality rates ranging from 24% to 88% in past outbreaks, depending on virus strain and case management. The first outbreak occurred in Marburg, Germany, in 1967. Since then, subsequent outbreaks have been mostly reported across Africa.

Marburg belongs to the filovirus family, like Ebola. Both pathogens are clinically similar, and although rare, can cause outbreaks with high fatality rates.



How does MVD spread?

Initially, human MVD infections were caused by prolonged exposure to mines or caves inhabited by colonies of Rousettus bats, most notably the Egyptian fruit bat. However, according to the World Health Organization (WHO), Marburg also spreads through human-to-human transition both directly (through contact with blood and other bodily fluids of infected people) and indirectly (through surfaces and materials like bedding, clothing, etc. contaminated with these fluids).

Medical workers treating confirmed or suspected MVD cases have been frequently infected in outbreaks, especially when infection control and precautions are lax.

What are the symptoms of MVD?

The interval between infection and onset of symptoms varies from 2 to 21 days. Initial symptoms, according to the WHO, include high fever, severe headache, muscle ache, severe watery diarrhoea, abdominal pain and cramping, and vomiting.

Many patients develop haemorrhagic symptoms (bleeding), often in many places including the digestive system (faeces and vomit often come with fresh blood), the nose, gums, and vagina. Haemorrhage leads to most MVD fatalities, with death in fatal cases occurring 8 to 9 days after the onset of symptoms, usually of severe blood loss and shock.

How can MVD be prevented, treated?

Currently, there are no approved vaccines or specific treatments for MVD. However, according to WHO, supportive care — rehydration with oral or intravenous fluids — and treatment of specific symptoms, improves survival.

Some treatments are currently in the works. Rwanda Health Minister Sabin Nsanzimana has said the country is seeking experimental vaccines and treatments, and hopes to address the outbreak with candidate drugs and shots — those in preclinical or clinical trial phases. The US-based Sabin Vaccine Institute has provided Rwanda with 700 doses of its experimental Marburg vaccine, which will be administered to healthcare professionals at the frontlines.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

7. MicroRNA, gene regulation: What 2024 Nobel Prize for Medicine was awarded for

Introduction

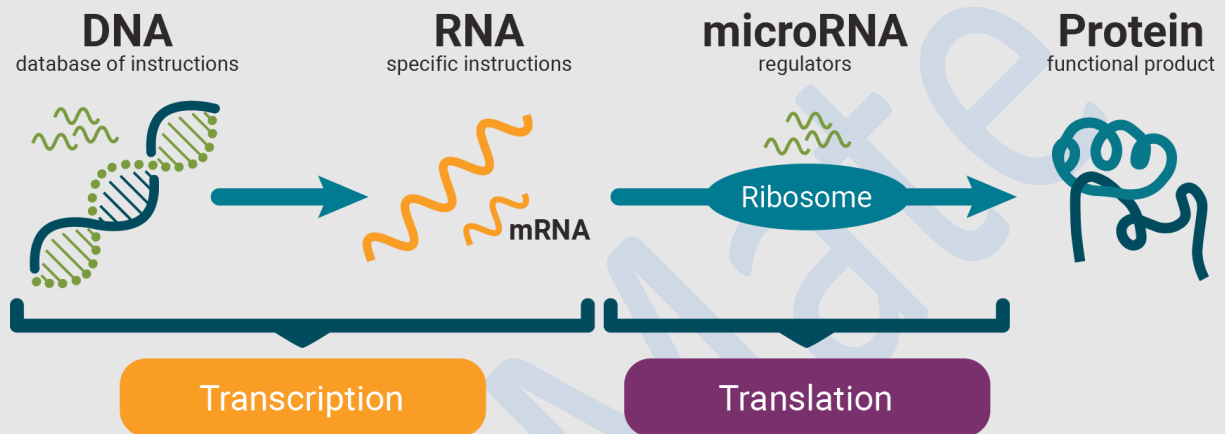
The Nobel Prize for Medicine this year has been awarded to scientists Victor Ambros and Gary Ruvkun for their discovery of microRNA — tiny molecules which play a crucial role in how genes function.

“Gene regulation by microRNA, first revealed by Ambros and Ruvkun, has been at work for hundreds of millions of years. This mechanism has enabled the evolution of increasingly complex organisms,” the Nobel press release for the announcement stated.

Why did Ambros and Ruvkun study microRNA?

According to the press release, the scientists were honoured for their “discovery of a fundamental principle governing how gene activity is regulated”. Here is an illustration to explain just what this means.

Think of chromosomes, which carry genetic information in the form of DNA, as a large toolbox. Every cell in the body has the same toolbox, containing identical tools (or genes). But different cells need to use different tools depending on their job — while a nerve cell might grab a tool that helps send signals, a muscle cell might choose a different tool to enable movement.



The key to these differences is gene regulation, a process that helps each cell pick the right tools for its specific tasks. In other words, only the appropriate set of genes is activated in each type of cell. Ambros and Ruvkun were curious about how gene regulation works. Their research led them to the discovery of microRNA, which provided a whole new way of understanding how bodies of complex organisms such as humans function.

Why is understanding gene regulation significant?

Genetic information is stored in DNA inside the nucleus of each cell. This information is copied to the mRNA, a molecule that contains the instructions that direct cells to synthesise appropriate proteins. Proteins handle all kinds of important jobs in the body, such as making muscles contract or helping nerves communicate.

Different tissues in the body create different proteins, depending on their specific functions. This differentiation among cells is governed by gene regulation, which effectively turns on or off specific genes in a cell in order to allow it to carry its specific task.

Faults in gene regulation can result in serious diseases like cancer, diabetes, or autoimmune conditions. Understanding gene regulation, thus, holds the key to understanding — and potentially treating — many of these conditions.

In the 1960s, scientists found that specialised proteins, called transcription factors, could bind to specific regions of DNA, and control which genetic messages were produced. These transcription factors essentially acted like switches, turning genes on or off depending on the

needs of the cell. This was a huge leap in understanding how genes are regulated, and for many years, it seemed like the mystery of gene regulation had been mostly solved. Thousands of transcription factors were identified, and it appeared that the scientific community had figured out the key to how cells control the flow of genetic information.

Then, in 1993, this year's Nobel winners published findings that revealed an entirely new process by which genes are regulated, one which no one had anticipated.

How was microRNA discovered?

In the late 1980s, Ambros and Ruvkun were working under Nobel Prize-winning researcher Robert Horvitz, studying a tiny roundworm called *C. elegans*. Despite being just 1 millimetre long, this worm had many of the same cell types found in larger animals, making it an ideal candidate for understanding how tissues develop.

Ambros and Ruvkun were particularly interested in two genes in these worms: *lin-4* and *lin-14*. These genes played important roles in determining when different cells matured. The scientists' curiosity was piqued when they noticed that certain mutant worms had problems with this timing. Ambros discovered that *lin-4* seemed to inhibit *lin-14*, but the scientific process behind this was unclear.

After setting up his lab at Harvard, Ambros began further investigating the *lin-4* gene. To his surprise, he found that *lin-4* produced a tiny RNA molecule that did not code for proteins like most genes do. Instead, this "micro" RNA simply blocked the activity of *lin-14*.

Meanwhile, Ruvkun, in his own lab, was closely examining the *lin-14* gene when he discovered that *lin-4* was not stopping the production of *lin-14*'s mRNA which carried genetic instructions for making its protein. Rather, it was preventing *lin-14* from making the protein itself. As Ambros and Ruvkun compared their findings, a breakthrough emerged — the short RNA from *lin-4* matched a specific part of *lin-14*'s mRNA, allowing it to latch on and effectively turn off *lin-14*'s protein production.

This discovery revealed a fascinating new way in which genes could be controlled through tiny RNA molecules now called microRNAs. Initially published in 1993, the discovery got little notice as most scientists believed that this peculiar process was limited to *C. elegans*.

However, everything changed in 2000 when Ruvkun's team discovered another microRNA, called *let-7*, which was found across many species, including humans. This finding sparked widespread interest, leading to the identification of hundreds of microRNAs. Today, we know that microRNAs play a crucial role in gene regulation for nearly all multicellular organisms, including humans.

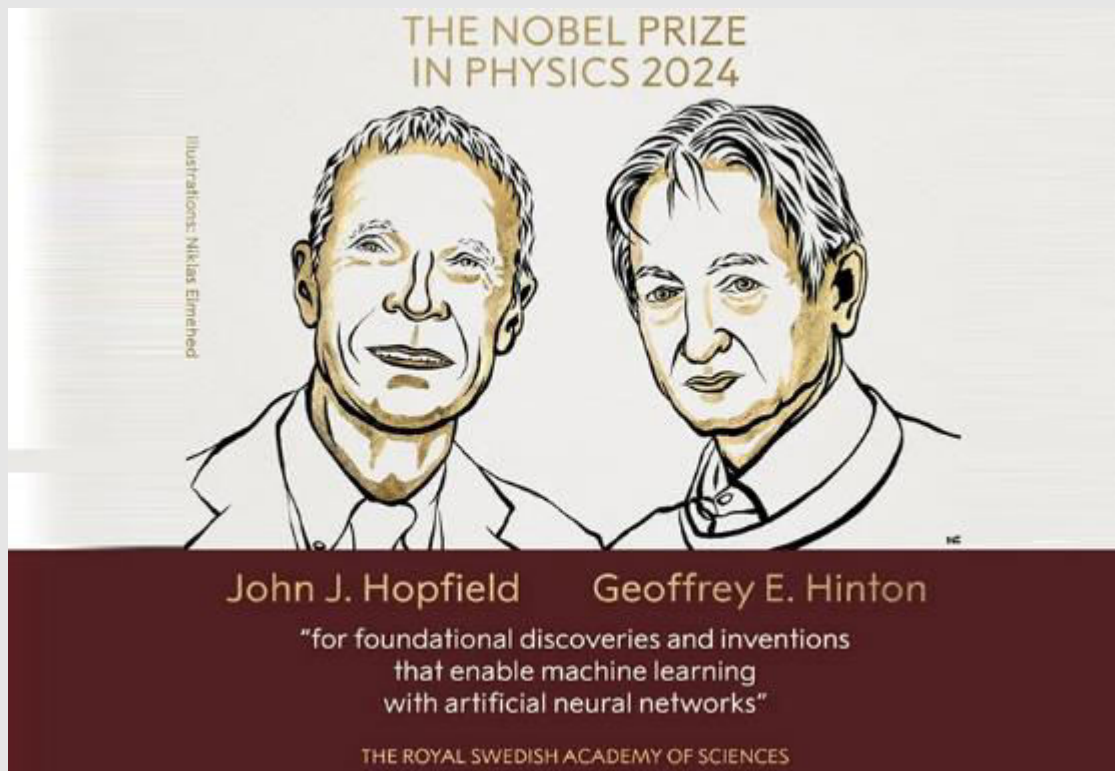
Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

8. Nobel Prize in Physics: Honoring AI Pioneers

AI Revolution

Artificial Intelligence (AI) tools are transforming daily life, enabling tasks like data analysis, image creation, and information retrieval. This year's Nobel Prize in Physics recognizes two scientists whose work laid the foundation for the AI advancements we see today—John Hopfield, a 91-year-old American, and Geoffrey Hinton, a 76-year-old British-Canadian. Their groundbreaking discoveries, primarily made in the 1980s, have now become key to machine learning with artificial neural networks.



Mimicking the Brain

Hopfield and Hinton's work involved developing algorithms that mimic the brain's functioning in tasks like learning and recognizing patterns. While early computers were designed for repetitive calculations, scientists soon sought to make machines perform more complex human-like tasks, such as learning and remembering.

Hopfield's breakthrough came in the 1980s with the creation of artificial neural networks that resembled the human brain's nerve cells, allowing computers to 'remember' and 'learn.' His model could capture entire patterns in one go, crucial for technologies like face recognition.

Deep Learning Advances

Building on Hopfield's work, Hinton developed artificial neural networks capable of handling more complex tasks, such as understanding voices and images. He introduced a method called backpropagation, which allowed neural networks to learn from mistakes and improve. This led

to the creation of deep neural networks, which are now central to speech recognition, translation, and self-driving cars.

In 2012, Hinton's deep networks made a major breakthrough at the ImageNet Visual Recognition Challenge, revolutionizing image recognition. His contributions have since earned him the prestigious Turing Prize.

Physics and AI

While Hinton's work is rooted in computer science, Hopfield's contributions stem from physics and biology. His neural network model was inspired by the mathematical principles of 'spin glass,' a special kind of physical system. This crossover between physics and AI marks the relevance of the Physics Nobel for their achievements.

In recognizing these pioneers, the Nobel Committee celebrates their foundational contributions to the AI revolution reshaping the modern world.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

9. DAE Inaugurates MACE, Asia's Largest and World's Highest Cherenkov Observatory in Ladakh

Introduction

On October 4, 2024, Dr. Ajit Kumar Mohanty, Secretary of the Department of Atomic Energy (DAE) and Chairman of the Atomic Energy Commission, inaugurated the Major Atmospheric Cherenkov Experiment (MACE) Observatory at Hanle, Ladakh. Standing at an altitude of 4,300 meters, MACE is not only the largest imaging Cherenkov telescope in Asia but also the highest in the world. This indigenous project, developed by the Bhabha Atomic Research Centre (BARC) with support from Indian industry, marks a significant milestone for India in the field of cosmic-ray research.



Cherenkov telescope

A Cherenkov telescope is a specialized type of astronomical instrument used to detect high-energy gamma rays from cosmic sources by observing Cherenkov radiation. It is primarily used in gamma-ray astronomy to study energetic phenomena such as supernovae, black holes, and gamma-ray bursts.

How It Works:

1. Cherenkov Radiation: When high-energy gamma rays from space interact with Earth's atmosphere, they produce cascades of secondary particles, such as electrons and positrons, which move faster than the speed of light in the atmosphere (though not faster than the speed of light in a vacuum). This creates a faint blue glow, called Cherenkov radiation.

2. Imaging Cherenkov Radiation: Cherenkov telescopes detect and image this brief flash of Cherenkov light, which lasts just a few billionths of a second. The light is captured by large mirrors and focused onto a camera, usually made of highly sensitive photomultiplier tubes or other optical sensors.

3. Data Analysis: By analyzing the shape, intensity, and timing of the Cherenkov radiation, scientists can infer the properties of the original gamma rays, such as their energy and the direction they came from in the sky.

Significance of the MACE Observatory

Dr. Mohanty emphasized that the MACE Observatory places India at the forefront of global cosmic-ray research. The telescope will study high-energy gamma rays, advancing our understanding of the universe's most energetic phenomena, such as supernovae and black holes. He also highlighted MACE's role in promoting the socio-economic development of Ladakh and inspiring future generations of Indian scientists and astronomers.

Collaborative Efforts and Community Engagement

Several dignitaries, including Shri Ajay Ramesh Sule, Additional Secretary of DAE, and Dr. Annapurni Subramaniam, Director of the Indian Institute of Astrophysics (IIA), spoke about the collaborative efforts that made the MACE project possible. Shri Sajjad Hussain Mufti, Chief Conservator of Forests, UT Ladakh, praised the project's alignment with the goals of the Hanle Dark Sky Reserve, encouraging community engagement and scientific tourism.

Technological Impact and International Collaboration

The MACE project aims to foster international collaboration and establish India's leadership in astrophysics and multi-messenger astronomy. It will complement global observatories in studying cosmic phenomena, strengthening India's contribution to space research. The inauguration event also featured the release of a special pictorial compilation documenting the journey of the MACE project and a film showcasing the technological advancements involved.

This observatory represents a monumental achievement for Indian astrophysics and is set to inspire generations of scientists while contributing to global research on the most energetic events in the universe.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: PIB

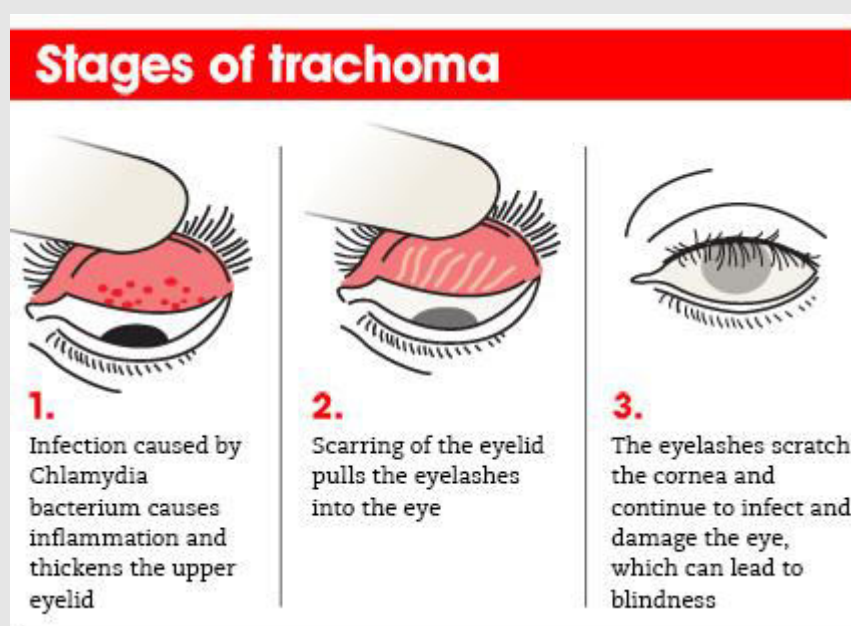
10. WHO declares that India has eliminated Trachoma as a public health problem in 2024

Introduction

World Health Organisation (WHO) has declared that the Government of India has eliminated Trachoma as a public health problem becoming the third country in the South-East Asia Region to achieve this milestone.

