

WEEKLY UPDATES – (4th-10th Feb)

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ART & CULTURE

Grammy Award 2024

Context: The fusion music group Shakti, comprising tabla maestro Zakir Hussain and singer Shankar Mahadevan, has clinched the 66th Grammy Award (2024) for Best Global Music Album for their work "This Moment." "This Moment" marks Shakti's third studio album, released on 23rd June 2023, marking their return after 46 years under the same name.

India's Performance in the 2024 Awards

- Shakti, comprised of Zakir Hussain, Shankar Mahadevan, John McLaughlin, Ganesh Rajagopalan, and Selvaganesh Vinayakram, secured the 2024 Grammy for their album "This Moment."
- Termed as an "unprecedented transcontinental collaboration," Shakti amalgamates musicians from Eastern and Western traditions, laying the groundwork for what is now acknowledged as world music.
- Zakir Hussain attained two additional victories, bagging Grammys for the best global music performance with 'Pashto' and for the best contemporary instrumental album 'As We Speak.'
- The album also features Indian flute player Rakesh Chaurasia, nephew of the renowned flautist Hariprasad Chaurasia.

What are Grammy Awards?

- The Grammy Award, originally named the Gramophone Award, is an annual series of accolades presented in the United States (US) by either the National Academy of Recording Arts & Sciences (NARAS) or the Latin Academy of Recording Arts & Sciences (LARAS), the latter solely for recordings in Spanish/Portuguese languages.
- These awards, initiated in 1959 to honor musical accomplishments of the year 1958, entail the presentation of a golden statuette resembling a gramophone.

ENVIRONMENT

Dusted Apollo sighted for first time in Himachal's Chamba

Context: Recently, the Dusted Apollo (*Parnassius stenosemus*), a rare butterfly species found at high altitudes, was observed and photographed in Chamba, Himachal Pradesh, marking its first sighting in the region.

Key Highlights

- Discovered in 1890, the Dusted Apollo inhabits regions ranging from Ladakh to West Nepal, typically flying at elevations between 3,500 to 4,800 meters within the inner Himalayas.
- Belonging to the snow Apollo genus (*Parnassius*) of the swallowtail family, the Dusted Apollo is characterized by its unique features.
- The species bears a striking resemblance to the Ladakh Banded Apollo (*Parnassius stoliczkanus*), yet can be distinguished by the completeness and extension of the discal band on the upper fore wing. In the Dusted Apollo, this band spans from costa to vein one, whereas in the Ladakh Banded Apollo, it extends only up to vein four.
- The sighting event also included another rare species, the Regal Apollo (*Parnassius charltonius*), which enjoys protection under Schedule II of the Wildlife Protection Act, 1972.



Characteristics of Apollo Butterfly

Characteristics	Details
Historical Rarity	Discovered in 1890, Dusted Apollo is a rare high-altitude butterfly.
Sighting Details	Spotted and photographed in September 2023 near Manimahesh Lake in Chamba during a trek.
Endangered Species	Many Apollo butterfly species are endangered, requiring immediate conservation efforts.
Wide Range	Distribution extends from Ladakh to West Nepal.
Altitude Preference	This unique butterfly thrives at altitudes ranging from 3,500 to 4,800 meters in the inner Himalayas.

Ergosphere: making a black hole work

Context: Rotating black holes have an ergosphere outside their event horizon, where matter and energy can be extracted.

What is an Ergosphere?

Origin

The term "ergosphere" originates from the Greek word 'ergon', meaning 'work', owing to its capability to yield energy and mass.

Definition

An ergosphere is the region situated between the event horizon and the stationary limit.

Stationary Limit

The stationary limit denotes a boundary encircling the exterior of a rotating black hole.

Event Horizon

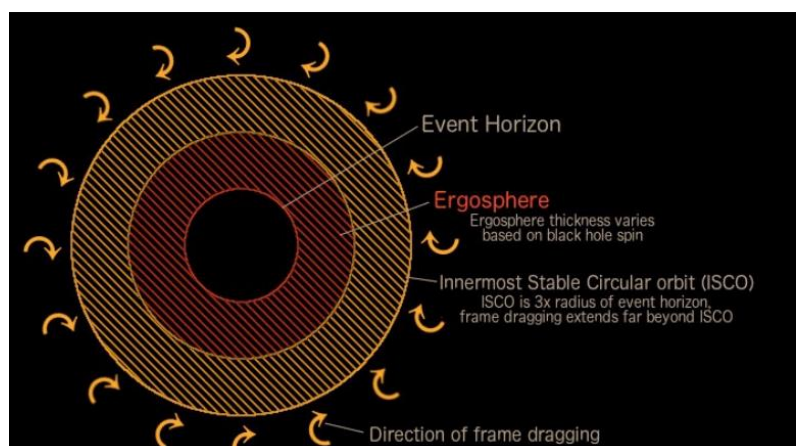
This is a sphere encompassing the singularity of a black hole, where objects cannot escape unless surpassing the speed of light.

Shape

The ergosphere assumes the shape of an oblate spheroid, resembling a pumpkin, with points of contact with the event horizon at the top and bottom, extending further outwards towards the middle.

Features of Ergosphere

- **Size:** The ergosphere constitutes a larger sphere compared to the event horizon, enabling the entry and exit of objects moving at velocities below the speed of light.
- **Extraction of Matter and Energy:** Matter and energy extraction is feasible within the ergosphere, distinct from beyond the event horizon.



Significance

- Scientists propose the potential of sending objects into the ergosphere and facilitating acceleration along the black hole's rotational axis, leading to enhanced velocity upon exiting. This process results in the transfer of energy from the black hole, thereby diminishing its angular momentum.

Black Hole

- **Formation:** Black holes originate from the implosion of the core of a massive star following its supernova explosion.
- **Einstein's Theory of General Relativity:** According to this theory, when a massive star undergoes collapse, it leaves behind a compact core. If this core's mass surpasses a certain threshold, gravity dominates, resulting in the formation of a black hole.
- **Visibility:** Black holes are observable solely through their effects on surrounding matter and radiation, as their gravitational pull impedes even light from escaping.
- **Gravitational Singularity:** At the heart of a black hole lies a gravitational singularity—a point of infinite density and infinitesimal volume—where space and time undergo extreme distortion. The immense gravitational force of a black hole emanates from its singularity.

What is a black hole?



- A black hole is a point in space where gravity pulls so much that even light can not get out
- There are four types of black holes: stellar, intermediate, supermassive, and miniature
- Because no light can get out, people can't see black holes
- Regardless of how big a black hole starts out, they can grow throughout their lives

Black necked Crane

Context: The Wildlife Institute of India and the Zoological Survey of India have conducted assessments on black-necked cranes.

- In the Ladakh region, a survey conducted by the Wildlife Institute of India in 2016-2017 found a population size of approximately 66-69 black-necked cranes.
- Arunachal Pradesh hosts a small population of about 11 black-necked cranes during the winter months.

Conservation status of the species

- The Black-necked Crane (*Grus nigricollis*) holds Schedule I status under the Wild Life (Protection) Act, 1972, affording them the highest level of protection.
- Additionally, the species is listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species (CMS).
- The IUCN Red List of Threatened Species categorizes the black-necked crane as near threatened.



Habitat Areas of Black-necked Crane

- Black-necked cranes breed in high-altitude marshes and lakes of the Tibetan Plateau (Tibet, Qinghai, Xinjiang, Gansu), Sichuan (China), and Eastern Ladakh (India).
- Major wintering flocks are found in Tibet, Yunnan, and Guizhou (China), as well as Bhutan (Phobjika and Bomdaling Valleys).

Important steps taken to protect the species

- Key habitats of the black-necked crane, like the Changthang Sanctuary in Ladakh, have been declared as Protected Areas.
- The Tso Kar Wetlands Complex, crucial for foraging and breeding, was designated as a Ramsar Site in December 2020.
- The National Wildlife Action Plan (2017-2031) released by the Ministry in October 2017 outlines specific chapters and priority actions for wildlife conservation.
- Financial assistance is provided to State/Union Territory Governments under the Centrally Sponsored Schemes 'Development of Wildlife Habitats' for wildlife and habitat management.
- Guidelines for the management planning process for Protected Areas have been issued under Section 33 of the Wild Life (Protection) Act, 1972.
- The Government of India launched the Mission LiFE (Lifestyle for Environment) program to raise public awareness about the environment and conservation.
- Important wildlife-related days like World Wildlife Day, Wetlands Day, Migratory Bird Day, and Wildlife Week are celebrated to enhance public awareness of wildlife and biodiversity.

Key Habitats Protection

Changthang Sanctuary in Ladakh declared as Protected Area for Black-necked crane habitat conservation.

Ramsar Site Designation

Tso Kar Wetlands Complex designated as a Ramsar Site in December 2020 for crucial foraging and breeding grounds of Black-necked crane.

National Wildlife Action Plan

Ministry released National Wildlife Action Plan (2017-2031) in October 2017.

Financial Assistance

Financial assistance provided to State/Union Territory Governments under Centrally Sponsored Schemes 'Development of Wildlife Habitats.'

