



**SIVARAJAVEL IAS ACADEMY**  
AN IDEAL INSTITUTE FOR **CIVIL SERVICE EXAMS**

# the **CATALYST**

**A Monthly Publication for Current Affairs**

**OCTOBER 2024**



**AI-GENERATED MEDICAL** Downside Risks of AI in Medicene.

OCTOBER 2024

# The CATALYST

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The **CATALYST** is a monthly magazine for current affairs which tries to give aspirants an in-depth comprehension of certain topics which appeared in different sources over the month. The Magazine has been designed in such a way that the reading experience is enriching and insightful for the readers.

The contents have been grouped into a thematic structure to help aspirants focus on the overall GS syllabus.

### Inside The Catalyst Magazine

- I. Within the Sub themes first few topics will be Prelims oriented followed by indepth coverage of Mains Topics.
- II. Book Summary Relevant for UPSC Exam.
- III. Fact Sheet and Quotes have also been provided.

*\*New sections will be added or removed based on the new updates we include in the forthcoming issues.*

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# POLITY & GOVERNANCE

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## SUPREME COURT UNVEILS NEW JUSTICE STATUE

### Context:

Recently, the Lady Justice statue was unveiled at the Supreme Court, on the directions of the Chief Justice of India.

The statue was without the blindfold, and with the Constitution held in place of the sword, signifying that the law in India is both informed and not driven by retribution.

### About Lady Justice:

Lady Justice is an allegorical figure representing the moral authority within judicial systems.

It is often depicted alongside Prudentia, another allegorical figure representing wisdom and prudence.

### Traditional Depiction:

Traditionally, the blindfold symbolised equality before the law, implying that justice should be delivered impartially, without being swayed by the wealth, power, or status of the parties involved.

The sword historically represented the authority of the law and its power to punish wrongdoing.

### New Depiction:

The new statue, dressed in a saree instead

of Lady Justice's robe, reflects a departure from colonial influences like replacing colonial-era laws like the IPC and CrPC.

Despite the changes, the scales of justice in Lady Justice's right hand have been retained, representing societal balance and the importance of carefully weighing facts and arguments from both sides before reaching a verdict.



## JUSTICE SANJIV KHANNA TO BE NEXT CJI

### Why in news?

Justice Khanna, the seniormost judge in the apex court, will succeed CJI Chandrachud a day after the latter's retirement on November 10.

Appointment Process of the CJI:

### Basis of Appointment:

The seniormost judge of the Supreme Court (SC), considered fit, is appointed as CJI, as per convention and the Memorandum of Procedure (MoP).

This convention existed before the MoP was

formalized in 1999.

### Initiation:

About a month before the incumbent CJI retires, the Union Minister of Law seeks the outgoing CJI's recommendation for their successor.

### Government Procedure:

The Law Minister forwards the recommendation to the Prime Minister.

The Prime Minister advises the President, who finalizes the appointment.

By convention, the government follows the outgoing CJI's recommendation.

## Evolution of the MoP: :

### Judicial Cases:

First Judges Case (1981), Second Judges Case (1993), and Third Judges Case (1998) established the SC Collegium system for appointing judges.

The Collegium includes the seniormost SC judges, and its recommendations are binding on the government.

### Introduction of the MoP (1999):

The MoP formalized procedures and obligations for appointing judges in the SC and High Courts.

### Challenge to the NJAC (2015):

The Supreme Court struck down the National Judicial Appointments Commission (NJAC), which sought to give the government greater influence in judicial appointments.

### Renegotiation of the MoP (2016):

The MoP was revised, but its finalization by the government remained pending until 2023.

## LAWS THAT REGULATE MINORITY INSTITUTIONS DO NOT BREACH SECULARISM, SAYS SUPREME COURT

### Context:

The Supreme Court of India, while hearing a case concerning the regulation of madrasas under the Uttar Pradesh Board of Madrasa Education Act, 2004, clarified that laws regulating religious or linguistic minority institutions do not inherently breach secularism. This observation followed a challenge to an Allahabad High Court decision, which had struck down the Act, claiming it violated secular principles.

### Supreme Court's Stand on Secularism and Minority Institutions:

The *Supreme Court* observed that regulating institutions run by *religious or linguistic minorities does not automatically breach secularism*.

*Chief Justice of India (CJI)* emphasized that a law regulating such institutions, by itself, does not violate the principle of secularism. He clarified that a *State has the right to regulate minority institutions, especially when they are government-aided*.

The CJI stressed that *providing broad-based education in madrasas* is essential for students to acquire knowledge beyond religious teachings and *become productive citizens*.

### What is the definition of minority under Indian laws?

The expression "*minorities*" appears in some Articles of the Constitution, but is not defined anywhere.

In the exercise of its powers under the *Section 2(c) of the NCM Act*, the *Centre on October 23, 1993*, notified *five groups — Muslims, Christians, Sikhs, Buddhists and Parsis — as 'minority' communities. Jains were added to the list in January 2014*.

### What does the Constitution say about minorities?

*Article 29*, which deals with the "*Protection of interests of minorities*", says that "any section of the citizens residing in the territory of India or any part thereof having a *distinct language, script or culture* of its own shall have the right to conserve the same", and that "*no citizen shall be denied admission into any educational institution* maintained by the State or receiving aid out of State funds *on grounds only of religion, race, caste, language or any of them*".

*Article 30* deals with the "*right of minorities to establish and administer educational institutions*". It says that all minorities, whether *based on religion or language*, shall have the right to establish and administer educational institutions of their choice. It says that "in making any law providing for the compulsory acquisition of any property of an educational institution



established and administered by a minority..., the State shall ensure that the amount fixed by or determined under such law for the acquisition of such property is such as would not restrict or abrogate the right guaranteed under that clause”, and that “the state shall not, in granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language”.

**Article 350(A)** says there shall be a **Special Officer for linguistic minorities to be appointed by the President**. “It shall be the duty of the Special Officer to investigate all matters relating to the safeguards provided for linguistic minorities under this Constitution and report to the President upon those matters at such intervals as the President may direct, and the President shall cause all such reports to be laid before each House of Parliament, and sent to the Governments of the States concerned”.