About Trachoma

Trachoma is a bacterial infection that affects the eyes. It is caused by the bacterium *Chlamydia Trachomatis*. Trachoma is contagious, spreading through contact with the eyes, eyelids, nose or throat secretions of infected people, if left untreated it causes irreversible blindness.



WHO has termed Trachoma as a neglected tropical disease. WHO estimates suggest that 150 million people worldwide are affected by Trachoma and 6 million of them are blind or at risk of visually disabling complications. Trachoma is found in underprivileged communities living in poor environmental conditions.

Trachoma in India

Trachoma was amongst the leading cause of blindness in the country during 1950-60. The Government of India launched the National Trachoma Control Program in 1963 and later on Trachoma control efforts were integrated into India's National Program for Control of Blindness (NPCB).

In 1971, blindness due to Trachoma was 5% and today, owing to the various interventions under the National Programme for Control of Blindness & Visual Impairment (NPCBVI), it has come down to less than 1%. WHO SAFE strategy was implemented throughout the country wherein SAFE stands for adoption of surgery, antibiotics, facial hygiene, environmental cleanliness etc. As a result, in 2017, India was declared free from infective Trachoma. However, surveillance continued for trachoma cases in all the districts of India from 2019 onwards till 2024.

The National Trachomatous Trichiasis (TT only) Survey was also carried out in 200 endemic districts of the country under NPCBVI from 2021-24, which was a mandate set by WHO in order to declare that India has eliminated Trachoma as a public health problem.

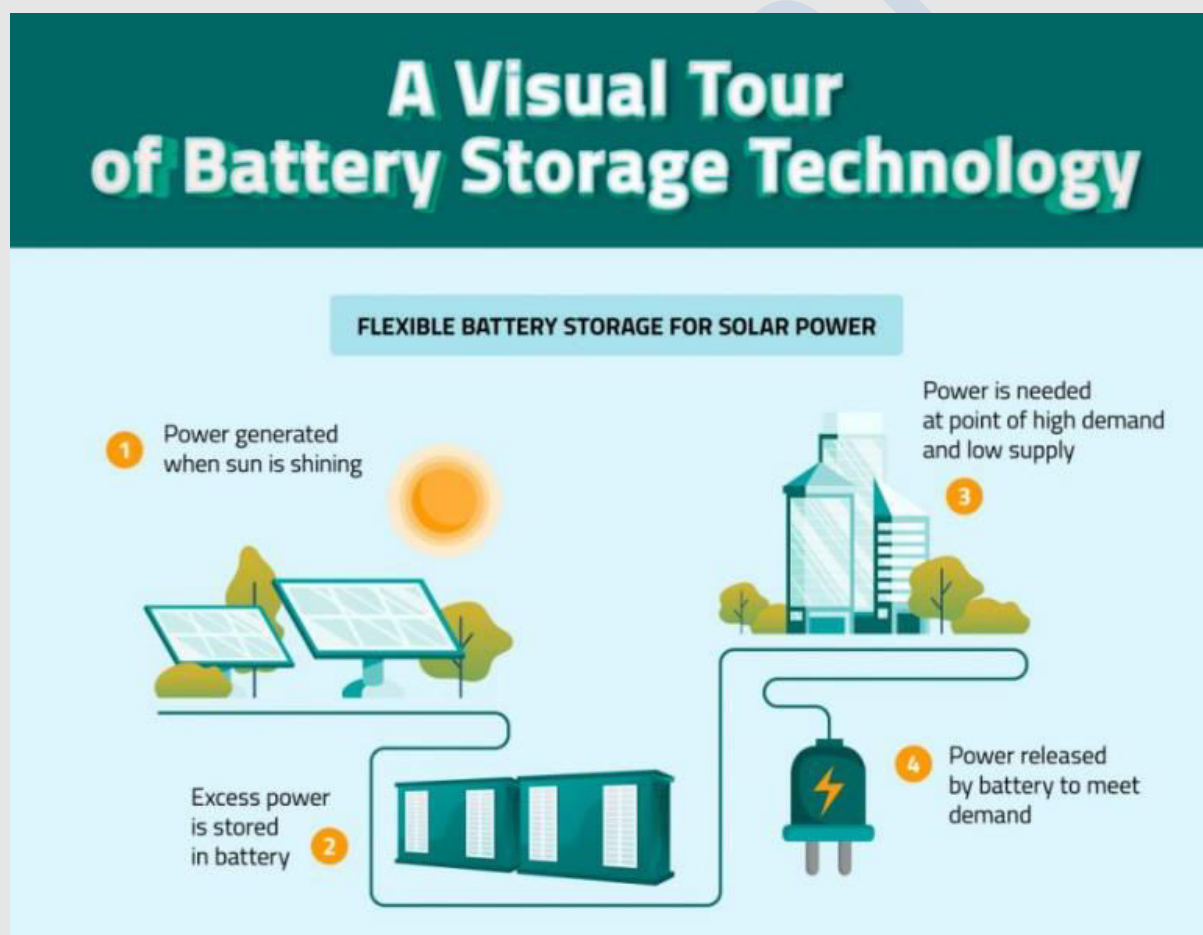
All the reports were compiled in a specific dossier format by the NPCBVI team and were shared with the WHO country office for final scrutiny. Finally, after years of fighting against Trachoma, WHO declared that India has eliminated Trachoma as a public health problem.

Relevance: GS Prelims; Science & Technology
Source: PIB

11. Why battery storage is essential for a renewables-heavy electricity grid

Introduction

With India targeting to have half of its electric power capacity come from renewables by 2030, the resilience and stability of its power grid have never been more critical. Renewables, while essential for a sustainable future, come with their own set of challenges.



Foremost among these is the inherent variability of renewable energy sources like wind and solar. Unlike traditional energy sources that provide a consistent and predictable output, renewable energy generation fluctuates based on weather conditions, posing a risk to grid stability. The electricity grid, thus, needs to be equipped with additional flexibility that will allow power generation to be ramped up or down based on demand.

To this end, a separate market for grid-flexible resources, called the ancillary services market, will have to be set up. Such markets exist in all geographies where the share of renewable energy in the grid has breached the 15-20% mark (renewables make up roughly 10% of India's energy portfolio at the moment).

Ancillary Services

In absence of infrastructure that can store electricity in large amounts, it must be produced as it is used. The electricity grid responds to shifting demand to continuously generate and route electricity to where it is needed the most.

This is all fine when it comes to traditional energy sources, with their consistent and predictable output. However, fluctuations in scheduled dispatches of electricity generated from renewables could have an error of 3-5%. For an installed renewables capacity of 500 GW (as India plans to achieve by 2030), a 3% error would amount to a supply reduction of 15 GW, enough to cause a severe imbalance in the grid.

Ancillary services provide quick, real-time adjustments to balance supply and demand of power. There are three kinds of ancillary services:

- Primary services respond to fluctuations in real-time (less than a second), which makes them the most relevant in addressing imbalances in renewables-heavy grids. They can only be provided via hydroelectricity, and battery storage (more on that later).
- Secondary services respond to fluctuations within 10-15 minutes. These comprise gas-based capacities.
- Tertiary services take about 20-30 minutes to respond, and comprise thermal power plants, including the coal-fired plants that remain in use in India.

The Covid Example

To illustrate just how these services would work, it will be useful to recall the evening of April 5, 2020 during the first Covid-19 lockdown. Prime Minister Narendra Modi had called for a switching off of lights at 9 pm for 9 minutes. This led to a sudden load reduction of almost 15 GW at 9 pm, and a subsequent increase in load at 9.09 pm.

A Power System Operation Corporation Ltd (POSOCO) report published after the event outlined how the grid was managed. The load reduction was carried out in a phased manner, a few minutes before 9 pm by reducing power generation from thermal, gas, and hydel sources by about 11 GW. At 9.10 pm, hydropower stations were ramped up to supply approximately 17.5 GW, enough to handle the sudden surge in demand.

The unique characteristic of hydropower — the ability to instantly ramp up or down — was crucial in this regard. Gas and thermal power stations require 8-20 minutes to do the same. The only other resource with similar characteristics as hydropower in this regard is battery storage.

This is more so because unlike in the Covid-19 event, which was meticulously planned for in advance, real life situations may not serve any advance notice. For the 9 minute long event, POSOCO had assumed full control of hydropower resources in advance, effectively removing it from the energy market and operating it independently.

Need for Battery Storage

The deployment of Battery Energy Storage Systems (BESS) within the ancillary services market will be crucial as India's grid becomes more renewables-heavy. This is because BESS is the fastest in responding to grid contingencies, and can transition from standby to full power in under a second. It can provide essential services such as frequency control, voltage regulation, congestion relief, peak shaving, power smoothing, and peak capacity support, making it an invaluable asset in the modern grid.

The Global Energy Alliance for People and Planet (GEAPP) partnered with BSES Rajdhani Power Limited (BRPL) and IndiGrid to launch India's first commercial-scale BESS pilot in New Delhi earlier this year. This 20MW/40MWh project (which can provide up to 20 MW of power for two hours) is designed to provide reliable power access to over 12,000 low-income consumers in Delhi.

The Central Electricity Regulatory Commission has identified the need for 4 GW of such capacities to ensure grid flexibility and stability. By 2031-32, India has estimated a storage requirement of 73.93 GW, a majority of which is expected to come from BESS.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

12. Chemistry Nobel 2024 out: What exactly have the winners done, why it matters

Introduction

2024 Nobel Prize in Chemistry: The Nobel Prize in Chemistry 2024 has been awarded to David Baker, Demis Hassabis and John M Jumper. While Baker (62), who works at the University of Washington, Seattle, won "for computational protein design", the American Jumper (39) and Briton Hassabis (48), who both work at Google DeepMind, were honoured for "protein structure prediction".

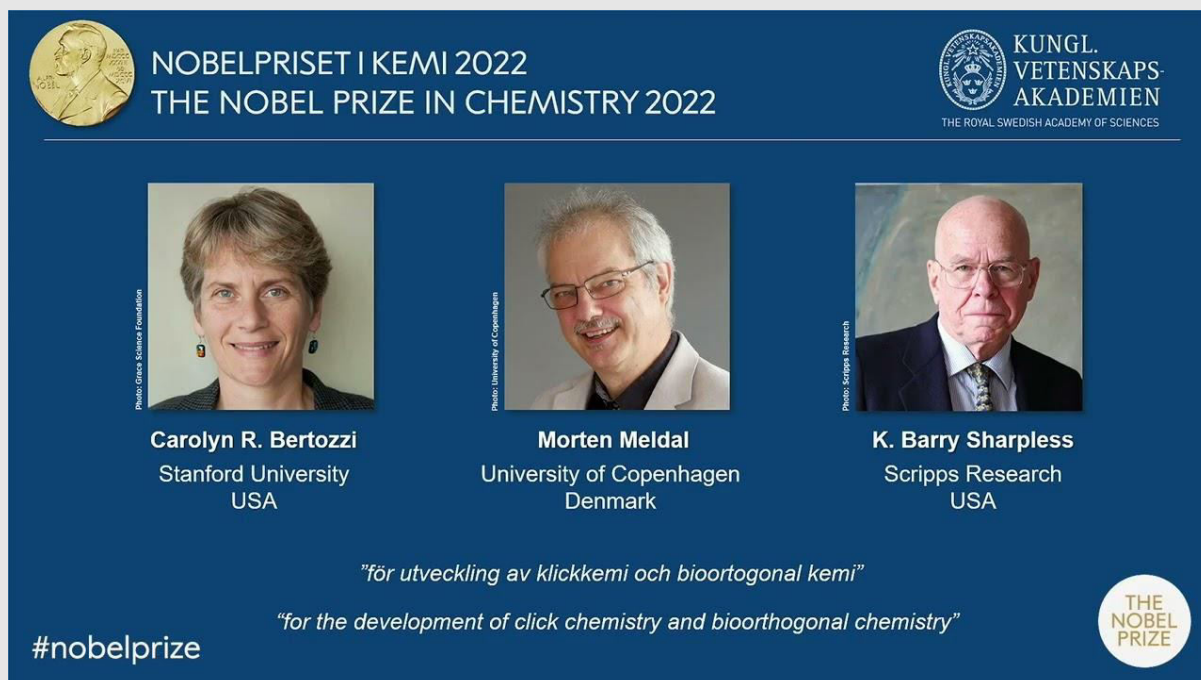
The Chemistry Nobel is the third to be announced, and combines work on cell proteins and Artificial Intelligence, which won the Nobels for Medicine and Physics respectively this year.

What exactly have Baker, Hassabis and Jumper done, and why is it important? We explain.

First, why is work on proteins important?

Proteins are fundamental to almost all biological processes, or as the Nobel Prize website poetically says, to "the exuberant chemistry of life". In human bodies, for example, the protein

haemoglobin transports oxygen, insulin helps absorption of glucose from blood, etc. Thus, anything that impacts protein production can have consequences for human health.



The graphic is a blue rectangular banner for the Nobel Prize in Chemistry 2022. In the top left corner is a gold Nobel medal. To its right, the text "NOBELPRISET I KEMI 2022" and "THE NOBEL PRIZE IN CHEMISTRY 2022" is displayed in white. In the top right corner is the logo of the Kungl. Vetenskaps-Akademien (The Royal Swedish Academy of Sciences). Below the title, three portraits of the laureates are shown in a row. Each portrait has a small vertical credit on its left: "Photo: Eric Science Foundation" for Carolyn R. Bertozzi, "Photo: University of Copenhagen" for Morten Meldal, and "Photo: Scripps Research" for K. Barry Sharpless. Below each portrait is the laureate's name and affiliation in white text. At the bottom center, the award citation is written in Swedish and English. The hashtag #nobelprize is in the bottom left, and a circular "THE NOBEL PRIZE" logo is in the bottom right.

NOBELPRISET I KEMI 2022
THE NOBEL PRIZE IN CHEMISTRY 2022

KUNGL. VETENSKAPS- AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

Carolyn R. Bertozzi
Stanford University
USA

Morten Meldal
University of Copenhagen
Denmark

K. Barry Sharpless
Scripps Research
USA

"för utveckling av klickkemi och bioortogonal kemi"
"for the development of click chemistry and bioorthogonal chemistry"

#nobelprize

THE NOBEL PRIZE

Given their central importance, proteins have been extensively studied for a long time. There was even a competition about predicting protein structures running from 1994 (called Critical Assessment of Protein Structure Prediction, or CASP), which ended only after Jumper's contributions to Hassabis's work helped them win it decisively in 2020. Baker, separately, had participated in the competition in 1998.

What did Jumper and Hassabis do?

Proteins are built from 20 amino acids, joined into long strings. As the Nobel Prize website explains, the "string of amino acids twists and folds into a distinct – sometimes unique – three-dimensional structure. This structure is what gives proteins their function."

In the 1960s, Christian Anfinsen, an American scientist, got a protein structure to unfold and fold itself. He found that the protein assumed exactly the same shape every time, and realised that this shape is determined by its sequence of amino acids.

This created an exciting possibility: "if chemists know a protein's amino acid sequence, they should be able to predict the protein's three-dimensional structure," the Nobel website says. This prediction eluded scientists for a long time.

Hassabis, meanwhile, had been working in the field of AI, and had co-founded DeepMind, which built AI models for boardgames and was later sold to Google. In 2018, he entered the CASP. His team built an AI model called AlphaFold, which displayed around 60 per cent accuracy in predicting protein structures. While impressive at the time, this accuracy rate was

not good enough. Research on AlphaFold continued, but saw a breakthrough only after Jumper joined Google DeepMind.

And what did Baker do?

Baker developed Rosetta, a software to predict protein structures.

"Baker made his debut in the CASP competition in 1998 using Rosetta and, in comparison to other participants, it did really well. This success led to a new idea – that David Baker's team could use the software in reverse. Instead of entering amino acid sequences in Rosetta and getting protein structures out, they should be able to enter a desired protein structure and obtain suggestions for its amino acid sequence, which would allow them to create entirely new proteins," the Nobel website says.

Baker and his team succeeded, and today, a variety of new proteins with various functions can be created in labs.

Why is their work important?

As the Nobel website says, "That we can now so easily visualise the structure of these small molecular machines is mind boggling; it allows us to better understand how life functions, including why some diseases develop, how antibiotic resistance occurs or why some microbes can decompose plastic."