Management Guidelines

Guidelines for the management planning process for Protected Areas issued under Section 33 of the Wild Life (Protection) Act, 1972.

Mission LiFE

Government of India launched Mission LiFE (Lifestyle for Environment) program.

Characteristics of Black Crane

Category	Description
State Bird	<ul style="list-style-type: none"> • Jammu and Kashmir, India • Recently, Ladakh has adopted Snow Leopard and Black-Necked Crane, as State animal and State bird
Conservation Status	Vulnerable (IUCN) CITES Appendix I
Taxonomy	<ul style="list-style-type: none"> • Family: Rallidae; • Order: Gruiformes; • Class: Aves; • Phylum: Chordata; Kingdom: Animalia
Scientific Name	Grus nigricollis
Common Name	Black-necked crane

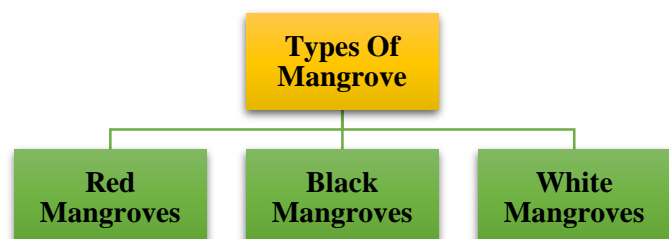
Category	Description
Description	<ul style="list-style-type: none"> • Medium-sized crane; 120-140 cm height; • 5,000-7,000 grams weight; • Wingspan: 200-235 cm; • Overall plumage: Whitish gray; • Black head, upper neck, tail, and legs; Reddish bare lores and crown; • White patch behind the eye; Pale yellow iris; Trumpeting call
Habitat	Alpine bog meadows, riverine marshes, wetlands, barley and wheat fields
Diet and Feeding Habits	Omnivorous; Plant matter (rhizomes, seeds, sprouts, roots, tubers, stems, shoots, leaves); Agricultural crops (barley); Insects, frogs, crabs, rodents
Breeding	<ul style="list-style-type: none"> • May breeding season; • Territorial; Nest construction with grass, rushes, and weeds; • One or two eggs laid in May-June; • Chicks forage independently
Distribution	Breeds in: <ul style="list-style-type: none"> • Qinghai-Tibetan plateau (China) • Ladakh (India); Wintering in Bhutan, • Arunachal Pradesh (India), • Tibet (China)
Movement and Migration Patterns	<ul style="list-style-type: none"> • Summer migration to high altitudes in Tibetan plateau and Ladakh; • Winter migration from early September to December to lower altitudes in Bhutan, Arunachal Pradesh (India), and Tibet (China)
Conservation Concerns	Declining global population (10,000-11,000 individuals); Threats - wetland and marsh degradation, grassland degradation, tourism and recreation disturbance, pesticide poisoning, hunting, power line collisions

Schemes for Restoration of Mangrove Forests

Context: Union Minister of State for Environment, Forest and Climate Change, Shri Ashwini Kumar Choubey, provided details about various schemes for mangrove forest conservation in a written reply in the Lok Sabha.

About Mangroves

- **Definition and Function:** Mangroves are plant communities found in inter-tidal zones along tropical and subtropical coastlines, serving multiple ecological functions such as habitat provision, coastline protection, and sediment accretion.
- **Unique Adaptations:** Mangrove plants possess unique adaptations allowing them to survive in harsh environments, with different types of roots including prop, air, and stilt roots.



Presence of Mangroves

Global Distribution

• Approximately 40% of the world's mangrove cover is found in South East Asia and South Asia, with India hosting about 3% of the total cover in South Asia.

Mangrove Cover in India

• India's mangrove cover has increased by 54 sq km (1.10%) compared to the previous assessment, totaling 4,975 sq km (1.2 million acres), which is 0.15% of the country's total geographical area.

Regional Distribution

• West Bengal, Gujarat, and the Andaman & Nicobar Islands are the top three regions with significant mangrove cover, with South 24 Parganas district in West Bengal hosting the Sunderban National Park, one of the largest mangrove forests globally.

Schemes for Conservation of Mangroves

- **MISHTI:** The 'Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)' was announced in the Union Budget 2023-24 to promote and conserve mangroves as a unique ecosystem with high biological productivity and carbon sequestration potential. It aims for restoration/reforestation covering approximately 540 km² across 9 States and 3 Union Territories.
- **MAC:** The "Mangrove Alliance for Climate" was launched by the UAE and Indonesia, aiming to establish an international mangrove research center in Indonesia to study ecosystem services such as carbon sequestration and ecotourism. Partner countries include India, Australia, Japan, Spain, and Sri Lanka.

Important Mangrove Region in India

- Gulf of Kutchh
- Gulf of Khambhat
- Dumas-Ubhrat

Gujarat



- Coringa East Godavari Delta
- Krishna Delta

Andhra Pradesh



- Bhaitarkanika
- Mahanadi
- Subarnarekha
- Devi-Kauda

Odisha



- Sunderbans

West Bengal



- North Andaman
- Nicobar

Andaman & Nicobar



- Achra-Ratnagiri
- Devgarh-Vijay Durg
- Veldur

Maharashtra



- Goa

Goa



- Coondapur
- Dakshin Kannada/Hannavar
- Karwar

Karnataka



- Vembanad
- Kannur (North Kerala)

Kerala



- Pichavaram
- Muthupet
- Ramnad
- Pulicat

Tamil Nadu



ECONOMY

Importance of Fiscal consideration

Context: During her Budget speech, the Finance Minister (FM) surprised analysts by revealing the government's plans to reduce the fiscal deficit to 5.1% of GDP in 2024-25 and below 4.5% by 2025-26, contrary to expectations of higher deficit targets.

- This article aims to elucidate the concept of fiscal deficit, its importance, the methods through which the government finances it, and the implications associated with reducing the deficit.

Government Funding of Fiscal Deficit



- **Borrowing:** To bridge the fiscal deficit, the government borrows funds from the bond market, where lenders vie to acquire government-issued bonds.
- **Central Banks:** Central banks, like the Reserve Bank of India (RBI), wield considerable influence in the credit market by purchasing government bonds in the secondary market, thereby indirectly providing funds to the government.
- **Borrowing Amount:** The Centre aims to borrow ₹14.13 lakh crore from the market in 2024-25, a figure lower than the target set for 2023-24.

What is Fiscal Deficit?

- **Definition:** Fiscal deficit denotes the disparity between a government's revenue and its expenditure, wherein expenses surpass revenues, necessitating borrowing or asset sales to cover the shortfall.
- **Revenue Sources:** Taxes constitute the primary revenue source for the government, with tax receipts expected to amount to ₹26.02 lakh crore in 2024-25, out of a total estimated revenue of ₹30.8 lakh crore. Government expenditure for the same period is projected to reach ₹47.66 lakh crore.

Why Does Fiscal Deficit Matter?

- **Inflation:** Elevated fiscal deficits can precipitate inflation, as the government might resort to printing currency to finance the deficit.
- **Market Confidence:** Fiscal prudence, evidenced by reduced deficits, can instill confidence among lenders, potentially enhancing bond ratings and lowering borrowing costs.
- **Debt Management:** A heightened fiscal deficit can strain the government's capacity to manage public debt, potentially leading to a significant increase in India's public debt and impacting fiscal well-being.
- **International Borrowing:** A diminished fiscal deficit may facilitate easier issuance of bonds overseas for the government, enabling access to cheaper credit.



Future Prospects

- **Reducing Fiscal Deficit:** The government aims to decrease the fiscal deficit to 5.1% of GDP in 2024-25, primarily through an anticipated 11.5% increase in tax collections.
- **Balancing Act:** Achieving the ambitious fiscal deficit target entails a delicate balance between revenue augmentation and expenditure restraint, which could potentially dampen economic growth.

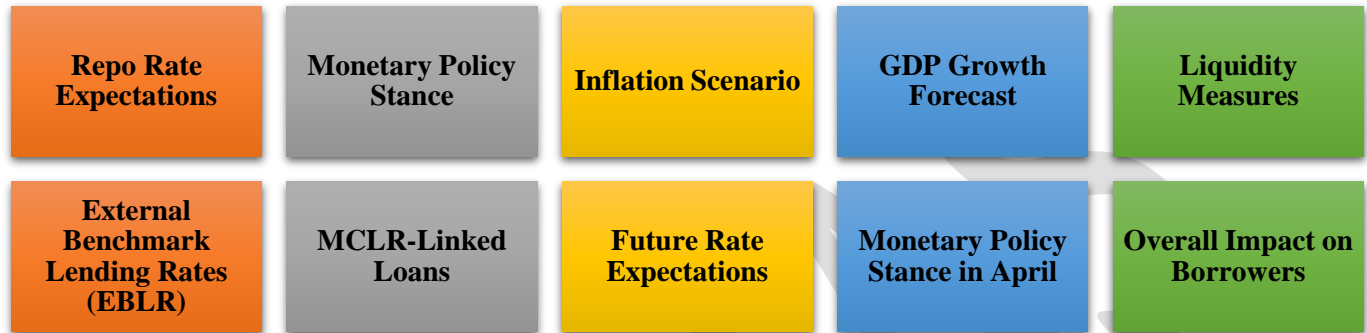
Conclusion

Fiscal deficit, delineating the variance between government revenue and expenditure, bears significant ramifications for inflation, market confidence, debt management, and international borrowing. The government's strategy to diminish the fiscal deficit in the forthcoming years necessitates a meticulous equilibrium between revenue generation and expenditure control.