## Article 28 – Prohibition of Religious Instruction in State-Funded Educational Institutions

**Article 28** deals with the issue of religious instruction in educational institutions, especially those funded or maintained by the state. It establishes clear boundaries between religion and education in India.

**Clause (1): Prohibits religious instruction** in educational institutions **fully funded by the state**.

**Clause (2):** Institutions with **religious endowments** can provide religious instruction even if maintained by the state.

**Clause (3):** No student in **state-recognized or state-aided institutions** can be forced to participate in religious instruction or **worship**

**without their consent**.

**Promotes secularism** by preventing religious teachings in government-funded institutions **while protecting individual freedom of religion in education**.

## About SECULARISM:

Secularism is defined as a **separation of religious institutions** from the institutions of state, and **no domination** of the political sphere by religious institutions.

It is the belief that **religion should not influence** or be involved in the organization of society, education, government, etc.

**The following are the features of Indian secularism:**

**Equal respect** and regard for **all faiths** by the nation.

**No prejudice** sponsored by the state between residents on religion basis.

India follows the **policy of non-interference** in the functioning of any faith by the state.

Moreover, **the 42nd Constitutional Amendment of the Indian Constitution** states that India is a secular country, thus, there is **no relationship between religion and state**. However, India pays respects to all religions but **it did not recognize any national religion**.

**Indian philosophy of secularism is related to “Sarva Dharma Sambhava”** which means equal respect to all religions.

India **does partially** separate religion and state. For example, it **does not have an official** state religion and state-owned educational institutions cannot impart religious instructions

# ON SECTION 6A OF THE CITIZENSHIP ACT

## Context

In a 4:1 majority verdict, the Constitution Bench of the Supreme Court upheld the constitutionality of Section 6A of the Citizenship Act, 1955.

October 2024

## Background

Section 6A of the Citizenship Act, 1955, confers citizenship to immigrants who entered Assam after January 1, 1966 but before March 24, 1971.

The provision was inserted into the Act in furtherance of a Memorandum of Settlement called the “Assam Accord”.

Under Section 6A, foreigners who had entered Assam before January 1, 1966, and been “ordinarily resident” in the State, would have all the rights and obligations of Indian citizens.

### Concerns raised on the provision

The cut-off date provides a different standard for citizenship for immigrants entering Assam than the rest of India (which is July 1948) and violates the right to equality (Article 14) of the Constitution.

Also the provision violates the rights of indigenous people from Assam under Article 29 by changing the demographics in the state.

#### What is the Assam Accord?

- The Assam Accord was signed in 1985 amongst Union of India, Govt. of Assam, All Assam Student of Union, All Assam GanaSangramParishad.
- To implement the various Clauses of Assam Accord a new Department has been established in the name of “Implementation of Assam Accord Department” during the year 1986.
- The Accord set **March 24, 1971**, as a cut-off. Anyone who had come to Assam before midnight on that date would be an Indian citizen, while those who had come after would be dealt with as foreigners.
- The same cut-off was used in updating the **National Register of Citizens (NRC)**.

### Supreme Court ruling

The Court opined that the mere presence of diverse ethnic groups within a state does not, in itself, constitute a violation of Article 29(1) of the Constitution (protection of interests of minorities).

Section 6A is a statutory intervention that

balances the humanitarian needs of migrants of Indian origin and the impact of such migration on economic and cultural needs of Indian states

#### Citizenship Amendment Act (CAA), 2019

- It amended the **Citizenship Amendment Act, 1955**, making two key changes to facilitate citizenship to undocumented migrants belonging to six non-Muslim communities — **Hindu, Sikh, Buddhist, Jain, Parsi or Christian from Afghanistan, Bangladesh and Pakistan**, who entered India on or before December 31, 2014.
  - It reduced the period to qualify for citizenship from the existing requirement of continuous stay of 11 years to continuous stay of **five years**.
  - However, Pakistani Hindus were anyway eligible for citizenship under **Section 5 and Section 6 (1)** of the Citizenship Act, 1955. The CAA only helped fast track the application process.
  - The Rules grant the final authority to accord citizenship to an empowered committee headed by the Director, Census Operations, while the scrutiny of applications filed online on the portal was done by a **district level committee (DLC)** headed by Department of Post officials.
- On successful verification of documents, the DLCs administered the oath of allegiance to the applicants.

### Concluding remark

The judgment underlined parliamentary supremacy over citizenship matters under Article 11 of the Constitution.

It also reinforced the Union government’s defense of amendments under the Citizenship (Amendment) Act of 2019, which is presently pending challenge in the Supreme court.

## SPECIAL STATUS FOR LADAKH

### Why in news:

Climate activist Sonam Wangchuk was detained on the Delhi border on Monday night

as he led a group of protesters to petition the Central government for the inclusion of Ladakh in the Sixth Schedule of the Constitution among other demands for autonomy to the region.

## Background:

Wangchuk began this 21-day hunger strike on March 6, terming it a “climate fast”.

In the 2019 Lok Sabha elections, the BJP listed implementation of the Sixth Schedule for Ladakh as one of its top three priorities in its manifesto for Ladakh.

After some ten rounds of meetings, the central government refused to bring Ladakh under the Sixth Schedule in March and then people decided to protest.

## Sixth schedule:

The Sixth Schedule of the Indian Constitution includes provisions for the administration of tribal areas in the states of Assam, Meghalaya, Tripura and Mizoram in northeast India under Article 244A.

It establishes autonomous councils that have legislative, judicial, executive and financial powers to independently govern these areas.

The purpose of the Sixth Schedule is to protect the interests of the tribal populations in these north-eastern states through autonomous governance.

## Special constitutional provisions Sixth Schedule provide for tribal areas:

The Sixth Schedule provides legislative, judicial and executive and financial powers to Autonomous District Councils (ADCs) or Regional Councils (RCs). The autonomous powers are intended to preserve the distinct tribal culture while promoting development.