"The ability to create proteins that are loaded with new functions is just as astounding. This can lead to new nanomaterials, targeted pharmaceuticals, more rapid development of vaccines, minimal sensors and a greener chemical industry – to name just a few applications that are for the greatest benefit of humankind," the website adds.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

13. What is fortified rice? Why did Centre extend initiative for its distribution in schemes

Introduction

The Union Cabinet recently extended the universal supply of fortified rice in all central government schemes providing free food grain under the National Food Security Act, 2011, in its present form, until December 2028.

In a briefing on the Cabinet decision, Union Information and Broadcasting Minister Ashwini Vaishnaw said that the aim of this was to "address anaemia and micro-nutrients deficiency".

The Cabinet Committee on Economic Affairs (CCEA), in April 2022, had decided to implement the rice fortification initiative throughout the country in a phased manner by March 2024. All three planned phases have now been successfully completed, with the target of universal

coverage achieved by March 2024, an official statement following the Cabinet announcement said.

What is rice fortification, and why is it needed?

The Food Safety and Standards Authority of India (FSSAI), country's top food regulator, defines fortification as "deliberately increasing the content of essential micronutrients in a food so as to improve the nutritional quality of food and to provide public health benefit with minimal risk to health".

India has very high levels of malnutrition among women and children.



According to the Food Ministry, every second woman in the country is anaemic, and every third child is stunted.

"According to the National Family Health Survey (NFHS-5) conducted between 2019 and 2021, anaemia remains a widespread issue in India, affecting children, women, and men across various age groups and income levels. Besides iron deficiency, other vitamin and mineral

deficiencies, such as Vitamin B12 and folic acid, also persist, impacting the overall health and productivity of the population,” the aforementioned government statement said.

Fortification of food is considered to be one of the most suitable methods to combat malnutrition. Rice is one of India’s staple foods, which is consumed by about two-thirds of the population. Per capita rice consumption in India is 6.8 kg per month. Fortifying rice with micronutrients is an option to supplement the diet of the poor.

What is the process by which rice is fortified?

Various technologies, such as coating, dusting, and ‘extrusion’, are available to add micronutrients to regular rice. The last mentioned technology involves the production of fortified rice kernels (FRKs) from a mixture using an ‘extruder’ machine. It is considered to be the best technology for India.

Dry rice flour is mixed with a premix of micronutrients, and water is added to this mixture, which is then passed through a twin-screw extruder with heating zones. Kernels similar in shape and size to rice are produced, which, as per Ministry of Consumer Affairs, Food and Public Distribution guidelines, must “resemble the normal milled rice as closely as possible”.

The kernels are dried, cooled, and packaged. FRK has a shelf life of at least 12 months. The kernels are blended with regular rice to produce fortified rice. Under the Ministry’s guidelines, 10 g of FRK must be blended with 1 kg of regular rice.

According to FSSAI norms, 1 kg of fortified rice will contain the following: iron (28 mg-42.5 mg), folic acid (75-125 microgram), and vitamin B-12 (0.75-1.25 microgram).

Rice may also be fortified with zinc (10 mg-15 mg), vitamin A (500-750 microgram RE), vitamin B-1 (1 mg-1.5 mg), vitamin B-2 (1.25 mg-1.75 mg), vitamin B-3 (12.5 mg-20 mg) and vitamin B-6 (1.5 mg-2.5 mg) per kg.

How is fortified rice cooked and eaten?

It is no different from the way any rice is cooked and eaten. The rice needs to be cleaned and washed in the normal way before cooking. After cooking, fortified rice retains the same physical properties and micronutrient levels as it had before cooking.

Fortified rice is packed in jute bags with the logo (‘+F’) and the line “Fortified with Iron, Folic Acid, and Vitamin B12”.

How has the fortification initiative fared so far?

In his Independence Day speech in 2015, Prime Minister Narendra Modi announced that rice distributed under various central government schemes like the Public Distribution System (PDS) and Mid-Day Meal Scheme in schools, would be fortified by 2024. In April 2022, the Centre cleared a phase-wise plan to implement the rice fortification initiative.

Phase 1 had already been implemented when the Centre's plan was cleared. It saw two programmes — Integrated Child Development Services and PM POSHAN — covered by March 2022.

Phase 2 extended the supply of fortified rice to PDS and other welfare schemes in 112 Aspirational Districts in 27 states, and 291 high stunting burden districts by March 2023.

Phase 3 saw all remaining districts in the country get covered under the initiative by March 2024.

The cost of rice fortification is around Rs 2,700 crore per annum — less than 2% of India's annual total food subsidy bill. Since the 2019-20 fiscal year through March 31, 2024, approximately 406 lakh metric tonnes (LMT) of fortified rice have been distributed through the PDS, the government said in a statement issued in July this year.

As per officials, there are 925 fortified rice manufacturers in the country, with a capacity of 111 LMT per annum. FRK produced by these manufacturers are sent to India's 21,000-odd rice mills for blending. Installed blenders in these mills have a monthly capacity to produce 223 LMT of fortified rice.

According to Vaishnav, the Centre has invested Rs 11,000 crore for developing the fortified rice supply chain in India.

Relevance: GS Prelims & Mains Paper III; Science & Technology
Source: PIB

14. How will tech reshape protein studies? Why is the work of the chemistry laureates, David Baker, Demis Hassabis, and John Jumper, significant?

Introduction

The 2024 Nobel Prize for Chemistry was jointly awarded to David Baker for his work on computational protein design and to Demis Hassabis and John Jumper for developing technologies to predict the structure of proteins.

Why are proteins important?

The chemistry prize concerns two areas in the field of protein research: design and structure.

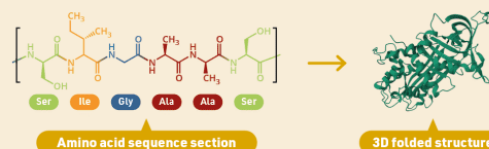
All life (as is known) requires proteins and all proteins are made of amino acids. While there are many types of amino acids in nature, only 20 of them in different combinations make up all the proteins in the human body and in most life forms. Amino acids are found in tissues that provide structural support; they are catalysts in biochemical reactions; move molecules across biological membranes; control muscle contraction that lets us move around and have our hearts beat; and help cells communicate to perform their tasks.

The 2024 Nobel Prize in Chemistry

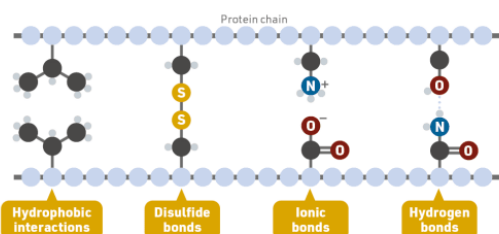


The 2024 Nobel Prize in Chemistry was awarded to **David Baker** for computational protein design and to **Demis Hassabis** and **John M. Jumper** for protein structure prediction.

Proteins are important biological molecules formed from 20 naturally occurring amino acids. Proteins form folded 3D structures which are key to their function and properties, but the exact way in which they fold is hard to predict. A protein with just 100 amino acids could have 10^{47} different 3D structures.



In 2020, **Demis Hassabis**, **John Jumper** and their co-workers unveiled an artificial intelligence model called AlphaFold2 to predict 3D folded structures of proteins. This is notoriously difficult because of the range of intermolecular forces in protein structures.



AlphaFold2 analyses amino acid sequences and evaluates how they might interact with each other. It has since been used to predict the structures of the almost 200 million known proteins.

David Baker developed Rosetta, software that also attempts to predict protein structures. He wondered if it was possible to work in the other direction: to start with a protein structure and use the software to work out its amino acid sequence.



Rosetta uses a database of protein structures and searches it for fragments with the same structure as the desired structure, pieces them together, then suggests an amino acid sequence based on this.

Baker's research group succeeded in doing this in 2003 to create an entirely new protein. They have since produced many other novel proteins that do not occur naturally.

WHY DOES THIS RESEARCH MATTER?

Being able to predict and design protein structures has benefits for the design of protein-based drugs, sensors, vaccines, catalysts, and more. It also aids our understanding of existing proteins and how they interact with other molecules.

What is the protein-folding problem?

A protein has many identities and one of them depends on the arrangement of its amino acids in the three dimensions of space — in other words, its 3D structure. In 1962, University of Cambridge researchers John Kendrew and Max Perutz won the Chemistry Nobel Prize for elucidating the first 3D models of hemoglobin and myoglobin, both proteins, using X-ray crystallography.

One breakthrough arrived in 1969 when scientists found that a protein does not try to bend into different shapes. It somehow knows the shape it needs to have and rapidly folds itself to acquire it. The mysterious nature of this 'knowledge' of the protein is called the protein-folding problem.

By the late 2010s, scientists had worked out the structures of around 1.7 lakh proteins — a large number yet still small compared to the roughly 200 million proteins in nature. This situation changed drastically around 2018.

What is AlphaFold?

Hassabis co-founded DeepMind in 2010 which Google acquired in 2014. Here, Hassabis and his colleagues unveiled AlphaFold in 2018. AlphaFold is a deep-learning model to predict the structures of almost all proteins. DeepMind launched its successor AlphaFold 2 in 2020, when it was able to predict the structure of proteins with an accuracy comparable to that of X-ray crystallography.

Jumper led the work on AlphaFold 3, which can predict the structures of various proteins and how two proteins and/or a protein and another molecule might interact. These models are capable of deducing the 3D shapes of most proteins in a matter of hours. However, they have not been able to say why a protein prefers a particular structure. Scientists have thus said it can help them test their hypotheses; making sense of them is still the task of humans.

As Derek Lowe, a pharmaceutical researcher and author of a column in Science, put it to The Hindu in June 2024, "If the protein folding problem was set to us by God to teach us how to learn molecular interactions from first principles, we cheated."

What is protein design?

Baker developed tools scientists use to design new proteins with specific shapes and functions. His first notable work was in 2003 when he led a team to create a novel protein and determined its structure using a bespoke computer program they had developed in 1999 called 'Rosetta'. The researchers compared Rosetta's output with that obtained from X-ray crystallography studies and found them remarkably similar.

According to the Nobel Committee for Chemistry, "Rosetta was designed to be a general program both for protein structure prediction and design, and it has continuously been developed since its inception, with a large cadre of users and co-developers."

The ability to design proteins has far-reaching implications. For example, in 2022, Baker's team developed an antiviral nasal spray to treat COVID-19. At its heart were proteins the team designed using computational methods in the laboratory to stick to vulnerable sites on the viral surface and target the spike protein.

Teams involving Baker have also designed new enzymes to support organic chemistry reactions of commercial value, including the aldol reaction (used to make atorvastatin) and the Diers-Alder reaction (to make vitamin B6). Recently, scientists have been exploring novel protein designs for use as biosensors to monitor, say, blood glucose levels in people with diabetes.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: The Hindu

15. Why is microRNA discovery a big leap?

Introduction

The Nobel Committee announced on October 7 that the Nobel Prize for Medicine or Physiology would be shared by Victor Ambros and Gary Ruvkun “for the discovery of microRNA and its role in post-transcriptional gene regulation,” thereby unlocking a secret on how different types of cells develop.



What is microRNA?

The human body is probably the most complex puzzle that humans are still trying to make sense of. Every time there is a better understanding and a piece slides into place with a resounding click, then it is an occasion for celebration. For a Nobel Prize too perhaps. This year's awardees of the Nobel Prize for Medicine — Ambros and Ruvkun — did slide in a couple of pieces into the right slots in the massive puzzle that suddenly opened our eyes to understanding how different cell types develop.

Consider this: Every cell in the body contains the same chromosome, so every cell contains exactly the same set of genes and presumably, the same instructions. But different cell types have different, unique characteristics. It confounded the imagination until Ambros and Ruvkun came along. Their discovery offered a plausible explanation for the conundrum. The piece of the puzzle was called microRNA, a new class of tiny RNA molecules that play a crucial role in gene regulation. As the Nobel announcement statement said, their groundbreaking discovery revealed a completely new principle of gene regulation essential for multicellular organisms, including humans.

It is now known that the human genome codes for over one thousand microRNAs. Genetic information flows from DNA to messenger RNA (mRNA), via a process called transcription, and then on to the cell for production of protein. There, mRNAs are translated so that proteins are made according to the genetic instructions stored in DNA.

The key is in the precise regulation of gene activity so that only the correct set of genes is active in each specific cell type. Additionally, gene activity must be continually fine-tuned to adapt cellular functions to changing conditions in our bodies and environment. If gene regulation goes awry, it can lead to serious diseases. Therefore, understanding the regulation of gene activity has been an important goal for many decades.

What is the work that led to the Nobel prize?

Ambros and Ruvkun, both American biologists, were together in their post-doctoral period at the H. Robert Horvitz lab in the 1980s, and their interest in cell development probably had its spark there. "It was the moment," Ruvkun said later, "when recombinant DNA was just starting to take off and it was obvious that it was a revolution and I wanted to be part of that." As they say, great achievements have humble beginnings, and this duo started appropriately enough with a humble 1 mm long roundworm. This creature was not an odd choice though: it possessed many specialised types of cells, such as nerve and muscle cells, making it a convenient model to study a complex genetic regulation process across species, one that was conserved throughout evolution.

After that, both scientists branched off on their own, though they remained focused on the same theme, obsessively, as great scientists are wont to, but exchanging data with each other, a task assigned great value in the modern scientific world.

The study of mutant strains that disrupt cellular processes offers great insights into gene function, and Ambros and Ruvkun took this path. They studied two mutant strains of worms, *lin-4*, and *lin-14*, that displayed defects in the timing of activation of genetic programmes during development.

After his post-doctoral research, Ambros analysed the *lin-4* mutant in his laboratory. He managed to clone the gene which revealed that the *lin-4* gene produced an unusually short RNA molecule that lacked a code for protein production. This suggested that the small RNA from *lin-4* was responsible for inhibiting *lin-14*.

Concurrently, Ruvkun investigated the regulation of the lin-14 gene at Massachusetts General Hospital and Harvard Medical School. Ruvkun showed that the inhibition occurred at a later stage in the process of gene expression, through the shutdown of protein production. Experiments also revealed a segment in lin-14 mRNA necessary for its inhibition by lin-4. There were therefore complementary sequences in lin-4 and lin-14 mRNA, and the former binds to such sequences in the latter, blocking protein production in lin-14.

The two laureates compared their findings, which resulted in a breakthrough discovery. A new principle of gene regulation, mediated by a previously unknown type of RNA, microRNA, had been discovered. The results were published in 1993 in two articles in the journal *Cell*. Incidentally, Ambros' wife Rosalind Lee was his colleague and the first author of the *Cell* paper cited by the Nobel Committee. As Iorio and Croce wrote in their paper *Causes and consequences of microRNA dysregulation*, in the *Cancer Journal*, "microRNAs represent indeed an entire novel level of gene regulation that forced scientists to revise and somehow reorganise their view of the molecular biology."

While these results were met with initial silence from the scientific community, perception changed and euphoria took over, after Ruvkun's research group published their discovery of another microRNA encoded by the let-7 gene, seven years later. This gene was highly conserved and present throughout the animal kingdom, unlike lin-4. Over the following years, different microRNAs were identified. As a result of this work, researchers are today aware of the presence of more than 1,000 genes for different microRNAs and that gene regulation for microRNA is present in all multicellular organisms.

What are the applications for the future?

As Iorio and Croce list, since the first discovery, there have been remarkable advances in the understanding of microRNA biology. These include the identification of hundreds of microRNA genes; the dissection of microRNA biogenesis pathways; the identification of numerous microRNA targets and the establishment of principles of target regulation; and more importantly, there have been vigorous studies of their biological functions in physiological and pathological conditions.