RBI Monetary Policy Preview

Context: After staying put on the key policy rate for the last five consecutive rate-setting meetings, the Monetary Policy Committee (MPC) of the Reserve Bank of India (RBI) is likely to maintain a status quo for the sixth time tomorrow, which will also be the last policy of fiscal 2023–24. The MPC, in its previous monetary policy, retained the repo rate at 6.5 per cent

Key Highlights



Repo Rate Expectations

- **Expected to Remain Unchanged:** The RBI's Monetary Policy Committee (MPC) is anticipated to uphold the repo rate at 6.5% for the sixth consecutive time.
- **Steady Repo Rate:** If this expectation holds, it would signify a year of uninterrupted stability in the repo rate.

Monetary Policy Stance

- **Expected as 'Withdrawal of Accommodation':** The likely stance of the monetary policy is expected to continue as a 'withdrawal of accommodation.'
- **Consistent with Inflation Targets:** The focus remains on maintaining Consumer Price Index (CPI) inflation at the targeted 4%.

Inflation Scenario

- **December CPI Inflation:** Experienced an uptick to 5.69%, reaching a four-month high, primarily driven by elevated food prices.
- **Government's Band:** Inflation is within the 2-6% band but surpasses the 4% target.
- **RBI's Projection for FY24:** Forecasts CPI inflation at 5.4%, with the third quarter at 5.6% and the fourth quarter at 5.2%.

GDP Growth Forecast

- **RBI's FY24 Forecast:** Envisions real GDP growth at 7%, indicating optimism towards growth and acknowledging fiscal consolidation efforts.

Liquidity Measures

- **Expectations:** Some economists anticipate the RBI to introduce liquidity measures to alleviate tight liquidity conditions.
- **Liquidity Gap:** The gap between incremental credit and deposits in the fiscal year to date (FYTD) 2024 stands at Rs 3.6 lakh crore.

External Benchmark Lending Rates (EBLR)

- **Linked to Repo Rate:** If the repo rate remains steady, EBLRs linked to it will not see an increase, offering relief to borrowers with loans tied to EBLRs.

MCLR-Linked Loans

- Possible Rate Hike: There's a possibility of lenders increasing interest rates on loans linked to the Marginal Cost of Funds based Lending Rate (MCLR).
- Incomplete Transmission: Full transmission of previous repo rate hikes hasn't been observed in MCLR-linked loans.

Future Rate Expectations

- Nomura's View: Anticipates 100 basis points of rate cuts, beginning from August, with potential risks of earlier cuts.
- Goldman Sachs' View: Expects the RBI to maintain the policy repo rate unchanged until the third quarter of calendar year 2024.

Monetary Policy Stance in April

- Expected Timing: A formal change to the monetary policy stance may be considered in April, while the RBI is expected to actively manage liquidity with the current stance.

Overall Impact on Borrowers

- EBLR-Linked Loans: Borrowers won't experience an immediate increase in Equated Monthly Installments (EMIs).
- MCLR-Linked Loans: There's a possibility of interest rate hikes, which could affect EMIs for loans linked

GOVERNANCE

Dispute over Varanasi, Mathura mosques

Context: With the escalation of the Babri-Masjid Ram Janmabhoomi conflict, attention turned to two other mosques: the Gyanvapi mosque in Varanasi and the Shahi Idgah in Mathura. In September 1991, a special law was enacted by the government to freeze the status of places of worship as it stood on August 15, 1947, excluding the ongoing Ayodhya litigation from its purview.

About Places of Worship (Special Provisions) Act, 1991

- Described as legislation to prohibit the conversion of places of worship and to maintain their religious character as of August 15, 1947.
- Stipulates that the religious character of a place of worship shall remain unchanged from that date and prohibits conversion of any place of worship to a different denomination or section.
- Exemptions include the disputed Ayodhya site, ancient and historical monuments, settled disputes, and conversions by acquiescence before the Act's enforcement.

Criticism

The law bars judicial review

Imposes an arbitrary retrospective cutoff date

Infringes upon the religious rights of certain groups

Status of Ongoing Cases on the Gyanvapi Mosque

- A suit filed in 2022 by Hindu women worshippers seeks to assert their right to worship deities they claim exist on the premises.
- Another batch of suits filed in 1991 aims to declare a part of the site as belonging to Lord Vishweshwar.

- Court orders have favored the continuation of these suits, with the Archaeological Survey of India (ASI) reporting the existence of a temple prior to the mosque's construction.

Status of Ongoing Cases on the Mathura's Shahi Idgah

- Suits concerning the Shahi Idgah mosque challenge its construction over the birthplace of Lord Krishna.
- A compromise settled in 1968, implemented through a decree in 1974, is contested as fraudulent, with suits seeking the transfer of the entire land to the deity.
- The Allahabad High Court has consolidated all suits related to the Mathura dispute.

2022 Lawsuit by Hindu Women

- Hindu women worshippers filed a suit in 2022.
- Objective: Assert their right to worship deities on the premises.

1991 Suits for Lord Vishweshwar

- Suits filed in 1991.
- Aim: To declare a specific site as belonging to Lord Vishweshwar.

Court Orders Support

- Ongoing court orders support the continuation of these suits. Archaeological Survey of India (ASI) reports the existence of a temple before the mosque's construction.

ASI Findings

- ASI's findings strengthen the case for the existence of a temple prior to the mosque's construction.

Legal Context

- Ongoing legal battles underline the significance of the dispute.
- Highlights the struggle for the rights of Hindu worshippers.

Historical Significance

- ASI's discovery adds historical weight to the Hindu claims.

Continued Litigation

- Ongoing legal proceedings indicate the unresolved nature of the issue.
- Signifies the complexity and importance of the dispute.

SALIENT POINTS

- ▶ The original suit of 1991 is not barred by the Places of Worship Act 1991
- ▶ The suits are of national importance, not between two parties, but two communities
- ▶ Trial court should expeditiously decide the suit
- ▶ preferably within a period of six months
- ▶ The report of the ASI survey just done in the Shringar Gauri case should be submitted in this case also
- ▶ If the trial court wants further survey, it can order the agency



Why Did the Places of Worship (Special Provisions) Act Not Cover Gyanvapi and Shahi Idgah?

- Court rulings assert that the Act does not bar suits concerning Gyanvapi and Shahi Idgah, as they aim to assert worship rights and challenge past agreements rather than convert the mosques.
- The Act's lack of definition for 'religious character' and the examination of evidence to determine it undermine claims of absolute prohibition on proceedings to ascertain religious character.

Rethinking India's Examination System

Context: As the examination season approaches, the discourse on India's Examination system gains momentum, shedding light on its deficiencies and suggesting avenues for improvement.

Issues Related to the Examination System in India

School-Leaving Examinations and Limited Secondary Education

- The school-leaving exam, originating in the late 19th century, served to select candidates for further education, then scarce, and lower-level office jobs, functioning as an elimination tool.
- This practice persists today, with Grade 10 exams barring many from further education due to the scarcity of secondary and higher secondary education opportunities.

School-Leaving Examinations and Limited Secondary Education

Illusion of Equal Opportunity

Illusion of Equal Opportunity

- Exams purportedly provide equal opportunities to all, regardless of background, as the identities of paper-setters and evaluators remain undisclosed, fostering a facade of equality amid diverse circumstances.

Emphasis on Competition over Comprehension

Emphasis on Competition over Comprehension

- India's educational system prioritizes competition, fostering rote memorization over genuine understanding.
- The rigid school structure and curriculum exacerbate this issue, leaving little room for exploration and holistic learning.

Intense Competition and Stress

Intense Competition and Stress

- India's examination system unfavorably compares to assessment systems in other societies, promoting intense competition and stress from an early age, leading to rote learning.

Poor Academic Infrastructure

Poor Academic Infrastructure

- Many Boards lack sufficient staff and academic faculty to oversee procedures, with several State Boards facing significant academic infrastructure challenges.
- Even prominent boards like CBSE and ICSE operate bureaucratically, potentially compromising examination quality.

What can be Done to Reform India's Examination System?

Addressing Institutional Dysfunction

Comprehensive Curriculum Reform

Flexible Assessment Methods

Professional Development for Educators

Holistic Evaluation Criteria

Role of National Curriculum Framework for School Education 2023 (NCF)

Addressing Institutional Dysfunction

- Rectify systemic inadequacies within examination boards, including staffing shortages and infrastructure deficiencies.
- Prioritize enhancement of academic faculty and administrative capabilities for effective monitoring and evaluation.
- Foster transparency and accountability within examination boards to uphold integrity and fairness.

Comprehensive Curriculum Reform

- Streamline and rationalize the curriculum to accommodate diverse learning needs while emphasizing critical thinking and problem-solving skills over memorization.
- Integrate interdisciplinary approaches to promote holistic understanding.