## Legislative powers:

Under the provisions of the Sixth Schedule of the Constitution of India, autonomous district councils can make laws, rules and regulations in the following areas: Land management. Forest management. Water resources.

## Judiciary powers:

The ADCs and RCs also have judicial authority to establish and appoint members and presiding officers for Village Councils or courts exclusively for resolving legal disputes among Scheduled Tribes within their areas. These supersede any other courts in the state, with specific exceptions.

The ADCs and RCs can also act as or establish separate Courts of Appeal in their jurisdiction to review decisions and outcomes of legal cases handled by the Village Councils or courts, in their areas.

## Executive powers:

Regarding executive power, ADCs and RCs have the authority to establish, construct, or manage primary schools, dispensaries, markets, cattle pounds, ferries, fisheries, roads, road transport and waterways in the district.

The councils can also regulate and control these facilities. Additionally, they have the authority to determine the language and manner of primary education in district schools.

## Why is Ladakh seeking inclusion in the Sixth Schedule?

Himalayan region’s vulnerability to climate change. Melting glaciers lead to water scarcity and frequent floods, exacerbating environmental challenges.

Before 2019, as part of Jammu and Kashmir, Ladakh enjoyed constitutional safeguards under Article 370 and 35A. However, their revocation left the Ladakh people without legislation to protect their land, culture, and jobs, and their statehood was reduced to a Union Territory without a legislature.

Ladakh’s demand for inclusion in the Sixth Schedule is for autonomy to make and have say in the laws of the union territory.

Seeking alternatives, Ladakh sought safeguards and legislative powers. Article 244A, under the Sixth Schedule, was identified as offering both.

# SC DISMISSES PLEAS TO REVIEW VERDICT UPHOLDING STATES' RIGHT TO TAX MINERAL LANDS, QUARRIES

## Context:

The Supreme Court, in a nine-judge Constitution Bench, dismissed review petitions against its earlier ruling that royalty paid by mining operators to the Central government is not a tax, and that states can impose cesses on mining activities.

## Background of the case

### *Mining and Royalties*

Royalties refer to the fees paid to the owner of a product in exchange for the right to use that product.

The issue of whether royalties on mining activities constitute a tax has been a longstanding legal question in India.

Under Section 9 of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDRA), entities holding mining leases are required to pay royalties to the owner of the land, which could be a state government.

This raised the question of whether these royalties are a form of tax when the state is the lessor.

## The Supreme Court first addressed this question in the 1989

The Supreme Court first addressed this question in the 1989 case *India Cement Ltd v State of Tamil Nadu*.

A seven-judge Bench heard a challenge by the company to a Tamil Nadu law imposing a cess on land revenues, including royalties.

A cess is a form of tax levied by the government on tax with specific purposes.

The court ruled that while states can collect royalties, they cannot impose taxes on mining activities, as the Central government has overriding authority over the regulation of mines and mineral development under Entry 54 of the Union List.

In this judgement, the apex court opined that royalty is a tax, and as such a cess on royalty being a tax on royalty, is beyond the competence of the State Legislature.

The court controversially stated, "royalty is a tax," leading to questions about the

interpretation of royalties as a tax.

## Key highlights of the July 2024 SC judgement

**Royalty vs. Tax:** The court emphasized that royalty is not a tax. It is a consideration paid to the government for the right to extract minerals, unlike taxes, which are sovereign impositions.

**Enhancement of royalty is not an imposition of a tax:** Since the royalty paid under Section 9 is not a tax on mineral rights, any limitation on the enhancement of royalty is not an imposition of a tax under Entry 50 of List 2. Section 9 limits power of the centre and it does not govern tax.

Under Section 9 of the *Mines and Minerals (Development and Regulation) Act, 1957* (MMDRA), entities holding mining leases are required to pay royalties to the owner of the land, which could be a state government.

**States' Taxing Power:** The court upheld that states retain the power to impose taxes on mineral rights, unless

Parliament explicitly limits this power.

**Mines Act:** The Mines and Minerals (Development & Regulation) Act does not strip states of their power to tax mineral rights.

**Parliament's Role:** While Parliament can impose restrictions on state taxation through statutory instruments, the court ruled that the current

scheme of the MMRDA Act does not interfere with the states' taxing authority.

Parliament can impose limitations under Entry 50 of List 2 of the Constitution by means of statutory instruments.

Entry 50 of List 2 of the Constitution of India is about taxes on mineral rights, subject to any limitations imposed by Parliament by law relating to

mineral development.

**Land and Minerals:** Mineral-bearing lands fall under the term "land" as per Entry 49 of List 2 of the Constitution, enabling states to tax such lands.

In other words, mineral-bearing lands also fall under the expression of "land" under Entry 49 of List 2.

## PRISON REFORMS IN INDIA:

### Context:

The Supreme Court on Thursday (October 3) 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.

The Supreme Court issued a series of directives to the Centre and states to ensure that no inmate is subjected to work assignments or housing arrangements based on their caste.

The SC declared this provision in various jail manuals "unconstitutional" for violating the inmates' right to dignity, equality and non-discrimination.

The ruling ended the long-standing practice of discrimination against prisoners based on caste and demanded prompt reforms in all states and UTs.

### SC's Verdict on Caste Bias, Segregation in Prisons:

Background: The court's verdict came on a petition moved by a journalist, urging the court to issue clear directions to ensure that all prison manuals and practices (that reinforce caste hierarchies) are overhauled.

### The court's verdict:

The verdict specifically addressed the entrenched discriminatory practices against marginalised communities, including scheduled castes (SC), scheduled tribes (ST)

and denotified tribes (DNTs) in India's prisons.

The apex court held that the treatment of inmates from DNTs as "habitual offenders" within prison walls across India are oppressive to fundamental human dignity and personality.

The bench held that caste-based assignments of labour, such as assigning menial tasks (cleaning and sweeping) to marginalised castes while reserving cooking for higher castes, is a violation of Articles 14 and 15 of the Constitution.