Researchers found that a single microRNA can regulate the expression of many different genes, and conversely, a single gene can be regulated by multiple microRNAs, thereby coordinating and fine-tuning entire networks of genes. Extensive research has also yielded knowledge that cells and tissues do not develop normally without microRNAs. Abnormal regulation by microRNA can contribute to cancer, and mutations in genes coding for microRNAs have been found in humans, causing conditions such as congenital hearing loss, eye and skeletal disorders. Mutations in one of the proteins required for microRNA production result in the DICER1 syndrome, a rare but severe syndrome linked to cancer in various organs and tissues.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

16. How are the physics laureates impacting AI?

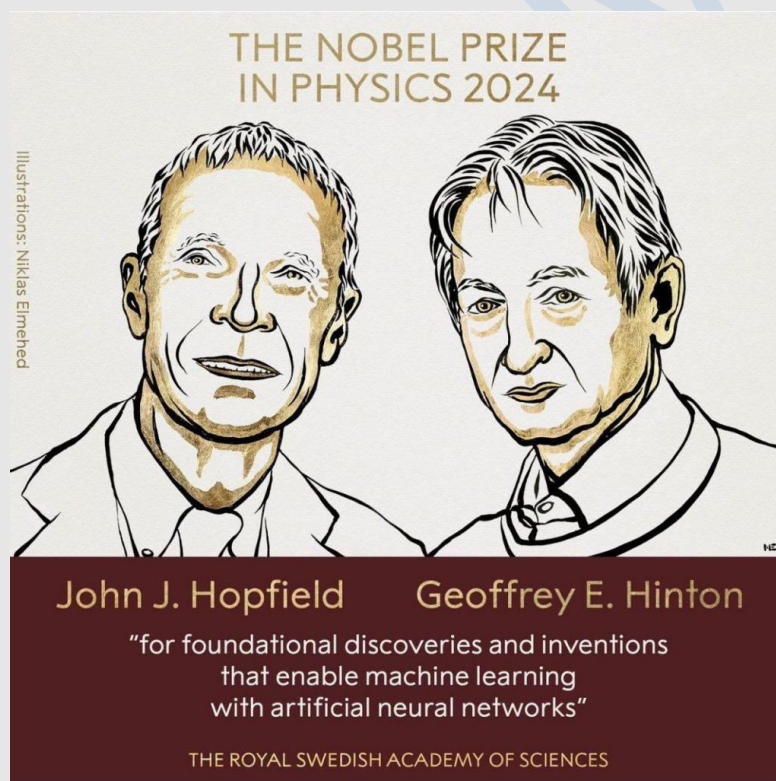
Introduction

On October 8, John Hopfield and Geoffrey Hinton won the 2024 Nobel Prize for Physics “for foundational discoveries and inventions that enable machine learning with artificial neural networks”. Their work lies at the roots of a large tree of work, the newest branches of which are seen today as apps like ChatGPT.

What is AI?

An accessible AI today is likely to be an implementation of an artificial neural network (ANN) — a collection of nodes designed to operate like networks of neurons in animal brains. Each node is a site where some input data is processed according to fixed rules to produce an output. A connection between nodes allows them to transfer input and output signals to each other. Stacking multiple layers of nodes, with each layer performing a specific task with great attention to detail, creates a machine capable of deep learning.

The foundations of contemporary AI, for which Hopfield and Hinton received this year’s physics Nobel Prize, are in machines that started off doing things humans were better at — pattern recognition — and based on ideas in statistical physics, neurobiology, and cognitive psychology.



What is the Hopfield network?

In 1949, Canadian psychologist Donald Hebb introduced a neuropsychological theory of learning to explain the ability of connections between neurons to strengthen or weaken. Hebb posited that the connection between two neurons becomes more efficient if the neurons constantly talk to each other. In 1983, Hopfield developed an ANN whose nodes used Hebb’s postulate to learn by association. For example, if a node is exposed to many texts, one set in English and the other its Tamil translation, it could use Hebbian learning to

conclude “hand” and “kai” are synonymous because they appear together most often.

Another feature of Hopfield network is information storage. When the network is ‘taught’ an image, it stores the visual in a ‘low-energy state’ created by adjusting the strengths of the

nodes' connections. When it encounters a noisy version of the image, it produces the denoised version by progressively moving it to the same low-energy state. The use of 'energy' here is an echo of the fact that the Hopfield network is similar in form and function to models researchers have used to understand materials called spin glasses. A low-energy state of a Hopfield network — which corresponds to its output — could map to the low-energy state of a spin glass modelled by the same rules. Hopfield's mapping was a considerable feat because it allowed researchers to translate ideas from statistical physics, neuro-psychology, and biology to a form of cognition.

What is a Boltzmann machine?

Hinton's share of the Nobel Prize is due to his hand in developing the first deep-learning machines. In 1872, Austrian physicist Ludwig Boltzmann published an equation to predict, say, the possible behaviours of a tub of fluid with one end hotter than the other. Whereas the first guess of a simple logic would be that all the possible states this system can take would be equally probable, Boltzmann's equation predicts that some states are more probable than others because the system's energy prefers them.

In the mid-1980s, Hinton and his peers developed an ANN with a tendency to move towards some outcomes over others by using Boltzmann's equation to process its inputs. Their network had visible nodes, which could input and output information, and a set of hidden nodes that only interacted with other nodes. The visible nodes worked like a Hopfield network whereas the hidden nodes modelled new possibilities using Boltzmann's equation. This was the dawn of generative AI. In another breakthrough in the 2000s, Hinton and others devised a form of the Boltzmann machine where the hidden nodes were connected only to visible nodes, and vice versa. These restricted Boltzmann machines (RBMs) could learn more efficiently, using the contrastive divergence algorithm Hinton et al. developed. Hinton, Simon Osindero, and Yee-Whye Teh also found that 'layers' of ANNs could be trained using RBMs and then stacked to create a deep learning model.

Where are ANNs today?

Technologies evolve through successive levels of abstraction. The individual computer of the late 1980s is today part of the cloud, a distributed network of computing sites linked by data networks and managed using software and hardware controls. ANNs are the product of a similar abstraction, which Hopfield and Hinton helped achieve, and have further transformed. Thus they are within the reach of millions of people but also less resemble their ancestors.

Advances in this area have benefited from the work of multiple teams and ideas, so much so that drawing a straight line from Hopfield's and Hinton's work to ChatGPT is impossible. One new form of ANN is the transformer, a two-part neural network that encodes and then decodes information, with valuable applications in object detection and recognition. Other developments include back-propagation, a technique that allows ANNs to upgrade themselves as they learn, and the long short-term memory that enables ANNs to 'remember' some information for a fixed number of steps.

ANNs are also on our minds. Hinton has said he is “worried the overall consequence... might be systems more intelligent than us that eventually take control.” He left Google in 2023 to spread awareness of AI’s risks. Hopfield has expressed similar sentiments. Why do it then? Presumably because the tree is big and it is impossible to see the branches sitting at the roots.

Relevance: GS Prelims & Mains Paper III; Science & Technology
Source: The Hindu

17. India's Renewable Energy Milestone: 200 GW of Clean Energy Capacity

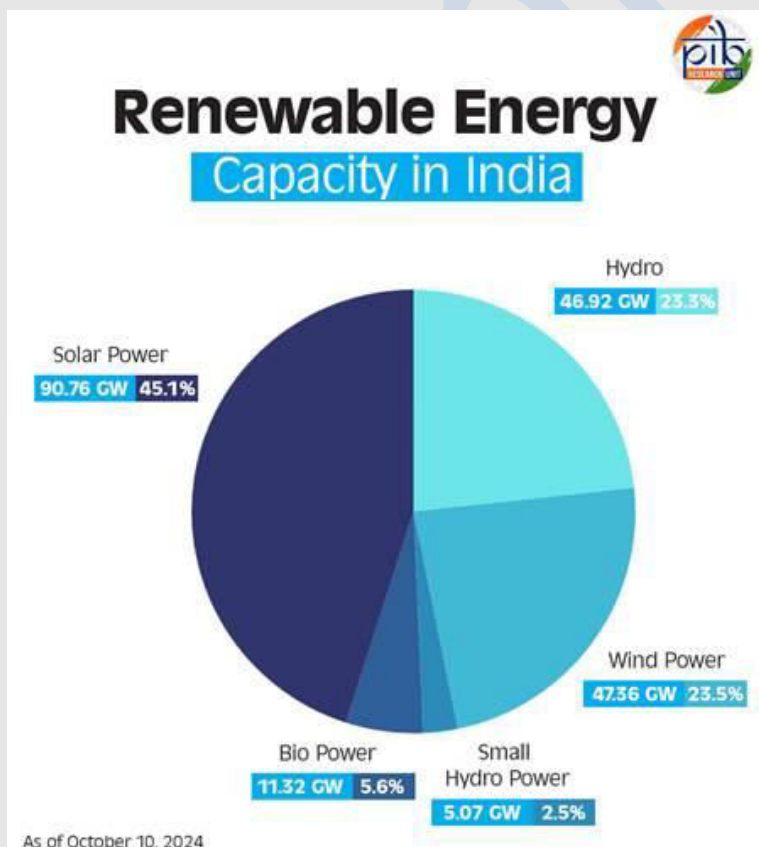
Introduction



India has crossed a significant milestone in its renewable energy journey, with the country's total renewable energy capacity surpassing 200 GW as of October 10, 2024. According to the Central Electricity Authority, renewable energy-based electricity generation now stands at 201.45 GW, constituting 46.3% of India's total capacity. This achievement highlights India's growing focus on clean energy and its efforts

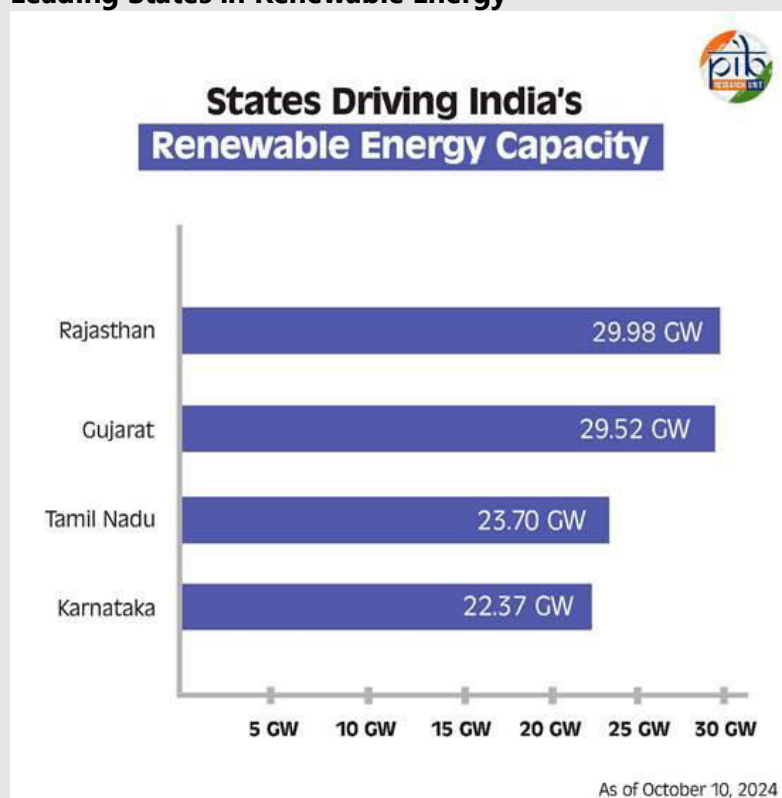
toward a greener future.

Overview of India's Renewable Energy Landscape



India's total electricity generation capacity has reached 452.69 GW, with renewable energy contributing 46.3% to the overall mix. Solar power leads with 90.76 GW, followed by wind energy at 47.36 GW, and hydroelectric power, which adds 51.99 GW from both large and small hydro projects. Biopower, which utilizes agricultural and organic waste, contributes 11.32 GW, further diversifying India's clean energy sources. Together, these renewable resources are reducing the country's dependence on fossil fuels and advancing its sustainability goals.

Leading States in Renewable Energy



Several Indian states have emerged as leaders in renewable energy. Rajasthan tops the list with 29.98 GW, followed closely by Gujarat at 29.52 GW. Tamil Nadu ranks third with 23.70 GW, while Karnataka holds fourth place with 22.37 GW. These states play a crucial role in driving India's renewable energy growth.

Conclusion

India's achievement of over 200 GW of renewable energy capacity underscores its commitment to a sustainable future. With ongoing government initiatives like the National Green Hydrogen

Mission and ambitious targets of 500 GW from non-fossil sources by 2030, India is well on its way to becoming a global leader in renewable energy, ensuring energy security and environmental sustainability.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

18. Issues in the treatment of 'rare diseases', and what the govt can do

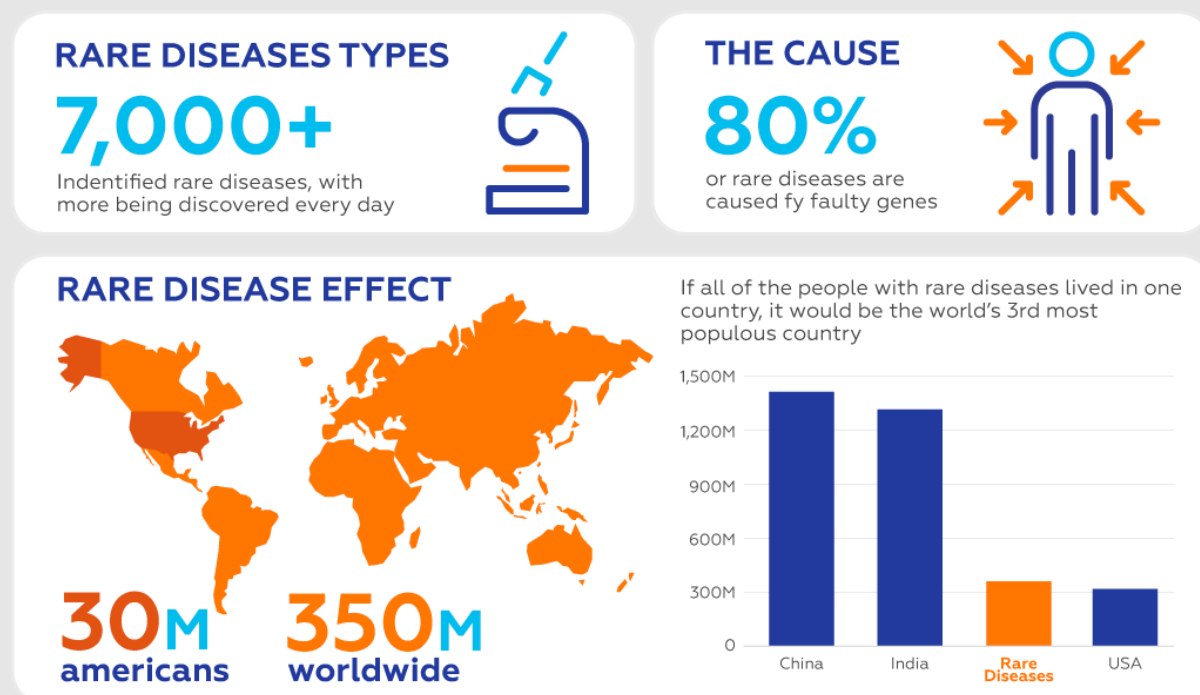
Introduction

The Delhi High Court last week issued directions aimed at improving the availability of so-called "orphan drugs", which are medications used to treat "rare diseases" — defined by the World Health Organization (WHO) as a debilitating, lifelong condition that affects 1 or fewer people in 1,000.

Around 55 medical conditions — including Gaucher's disease, Lysosomal Storage Disorders (LSDs), and certain forms of muscular dystrophy — are classified as rare diseases in India. The National Registry for Rare and Other Inherited Disorders (NRROID) started by the Indian Council of Medical Research (ICMR) has the records of 14,472 rare disease patients in the country.

Therapies are available for less than 5% of rare diseases, leading to less than 1 in 10 patients receiving disease-specific care. Existing treatments are often very expensive. While the Centre

provides financial assistance to various Centres of Excellence (CoE) for treatment, stakeholders have gone to court to highlight challenges in accessing funds.



Categories of rare diseases

In India, rare diseases are categorised into three groups based on the nature and complexity of available treatment options.

Group 1 includes diseases that can be treated with a one-time curative procedure. Group 2 diseases require long-term or lifelong treatment which are relatively less costly and have shown documented benefits, but patients need regular check-ups. Group 3 diseases are those for which effective treatments are available, but they are expensive and must often continue lifelong. There are challenges in selecting the right beneficiaries for these treatments.

Current funding policy

In 2021, the National Policy for Rare Diseases (NPRD) was launched, under which financial assistance up to Rs 50 lakh is provided to patients receiving treatment at an identified CoE. The CoEs include AIIMS in Delhi, PGIMER in Chandigarh and the Institute of Postgraduate Medical Education and Research at Kolkata's SSKM Hospital.

The following year, the Health Ministry opened a Digital Portal for Crowdfunding & Voluntary Donations with information about patients and their rare diseases, the estimated cost of treatment, and bank details of the CoEs. Donors can choose the CoE and patient treatments they wish to support. Each CoE also has its own Rare Disease Fund, which is used with approval from its governing authority.

In August 2024, the government told Parliament that financial assistance of Rs 24 crore had been released to CoEs for treating rare disease patients until August in the current financial year. Before that, Rs 3.15 crore, Rs 34.99 crore, and Rs 74 crore was released in 2021-22, 2022-23, and 2023-24 respectively. Further, Rs 35 crore has been released for purchasing equipment to improve patient care services.

Cost of orphan drugs

* Many medicines and therapies for rare diseases are patented, which makes them very expensive. The market for these drugs is small and the development costs are high, so pharmaceutical companies often don't find it profitable to produce them, pushing up prices.

* Developing and manufacturing these drugs in India could help bring down prices, but the government will have to offer incentives such as tax breaks to companies.

* Import of rare disease medicines by patients does not attract customs duty, but companies that bring these drugs to India still pay 11% customs duty and 12% GST. Delhi High Court has now set a deadline of 30 days to process the necessary exemptions for these medicines under the customs, GST, and Income Tax laws.

* On January 3, 2019, the Department of Pharmaceuticals under the Union Ministry of Chemicals and Fertilisers issued an order freeing orphan drugs from price controls. The High Court expressed concern over this exemption, saying "the position cannot continue in this manner".