Flexible Assessment Methods

- Introduce modular examination formats to allow proficiency demonstration over time.
- Shift from high-stakes examinations to a nuanced assessment framework valuing continuous learning.

Professional Development for Educators

- Invest in comprehensive training programs for educators to deepen pedagogical and assessment understanding.
- Promote collaboration among teachers for continuous improvement and innovation.

Holistic Evaluation Criteria

- Expand evaluation criteria to include creativity, collaboration, and emotional intelligence.
- Develop alternative assessment methods such as portfolios and projects.

Role of National Curriculum Framework for School Education 2023 (NCF)

- Envisaged in NEP 2020, the NCF aims to positively transform India's school education system through curriculum changes aligned with constitutional principles.

What Initiatives have been Taken to Reform the Education System?



Conclusion

By adopting a multifaceted approach, India can reform its examination system structurally, pedagogically, and culturally, paving the way for an equitable, empowering education system. Collaboration among stakeholders is crucial to enact meaningful reforms prioritizing holistic student development and well-being, ensuring a brighter future for generations.

POLITY

A Sunshine Initiative

Context: PM Modi initiates a new rooftop solar power scheme aimed at providing solar power to one crore households in India through rooftop solar panels. Finance Minister Nirmala Sitharaman highlighted this initiative in her interim Budget address, stressing its potential to bring significant savings of ₹15,000 annually for households.

Eligibility and Subsidies

- Households consuming less than 300 units of electricity per month qualify for installing a mid-sized solar system (1-2 kilowatt) under this scheme.
- The government plans to increase the subsidy from the current 40% to 60% of the system's cost.
- Private developers associated with public sector enterprises linked to the Power Ministry will cover the remaining expenses, ensuring installation quality and reliability.

Net-Metering Mechanism

- The program incorporates a 'net metering' mechanism, allowing surplus electricity generated by households to be sold back to the grid to offset the loan. However, the implementation of this mechanism may pose complexities.
- While 300 units of monthly consumption might seem modest for households with appliances like air conditioners and heaters, it represents a significant average consumption metric nationally.
- Approximately 80% to 85% of India's 25 crore to 30 crore households consume between 100 and 120 units of electricity per month, making them eligible for the scheme.

Shift from State Discoms to Centre

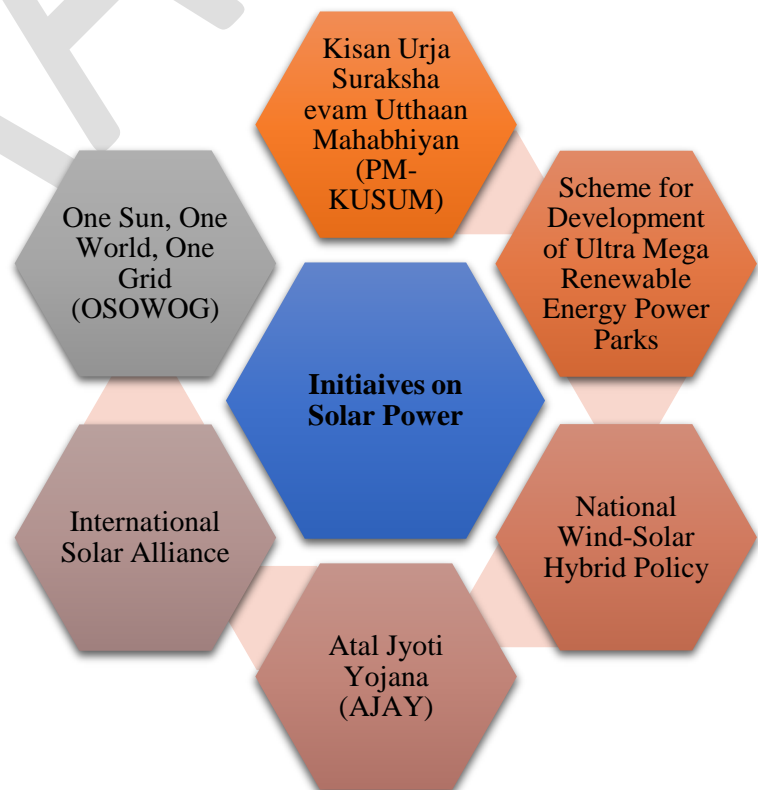
- The Center will spearhead the solarization efforts instead of State power distribution companies (discoms), many of which show little interest in promoting decentralized solutions like rooftop solar.
- Given the detailed knowledge of household-level power supply possessed by discoms, bypassing them would not be a feasible strategy.

Current Status and Industry Impact

- Out of the targeted 40 GW of rooftop solar panels, only 12 GW have been installed so far, with household rooftops contributing just 2.7 GW, the remainder being commercial or building units.
- This initiative can invigorate the domestic solar panel industry, as subsidies will be exclusively available for domestically produced panels.

Other Initiatives

- **Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM):** Includes grid-connected Renewable Energy power plants (0.5 – 2 MW) and solar water pumps.
- **Scheme for Development of Ultra Mega Renewable Energy Power Parks:** Aims to establish Ultra Mega Renewable Energy Power Parks (UMREPPs) within the existing Solar Park Scheme framework.
- **National Wind-Solar Hybrid Policy:** Aims to promote large grid-



connected wind-solar PV hybrid systems, enhancing grid stability and encouraging innovative technologies.

- **Atal Jyoti Yojana (AJAY):** Focuses on installing solar street lighting systems in states where less than 50% households have access to grid power.
- **International Solar Alliance:** Comprises solar resource-rich countries for global cooperation in solar energy development.
- **One Sun, One World, One Grid (OSOWOG):** Aims to establish a worldwide interconnected ecosystem of renewable energy resources, primarily focusing on solar energy.
- **National Solar Mission:** Part of the National Action Plan on Climate Change, dedicated to promoting and developing solar energy in India.

Uttarakhand's Uniform Civil Code

Context: Recently, the Uttarakhand Cabinet approved the draft report of the Uniform Civil Code (UCC), which is expected to be presented as a bill in the state assembly on February 6, 2024.

Key Players

- The UCC drafting committee, led by retired Supreme Court judge Ranjana Prakash Desai, formulated the proposed set of common laws for all residents of Uttarakhand, irrespective of religion, caste, or gender.
- Article 162 of the Indian Constitution empowers state executives to legislate on matters within the jurisdiction of the state legislature, including those related to personal laws as per Entry 5 of the Concurrent List.

Key Highlights of Uttarakhand's UCC Draft Report

- The UCC aims to replace individual personal laws of different religions, focusing on marriage, divorce, adoption, and inheritance, aligning with Article 44 of the Constitution.
- Proposed measures include the prohibition of practices like polygamy,



triple talaq, and child marriage, along with uniform marriage age for girls across all religions and mandatory registration of live-in relationships.

- The draft emphasizes gender equality, ensuring equal treatment in matters of inheritance and marriage, including extending equal property share to Muslim women.

Concerns Regarding the UCC Draft Report for Uttarakhand

- Critics argue that the UCC may infringe upon fundamental rights like religious freedom and personal liberty, and may not respect the diverse customs and practices of different communities.
- Concerns are raised regarding its impact on the rights and interests of Scheduled Tribes (STs) in Uttarakhand, with activists highlighting potential erosion of cultural identity and autonomy.

Understanding the Uniform Civil Code

- Article 44 of the Constitution envisions a uniform civil code for all citizens of India, though its implementation is discretionary.
- Goa stands as the only state with a UCC, following the Portuguese Civil Code of 1867.
- The Supreme Court and the Law Commission have expressed differing views on the necessity and desirability of a UCC, with ongoing consultations seeking input from various stakeholders.

Panchayats earn only 1% of their revenue through tax

Context: The recent publication titled 'Finances of Panchayati Raj Institutions' by the Reserve Bank of India (RBI) for the fiscal year 2022-23 sheds light on the financial dynamics of Panchayati Raj Institutions (PRIs) in India.

Key Highlights of the Report

Revenue Composition

- Panchayats derive only 1% of their revenue from taxes, with the majority sourced from grants provided by the Centre and States.
- Approximately 80% of the revenue originates from Central government grants, while 15% comes from State government grants.

Revenue Statistics

- In the fiscal year 2022-23, panchayats amassed a total revenue of Rs 35,354 crore, of which only Rs 737 crore was generated through their own tax revenue.

Revenue Composition

- Panchayats derive only 1% of revenue from taxes.
- Majority sourced from grants by Centre and States.

Major Grant Sources

- Approximately 80% of revenue from Central government grants.
- 15% from State government grants.

Total Revenue (2022-23)

- Panchayats amassed Rs 35,354 crore in FY 2022-23.
- Own tax revenue: Rs 737 crore.
- Non-tax revenue: Rs 1,494 crore.

Grant Contributions

- Central government grants: Rs 24,699 crore.
- State government grants: Rs 8,148 crore.

Revenue Per Panchayat

- Own tax revenue per panchayat: Rs 21,000.
- Non-tax revenue per panchayat: Rs 73,000.
- Central government grants per panchayat: Rs 17 lakh.
- State government grants per panchayat: Over Rs 3.25 lakh.