The provision that food shall be cooked by 'suitable caste' reflects notions of untouchability prohibited under the Constitution in Article 17.

The SC expanded the scope of Article 21, stating

that caste-based discrimination hinders personal growth and development.

The court further held that the selective assignment of menial jobs to specific castes amounted to forced labour under Article 23.

The judgement highlighted several gaps in the Model Prison Manual of 2016 in addressing caste-based discrimination.

The court noted that it failed to fully eliminate caste-based segregation and labour division in prisons.

It also criticised the manual for not incorporating the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act 2013 that bans manual scavenging.

Court's directives to Centre, states and UTs: To combat caste-based prejudices, the bench called for strict adherence to guidelines laid down in *Arnesh Kumar Vs State of Bihar* (2014) and *Amanatullah Khan Vs Commissioner of Police, Delhi* (2024) cases.

The guidelines require police officers to ensure procedural safeguards, particularly for vulnerable communities, reinforcing the

broader fight against systemic biases.

### Issues Related to Prisons in India:

Fundamental rights of prisoners:

Article 21 guarantees the right to life and personal liberty.

Article 39A ensures free legal aid for those in need.

Key issues in Indian prisons: Prison conditions in India face several critical challenges that impact inmates' rights and welfare. These include -

#### Overcrowding:

Currently, prisons in India operate at 117% capacity, primarily due to a high number of under-trial prisoners.

The SC has emphasised the right to speedy justice under Article 21 of the Constitution, but many cases remain unresolved.

Unhygienic conditions: Many inmates lack access to proper medical facilities. Female prisoners often do not receive adequate sanitary products and basic health services.

Custodial torture: Despite the 1986 *DK Basu* judgement

prohibiting torture, reports of custodial violence continue, with increasing cases of custodial deaths.

Delays in trials: Lengthy legal processes disrupt prison administration and prolong inmates' suffering. The right to a speedy trial has been recognised but is often not upheld.

Challenges for women prisoners: The number of female inmates is rising, but they often face inadequate facilities. There is also a lack of dedicated women's prisons.

Prison Reforms - Recommendations of Committees, Provisions of Laws and Key Judgements:

Justice Mulla committee 1983: It recommended -

Improved prison accommodations,

Creation of the Indian Prisons and Correctional Services,

Public and media visits for transparency,

Reduction of under-trial prisoners through expedited trials.

A national policy on prisons.

Using alternatives to imprisonment, such as community service, etc.

### **Justice V.R. Krishna Iyer committee 1987:**

Induction of more women into the police force.

Separate institutions with women employees alone, especially for women offenders.

Necessary provisions to restore the dignity of convicted women.

Justice Amitav Roy panel (2018) of the SC: It recommended several prison reforms - special fast track

courts, improvements in lawyer-prisoners ratio, use of video-conferencing for trial, etc.

### **Provisions of the Model Prisoners Act of 2023:**

Legal aid to prisoners: It is the state's duty to provide free legal aid by suitable legislation or schemes.

Parole: It is a form of early release for prison inmates where the prisoner agrees to abide by behavioural conditions.

Furlough: It is the right of prisoners to retain family and social ties. This also helps

them counter the ill effects of prolonged time spent in prison.

### **Other provisions:**

Special facilities for women and transgender prisoners, Provisions for use of technology in prison administration, etc.

### **Key case laws:**

Hussainara Khatoon vs. Home Secretary (1979): Emphasises the right to a speedy trial.

State of Rajasthan vs. Balchand (1978): Establishes that bail is the rule, not jail.



# INTERNATIONAL RELATIONS



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AS CHINA TIGHTENS GRIP,  
INDIA AND US SIGN AGREEMENT  
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# BRICS SUMMIT BEGINS IN KAZAN TODAY, FIRST SINCE GROUPING'S EXPANSION IN JAN

## Context:

Prime Minister Narendra Modi is currently in Russia for the 16th BRICS Summit, along with Chinese President Xi Jinping and South African President Cyril Ramaphosa. The summit is hosted by Russian President Vladimir Putin in the city of Kazan.

## What is BRICS?

BRICS, in its earlier format, brought together 5 major emerging economies – Brazil, Russia, India, China and South Africa.

In 2023, during the 15th BRICS Summit, held in South Africa, six countries were invited to join the alliance.

These were - Iran, the United Arab Emirates, Saudi Arabia, Argentina, Egypt, and Ethiopia.

Before, expanding in 2023, BRICS as a platform represents 42% of the world population, 30% of the world's territory, 23% of global GDP, and around 18% of world trade.

The aim of the alliance is to challenge the economic and political monopoly of the West.

The group sets priorities and has discussions once every year during the BRICS summit, which members take turns hosting.

## Role of BRICS: An Analysis

### *Successes/achievements*

#### *Economic Cooperation and Trade*

BRICS has encouraged greater trade and investment among member countries.

There has been a rise in intra-BRICS trade, contributing to stronger economic links.

The group has emphasized reducing dependency on Western financial systems and enhancing their own economic resilience, with a focus on creating more inclusive growth models.

## New Development Bank (NDB)

A major milestone for BRICS is the establishment of the New Development Bank (NDB) in 2014, with a capital of \$100 billion.

The bank provides funding for infrastructure and sustainable development projects within BRICS and other developing nations.

The NDB has successfully financed numerous projects in member countries, including investments in renewable energy, urban development, and social infrastructure.

### *Contingent Reserve Arrangement (CRA)*

BRICS established a CRA with a \$100 billion reserve pool to provide financial support to members facing short-term liquidity pressures.

The CRA aims to provide a safety net and safeguard member economies from external economic shocks.

### *Political Influence and Multilateral Engagement*

BRICS has become an influential political bloc, advocating for a more multipolar world order and greater representation of developing countries in global institutions like the United Nations, International Monetary Fund (IMF), and World Bank.

### *Technical Cooperation*

BRICS has established mechanisms for cooperation in technology, science, and innovation.