* If treatments or medicines for rare diseases are not available, the government can, under the Patents Act of 1970, allow a third party to manufacture them against payment of a royalty to the patent holder. The government can also acquire patents to ensure the availability of medicines if the patent holder does not provide them. The court said there wasn't enough research and development in the field of rare diseases, and stressed that negotiating with pharma companies and boosting domestic efforts could help lower costs of treatment.

* Delays and red tape in decision making is another problem. The National Rare Diseases Committee meeting in June 2023 discussed the delay in getting approval from the Drug Controller General of India (DCGI) for US-based Sarepta Therapeutics to sell its medicines in India. AIIMS and other CoEs were importing the drugs through distributors for patients, and the delay was impacting treatment.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

19. Kerala man infected with rare bacterial disease: What to know about murine typhus

Introduction

A 75-year-old man from Kerala who recently travelled to Vietnam and Cambodia was recently diagnosed with the bacterial disease murine typhus.

After completing his trip, the patient sought medical attention on September 8, complaining of body pain and fatigue. Tests for rat-induced and flea-borne diseases were inconclusive, although it was found that his liver and kidney functions were deteriorating.

After considering his travel history, the doctors suspected his ailment to be a case of murine typhus. This marks the first case of the rare disease reported in the state.



What is murine typhus?

Murine typhus is an infectious disease caused by the flea-borne bacteria *Rickettsia typhi*. It is transmitted to humans through the bites of infected fleas. The disease is also known as endemic typhus, flea-borne typhus or flea-borne spotted fever. Rodents like rats, mice and mongoose, are known to be reservoirs of the disease.

The disease-carrying fleas can also live on other small mammals, including pets such as cats and dogs. Once a flea is infected, it can spread the disease for the rest of its life.

How does murine typhus spread?

The disease is spread when infected flea faeces come into contact with cuts or scrapes in the skin. Transmission can also happen through exposure of mucous membranes to infected flea faeces. Murine typhus is not spread from one person to another, or from person to fleas.

The disease has been reported in coastal tropical and subtropical regions, where rats are prevalent. In India, cases of murine typhus have been reported in the Northeast, Madhya Pradesh and Kashmir.

What are the symptoms of murine typhus?

The symptoms usually appear seven to 14 days after the exposure and include fever, headaches, body aches, joint pains, nausea, vomiting, and stomach aches. Some people may later develop rashes on the skin, days after the initial symptoms. The illness seldom lasts longer than two weeks, but may last for months with complications if not treated.

In the case of the Kerala patient, Next Generation Sequencing (NGS) technology, which uses microbial DNA, was used to identify the diagnosis. Further tests were conducted in CMC Vellore for confirmation.

What is the treatment for murine typhus?

There is no vaccine currently available against the disease. The antibiotic doxycycline is considered effective in therapy, but early diagnosis is vital for treatment. Without timely treatment, the disease could turn severe in one or two weeks, and become fatal in rare cases.

How can one prevent themselves from murine typhus?

Households with pets should ensure that fleas are kept off them, through regular washing and awareness about the signs of fleas. A flea treatment should be done if needed.

Rodents should be kept away from households and kitchens in particular, with food items properly covered.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

20. Why SpaceX 'catching' Starship booster with robotic arms is significant

Introduction

A pair of giant robotic arms caught the more than 70-metre-long first stage booster of SpaceX's Starship recently, bringing Elon Musk's company a step closer to its goal of building a fully and rapidly reusable rocket system.

What is Starship?

Starship is a two-stage heavy lift vehicle comprising a booster (called Super Heavy), and an upper section (the Starship spacecraft).

Together, the rocket system is nearly 120 metres tall, making it the largest rocket ever — taller than even the Saturn V (111 metres), which took Neil Armstrong to the Moon. For perspective, the Qutab Minar is 72.5 m tall, roughly the length of the first stage booster that was caught recently.



Starship is designed to carry crew or/ and cargo to Earth orbit, the Moon, Mars, and beyond, and once fully operational, can revolutionise space travel.

What was the mission?

The rocket system lifted off from Starbase in Boca Chica, Texas at 7.25 am local time on Sunday with the help of

Super Heavy's 33 methane-burning Raptor engines. This was the rocket system's fifth test launch.

Three minutes and 40 seconds after the launch, the booster detached from Starship, flipped, and restarted 13 Raptors to return towards the Texas coast. Rather than splashing down in the ocean (as is generally the case with first stage boosters), SpaceX wanted to land Super Heavy safely at the launch site.

The booster slowed down from its speeds of more than 27,350 km/hr, descending at an angle, before straightening as it approached the gantry (the structure supporting a rocket before its launch). The gantry's arms, which have been given the moniker of "Mechazilla", literally caught the descending booster, which then switched off its engines.

Meanwhile, the Starship spacecraft continued to head to space, powered by its six Raptors. It completed one revolution around Earth, before carrying out a controlled, on-target splashdown in the Indian Ocean.

Why was this mission significant?

Most rocket systems are expendable, meaning they can be used only once. This makes rocket launches quite costly and time-consuming. For decades, engineers have attempted to devise reusable space vehicles — but with limited success.

SpaceX is the latest space organisation to want to transcend the limitations of expendable rocket systems, by creating a system that is fully and rapidly reusable. Catching the Super Heavy is a milestone to this end. In future, the company hopes it will be able to rapidly stack a Starship spacecraft back on top of the landed booster, allowing the rocket to launch again, almost immediately.

In an interview to YouTube channel Everyday Astronaut, Musk said that his vision is that Mechazilla will one day be able to turn around and set a rocket back on the launchpad, perhaps as little as 30 minutes after touchdown.

Notably, over the years, SpaceX has mastered the process of landing its smaller workhouse rocket, the Falcon 9. That process, however, is very different, with the booster landing on specially-built platforms using landing legs strapped to its side, rather than being caught in mid-air.

Why is Starship important for the future of space travel and exploration?

Starship is a key part of SpaceX's plans to send astronauts or/and cargo to celestial bodies. The company wants to use the Starship HLS (Human Landing System) to take NASA astronauts back to the moon by 2026 as a part of the Artemis III mission. SpaceX has received government contracts worth up to around \$4 billion to complete the task, according to a report by CNN. Eventually, SpaceX hopes that Starship will put the first humans on Mars.

However, before executing these ambitious plans, the company needs to prove that Starship is safe and reliable, while keeping costs low. Historically, this has been a daunting task for space flight programmes.

For instance, while NASA's Space Shuttle programme (which ended in 2011) comprised partially reusable space vehicles, the cost of maintaining and refurbishing space shuttles turned out to be far greater than that of launching expendable rockets.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

21. How bone ossification test works, and its application in law

Introduction

One of the accused in the murder of former Maharashtra MLA Baba Siddique claimed before a court in Mumbai that he was 17 years old — and should thus be tried under the Juvenile Justice Act. The Mumbai Police Crime Branch, which sought custody of the accused, said an Aadhaar card found on the individual showed his age as 19.

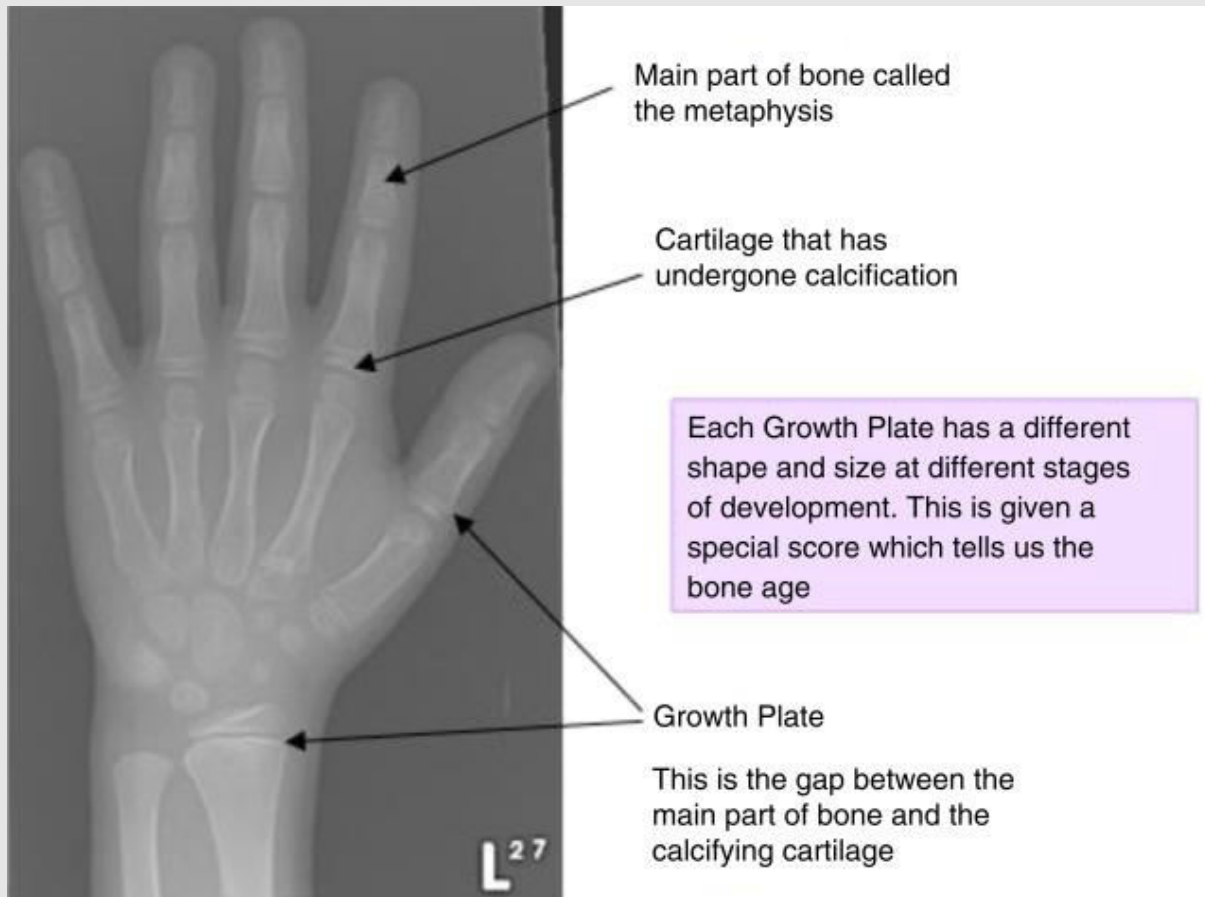
To determine whether the accused was a minor, the magistrate ordered a bone ossification test, which was carried out at the state-run J J Hospital. After the report established that the accused, Dharmaraj Kashyap, was not a minor, the court remanded him in police custody until October 21.

What is a bone ossification test, and how does it determine the age of a person?

Ossification is the natural process of bone formation. This starts from the early developmental stage of the foetus and continues until late adolescence, but differs slightly from individual to individual. Based on the stage of development of the bones, experts can determine the approximate age of the person.

In a bone ossification test, X-rays of a few bones, such as those of hands and the wrists, are conducted to determine skeletal and biological development. The images may be compared with X-rays of standard development, which can assist in determining the age.

The analysis could be also based on a scoring system that looks at individual bones on the hands and wrists and their growth, and compares them with the standard of maturation of bones among a certain population.



Why is age determination significant in the criminal justice system?

In India, a person who is below 18 years of age is considered a minor. The criminal law differentiates between a child and an adult when it comes to procedure, correction and rehabilitation, and punishment.

Anyone below the age of 18 is governed by the Juvenile Justice (Care and Protection of Children) Act, 2015. A child who is found to be in conflict with the law cannot be sent to a prison meant for adults, and is instead sent to an observation home.

Instead of a court, the child is brought before a Juvenile Justice Board (JJB) comprising a magistrate and two social workers with experience in working with children. After an inquiry, the Board may direct the child to be let off with an admonition, community service, or a maximum of three years in a special home, among other options.

Following an amendment to the JJ Act in 2021, in cases where "a child above the age of sixteen years" has been apprehended for a "heinous offence" (for which the minimum punishment is seven years' imprisonment), the JJB must "conduct a preliminary assessment with regard to his

mental and physical capacity to commit such offence, ability to understand the consequences of the offence and the circumstances in which he allegedly committed the offence" before deciding whether the child should be tried as an adult.

What have courts said about the bone ossification test?

Under Section 94 of the JJ Act, "where it is obvious...based on the appearance...that the said person is a child", the Board can proceed without confirmation of age. But if there are "reasonable grounds for doubt", the Board must "undertake the process of age determination". Evidence has to be obtained from "the date of birth certificate from the school", or "the matriculation or equivalent certificate from the concerned examination board". If these are not available, a birth certificate issued by a corporation, municipal authority, or a panchayat may be considered.

"Only in the absence of [these], age shall be determined by an ossification test or any other latest medical age determination test conducted on the orders of the Committee or the Board," says the Act. In an order passed in March this year, the Supreme Court also said that tests such as ossification must be the last in the order of priorities to determine age.

Courts have held that the test cannot override documentary evidence on the age of an accused person. In some cases, courts have rejected pleas by accused seeking a test, when documentary evidence is already present.

How reliable are bone ossification tests?

Variability in observing the maturation of bones could impact the accuracy of the test. Also, the slight differences in development among individuals leaves some scope for error.

Ossification tests give a range — say, 17-19 years. Courts have dealt with the question of margin of error in the range, and considered whether to accept the age at the lower or the upper end of the range.

The Delhi High Court said this year that in POCSO (Protection of Children from Sexual Offences) Act cases where the age of the victim is determined through an ossification test, the upper age in the test's reference range should be considered, and a "margin of error of two years is required to be applied".

Relevance: GS Prelims; Science & Technology

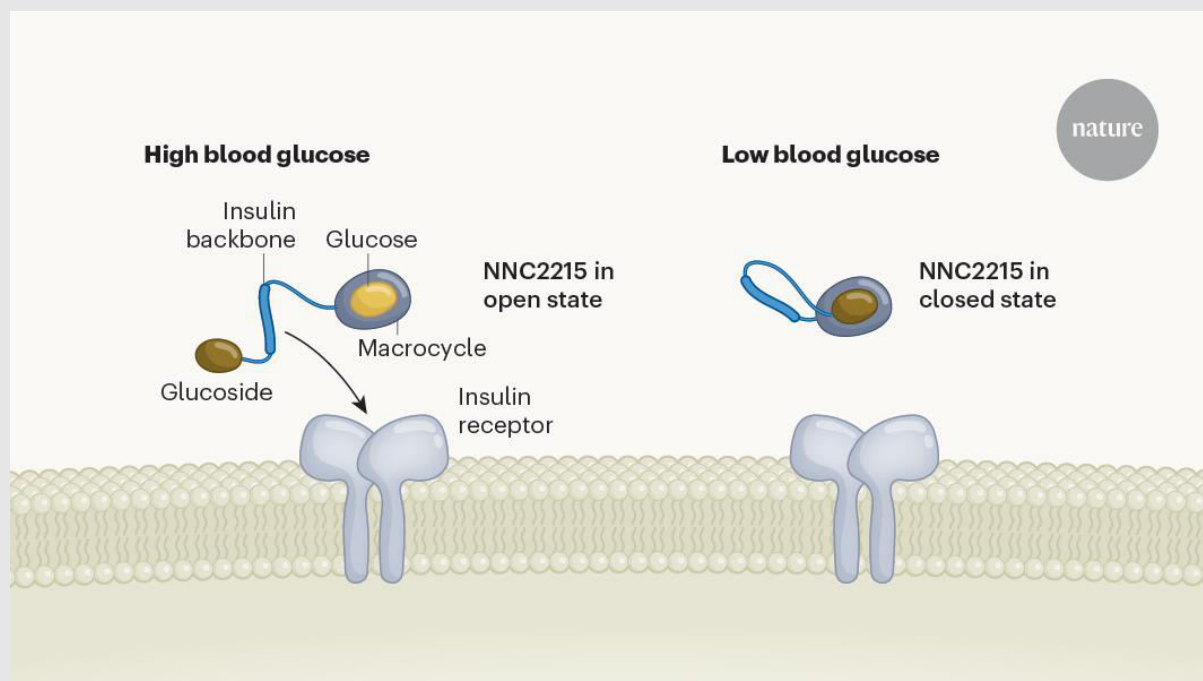
Source: Indian Express

22. How 'smart insulin' promises to revolutionise diabetes treatment

Introduction

Diabetes afflicts more than half a billion people worldwide, and causes nearly seven million deaths a year. In recent decades, the prevalence of this disease characterised by elevated levels of blood sugar has skyrocketed around the world.

Now, scientists have made a major breakthrough in developing what has been long called the “holy grail” diabetes treatments — a “smart” insulin that responds in real time to fluctuations in one’s blood sugar level. The research was published in the journal Nature recently.



Diabetes & treatment

There are two kinds of diabetes. Both are related to the body’s ability to synthesise and react to insulin, the hormone that breaks down sugar in the blood to produce energy.