State Revenue Share and Disparities

- Panchayats' share in State revenue minimal.
- Wide variations among states in average revenue per panchayat.

RBI Recommendations

- Advocate for greater decentralization and empowerment.
- Emphasizes transparent budgeting, fiscal discipline, community involvement, staff training, and monitoring for optimal resource utilization.

- Non-tax revenue amounted to Rs 1,494 crore, primarily from interest payments and Panchayati Raj programs.
- Notably, panchayats received Rs 24,699 crore in grants from the Central government and Rs 8,148 crore from State governments.

Revenue Per Panchayat

- On average, each panchayat earned Rs 21,000 from its own tax revenue and Rs 73,000 from non-tax revenue.
- Conversely, grants from the Central government averaged approximately Rs 17 lakh per panchayat, with State government grants totaling over Rs 3.25 lakh per panchayat.

State Revenue Share and Inter-State Disparities

- Panchayats' share in their respective State's own revenue remains minimal, with wide variations among states regarding average revenue earned per panchayat.
- For instance, in Andhra Pradesh, revenue receipts of panchayats constitute just 0.1% of the State's own revenue, whereas in Uttar Pradesh, it accounts for 2.5%, the highest among states.

Recommendations of RBI

- The RBI advocates for greater decentralization and empowerment of local leaders and officials to enhance financial autonomy and sustainability of Panchayati Raj.
- The report underscores the importance of transparent budgeting, fiscal discipline, community involvement in development prioritization, staff training, and rigorous monitoring and evaluation for optimal resource utilization.

Why do Panchayats Face Funding Related Issues?

Limited Taxation

Low Capacity and Utilization

Fiscal Decentralization Issues

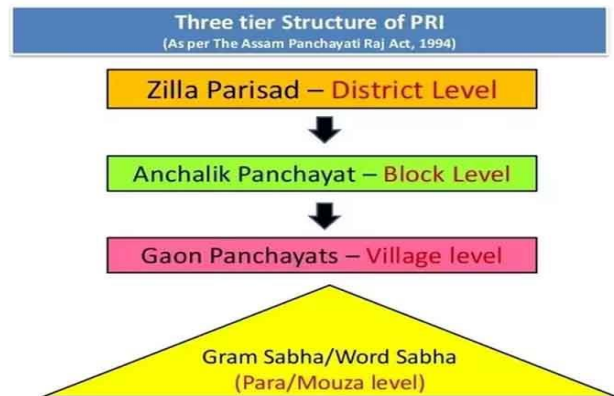
Repercussions of Panchayats' Financial Dependence

- **Limited Taxation:** PRIs possess restricted powers to impose cesses and taxes and receive minimal funds from the State Government, often hesitating to raise necessary funds due to concerns over popularity.
- **Low Capacity and Utilization:** PRIs may lack the capacity and skills to generate revenue from various sources and face challenges in utilizing funds efficiently due to inadequate planning, monitoring, and accountability mechanisms.
- **Fiscal Decentralization Issues:** Insufficient devolution of financial powers and functions from higher levels of government to PRIs hampers their ability to mobilize resources independently, undermining local governance and community empowerment.
- **Repercussions of Panchayats' Financial Dependence:** Dependence on external funding leads to interference from higher tiers of government and delayed release of funds, forcing panchayats to resort to private funds. Some regions report non-receipt of funds under key schemes, affecting their functioning adversely.

What is a Panchayati Raj Institution?

- The 73rd Constitutional Amendment Act, 1992 bestowed constitutional status upon PRIs and established a uniform structure comprising gram sabhas, panchayat samithis, and zila parishads.

- Article 243G of the Constitution empowers state legislatures to provide PRIs with authority and powers to function as self-government institutions.
- Provisions in Article 243H, Article 280(3)(bb), and Article 243-I of the Constitution aim at financial empowerment of PRIs.
- The Ministry of Panchayati Raj, established in May 2004, oversees all matters relating to PRIs.



Delimitation

Context: Delimitation of constituencies for the Lok Sabha and State Legislative Assemblies will be based on the First Census post-2026. The 2021 Census delay, initially due to the Covid-19 pandemic and subsequently due to Central government delays, has led to this development.

What is Delimitation?

- **About:** Delimitation involves fixing the number of seats and boundaries of territorial constituencies for the Lok Sabha and Legislative assemblies, including reserved seats for Scheduled Castes (SC) and Scheduled Tribes (ST).
- **Process:** The Delimitation Commission, established by Parliament, performs this task as mandated by respective Acts.
- **History:** Delimitation has occurred four times, with the first exercise conducted in 1950-51 by the President (with Election Commission assistance).
- **Last Exercise:** The most recent delimitation in 1976 adjusted Lok Sabha composition based on the 1971 census.

About Delimitation

- Delimitation fixes seats and boundaries for Lok Sabha and Legislative assemblies.
- Includes reserved seats for SC and ST.

History

- Conducted four times, first in 1950-51 by the President with Election Commission assistance.
- Last exercise in 1976 adjusted Lok Sabha based on 1971 census.

Constitutional Provisions

- **Article 82:** Parliament enacts a Delimitation Act post every Census.
- **Article 170:** States divide into territorial constituencies according to Delimitation Act post every Census.

What is the Significance of Delimitation?

- **Representation:** Delimitation ensures fair representation in Parliament and State Legislative Assemblies, adhering to the democratic principle of "one citizen-one vote-one value."
- **Equity:** By adjusting constituency boundaries, delimitation ensures equitable seat distribution, preventing underrepresentation or overrepresentation.
- **Reserved Seats:** It determines reserved seats for SC/ST communities, ensuring their political representation.
- **Federalism:** Delimitation balances federal principles by distributing political power among states while considering population shifts.

- **Population Control:** Historical policies aimed at population control, such as freezing seats based on the 1971 Census, raise questions amid changing demographics.

Concerns Related to Delimitation

- **Regional Disparity:** Concerns arise about regional representation disparities, particularly between northern and southern India.
- **Funding:** Using the 2011 Census for funding allocation may disadvantage states, especially in the south.
- **SC/ST Reservations:** Delimitation may alter SC/ST reservation dynamics, potentially shifting political power.

International Practices Related to Delimitation

- **US:** Seat redistribution occurs after every Census, maintaining proportional representation among states.
- **EU:** EU Parliament seats are allocated based on population size, following the principle of degressive proportionality.

What is the Delimitation Commission?

Appointment	•The President appoints the Commission, which collaborates with the Election Commission of India.
Composition	•It comprises a retired Supreme Court judge, the Chief Election Commissioner, and State Election Commissioners.
Functions	•The Commission determines constituency numbers and boundaries, as well as reserved seats for SC/ST communities.
Powers	•Commission decisions hold legal force and are not subject to court review.

Way Forward

Balancing representation and federalism is crucial, with suggestions including capping Lok Sabha seats, increasing MLA numbers based on population, and empowering local governance for grassroots democracy.

Public Examinations (Prevention of Unfair Means) Bill, 2024

Context: The Public Examinations (Prevention of Unfair Means) Bill, 2024, recently introduced in Lok Sabha, aims to combat "Unfair Means" to enhance transparency, fairness, and credibility in the Public Examinations System. Once enacted, the Bill will also serve as a model for states to adopt at their discretion.

What is the Need for Such a Bill?

- **Instances of Question Paper Leaks**
 - Numerous cases of question paper leaks in recruitment exams nationwide have occurred in recent years.

What's in new Bill to stop cheating in exams

Public Examinations (Prevention of Unfair Means) Bill, 2024, was introduced in Lok Sabha on Feb 5.

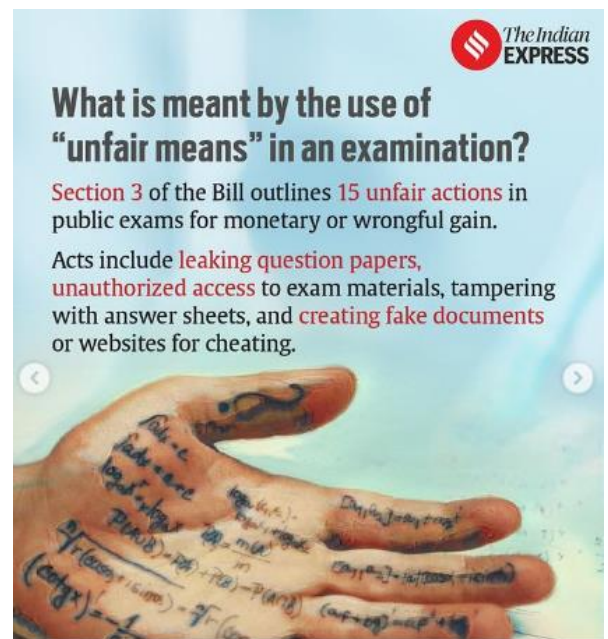
It aims to prevent "unfair means" in order to "bring greater transparency, fairness and credibility to the public examinations system".