Initiatives like the BRICS Science, Technology, and Innovation Framework Programme aim to enhance collaboration in research, innovation, and technical fields.

There have been joint efforts in health, agriculture, and disaster management, showcasing the group's commitment to addressing global challenges.

## Challenges Faced by BRICS

### *Economic Disparities Among Members*

The BRICS nations are economically diverse, with varying development levels, economic structures, and political systems.

This disparity sometimes hinders consensus on key issues, as the priorities and interests of each member can differ significantly.

### *Geopolitical Rivalries*

Geopolitical tensions, especially between China and India, have sometimes strained intra-BRICS relationships, impacting the group's cohesion.

Territorial disputes and regional interests can influence the decision-making process.

### *Relationship with Western Powers*

Relationship of BRICS with Western powers is complex, as BRICS countries often have differing strategies regarding the West.

Both China and Russia are now viewing the West with a lot more suspicion than before. This is due to Russia - Ukraine War and frequent roadblocks in US-China ties.

India, meanwhile, has been deepening its relations in spheres of economy and technology with the US.

### *Slow Progress on Institutional Reforms*

Despite advocating for a more democratic and multipolar global order, progress on reforming global institutions like the IMF and UN has been slow.

The group's influence is often limited by entrenched global power structures.

### *China's Economic Dominance*

China, as the largest economy within BRICS, often has a dominant influence on the group's economic agenda.

This can create an imbalance and generate concerns among other member states about Beijing's increasing sway in the bloc's decision-making.

## 16th BRICS Summit

**Host** – Russia (16th BRICS summit is being held in Kazan, one of Russia's largest and wealthiest cities).

### *Agenda*

The central theme uniting BRICS members is their disillusionment with Western-led global governance, particularly in the economic sphere.

This sentiment has intensified following the sanctions on Russia after its 2022 invasion of Ukraine, which raised concerns among Global South nations about the West potentially using global financial tools as weapons.

In response, BRICS aims to reduce reliance on the US dollar and the SWIFT financial system, from which Russian banks were excluded in 2022.

In 2023, Brazil's President Lula proposed a trading currency for BRICS, though experts expressed doubts about its feasibility.

Instead, the focus is shifting to using national currencies for bilateral trade, reducing exposure to currency fluctuations and dependence on the dollar.

Additionally, China has developed a limited alternative to SWIFT, while countries like Turkey and Brazil are increasing their gold reserves.

Currency swaps for energy deals are also gaining popularity, all reflecting a desire for greater financial autonomy from the West.

## Significance of Kazan in Russia

### *Kazan: Russia's Emerging Third Capital*

Known for its strong petrochemicals, military industry, and rapidly expanding IT sector, Kazan was branded Russia's third capital in 2009.

This designation highlights its status as a cultural and economic hub alongside Moscow and St Petersburg.

### *Kazan's Significance in Russia's Demographic Changes*

Kazan, located 900 km east of Moscow at the confluence of the Volga and Kazanka rivers, is the capital of the Republic of Tatarstan.

The city's population is almost evenly split between ethnic Russians (48.6%) and Tatars (47.6%), a predominantly Muslim Turkic ethnic group.

This demographic balance makes Kazan a symbol of Russia's evolving identity as a multi-

ethnic and multi-religious nation.

### *Cultural Symbols in Kazan*

Kazan's diversity is visible in its city kremlin, a fortified complex housing the Orthodox Annunciation Cathedral alongside the Kul Sharif Mosque, one of Europe's largest.

The mosque, initially destroyed by Ivan the Terrible in the 16th century, was reconstructed in 2005 with assistance from Saudi Arabia and the UAE.

## INDIA, PAKISTAN RENEW PACT ON KARTARPUR CORRIDOR

### Context:

India and Pakistan have renewed the Kartarpur Corridor agreement for another five years, ensuring uninterrupted access for pilgrims to the Kartarpur Sahib Gurudwara in Pakistan.

### Kartarpur Corridor Agreement

Agreement, signed on 24 October 2019, was established to facilitate pilgrimages from India to Gurdwara Darbar Sahib Kartarpur in Narowal, Pakistan, via the Kartarpur Sahib Corridor.

The corridor will remain operational until 2029, allowing pilgrims to continue their religious visits.

Indian External Affairs Minister, emphasised the government's commitment to ensuring Sikh pilgrims' access to holy sites.

### About Kartarpur Corridor

It connects Darbar Sahib Gurdwara in Pakistan with Dera Baba Nanak shrine in India's Punjab.

Kartarpur gurudwara is the revered shrine about 4 km across the border where Guru Nanak Dev spent the last 18 years of his life.

The Maharaja of Patiala donated money to construct the Gurudwara in the between 1920's.

#### Gururanak Dev

- **Born:** 1469 in Nanakana Sahib, Punjab, Pakistan.
- **Died:** In Kartarpur, Pakistan.

**Teachings and Beliefs:** Founder of Sikhism and the First of the Ten Sikh Gurus.

- **Bhakti Saint:** Advocated the 'Nirguna' form of Bhakti (devotion to a formless God).
- **Message of 'Ek Omkar':** Belief in One God, present everywhere. ("God is one").
- **Rejection of Rituals:** Disapproved of sacrifices, ritual baths, image worship, and austerities. Rejected the religious scriptures of both Hindus and Muslims.
- **Equality:** Promoted equality for all, regardless of caste, religion, or gender.
- **Caste System:** Strongly opposed the caste system and social hierarchies.

#### Religious Practices:

- **Sangat:** Established the concept of **Congregational Worship (Sangat)** which encouraged collective prayer and recitation in a community setting.
- **Langar:** Introduced the tradition of Langar, a community kitchen promoting social equality where people share meals regardless of status.

**Succession:** Choose Guru Angad Dev as his successor, ensuring the continuity of his teachings.

- **Guru Arjan Dev (the fifth Guru)** compiled **Guru Nanak's hymns** in the **Adi Granth Sahib**, which is the central holy scripture of Sikhism today.