Type 1 diabetes, which often starts in childhood, occurs when the pancreas do not produce insulin (or enough insulin). Type 2 diabetes sees the cells of the body develop resistance to insulin, meaning greater amounts are required than what is produced by the pancreas.

Both conditions are managed by the administration of synthetic insulin. But this poses a fundamental challenge as the blood glucose levels in the body are not constant. Blood glucose levels falling too much due to the overdosage of insulin in the body can be life-threatening. Most patients have to constantly monitor their insulin levels, and adjust doses accordingly.

For decades, scientists have thus tried to develop glucose-sensitive insulin therapies. Thus far, the most advanced glucose-sensitive systems rely on the molecule being stored somewhere in the body (like in a packet under the skin), and being released based on one’s blood sugar level, which is detected by a sensor attached to the body.

Engineering insulin

For the latest study, however, an international team of scientists from companies in Denmark, the UK, and Czechia, as well as the University of Britol, have modified the insulin molecule itself to give it an "on-and-off switch" that automatically responds to changing blood glucose levels. The newly developed insulin named NNC2215 comprises two parts: a ring-shaped structure, and a molecule with a similar shape to glucose called a glucoside. When blood sugar levels are low, the glucoside binds to the ring, keeping the insulin in an inactive state to prevent further lowering of blood sugar. But, as blood glucose rises, the glucoside is replaced by glucose itself, triggering the insulin to shift its shape and become active, helping bring blood sugar levels down to safer ranges.

Researchers who developed NNC2215 found it to be as effective as human insulin at lowering blood glucose in rats and pigs. Human trials will be conducted in the near future.

At the moment, the major problem with NNC2215 is that its activation and impact are not gradual. The engineered insulin requires a significant glucose spike to be activated, and once it is activated, there is a sudden rush of insulin in the system. Scientists are currently working to refine the molecule so that it is activated gradually, and insulin levels rise more slowly.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

23. India to seek certification from WHO for eliminating Kala-azar

Introduction

India could be at the threshold of eliminating Kala-azar as a public health problem with the country having managed to keep the number of cases under one in 10,000 people for two consecutive years now as required by World Health Organization (WHO) parameters for elimination certification.

Declining Cases

Kala-azar, also known as visceral leishmaniasis, is the second deadliest parasitic disease after malaria in India. Figures released by the Health Ministry show that India registered 595 cases and four deaths in 2023 and this year, it has recorded 339 cases and one death so far.

If it can maintain the declining trend for another year, India will become eligible to seek the elimination certificate from the WHO, making it the second country in the world after Bangladesh which in October became the only country to have eliminated Kala-azar as a public health problem. The WHO validated this status after Bangladesh reported fewer than one case per 10,000 people in each of its subdistricts for three consecutive years.

About Kala azar

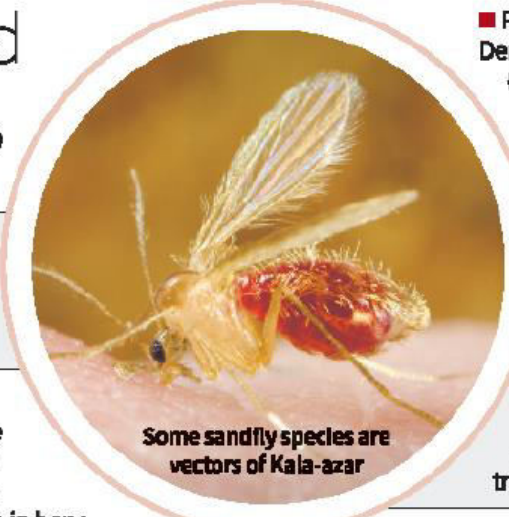
Kala-azar is a disease caused by a protozoa parasite that is transmitted by the bite of an infected female sandfly.

Symptoms of the disease include irregular fevers, weight loss, enlarged spleen and liver, and anaemia. Kala-azar is fatal if left untreated in more than 95% of cases.

At the threshold

India has managed to keep the number of cases under one in 10,000 for two consecutive years now

- Kala-azar is a slow progressing indigenous disease caused by a protozoan parasite of genus *Leishmania*
- In India, *Leishmania donovani* is the only parasite causing this disease
- The parasite primarily infects the reticuloendothelial system and may be found in abundance in bone marrow, spleen and liver



Some sandfly species are vectors of Kala-azar

- Post Kala-azar Dermal Leishmaniasis (PKDL) is a condition when *Leishmania donovani* invades skin cells, resides there and develops there and manifests as dermal lesions
- Some of the Kala-azar cases manifests PKDL after a few years of treatment

Source: Health Ministry, National Centre for Vector-Borne Diseases Control

Target

India's National Health Policy (2002) initially set a target of eliminating Kala-azar by 2010, but this was later revised to 2015, 2017, and then 2020. The WHO's Neglected Tropical Disease road map set a goal of eliminating Kala-azar by 2020, but the target was not achieved.

The WHO is now accelerating work to achieve the target by 2030.

A disease is certified as eliminated as a public health issue when a country can prove that local transmission has been interrupted for a set period, and that there is a system to prevent the disease from re-emerging. The WHO assesses countries' submissions to determine if they meet the criteria for elimination.

K. Madan Gopal, adviser at the public health administration, National Health Systems Resource Centre, Health Ministry, said India's Kala-azar programme focuses on active case detection, effective vector control, and raising community awareness. Achieving a low case of Kala-azar to less than one case per 10,000 population at the sub-district (block PHCs) for two straight years puts India on track to earn WHO certification for eliminating Kala-azar as a public health problem. This will mark a significant milestone.

Vulnerable States

Bihar, Jharkhand, West Bengal, and parts of Uttar Pradesh have seen the highest number of Kala-azar cases, with Bihar alone accounting for over 70% of India's cases. These areas offer ideal sandfly breeding conditions due to poor sanitation and climate factors.

Despite this, these regions have made huge progress in recent years by increasing awareness, controlling vectors, and ensuring quick diagnosis and treatment. "India is moving closer to Kala-azar elimination. It's also important to address the root causes, like poverty and inadequate sanitation, that allow diseases like Kala-azar to spread," Dr. Gopal said while cautioning that India must keep improving surveillance, expanding access to rapid diagnostic tools, and making treatments readily available to sustain these gains.

He added that for a long-term solution, India should focus on better vector control, address social and economic conditions, and invest in research for vaccines and new treatments.

The Health Ministry had adopted strategies such as early diagnosis and complete case management, integrated vector management and vector surveillance, supervision, monitoring, surveillance, evaluation, and advocacy, communication and social mobilisation for behavioural impact and inter-sectoral convergence.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

24. Union Cabinet approves establishment of Rs.1,000 crore Venture Capital Fund for Space Sector under aegis of IN-SPACe

Introduction

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, has approved setting up of Rs.1000 crore Venture Capital Fund dedicated to space sector, under aegis of IN-SPACe.

CABINET APPROVES SETTING UP OF VENTURE CAPITAL FUND FOR SPACE SECTOR

Venture Capital Fund (VCF) worth Rs. 1,000 crore will be established

The VCF will be dedicated to space sector, under the aegis of IN-SPACe

The VCF is expected to support around **40 startups**

Benefits:

- Driving economic growth and job creation
- Space technology development
- Retention of space companies domiciled within India
- Increased global competitiveness

Cabinet Decision | 24 October 2024

Financial implications

The deployment period of the proposed Rs.1,000 crore VC fund is planned to be up to five years from the actual date of start of the fund operations. The average deployment amount could be Rs.150-250 crore per year, depending on the investment opportunities and fund requirements.

The indicative range of investment is proposed to be Rs.10-Rs.60 Crore, contingent upon the stage of the company, its growth trajectory, and its potential impact on national space capabilities. Indicative Equity Investment Range could be:

- Growth Stage: Rs.10 Crore – Rs.30 Crore
- Late Growth Stage: Rs.30 Crore – Rs.60 Crore

Based on the above investment range, the fund is expected to support approximately 40 startups.

Background

The Government of India, as part of its 2020 space sector reforms, established IN-SPACe to promote and oversee private sector participation in space activities. IN-SPACe has proposed a Rs.1000 crore Venture Capital Fund to support the growth of India's space, economy, currently valued at \$8.4 billion, with a target to reach \$44 billion by 2033.

The fund aims to address the critical need for risk capital, as traditional lenders are hesitant to fund startups in this high-tech sector. With nearly 250 space startups emerging across the value chain, timely financial support is crucial to ensure their growth and prevent talent loss overseas. The proposed government-backed fund will boost investor confidence, attract private capital, and signal the government's commitment to advancing space reforms. It will serve as an Alternative investment Fund under SEBI regulations, providing early-stage equity to startups and enabling them to scale for further private equity investments.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: PIB

25. All about the C295 aircraft assembly plant, inaugurated by PM Modi in Vadodara

Introduction

Prime Minister Narendra Modi today inaugurated a plant in Vadodara, where Tata Advanced Systems Ltd (TASL) will manufacture the C-295 aircraft for the Indian Air Force (IAF). Spanish Prime Minister Pedro Sanchez was also present in Gujarat, with the two leaders having laid the foundation stone of the Final Assembly Line (FAL) plant in October 2022.

The facility will be the first private sector final assembly line for military aircraft in India, according to a statement from the Prime Minister's Office. Here is what to know about the C295 and its significance for the Indian military.

Where is the C295 produced and by whom?

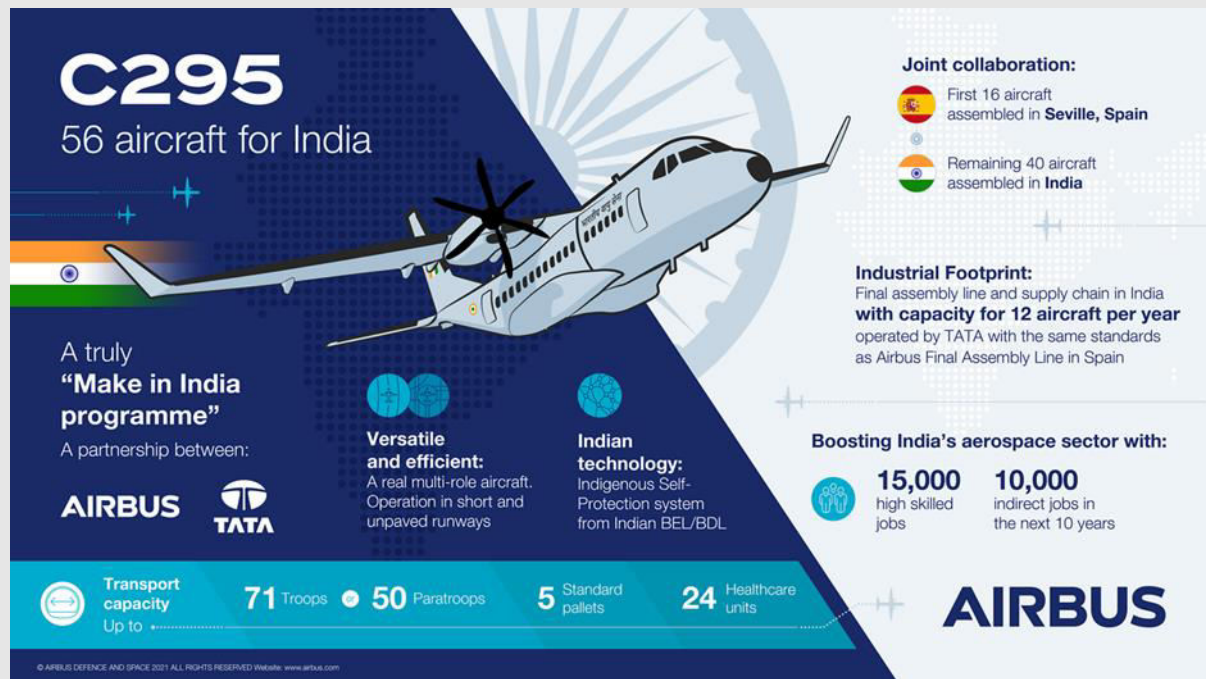
The C295 was originally produced by a Spanish aircraft manufacturer named Construcciones Aeronáuticas SA. This company is now part of Airbus and the aircraft's manufacturing takes place at Airbus's plant in Spain.

In September 2021, India signed a Rs 21,935 crore deal with Airbus Defence and Space to procure 56 C295 aircraft to replace the IAF's ageing Avro-748 planes, which entered service in the early 1960s.

Under the agreement, Airbus will deliver the first 16 aircraft in 'fly-away' condition from its final assembly line in Seville, Spain within four years. The subsequent 40 aircraft will be manufactured by TASL in India as part of an industrial partnership between the two companies.

The 16 fly-away aircraft will be delivered between September 2023 and August 2025. On September 13, 2023, the IAF received the first of the 56 aircraft in Spain. The first Made-in-India aircraft will be rolled out of the manufacturing facility in September 2026 and the remaining 39 will have to be produced by August 2031.

After the completion of the delivery, Airbus Defence and Space will be allowed to sell the aircraft manufactured in India to civil operators and export to countries which are cleared by the Government of India.



What are the technical specifications of the C295 aircraft?

The C295MW is a transport aircraft with a 5 to 10-tonne capacity and a maximum speed of 480 kmph. It has a rear ramp door for quick reaction and para-dropping of troops and cargo. Short take-off and landing from semi-prepared surfaces are some other features.

The technical specifications released by Airbus say that the aircraft has a cabin dimension of 12.7 metres or 41 feet and eight inches. The company claims this aircraft has the longest unobstructed cabin in its class and can accommodate 71 seats. The company also claims that C295 can carry more cargo than its competitors with direct off-loading through the rear ramp. All 56 aircraft will be fitted with an indigenous electronic warfare suite to be developed by Bharat Electronics Ltd and Bharat Dynamics Limited. Former Defence Secretary Ajay Kumar has said the indigenous content in the plane will be the highest ever in India, and that 96 per cent of the work that Airbus does in Spain to produce the plane will be done at the manufacturing unit in Vadodara.

In which terrains have the C295 operated across the world?

As per Airbus, the C295 operates in the Brazilian jungles and Columbian mountains in South America, the deserts of Algeria and Jordan in the Middle East and the cold climates of Poland and Finland in Europe. The aircraft has also flown in military operations in Chad, Iraq and Afghanistan.

What are the roles that the C295 can perform?

As a tactical transport aircraft, the C295 can carry troops and logistical supplies from main airfields to forward operating airfields of the country. It can also operate on short unprepared airstrips as it is capable of Short Take-off and Landing (STOL). It can operate from short airstrips just 2,200 feet long and can fly low-level operations for tactical missions flying at a low speed of 110 knots, says Airbus.

The aircraft can additionally be used for casualty or medical evacuation, performing special missions, disaster response and maritime patrol duties.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

26. What to know about 4 online scams targeted towards Indians in recent months

Introduction



Prime Minister Narendra Modi highlighted the threat of online scams during his Mann ki Baat radio address recently. Government data says that Indians lost Rs 120.30 crore in "digital arrest" frauds in the first quarter of 2024.

According to the Ministry of Home Affairs (MHA), which monitors cybercrime at the central level through the Indian Cybercrime Coordination Centre (I4C), it is one of the four major online scams targeted towards Indians. The others are trading scams, investment scams and romance/dating scams.

"We found that Indians lost Rs 120.30 crore in digital arrest, Rs 1,420.48 crore in trading scam, Rs 222.58 crore in investment scam, and Rs 13.23 crore in romance/dating scam," Chief Executive Officer (I4C) Rajesh Kumar had said while releasing the January-April data in May.

1. TRADING SCAM

How it worked: The alleged fraudsters issued ads on social media offering free trading tips, often using pictures of well-known stock market experts and fake news articles. The victims were asked to join a WhatsApp group or Telegram channel, where they would receive “tips” on making money by investing in shares.

After a few days, the victims would be asked to install some specific trading applications and register themselves in order to receive further guidance on making “huge” profits. The victims would start “investing” on the apps, following recommendations made by the cybercriminals. None of these apps would be registered with the stock market regulator Securities and Exchange Board of India (SEBI), but the victims typically neglected to check this.

The victims deposited money in particular bank accounts to “buy shares”, and were shown some fake profits in their digital wallets. But when they tried to withdraw this “money”, they were shown a message that they could do so only after they had accumulated a certain amount, say Rs 30-50 lakh, in their wallet. This meant the victim had to keep “investing” and, sometimes, had to also pay “taxes” on the “profits” they were purportedly earning.

2. DIGITAL ARREST

How it worked: Potential victims would get a call in which the caller would tell them that the victims had sent or were the intended recipients of a parcel containing illegal goods, drugs, fake passports, or other contraband.

Once they had the target — who would be chosen carefully — in their net, the criminals would contact them over Skype or another video calling platform. They would pose as law enforcement officials, often wearing uniforms and calling from places resembling police stations or government offices, and demand money for a “compromise” and “closure of the case”.

In certain cases, the victims were “digitally arrested”, which meant they were forced to stay visible to the criminals until their demands had been met.