- Over the last five years, 48 instances of paper leaks in 16 states disrupted the government job hiring process, affecting approximately 1.51 crore applicants for about 1.2 lakh posts.
- **Malpractices Lead to Delay in Examinations**
 - Malpractices in public examinations cause delays and cancellations, adversely affecting the aspirations of millions of youth.
 - Currently, there is no specific substantive law addressing unfair means or related offenses.
 - Comprehensive central legislation is crucial to identify and address vulnerabilities within the examination system effectively.
- **To Bring Greater Transparency**
 - The Bill aims to enhance transparency, fairness, and credibility in public examination systems, reassuring youth that sincere efforts will be duly rewarded and their future secured.
 - It seeks to deter individuals, organized groups, or institutions from engaging in unfair means that undermine public examination systems for personal gain.

What are the Key Provisions of the Bill?

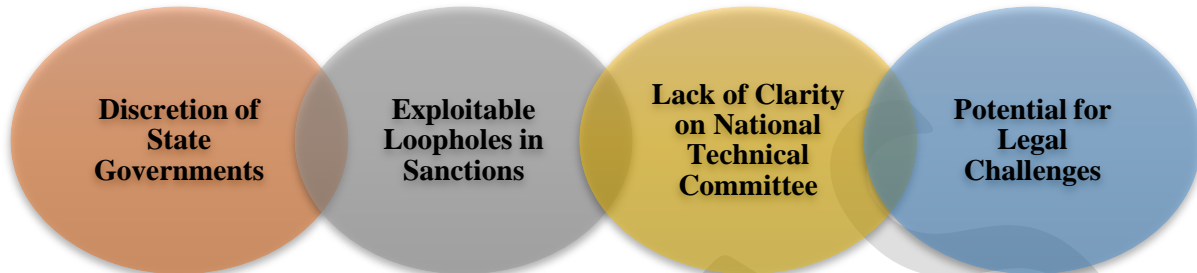


- **Defines Public Examination**
 - Under Section 2(k), a Public Examination encompasses any examination conducted by listed "public examination authorities" or other notified authorities by the Central Government.
 - Designated authorities include UPSC, SSC, RRBs, IBPS, NTA, and ministries or departments of the Central Government and their attached offices.
- **Punishments**
 - Offenses are cognizable, non-bailable, and non-compoundable, necessitating police investigation without magistrate permission and trial following a complaint.
 - Punishments include imprisonment for three to five years and a fine up to Rs 10 lakh, with additional imprisonment for non-payment.
 - Service providers involved in illegal practices face fines up to Rs 1 crore, with examination costs recovered proportionately.
- **Defines Unfair Means**
 - Section 3 lists 15 actions constituting unfair means, including question paper leaks, tampering with documents or computer systems, and creation of fake websites.
- **Investigation and Enforcement**
 - Offenses will be investigated by officers not below the rank of Deputy Superintendent of Police or Assistant Commissioner of Police.
- **Model Draft for States**
 - The Bill provides a model draft for states to adopt, aiding them in preventing disruptions in state-level public examinations.



- **High-Level National Technical Committee**
 - Establishment of a committee to develop protocols for securing digital platforms and formulating national standards for examination conduct.

What are the Concerns Related to the Bill?



- **Discretion of State Governments**
 - State government discretion in adopting the model may lead to variations in implementation, potentially weakening the law's effectiveness.
- **Exploitable Loopholes in Sanctions**
 - Provisions such as fines for service providers may not serve as adequate deterrents if not commensurate with gains from unfair means.
- **Lack of Clarity on National Technical Committee**
 - Lack of clarity regarding committee composition, qualifications, and mandate may raise concerns about expertise and impartiality.
- **Potential for Legal Challenges**
 - Stringent measures on cognizability and non-bailability may face legal challenges regarding proportionality and adherence to natural justice principles.

Conclusion

While the Bill addresses investigation and enforcement by designated officers, comprehensive oversight mechanisms are needed to ensure accountability and transparency in the examination process, including monitoring, complaint handling, and auditing procedures.

HEALTH

Typbar Typhoid Vaccine

Context: Recently, a phase-3 trial conducted in Malawi, Africa, an area endemic for typhoid fever, showcased the long-term efficacy of Bharat Biotech's Typhoid conjugate vaccine (TCV), Typbar, demonstrating efficacy across all age groups of children studied.

Major Findings of the Typbar Vaccine Trials

- Typbar TCV is hailed as the world's first clinically proven conjugate Typhoid vaccine.
- A conjugate vaccine, it combines a weak antigen with a strong antigen, known as a carrier protein, thereby stimulating a robust and effective immune response against the pathogen associated with the weak antigen.

What is Typhoid?

- **About:** Typhoid fever, caused by the bacterium *Salmonella Typhi*, is a severe infection that poses a threat to life. Typically, it spreads through contaminated food or water.

- **Transmission:** It spreads via the faecal-oral route, primarily through the ingestion of contaminated food or water, leading to bacterial multiplication and dissemination into the bloodstream. Urbanisation and climate change are factors that could exacerbate the global burden of typhoid.

- **Symptoms:** Symptoms include fever, fatigue, gastrointestinal issues, headache, and occasionally, a rash. Severe cases may lead to complications or death, confirmed through blood testing.

- **Risk Factor and Disease Burden:** In 2019, there were approximately 9.24 million cases of typhoid and 110,000 deaths worldwide, with a substantial burden in developing regions, particularly South-East Asia and Africa. Lack of access to safe water and sanitation heightens the risk, especially among children.

- **Treatment:** Antibiotics are the primary treatment, but increasing resistance poses a challenge, particularly in communities lacking access to safe water and sanitation.

- **Prevention:** Strategies for prevention include ensuring access to safe water, sanitation, and hygiene. The WHO recommends integrating typhoid conjugate vaccines into routine childhood immunization programs in endemic countries, with support from organizations like Gavi, which aims to provide equal access to vaccines for children in the world's poorest nations. At the Global Vaccines Summit in June 2020, India pledged USD 15 million for Gavi's 2021–2025 program.

About Typhoid Fever

- Caused by Salmonella Typhi, a severe and life-threatening infection.
- Typically spreads through contaminated food or water.

Transmission

- Spreads via faecal-oral route.
- Mainly through ingestion of contaminated food or water.

Symptoms

- Fever, fatigue, gastrointestinal Issues, headache, occasionally a rash
- Severe Cases May Lead To Complications Or Death.

Risk Factor and Disease Burden

- In 2019, approximately 9.24 million cases and 110,000 deaths worldwide.
- Lack of access to safe water and sanitation heightens the risk, especially among children.

Treatment

- Antibiotics are the primary treatment.
- Increasing antibiotic resistance poses a challenge, particularly in communities lacking access to safe water and sanitation.

Prevention

- Ensure access to safe water, sanitation, and hygiene.
- WHO recommends integrating typhoid conjugate vaccines into routine childhood immunization programs in endemic countries.

SCIENCE & TECHNOLOGY

The unusual cabbage mutation that could boost crop yield

Context: Recent research highlights the remarkable ability to induce sterility in a variety of plants, such as cabbage, cauliflower, broccoli, tomato, and rice, through a tiny genetic deletion. This deletion holds the potential to significantly increase crop yields by leveraging heterosis.

Unveiling Genetics

DNA Structure

Genome Organization

Role of Genes

Protein Production

Fine-Tuning of Protein Levels

- **DNA Structure:** DNA comprises two long strands containing four nucleotide bases: Adenine (A), Cytosine (C), Guanine (G), and Thymine (T), forming pairs (A-T and G-C) connected by hydrogen bonds.
- **Genome Organization:** The genome of the cabbage plant (*Brassica oleracea*) spans about 1.06 billion base pairs across 18 chromosomes, with each chromosome pair sharing a mostly identical sequence from pollen and egg.
- **Role of Genes:** Genes are specific DNA sequences, typically spanning a few thousand base pairs, which, when expressed, are transcribed into RNA, guiding protein synthesis.
- **Protein Production:** RNA is processed by ribosomes, directing the assembly of amino acids into proteins.

Role of Sterility in Hybrid Vigor

Discovery of Ms-cd1

Hybrid Seeds

Dominant Mutation

Recessive Mutations

- **Discovery of Ms-cd1:** Around 44 years ago, researchers identified a cabbage plant with a natural mutation called Ms-cd1, rendering it male-sterile yet capable of fertilizing eggs from normal plants, resulting in robust hybrid seeds.
- **Hybrid Seeds:** Seeds from mutant plants were a result of out-crossing, where eggs were fertilized by pollen from different strains, leading to enhanced vigor in resulting hybrid plants, known as heterosis.
- **Dominant Mutation:** The Ms-cd1 mutation, found to be dominant, caused male sterility with the presence of just one mutated chromosome.
- **Recessive Mutations:** Mutations in both copies of the Ms-cd1 gene were necessary for male fertility, becoming recessive in such cases.

Crucial Missing Base-Pair

Genetic Mapping

Promoter's Role

ERF Binding

Fine-Tuning of Protein Levels

- **Genetic Mapping:** Researchers identified a critical difference between mutated and non-mutated Ms-cd1 genes: the mutated gene lacked a single DNA base pair in its promoter region.
- **Promoter's Role:** The promoter sequence binds regulatory proteins that control gene transcription timing and location.
- **ERF Binding:** The missing base-pair in the mutated gene disrupted its binding to the regulatory protein ERF, resulting in continued expression of the Ms-cd1 gene and subsequent male sterility.
- **Fine-Tuning of Protein Levels:** Proper pollen development relies on precise Ms-cd1 protein level balance, with ERF binding regulating its expression during various developmental stages.