Protocol on Visits to Religious Shrines : Pilgrimages between India and Pakistan are governed by the 1974 Protocol on visits to Religious Shrines, which includes a list of shrines in Pakistan and India open for visitors from the other country for which visas are required.

Kartarpur Corridor provides visa-free access from India to the shrine inside Pakistan.

Indian pilgrims need only a permit to cross into Pakistan.

Located on the Ravi River which is one of the rivers of the Indus System.

Commemoration: It was built to celebrate the 550th birth anniversary of Guru Nanak Dev on November 12, 2019.

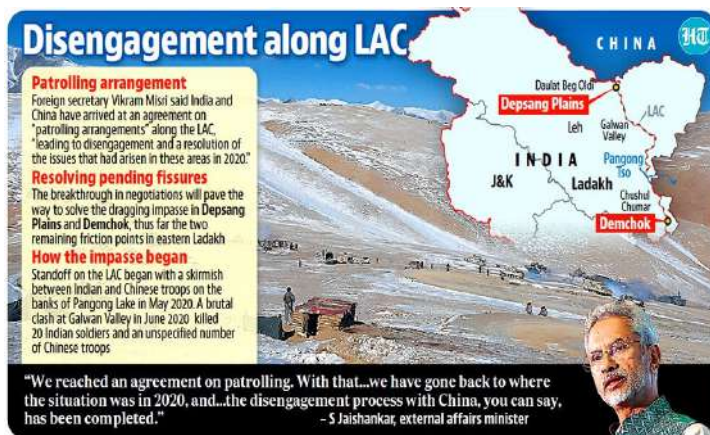
## INDIA, CHINA REACH DEAL ON EASING LAC TENSIONS

### Context:

India and China announced an agreement on patrolling arrangements, resolving the military standoff along the Line of Actual Control (LAC), as per government officials.

addressing issues at friction points like Demchok and Depsang.

The existence or adjustment of buffer zones, which were established to prevent clashes, remains undisclosed.



### Diplomatic and Military Dialogue:

The resolution is a result of multiple high-level meetings and negotiations, involving Foreign Ministers, the Working Mechanism for Consultation and Coordination (WMCC), and military commanders from both sides.

### Return to Pre-2020 Status:

Indian officials have indicated that the situation at the LAC will revert to what it was before 2020, although further steps like deinduction and demobilization of troops still need to be undertaken.

### What are the key components of the agreement between India and China?

#### Patrolling Arrangements:

The agreement includes the resumption of patrolling along the Line of Actual Control (LAC) in previously disputed areas, where patrolling had been stopped since 2020.

#### Disengagement and Buffer Zones:

The agreement aims to complete the disengagement process by restoring the situation to pre-2020 levels, including

### How does this agreement impact the broader geopolitical landscape in the region?

#### Regional Stability:

The agreement could contribute to stability along the India-China border and help reduce military tensions in the region, especially at sensitive points like the Galwan Valley, where past clashes occurred.

***Influence on China-India Relations:***

It marks a potential thaw in India-China relations, creating a conducive atmosphere for high-level diplomatic engagements, possibly including a meeting between Prime Minister Modi and President Xi Jinping during the BRICS summit.

***Implications for Multilateral Forums:***

The agreement preceding the BRICS summit indicates a strategic effort to avoid bilateral friction overshadowing multilateral diplomacy. A peaceful resolution along the border could bolster cooperation within BRICS and other regional platforms.

***Signal to Neighboring Countries:***

The resolution may influence the perception of China's border policies among other neighboring countries in Asia, possibly setting a precedent for dispute resolution.

## What are the implications for India's national security strategy?

**Shift Towards Dialogue and Diplomacy:**

The agreement underscores India's willingness to resolve border issues through diplomatic means while maintaining a strong defense posture.

***Strategic Focus on LAC Management:***

Although disengagement is underway, continued monitoring and readiness at the

LAC will remain crucial. The agreement may lead to a recalibration of India's military deployments and infrastructure development along the border.

***Enhanced Security Coordination:***

With border tensions easing, India can refocus on comprehensive security strategies involving cooperation with allies and partners in the Indo-Pacific region, addressing broader challenges such as maritime security and countering China's influence.

***Preparedness for Future Contingencies:***

The completion of disengagement does not eliminate future risks. India will likely continue to strengthen its border infrastructure and military capabilities as a precaution against any future incursions.

## Way forward:

***Strengthen Diplomatic Engagements:***

India should prioritize continuous diplomatic dialogues with China to solidify the agreements reached and prevent future misunderstandings.

***Enhance Border Infrastructure and Defense Preparedness:***

India should invest in improving border infrastructure and logistics to support troop mobility and supply lines.

# UK CEDES CHAGOS ISLANDS' SOVEREIGNTY TO MAURITIUS, KEEPS BASE; INDIA HAILS DEAL

## Context:

The United Kingdom announced to give sovereignty of the Chagos Archipelago back to Mauritius.

## Details

The U.K. and Mauritius have reached a political agreement to transfer Mauritius sovereignty over the Chagos Islands, including Diego Garcia. However, the U.K. will still

have the right to operate the military base on Diego Garcia for the next 99 years. This deal benefits both countries. Mauritius gets its land back, and the U.K. can continue using the base, which is crucial for global security.

## About Chagos Archipelago

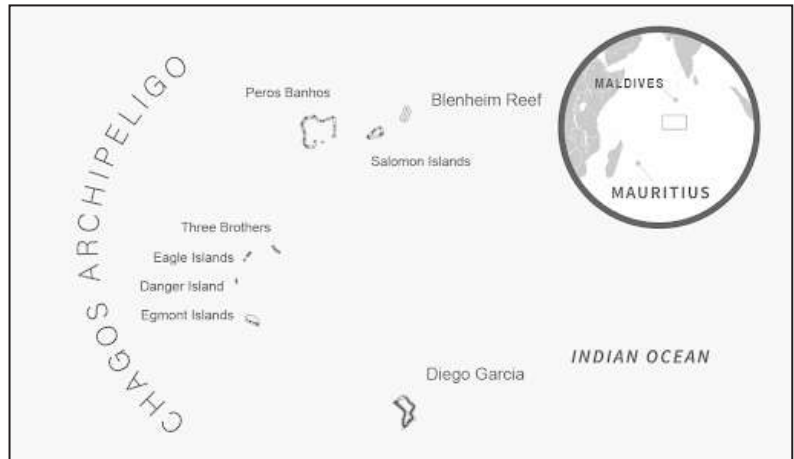
The Chagos Archipelago is located about 500 kilometres south of the Maldives, it consists of about 58 islands in the Indian Ocean.