3. INVESTMENT SCAM (TASK-BASED)

How it worked: Victims typically received a WhatsApp message from an overseas number, purportedly belonging to a representative of a company, with an offer to earn a large sum of money, say, Rs 30,000, while working from home.

Those who responded were told they would have to help boost the social media ratings of some entities by giving them a five-star rating. After the “task” was completed, victims received a “code”, which they were asked to share with their “admin” on Telegram.

The “admin” would ask the victims where they wanted to receive their money and, after a few five-star rating “tasks” on YouTube or Google reviews etc. were completed, would deposit a small sum, perhaps Rs 500.

At this point, the victim would be asked to participate in a "pre-paid" or "merchant" task, in which a higher return would be promised after a certain amount — which could be between Rs 1,500 and Rs 1 lakh — had been deposited. Victims who refused were blocked, but those who chose to participate were told the money and profit would come to them in a day.

However, the following day, the victims would be told that their "performance score" was not good enough, and they needed to improve it by participating in new tasks so they could get their money.

4. ROMANCE/DATING SCAM

How it worked: This was a somewhat more conventional trap, though laid online. The victims, who were male, were lured by people they thought were foreign women. These "women" would propose relationships or marriage, and then make plans to come and meet in person. However, the victim would typically get a call from the "woman" that she had been detained at the airport, and needed money to get out.

On its website, the US FBI, which has dealt with such cases, says romance scamsters are experts at appearing genuine, caring, and believable. These con artists lurk on most dating and social media sites, and seek to quickly gain the victim's trust.

Relevance: GS Prelims & Mains Paper III; Science & Technology
Source: Indian Express

27. Salt Typhoon: All about the Chinese hackers who targeted the 2024 US election

Introduction



A sophisticated breach of U.S. telecommunications systems has extended to the presidential campaigns, raising questions about the group behind the attack and the extent of its efforts at collecting intelligence.

It was unclear what data was taken in the attack. The far-reaching

operation has been linked to the Chinese government and attributed to a group experts call Salt Typhoon. Investigators believe hackers took aim at a host of well-connected Americans, including the presidential candidates — reflecting the scope and potential severity of the hack.

What is Salt Typhoon?

Salt Typhoon is the name Microsoft cybersecurity experts have given to a Chinese group suspected of using sophisticated techniques to hack into major systems — most recently, US telecommunication companies. The moniker is based on Microsoft's practice of naming hacking groups after types of weather — "typhoon" for hackers based in China, "sandstorm"

for efforts by Iran and “blizzard” for operations mounted by Russia. A second term, in this case “salt,” is used to denote the type of hacking.

Experts say Salt Typhoon seems to be focused primarily on counterintelligence targets, unlike other hacking groups that may try to steal corporate data, money or other secrets.

What do US officials think Salt Typhoon has done?

National security officials have gathered evidence indicating the hackers were able to infiltrate major telecom companies, including but not limited to Verizon.

The New York Times reported Friday that among the phones targeted were devices used by former President Donald Trump and his running mate, Sen. JD Vance of Ohio. The effort is believed to be part of a wide-ranging intelligence-collection effort that also took aim at Democrats, including staff members of both Vice President Kamala Harris’ campaign and Sen. Chuck Schumer of New York, the majority leader.

How serious is this hacking?

National security officials are still scrambling to understand the severity of the breach, but they are greatly concerned if, as it appears, hackers linked to Chinese intelligence were able to access U.S. cellphone and data networks. Such information can provide a wealth of useful intelligence to a foreign adversary like China.

To some degree, the breach represents a continuation of data collection on the types of targets that spies have been gathering for decades. In this instance, however, the sheer quantity and quality of the information Salt Typhoon may have gained access to could put the intrusion into its own category, and suggests that U.S. data networks are more vulnerable than officials realized.

What did the hackers get?

At this stage, that is still unclear. One major concern among government officials is whether the group was able to observe any court-ordered investigative work, such as Foreign Intelligence Surveillance Act collection — a highly secretive part of American efforts to root out spies and terrorists.

No one has suggested yet that the hackers were able to essentially operate inside individual targets’ phones. The more immediate concern would be if they were able to see who was in contact with candidates and elected officials, and how often they spoke and for how long. That kind of information could help any intelligence agency understand who is close to senior decision-makers in the government.

People familiar with the investigation say it is not yet known if the hackers were able to gain access to that kind of information; investigators are reasonably confident that the perpetrators were focused on specific phone numbers associated with presidential campaigns, senior government leaders, their staff members and others.

Like the weather, hacking is never really over, and the Salt Typhoon breach may not be over either. It is also possible that the United States may never learn precisely what the hackers got.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

PrepMate

1. Bihar under water: Why the state sees floods every year

Introduction

Bihar is flooded yet again, with 11.84 lakh people hit — driven out of their homes, surviving on air-dropped food packets, huddling in shelters, vulnerable to water-borne diseases.

North Bihar sees floods every year. Lakhs of people see their crops and livestock destroyed. They pick up the pieces and start again, only for the story to be repeated the next year.

What makes this region so prone to floods? The answers lie in Bihar's geography, and a decades-old solution that has proved short-sighted.

Bihar's geography

According to the state government's Flood Management Improvement Support Centre (FMISC), "Bihar is India's most flood-prone state, with 76 per cent of the population in north Bihar living under the recurring threat of flood devastation."

Bihar is crisscrossed by both snow-fed and rain-fed rivers, putting it at the risk of various kinds of floods.



Districts in north Bihar are the most prone to flooding.

The state's Disaster Management Authority has categorised floods into four classes. The first are flash floods, "occurring due to rainfall in Nepal, lead time [time between forecast and flood] is short (8 hours), receding of flood waters is fast." Then are river floods, where the lead time is 24 hours and receding of flood waters takes one week or more. The authority's website further says, "Class III: Drainage congestion in river confluence- lead time more than 24 hours, lasting full monsoon season (i.e. receding of flood water takes 3 months); Class IV: Permanent water logged area."

A major reason for the first three kinds of flooding is that Bihar is located below Nepal, with its Himalayan rivers flowing down to the state. Because the Himalayas are a young mountain range with a lot of loose soil, these rivers — Kosi, Gandak, Burhi Gandak, Bagmati, Kamla Balan, Mahananda, Adhwara — are full of sediments. Thus, when the volume of water increases due to rains, the rivers quickly overflow their banks.

The fourth category of permanent waterlogging is because of several factors. As the Flood Atlas of Bihar, prepared by ISRO along with the central and state governments, says, "The reasons of water-logging are spilling of silted small rivers, encroachment of drainage channels, embankment-induced waterlogging, and presence of saucer type depression locally called Chaur." Chaur are created due to a river changing course and deposition of its sediments.

This year, the flood has been caused by heavy rainfall and flooding in Nepal and release of water from its barrage on the Kosi river. Supaul, Darbhanga, Madhubani, Sitamarhi, West and East Champaran, Muzaffarpur, Siwan, Madhepura, Purnea, Araria, Gopalganj, Kishanganj, Sheohar, Saharsa and Saran.

Embankments, and the Kosi question

Given that Bihar's geography makes floods inescapable, solutions have been sought for decades. Among the more destructive rivers of the state is Kosi, known as the 'sorrow of Bihar'. Soon after independence, in the 1950s, embankments were built along the Kosi to contain its flow. While they were seen as a lasting solution, not only have the embankments been breached several times, they have created a new problem.

Embankments narrowed the course of the river. Thus, while Kosi earlier had the option to distribute its sediments, now it was in a straitjacket. With nowhere for the sediments to go, the river's bed has been rising by about 5 inches a year, making it more prone to overflowing.

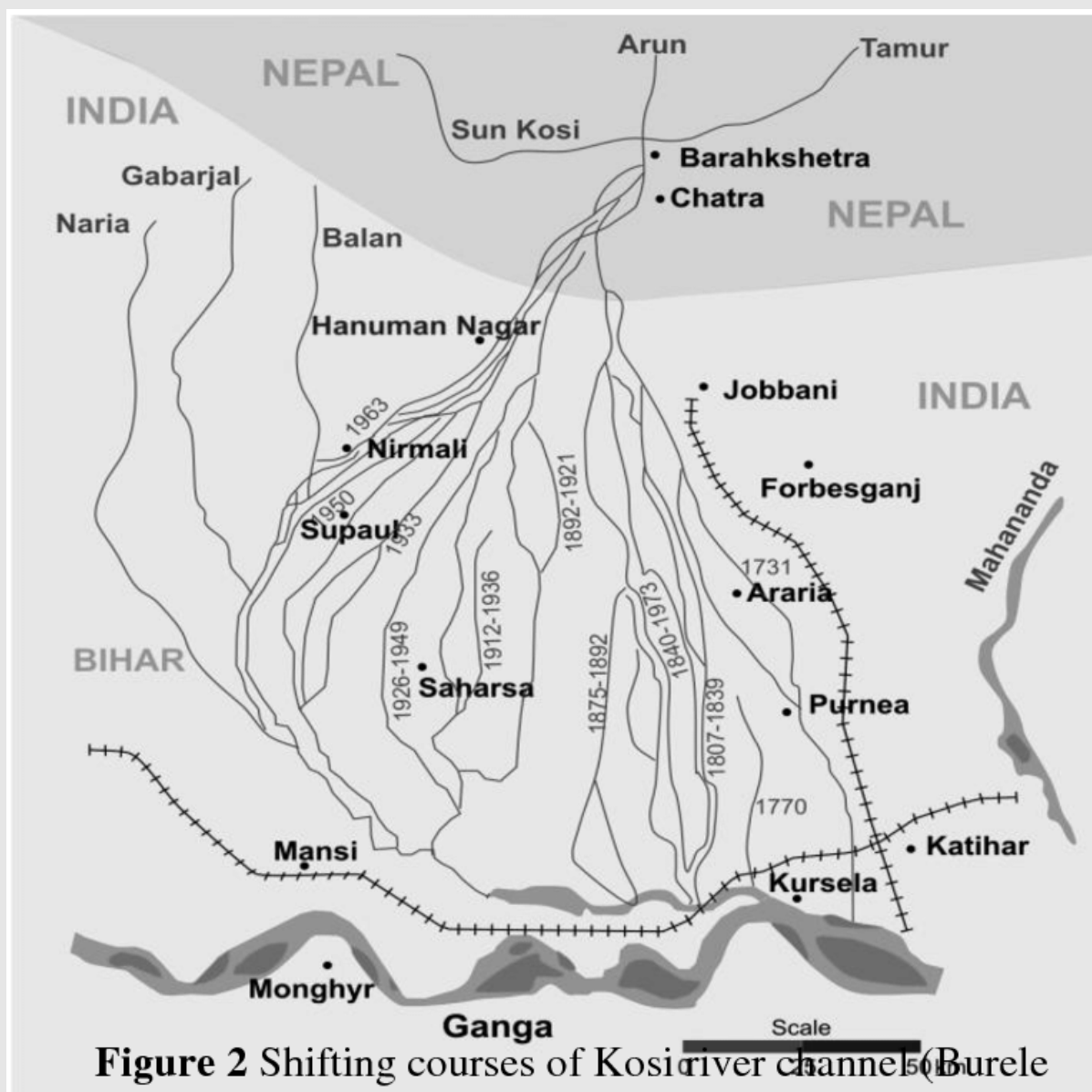
Effect of the Bihar floods

While Bihar floods may not result in loss of lives every year, their economic cost is steep, if one looks at the damage to crops, infrastructure, loss of livestock, and distress migration outside the state. The state government spends about Rs 1,000 crore annually for flood management and relief.

Possible solutions

For decades, the proposal of a dam on the Kosi has been mooted, but since that will require Nepal to come on board too, the plan has not progressed. The state government is also

considering a barrage each at Dagmara (Supaul) over Kosi, in Areraj over the Gandak, and another over Bagmati.



However, the experience with embankments shows that engineering solutions might not be enough to fix the Kosi problem.

The Flood Atlas of Bihar also says, "There must be a realisation that minimising the risk and damage from floods may be a more rational way of flood management rather than formulating structural measures along dynamic rivers such as the Kosi."

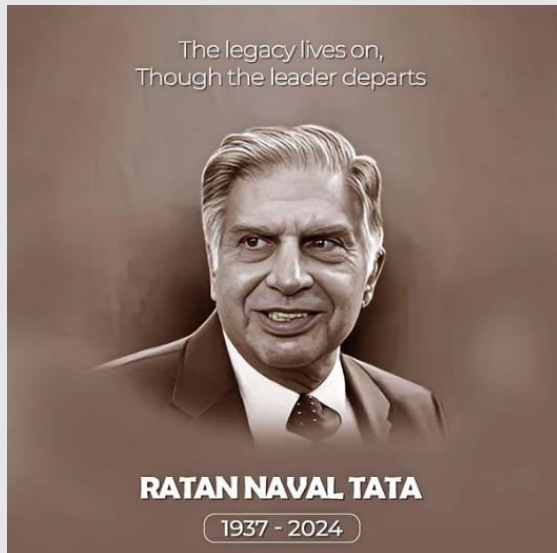
Relevance: GS Prelims & Mains Paper III; Disaster Management

Source: Indian Express

2. Ratan Tata: A Titan of Indian Industry Takes His Final Bow

Passing of a Legend

Ratan Naval Tata, chairman emeritus of Tata Group and veteran industrialist, passed away peacefully at the age of 86 on Wednesday evening at Breach Candy Hospital, Mumbai.



Family's Statement

In a heartfelt statement, his family shared, "We take solace in the outpouring of love and respect from all who admired him. While he is no longer with us in person, his legacy of humility, generosity, and purpose will continue to inspire future generations." Tata is survived by his younger brothers, Jimmy and Noel, and his stepmother Simone.

Tributes from Leaders

Prime Minister Narendra Modi honored Tata, calling him a visionary business leader and an extraordinary human being. Modi highlighted Tata's dedication to dreaming big and giving

back, noting his contributions to education, healthcare, sanitation, and animal welfare.

Tata Sons Chairman N. Chandrasekaran expressed a deep sense of loss, stating that Tata's immeasurable contributions had shaped both the Tata Group and the nation.

Rahul Gandhi, Leader of the Opposition, also paid tribute, acknowledging Tata's visionary leadership and lasting impact on business and philanthropy.

Career and Legacy

Leadership at Tata Group

Ratan Tata, often referred to as "RNT" within the Tata Group, led the conglomerate from 1990 to 2012, and briefly returned as interim chairman in 2016. He passed the reins to N. Chandrasekaran in 2017. Despite retiring, Tata remained influential, particularly through Tata Trusts, which holds a majority stake in Tata Sons.

Global Expansion

Tata's leadership transformed the Tata Group into a global powerhouse. Notable acquisitions under his leadership included Tetley, Jaguar, Land Rover, and Corus Steel, making Tata a recognized international brand. While known for his politeness, Tata was firm and resolute when it came to business matters.

Post-Retirement Ventures

Even after retirement, Tata continued to influence Indian industry by nurturing start-ups through his investment firm, RNT Associates.

A Lasting Legacy

Ratan Tata's passing marks the end of an era, but his contributions to Indian industry, philanthropy, and society will continue to inspire future generations.

Relevance: GS Prelims

Source: The Hindu

3. Succession After Ratan Tata's Passing

Leadership Uncertainty

Following Ratan Tata's death, the assumption is that his half-brother Noel Tata will take control of the Tata Group. However, no clear successor has been named, and Ratan did not personally own shares in Tata Sons that could be inherited. Unlike typical family-owned businesses, Tata Sons is largely controlled by two charitable trusts: the Sir Ratanji Tata Trust and the Sir Dorabji Tata Trust, which own a significant majority stake in Tata Sons.



Role of Tata Trusts

The Tata Trusts hold controlling power over the group, as they have the right to nominate one-third of Tata Sons' directors and influence key decisions. Whoever leads these trusts will indirectly control the group's future. Currently, businessman Venu Srinivasan and former Defence Secretary Vijay Singh are vice-chairpersons of the trusts, with Noel Tata also a trustee.

Potential Successors

Noel Tata: Strong Contender Noel Tata, currently chairperson of several Tata companies like Trent and Voltas, is seen as a strong contender due to his role as a trustee in the Sir Ratanji Tata Trust and Sir Dorabji Tata Trust. His appointment as a trustee in recent years suggests he is a favored candidate to lead the trusts.

Mehli Mistry: A Close Associate Another potential successor is Mehli Mistry, a close associate of Ratan Tata and a director of the M Pallonji Group. Despite being a cousin of the late Cyrus Mistry, corporate sources indicate that Mehli is a possible contender for leadership.

A Dark Horse? There is speculation that a less prominent candidate could emerge to lead the trusts, as the Tata Group needs a strong leader to navigate the challenges of the global economic downturn and domestic issues.

Challenges for the Future

Group Structure and Cohesion

The Tata Group's decentralized structure, with each of the 26 publicly listed companies operating independently, requires strong leadership to ensure unity and cohesive direction. The group's market capitalization exceeds \$365 billion, and major companies like TCS, Tata Steel, and Tata Motors are crucial to its profitability and growth.