Extending the Discovery

- **Cross-Species Applicability:** The dominant mutant gene was introduced into other plant species like rice, tomato, and arabidopsis, resulting in pollen developmental disruptions.
- **A Promising Tool:** The genetic deletion of a single base-pair emerges as a potent tool for hybrid seed production not only in cabbage but also in various other crops.
- **Implications for Agriculture:** This breakthrough has the potential to harness heterosis and elevate crop yields across diverse plant species, tackling global food security challenges.

Conclusion

The genetic deletion inducing male sterility in plants represents a significant advancement in agricultural science, offering the possibility of abundant harvests through hybrid seeds. This discovery paves the way for sustainable agriculture and underscores the pivotal role of genetic research in addressing the world's escalating food demands.

Reducing ammonia emissions through fertilizer management

Context: Researchers have utilized machine learning techniques to provide detailed estimations of ammonia emissions originating from rice, wheat, and maize crops.

Key findings of the study

A crop-specific evaluation regarding potential emission reductions suggests that implementing effective fertilizer management practices during the cultivation of rice, wheat, and maize could lead to a decrease in atmospheric ammonia emissions from farming by up to 38%.

This optimized approach entails the application of enhanced-efficiency fertilizers at greater depths into the soil using conventional tillage methods throughout the growing season.

The study reveals that, within the context of fertilizer management, rice cultivation could contribute 47% towards the total reduction potential, while maize and wheat could contribute 27% and 26%, respectively.

Without the implementation of any management strategies, the authors predict that ammonia emissions could escalate between 4.6% to 15.8% by 2100, contingent upon the level of future greenhouse gas emissions.

The methodology adopted in the study

- Researchers from the Southern University of Science and Technology in Shenzhen, China, along with collaborators, employed machine learning algorithms to model ammonia output from global rice, wheat, and maize agriculture. This modeling incorporated various variables such as climate conditions, soil attributes, crop varieties, irrigation methods, tillage practices, and fertilizer application techniques.
- To enrich the model, the researchers compiled a dataset comprising over 2,700 observations sourced from a systematic review of published literature detailing ammonia emissions.
- Utilizing this model, the researchers estimated that global ammonia emissions amounted to 4.3 teragrams (4.3 billion kilograms) in the year 2018.

Why the reduction in ammonia emissions is necessary?

- Atmospheric ammonia stands as a significant environmental pollutant with ramifications for ecosystems worldwide and human health.
- Approximately 51-60% of anthropogenic ammonia emissions can be attributed to crop cultivation, with half of these emissions (25-30%) linked to three primary staple crops: rice, wheat, and maize.
- Ammonia plays a crucial role in various environmental issues, including acidification, eutrophication, and the formation of secondary particulate matter, thereby impacting human health and contributing to climate change.

About Ammonia (NH₃)

- Gaseous ammonia (NH₃) constitutes the most prevalent alkaline gas in the atmosphere and represents a significant component of total reactive nitrogen.
- Agriculture, including animal husbandry and NH₃-based fertilizer applications, serves as the primary source of NH₃ emissions, alongside industrial processes, vehicular emissions, and volatilization from soils and oceans.
- Ammonia serves essential functions in the human body as a building block for proteins and other complex molecules and occurs naturally in soil from bacterial processes and through decay processes of plants, animals, and animal waste.

Properties of ammonia

- Ammonia is a colorless, highly irritating gas possessing a sharp, suffocating odor, which readily dissolves in water to form an ammonium hydroxide solution, causing irritation and burns.
- Although not highly flammable, ammonia gas may lead to container explosions under high heat conditions, and it is usually transported as a compressed liquid in steel cylinders.

Property	Value or Details
Chemical Formula	NH ₃
Type of Base	Weak
Affinity (water)	High
Corrosiveness	Corrosive to Some Metals
Oxidation Power	Strong Reducing Agent
Reactivity	Quite Reactive
Volatility	Increase with increase in pH

Uses of ammonia

Agriculture	Refrigeration	Water Purification
Plastics Manufacturing	Explosives	Textiles
Pesticides	Dyes	Various Chemical Products

Approximately 80% of industrial ammonia production is utilized in agriculture as fertilizer, with additional applications in refrigeration, water purification, plastics manufacturing, explosives, textiles, pesticides, dyes, and various chemical products.

Conclusion

This research underscores the environmental significance of addressing ammonia emissions stemming from rice, wheat, and maize cultivation, offering a viable pathway to mitigate adverse impacts on ecosystems and human health.

Kufos Joins NISAR Phase II Project

- The Kerala University of Fisheries and Ocean Studies (KUFOS) is set to engage in the advanced NASA-ISRO Synthetic Aperture Radar (NISAR) Phase II research initiative, which concentrates on forest biomass and carbon monitoring via radar data.
- This partnership stems from the successful conclusion of the initial phase of the Indian Space Research Organisation (ISRO)-NISAR program, which focused on validating ground truth data concerning forest biomass across diverse regions.
- NASA and ISRO are collaboratively developing a space-borne synthetic aperture radar, slated for launch in 2024.
- NISAR aims to transform earth resource observation by furnishing high-resolution data for vast areas.
- The project holds immense promise for the systematic surveillance of agriculture, forestry, wetlands, and estimation of soil moisture.

NASA-ISRO Synthetic Aperture Radar (NISAR)

NISAR will be world's most expensive satellite with estimated cost of US \$1.5 billion. It will also become world's first radar satellite to operate on dual frequency.

NISAR is joint project between NASA and ISRO to observe the earth in never before resolution! It will observe earth's most complex processes like volcanoes, earthquakes, ecosystem disturbance and various hazards. NISAR is expected to launch in December, 2021 from Satish Dhawan Space Center, India.

Safeguarding Personally Identifiable Information

Context: Recently, the Ministry of Corporate Affairs resolved a significant vulnerability in its online portal after a cybersecurity researcher notified the Computer Emergency Response Team of India (CERT-In).

- The vulnerability exposed Personally Identifiable Information (PII), including Aadhaar, Permanent Account Number (PAN), Voter identity, date of birth, contact number, and communication address of over 98 lakh directors of Indian companies.

What is Personally Identifiable Information (PII)?

- About:** PII encompasses data held by organizations that can potentially identify specific individuals, including Aadhaar, PAN, voter identity, passport, date of birth, contact number, communication address, and biometric information.
- Sensitive vs. Non-sensitive PII**
 - Sensitive PII directly identifies individuals and, if leaked, can cause significant harm, necessitating strict privacy measures.
 - Non-sensitive PII, like social media handles or zip codes, is less harmful if leaked and may or may not be unique to individuals.
- Non PII**
 - Non-personally identifiable information (non-PII) alone cannot trace or identify a person but, combined with additional data, can do so. It includes photographic images, place of birth, religion, etc.

Types of PII

Direct identifiers, like passport numbers or driver's license numbers, uniquely identify individuals.

Indirect identifiers, such as race or place of birth, don't uniquely identify individuals but can do so when combined.

What are the Risks of PII Exposure?

Identity Theft

PII exposure heightens the risk of identity theft, leading to financial fraud and privacy violations.

Financial Fraud

Exposed PII can lead to unauthorized access to bank accounts and payment fraud.

Privacy Violations

Unauthorized access to PII compromises individuals' confidentiality and autonomy.

Phishing and Social Engineering Attacks

Exposed PII enables cybercriminals to conduct phishing and social engineering attacks.

Data Breach Fallout

PII exposure through data breaches results in significant financial losses and reputation damage.

Reputation Damage

Exposure of sensitive PII can tarnish individuals' reputations and lead to social and professional consequences.

Instances of Data Breach in Past

- CoWIN Data Breach Allegations:** Reports surfaced about CoWIN portal data leaks and alleged sales of Indian citizens' PII on the dark web.
- Aadhaar:** Aadhaar data leaks were reported multiple times, including instances of large-scale leaks and data breaches on government platforms.

Legislations Related to Data Governance in India

Various laws and regulations, including the Information Technology Rules 2021, the Digital Personal Data Protection Act 2023, and the establishment of CERT-In, aim to govern data protection and cybersecurity in India.

- **RailYatri Platform Data Breach:** A data breach occurred on the RailYatri platform in January 2023.
- **Increase in Cyberattacks on Government and Essential Services:** A significant increase in cyberattacks on Indian government and essential services was reported, highlighting vulnerabilities in digital infrastructure.

What are the Challenges in Protecting PII?

- **Diverse Sources:** PII is stored across multiple locations due to cloud computing and SaaS services.
- **Increasing Data Volume:** The growing volume of sensitive data poses challenges in ensuring its security.
- **Evolving Threat Landscape:** Cybercriminals constantly evolve their tactics to steal PII.
- **Complex Regulatory Environment:** Organizations must navigate different data privacy regulations.