These islands were mostly uninhabited until the late 18th century when the French brought slaves from Africa and India to work on coconut plantations. In 1814, Britain took control of the islands after they were surrendered by France.

In 1965, the UK formed the British Indian Ocean Territory (BIOT), which included the Chagos Islands. Interestingly, these islands were administratively attached to Mauritius. However, when Mauritius gained independence in 1968, the UK decided to keep Chagos for itself.

Mauritius demanded control over the Chagos Islands arise of a strong sense of national identity and historical injustice. The islands were detached from Mauritius without proper consent, which

operations in the Indian Ocean and beyond. This base is essential for intelligence, surveillance, and military logistics. The presence of U.S. forces strengthens security in the Indian Ocean region and helps maintain peace. The transfer of sovereignty raises several questions about the future of the military base.



For India, the UK-Mauritius agreement offers an opportunity to strengthen its ties with Mauritius. The Islands are strategically located and India's active involvement could help in maintaining a balance of power in the Indian Ocean.

### Way Forward

The recent agreement between the UK and Mauritius shows that former colonial powers recognized the rights of nations they once controlled. This treaty can lead to improved relations between the UK and Mauritius, and also encourage collaboration with the U.S. and India to ensure peace and stability in the Indian Ocean.

many Mauritians see as a violation of their sovereignty. The native population "Chagossians" was forcibly removed in the 1960s and 1970s to construct a U.S. military base on Diego Garcia, the largest island in the archipelago.

### About Diego Garcia

The island has a strong U.S. military base, which plays a vital role in the US military

# SHANGHAI COOPERATION ORGANISATION

## Why in news?

EAM Jaishankar arrives in Islamabad to attend SCO meeting.

It is the first time in nearly nine years that India's foreign minister travelled to Pakistan.

Shanghai Cooperation Organisation:

## Origins:

The SCO originated from the "Shanghai Five," formed in 1996, consisting of China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan.

It was created to address concerns about extremist religious groups and ethnic tensions following the dissolution of the USSR in 1991.

## Establishment:

SCO was established on 15th June 2001, in Shanghai, adding Uzbekistan as a sixth member.

The SCO is governed by the Heads of State Council (HSC), which serves as its highest decision-making body and convenes once a year.

Over time, the organization expanded its membership to include eight states, with India and Pakistan joining on 9 June 2017.

Iran officially became a member in 2023.



# AS CHINA TIGHTENS GRIP, INDIA AND US SIGN AGREEMENT TO STRENGTHEN SUPPLY CHAIN FOR CRITICAL MINERALS

## Context

India and the United States signed a memorandum of understanding (MoU) to expand and diversify the critical minerals supply chain.

## What are Critical Minerals?

These are minerals that are essential for economic development and national security.

The lack of availability of these minerals or the concentration of extraction or processing in a few geographical locations could potentially lead to “supply chain vulnerabilities and even disruption of supplies”.

## Applications of Critical Minerals

Clean technologies initiatives such as zero-emission vehicles, wind turbines, solar panels etc.

Critical minerals such as Cadmium, Cobalt, Gallium, Indium, Selenium and Vanadium and have uses in batteries, semiconductors, solar panels, etc.

Advanced manufacturing inputs and materials such as defense applications, permanent magnets, ceramics.

Minerals like Beryllium, Titanium, Tungsten, Tantalum, etc. have usage in new technologies, electronics and defense equipment.

Platinum Group Metals (PGMs) are used in medical devices, cancer treatment drugs, and dental materials.

## List of Critical Minerals

Different countries have their own unique lists of critical minerals based on their specific circumstances and priorities.

A total of 30 minerals were found to be most critical for India, out of which two are critical as fertilizer minerals: Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.

## Significance of partnership

India’s participation in the network will help in diversifying and securing its supply of critical minerals from nations like Argentina, Chile, Australia, and select African countries.

The partnership marks a critical step forward for India

### Mineral Security Partnership (MSP)

– It is a US-led collaboration of 14 countries that would focus on the supply chains of minerals such as Cobalt, Nickel, Lithium, and also the 17 ‘rare earth’ minerals.

– **Members:** Australia, Canada, Finland, France, Germany, India, Italy, Japan, the Republic of Korea, Norway, Sweden, the UK, U.S., and the EU.

– **Mandate:** To catalyze public and private investment in critical mineral supply chains globally. It directly addresses four major critical minerals challenges:

- Diversifying and stabilizing global supply chains;
- Investment in those supply chains;
- Promoting high environmental, social, and governance standards in the mining, processing, and recycling sectors; and
- Increasing recycling of critical minerals.



in its quest to reduce reliance on China for these minerals and build a robust, self-sustaining supply chain for its green energy initiatives.

### Other steps taken by India

India has joined the Minerals Security Partnership, a US-led plurilateral effort of 14 countries and the European

Union.

India has joined the US-led Minerals Security Finance Network, an initiative aimed at strengthening global cooperation in securing critical mineral supply chains.

KhanijBidesh India Limited (KABIL): It was formed in 2019 as a joint venture of state-run miners NALCO, HCL and MECL to source strategic minerals such as lithium and

cobalt etc. from abroad.

### Way Ahead

Critical minerals have become essential for economic development and national security in the country.

Minerals such as Lithium, Cobalt etc. have gained significance in view of India's commitment towards energy transition and achieving net-zero emission by 2070.