Navigating Economic Headwinds

The new leader will face significant challenges, including steering Tata companies through global economic uncertainty and continuing to invest in innovation and growth. Tata Consultancy Services (TCS) remains the group's major profit driver, but sectors like steel and automobiles face stiffer challenges in the current economic climate.

The ultimate decision on Ratan Tata's successor will play a crucial role in the future of the Tata Group, influencing its leadership, strategy, and legacy.

Relevance: GS Prelims

Source: Indian Express

4. What is the Lawrence Bishnoi gang, linked with Baba Siddique's murder and threats to Salman Khan

Introduction

Nationalist Congress Party (NCP) leader and veteran Maharashtra politician Baba Siddique, 66, was shot dead on Saturday night (October 12). Long associated with the Indian National Congress (INC), he served as a state minister in the Congress-NCP government between 2004 and 2008. Siddique was also known for mingling with top Bollywood stars, including Shah Rukh Khan and Salman Khan.

Mumbai police confirmed that the three shooters involved in Siddique's killing were linked to the Lawrence Bishnoi gang. Here is what to know about the group and its criminal operations.

Who is Lawrence Bishnoi?

Lawrence Bishnoi, 31, is the son of a well-off agriculturist from the Dhattaranwali village in Punjab's Ferozepur district. He belongs to the Bishnoi community whose members have settled in Punjab, Haryana and many parts of Rajasthan.

Bishnoi studied till Class 12 and later shifted to Chandigarh in 2010 to pursue a college education. Following enrollment in DAV College, he joined student politics and became president of the Student Organisation of Panjab University (SOPU) between 2011 and 2012.

As per his criminal dossier, the first FIR against Lawrence Bishnoi was for an attempt to murder, followed by another FIR for trespass in April 2010. In February 2011, a case of assault and robbery of a cell phone was registered against him. All three cases were related to student politics.

Eventually, Jaswinder Singh alias Rocky, a gangster-turned-politician from Punjab's Fazilka, joined his group. The group remained active in parts of Rajasthan, in cities like Sri Ganganagar located on the Rajasthan-Punjab border, as well as Bharatpur, under the garb of student politics. Rocky, who also had a criminal background, was assassinated near Parwanoo in Himachal Pradesh in May 2016. Notorious gangster Jaipal Bhullar had taken responsibility for the murder. Bhullar was later gunned down in Kolkata in June 2020.



For many years, the gang has been named in cases of revenge killings as part of gang rivalries. Bishnoi has faced two dozen cases of murders, attempts to murder, extortion and other crimes. Currently, he is lodged in the Sabarmati Central Jail in Ahmedabad and is believed to be operating his gang from inside the jail. The gangster was taken to Gujarat by the state's Anti-Terrorist Squad (ATS) in connection with a case of cross-border drug smuggling.

Who is the Lawrence Bishnoi gang known to target?

Recently, the gang allegedly targeted a Delhi-based Afghan national named Nadir Shah to reportedly send a message to his associate, who was not responding to their extortion demands. Before that, the Bishnoi gang was believed to be involved in the murder of a gym owner in Delhi.

Perhaps most infamously, Lawrence Bishnoi made headlines when Punjabi singer Sidhu Moosewala was shot dead in 2022. Goldy Brar, a gang member, claimed responsibility for the murder. Brar first went to Canada in 2017 and was based out of the country. Other aides of Bishnoi are also believed to be in Canada and the United States.

In a social media post, purportedly by Goldy Brar, it was claimed that Moosewala's murder was a revenge killing, carried out to avenge the murder of youth Akali Dal leader Vikramjit Singh, aka Vicky Middukhera. Earlier this year, Brar was declared a designated terrorist by the Centre under the Unlawful Activities (Prevention) Act (UAPA).

For many months now, the Bishnoi gang's plans have reportedly involved targeting Salman Khan and sending him death threats. In April, multiple bullet rounds were allegedly fired outside the actor's house in Mumbai. Since then, police vans have been deployed in the area and the actor has a security detail attached to him.

What has the police said about the Bishnoi gang?

With Mumbai's underworld gangs led by Dawood Ibrahim, Chhota Rajan and Ravi Pujari, among others, largely neutralised over the past decade and a half, police suspect the Bishnoi gang, which has so far been active mainly in the northern states of Punjab, Haryana, Delhi, Rajasthan and (western) UP, is attempting to step into this vacuum.

A police officer also said that Bishnoi's aims are often associated with Khan reportedly shooting a blackbuck in Rajasthan, because of the animal being revered by the Bishnoi community. However, the officer added that targeting Khan may be an attempt by the gangster to gain notoriety.

Relevance: GS Prelims & Mains Paper III; Internal Security

Source: Indian Express

5. What is the Z-Morh project in Kashmir, where 7 were killed by militants?

Introduction

Seven people were killed in Jammu and Kashmir recently when suspected militants targeted the workers of infrastructure company APCO Infratech, which is constructing the Z-Morh tunnel on the Srinagar-Sonamarg highway. This is the first militant attack on a key infrastructure project in Jammu and Kashmir. In the past, militants have not targeted such infrastructure projects in the region.

What is the Z-Morh tunnel?

The Z-Morh tunnel is a 6.4-kilometer tunnel connecting the Sonamarg health resort with Kangan town in central Kashmir's Ganderbal district. The tunnel has been constructed near Gagangir village ahead of Sonamarg. The tunnel will provide all-weather connectivity to Sonamarg, a famous tourist destination on the Srinagar-Leh highway.

The tunnel has acquired its name for the Z-shaped road stretch at the place where the tunnel is being constructed.

What was the need for the tunnel?

The stretch where the tunnel is under construction is situated at an altitude of over 8,500 feet, and is prone to snow avalanches in the winter. The road to Sonamarg as such remains closed for most part of the winter.



When did work commence, what is its cost and when is it likely to be completed?

The tunnel project was originally conceived by the Border Roads Organisation in 2012. The Border Roads Organisation awarded the construction contract to Tunnelway Ltd. However, the project was later taken over by the National Highways & Infrastructure Development Corporation Limited (NHIDCL). The NHIDCL retendered the tunnel project and the contract was bagged by APCO Infratech, which executed the project through a special purpose vehicle, APCO-Shri Amarnathji Tunnel Private Limited.

While the project was expected to be completed by August 2023, it was delayed. The soft-opening of the tunnel was carried out in February this year. While the tunnel project is almost complete, its inauguration was delayed by the Model Code of Conduct (MCC) in place because of the Jammu and Kashmir Assembly elections.

What is the strategic importance of the Z-Morh tunnel?

The Z-Morh tunnel is part of the Zojila tunnel project that aims to provide all weather connectivity from Srinagar to Ladakh throughout the year.

While the tunnel would give all-weather connectivity to Sonamarg health resort in the Valley, it is essential for all-weather connectivity to Ladakh. This is important, as it would provide quick access for military personnel to the border areas of Ladakh. While the construction of the Zojilla tunnel at an altitude of approximately 12,000 feet connecting Sonamarg in Kashmir valley to Drass in Ladakh is under way and is expected to be completed by December 2026, the opening of the Z-Morh tunnel is essential for its all-weather connectivity.

The construction of the tunnel will provide safe connectivity between Srinagar, Dras, Kargil and Leh regions. The Indian defence forces are deployed against Pakistan in Siachen Glacier and

in the Turtuk sub sector, which abuts Baltistan in Pakistan-Occupied Kashmir (PoK). Similarly, there is widespread Indian Army deployment against Chinese forces in Eastern Ladakh, which has increased manifold after the 2020 face off with Chinese troops.

All-weather road connectivity will lessen the dependence of air maintenance of the forward locations of the Army through the transport aircraft of the Indian Air Force. The transportation of troops and supplies will be done by road and this will lead to lesser expenditure on the use of aircraft and also increasing the life of the aircraft.

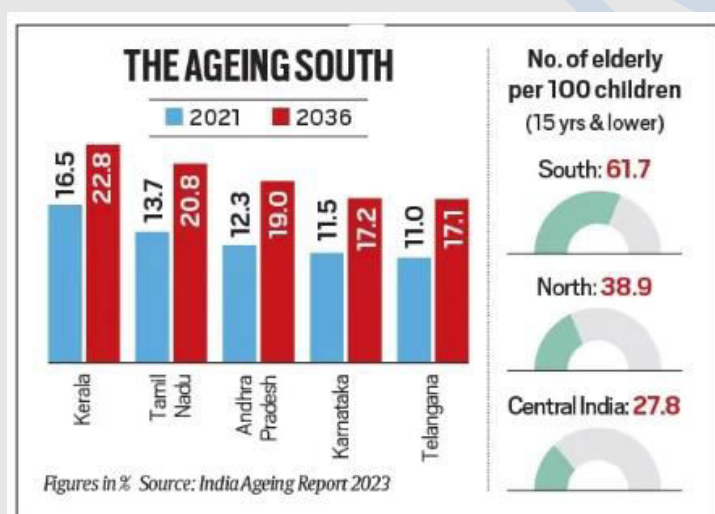
Relevance: GS Prelims & Mains Paper III; Internal Security

Source: Indian Express

6. Challenges of South India's Aging Population

Introduction

South India is experiencing a demographic shift, with its aging population becoming a growing concern. Andhra Pradesh's Chief Minister N Chandrababu Naidu recently highlighted this issue, noting that the region's low fertility rates may lead to a declining young population, which in turn could impact the state's workforce and economic future. This demographic transition, while positive in controlling population growth, presents new challenges, particularly in managing an aging society.



Population Projections and Aging Trends

According to a 2020 report by the Union Ministry of Health and Family Welfare, the proportion of people aged 60 and above is rising across India. Southern states, having achieved lower fertility rates earlier than their northern counterparts, are expected to see a faster increase in their aging population:

- **Kerala:** The proportion of people aged 60+ will rise from 13% in 2011

to 23% by 2036.

- **Andhra Pradesh:** The fertility rate dropped to the replacement level (2.1 children per woman) as early as 2004, more than two decades ahead of states like Uttar Pradesh.

With these trends, the dependency ratio—the percentage of non-working, dependent individuals—will increase, placing pressure on social services and healthcare.

Economic Impact of an Aging Population

An aging population poses challenges for economic productivity. As the working-age population shrinks, there will be fewer people to support the elderly. This could lead to higher spending on healthcare and pensions, potentially straining state resources. Southern states are particularly concerned that their smaller population growth could reduce their representation in Parliament after electoral delimitation.

Can Incentives to Increase Fertility Work?

N Chandrababu Naidu suggested policies to incentivize larger families to counter the population decline. However, research indicates that pro-natalist policies—efforts to encourage more births—have had limited success globally. Countries like Japan, South Korea, and parts of Europe have tried similar policies, but have not been able to significantly raise birth rates. Even Scandinavian countries, where extensive family and childcare support exists, have only managed to prevent fertility rates from falling too drastically.

Experts like Sonalde Desai argue that once populations reach a certain level of prosperity and education, it becomes difficult to encourage higher fertility, even with financial incentives.

Addressing the Aging Challenge: Migration as a Solution

Rather than focusing on increasing fertility, experts recommend internal migration as a more viable solution for South India. Migration from the northern states, where the population is younger and growing, can help offset the labor shortages in the South. This approach has several advantages:

- Southern states can benefit from an influx of working-age individuals without having to invest in their education and upbringing.
- Migrants can contribute immediately to the local economy, filling gaps in sectors like manufacturing and services.

This model of leveraging migration is similar to the approach taken by the United States, which has sustained its economy through immigration and the economic contributions of younger populations from abroad.

Boosting Economic Productivity

Experts also stress that instead of focusing on increasing the birth rate, the priority should be on enhancing the economic productivity of the existing workforce. Ensuring that South India fully benefits from its current demographic dividend, with a focus on improving skills, education, and employment opportunities, can help maintain economic growth even as the population ages.

Conclusion

South India faces significant challenges with its aging population, but incentivizing larger families may not be a successful or sustainable solution. Instead, encouraging internal migration from other parts of India and boosting workforce productivity are seen as more effective strategies to maintain economic stability in the face of demographic change.

Relevance: GS Prelims & Mains Paper I; Society

7. What is the flight protocol for a bomb threat?

Introduction

Over 100 hoax alerts in a week

Legal changes: Aviation minister has said hoax bomb threats may be classified as cognisable offence with longer potential sentences

No-fly list: Minister also said govt proposing to place perpetrators on a no-fly list.

Increased security: Agencies have increased security deployment by 10% over the past week and have stepped up surveillance.

Protocols enforced: Airport staff said all protocols meticulously followed for each threat, even if most hoaxes.



Over nearly two weeks, almost all Indian carriers including the Tata group airlines — Air India, Vistara, and Air India Express — as well as IndiGo, Alliance Air, and Star Air have faced a wave of threats, resulting in emergency responses and rerouting. There has been military fighter jet interception of some of the flights when they were in international airspace after the crew squawked an emergency transponder code. While all the threats have been determined to be a hoax, they have still led to significant flight delays and financial losses to the airlines, about ₹13 lakh-₹17 lakh an hour.

What do we know about the threats?

According to the Union Civil Aviation Minister, Kinjarapu Rammohan Naidu, most threats have been through social media. Intelligence agencies are looking into the issue and there is a strong possibility of cases being registered. As the threats are largely of an online nature, the tracking of IP addresses and virtual private network use are in focus. The Minister added that even if intuition was that it could be a hoax, nothing was being left unchecked. India has nearly 4,000 flight operations in a day, he said, and within the timeline since the threats began, this would mean over 275 threats for 48,000 flights. He said that efforts were on to make changes in the aviation laws in order to have a strong framework in place. There has been one detention so far — of a teenager who made hoax calls. Representatives of some of the social media platforms concerned have indicated that they are “committed to crack down on terror threats being made against Indian flights”.

What is the aviation security architecture?

Almost all the main security guidelines and directives are rooted in the International Civil Aviation Organization's (ICAO) Annex 17—Aviation Security (Restricted). An ICAO spokesperson told The Hindu that the formulation and adoption of Standards and Recommended Practices (SARPs) for international civil aviation are important, which are detailed in technical annexes to the Convention on International Civil Aviation — also called the Chicago Convention. The ICAO has measures against acts of ‘unlawful interference against civil aviation throughout the world’. The SARPs for international aviation security form Annex 17 to the Chicago Convention. There is also the ICAO Aviation Security Manual (Doc 8973—Restricted) which assists ICAO member-states. The spokesperson said that Annex 17 and Doc 8973 are under constant review keeping in mind new threats and evolving technological developments. The spokesperson added that there are restrictions to the information on (member-) state discussions regarding

the evolution of security matters, the resulting assessments, and the associated mitigation measures. Specific ICAO guidance on security matters is restricted.

In India, the nodal agency concerned is the Bureau of Civil Aviation Security. Its main responsibility is to have in place standards and measures for the security of civilian flights. The Directorate General of Civil Aviation (DGCA) is concerned with safety. Other agencies involved, directly and indirectly, include the Airports Authority of India; the Central Industrial Security Force; the National Security Guard; the Intelligence Bureau; the Research and Analysis Wing; the Ministry of Home Affairs, and the higher judiciary.

In the context of the threats, amendments could be planned to the Aircraft Act 1934, the Aircraft Rules 1937, and subordinate pieces of legislation to ensure stringent punishment and placing offenders on a 'no-fly list'. The Minister highlighted planned amendments to the Suppression of Unlawful Acts against Safety of Civil Aviation Act, 1982, which would allow legal action even when the aircraft is on the ground. Regulations now focus on in-flight incidents. An official said that in every airport, the operator, airlines, and security agencies have procedures to handle security threats based on approved documents. He said, "Every airport is prepared to handle such situations as the procedures are regularly tested and updated." There are specific documents but they are restricted. Contingency procedures for unusual occurrences include bomb threats (and aircraft isolation), hijacks, radio communication failure, and other emergencies associated with aircraft.

A pilot who flies the Boeing 777 aircraft says a threat is taken very seriously and there are procedures for the crew. Air traffic control agencies also have procedures.

How are threats to be handled?

An aviation security expert who served in various geographical domains has told The Hindu that hoax calls are of a specific or non-specific nature. While specific details about the hoax calls in the Indian context might not be publicly available, the issue has highlighted systemic issues that concern standardised procedures, guidelines, training, technological limitations, communication gaps, and regulatory challenges.

Tackling hoax calls, for instance, according to the expert, would require investment in technology such as advanced call tracking systems, AI-powered call analysis, voice stress analysis, comprehensive threat assessment, and rewards and incentives for informers. The expert says the industry must look at emerging technologies such as quantum computing, having an aviation cybersecurity framework, pitching for a global hoax call database, having AI-powered chatbots for initial threat assessment, and putting in place enhanced psychological profiling of callers.

An aviation safety expert and a former member of the Civil Aviation Safety Advisory Council suggests placing the photographs of offenders on social media and on display at airports.

Relevance: GS Prelims & Mains Paper III; Internal Security

Source: The Hindu