Way Forward



- **Encryption:** Employ encryption techniques to protect PII.
- **Identity and Access Management (IAM):** Implement two-factor authentication and zero-trust architecture.
- **Training:** Provide employees with training on handling and protecting PII.
- **Anonymization:** Anonymize sensitive data to remove identifying characteristics.
- **Cybersecurity Tools:** Deploy data loss prevention (DLP) and extended detection and response (XDR) tools.
- **Collaboration and Partnerships:** Collaborate with cybersecurity experts and regulatory bodies to stay informed about emerging threats.

REPORT & INDEX

5 takeaways from higher education survey 21-22

Context: The Ministry of Education, Government of India, unveiled the All India Survey on Higher Education (AISHE) 2021-2022 in January 2024.

- AISHE, initiated by the Ministry in 2011, encompasses all Higher Educational Institutions (HEIs) registered with AISHE across the nation.
- Released on January 25, the AISHE 2021-22 report highlighted a surge in higher education enrolment, with 4.33 crore students currently enrolled, up from 4.14 crore in 2020-21 and 3.42 crore in 2014-15.
- The survey covers student enrolment across eight levels, including undergraduate, postgraduate, PhD, MPhil, diploma, PG diploma, certificate, and integrated programs, with participation from 10,576 standalone institutions, 42,825 colleges, and 1,162 universities/university level institutions.

Key Findings of the Report



Female Enrolment Surpasses Male

- The AISHE report illustrates a consistent rise in the number of women enrolled in higher education institutes.
- From 1.5 crore in 2014-15, female enrolment increased by 32% to 2.07 crores in 2021-22.
- PhD enrolment among women doubled from 47,717 in 2014-15 to 98,636 in 2021-22.

- Among the 91 lakh additional students joining higher education in 2021-22 compared to 2014-15, 55% were women.

Gross Enrollment Ratio (GER) and Gender Parity

- The GER for the age group 18-23 years reached 28.4 in 2021-22, compared to 23.7 in 2014-15.
- Gender Parity Index (GPI) reflects a notable disparity in favor of women, with 26 states and Union Territories showing a higher GER for women.
- At the national level, the GPI stands at 1.01, while for SC and ST categories, it's 1.01 and 0.98 respectively.

Preference for Arts and Social Sciences

- The Bachelor of Arts (BA) program leads in enrolment, accounting for 34.2% of total undergraduate enrolment.
- Social science programs attract the highest number of postgraduate students, with 10.8 lakh enrolled.
- Master of Arts (MA) program tops postgraduate enrolments, constituting 40.7% of the total.

Government Institutions Dominate

- Government universities witness a significant enrolment of 71.06 lakh students, comprising 73.7% of the total student body.
- State public universities account for around 31% of total university enrolment, despite comprising a smaller proportion of all universities.

Graduation Demographics

- Approximately 1.07 crore students graduated in 2021-22, with women constituting 50.8%.
- Around 35% of graduates belong to Other Backward Classes (OBC), 13% to Scheduled Caste (SC), and 5.7% to Scheduled Tribe (ST) communities.
- Arts and social sciences streams witness higher graduation rates, with BA and MA programs leading at undergraduate and postgraduate levels respectively.

About All India Survey of Higher Education (AISHE)

Established by the Ministry of HRD, AISHE conducts an annual web-based survey to portray the status of higher education in India. The survey encompasses various categories such as teachers, student enrolment, programs, examination results, education finance, and infrastructure. AISHE serves as a crucial tool for informed policy decisions and research for the advancement of the education sector.

30 Indian fugitives were located abroad in 2022: Govt. Report

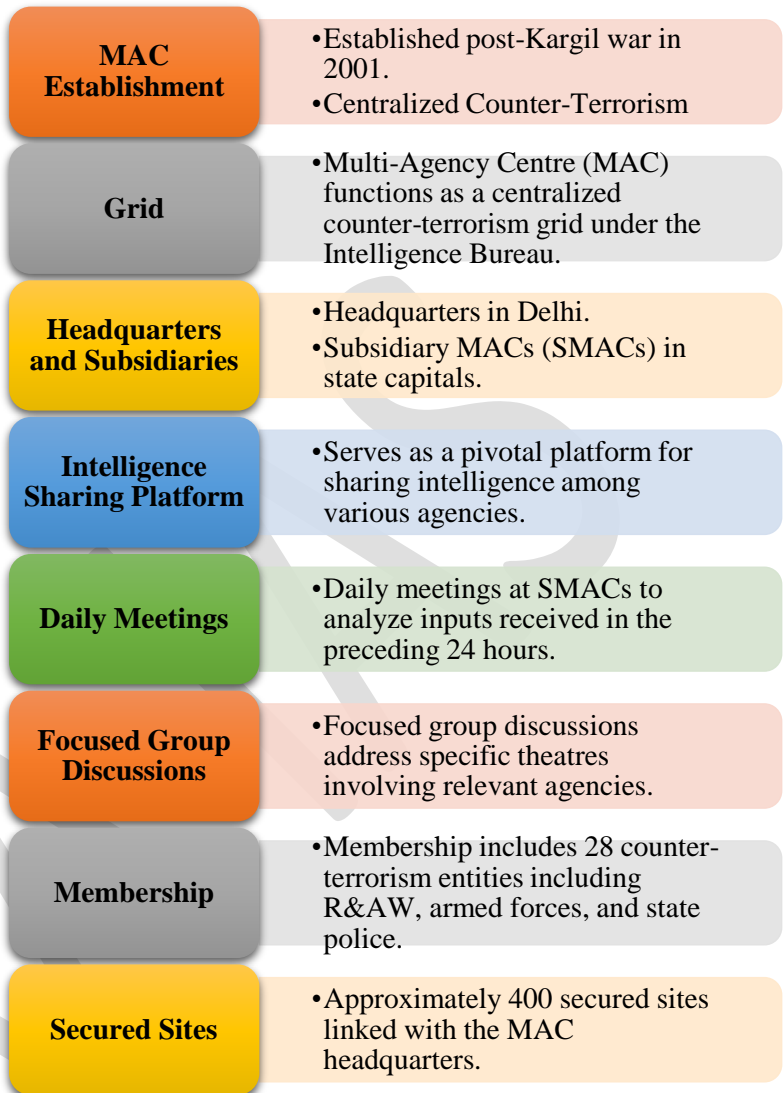
Context: According to the 2022-23 annual report of the Department of Personnel and Training (DoPT), India harbored 278 fugitives wanted in other countries.

Interpol Reports to CBI (2022)

- In 2022, Interpol shared 304 reports concerning "foreign terrorist fighters" with the Central Bureau of Investigation (CBI).
- Reports forwarded to the CBI are subsequently directed to the Multi Agency Centre (MAC), operated under the Intelligence Bureau (IB) and the National Investigation Agency (NIA).

About Multi-Agency Centre (MAC)

- Established post-Kargil war in 2001, the Multi-Agency Centre (MAC) functions as a centralized counter-terrorism grid under the Intelligence Bureau.
- It serves as a pivotal platform for sharing intelligence among various agencies, with its headquarters in Delhi, and subsidiary MACs (SMACs) in state capitals.
- Daily meetings are conducted at SMACs to analyze inputs received within the preceding 24 hours, with focused group discussions addressing specific theatres involving relevant agencies.
- Membership of the MAC includes all organizations contributing to counter-terrorism efforts, spanning 28 entities such as the Research and Analysis Wing (R&AW), armed forces, and state police.
- Approximately 400 secured sites are linked with the MAC headquarters.



Fugitive Economic Offender

- As defined by the Fugitive Economic Offenders Act of 2018 (FEO), a fugitive economic offender is an individual involved in scheduled crimes amounting to 100 crore rupees or more, who either absconds from India or refuses to return to evade prosecution.
- The act enables confiscation of properties belonging to such offenders and facilitates expeditious trials, aiming to combat economic offenses and prevent financial fraud.

HEAT ON ECONOMIC ABSCONDERS

■ **Bill name:** Fugitive Economic Offenders Bill

■ **Purpose:** Catch alleged absconders. Nirav Modi, his uncle Mehul Choksi have been charged of defrauding PNB and leaving the country. Also Vijay Mallya

■ **What will govt do:** Try to put bill before Parliament as early as second part of budget session starting next month



Bill highlights

■ ED to start proceedings in special court by first issuing notice to 'fugitive economic offender'

■ If offender appears in six weeks, notice will be terminated

■ Prosecution starts if he chooses to stay away from country and sends counsel

Letters Rogatory (LR)

Letters Rogatory, originating from the Latin term "rogatorius," are formal requests sent by the courts of one country to another for assistance in criminal investigations or prosecutions.

Mutual Legal Assistance (MLA)

- Mutual Legal Assistance entails cooperative mechanisms between countries to provide and obtain formal assistance in crime prevention, suppression, investigation, and prosecution.
- The Ministry of Home Affairs serves as India's Central Authority for managing requests for mutual legal assistance in criminal matters, transmitting and receiving such requests directly or through diplomatic channels.
- Bilateral Mutual Legal Assistance Treaties (MLATs) in criminal matters are agreements between countries to facilitate international cooperation and assistance.