## A RE-BALANCING OF INDIA'S GREAT POWER RELATIONS

### Context:

Prime Minister Modi's recent participation in the Quad Leaders Summit highlights India's efforts to strengthen Indo-Pacific security and its role as a global peacemaker, while rebalancing its foreign policy to maintain strategic autonomy amid changing global dynamics.

powers.

### Strategic Interests in the Indo-Pacific:

India's participation in the Sixth Quad Leaders' Summit highlights its aim to strengthen security cooperation among Quad nations.

This collaboration is focused on maintaining a rules-

India is actively managing its complex relationship with China, as evidenced by National Security Adviser Ajit Doval's discussions with Chinese Foreign Minister Wang Yi.

These talks underline India's commitment to resolving military tensions along the Line of Actual Control (LAC).

### Global Mediation Role:

Doval's recent interactions with the Russian President illustrate India's aspirations as a global peacemaker.

By proposing Modi's Ukraine peace plan, India seeks to position itself as a mediator in international conflicts, thereby enhancing its diplomatic profile.

Associated Geopolitical Challenges

### Russia-China Relations:

The strengthening military and economic ties between

**The Quad**, comprising the **U.S., India, Japan, and Australia**, is a strategic alliance aimed at promoting a free, open, and secure Indo-Pacific.

- Its purpose is to **enhance cooperation** on security, economic, and technological issues while addressing **regional challenges** like China's growing influence.

India's Aspirations and Initiatives

India has been actively pursuing a diplomatic balancing act through multiple engagements with major global

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based order in the Indo-Pacific to counter challenges from revisionist powers.

### Balancing Relations with China:

Russia and China present significant security challenges for India.

China's increasingly aggressive actions along the Himalayan borders heighten these risks, necessitating India to carefully navigate its diplomatic strategies to safeguard national interests.

### **Diplomatic Scrutiny over Russia-Ukraine Conflict:**

India's continued purchase of discounted Russian oil amid the Russia-Ukraine conflict has raised eyebrows among Western nations, leading to scrutiny regarding its commitment to global norms.

### **Perception of the Quad by Russia:**

While the Quad aims to counter Chinese aggression, Russia views it as a Western alliance, raising concerns over India's close ties with Moscow.

India seeks to maintain a balanced relationship with Russia to navigate this geopolitical landscape.

### **Navigating Quad and BRICS Dynamics:**

India seeks to participate actively in both groups; however, the growing dominance of China within BRICS, contrasted with Russia's influence, complicates India's efforts to maintain a balanced foreign policy amidst competing interests.

### **Role as Mediator:**

India may not become a mediator in global conflicts due to a lack of leverage to compel compliance, unlike the U.S. or UK.

### **Way Forward**

Pragmatic relation with Russia:

As global dynamics shift, India must adapt its foreign policy to prioritize pragmatism and current geopolitical realities.

The absence of a guaranteed Russian backing in contemporary conflicts necessitates a reassessment of this long-standing partnership, as past support does not ensure future alignment.

### **Strategic Partnership with the U.S.:**

India's relationship with the

U.S. is becoming increasingly crucial, especially in light of the structural challenges in India-China relations.

This includes security issues along the LAC, territorial issues, Chinese naval presence in the Indian Ocean Region, and the China-Pakistan Economic Corridor (CPEC).

### **Mediation:**

India can effectively serve as a facilitator, encouraging dialogue, or as an interlocutor, actively listening to both sides to promote understanding and cooperation.

### **Conclusion**

India must recalibrate its foreign policy to embrace a pragmatic approach that reflects evolving global dynamics. By strengthening ties with the U.S. while managing its historical relationship with Russia, India can navigate complex geopolitical challenges, bolster its strategic interests, and enhance its role as a global mediator in the Indo-Pacific region.



# SOCIETY &

# SOCIAL JUSTICE

What's Inside?

1. ISSUES IN THE TREATMENT OF 'RARE DISEASES', AND WHAT THE GOVERNMENT CAN DO
2. WHY DID THE CENTRAL GOVT. SANCTION A 50% HIKE IN PRICES OF COMMONLY USED DRUGS?
3. INDIA'S 'SILVER DIVIDEND', CHALLENGE TO OPPORTUNITY (ABOUT OLD AGE POPULATION)
4. GLOBAL HUNGER INDEX
5. AYUSHMAN BHARATH
6. THE UNDER-REPRESENTATION OF WOMEN IN THE JUDICIARY

## ISSUES IN THE TREATMENT OF 'RARE DISEASES', AND WHAT THE GOVERNMENT CAN DO

### Context:

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.

### More on news:

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.

### What are rare diseases?

Rare diseases, also known as orphan diseases, are conditions that occur infrequently within a population.

They are characterized by three key markers: Total number of people with the disease, Prevalence and Availability /Non-availability of treatment options.

The World Health Organization

(WHO) defines a rare disease as a condition that affects a small percentage of the population, typically fewer than 1 in 1,000 to 2,000 people.

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.

### Categories of rare diseases

In India, rare diseases are categorized 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.

### What are orphan drugs?

Orphan drugs are medicines used to treat rare diseases, which are life-threatening or cause long-term health issues. The term “orphan disease” refers to the rare diseases that these drugs treat.

## WHY DID THE CENTRAL GOVT. SANCTION A 50% HIKE IN PRICES OF COMMONLY USED DRUGS?

### Context

The Central Government sanctioned a 50% increase in the prices of eight commonly used drugs to ensure the availability of essential

medications and to address “extraordinary circumstances” and “public interest”:

### Rationale

The National Pharmaceutical Pricing

Authority (NPPA) increased the ceiling prices of drugs used to treat asthma, tuberculosis, bipolar disorder, and glaucoma. The NPPA's mandate is to ensure that essential drugs are available at affordable prices. The industry has been demanding price increases due to rising input costs.

### Drugs affected

The drugs affected by the price increase include:

Benzylpenicillin (1 million IU injection)

Atropine injection (0.6 mg/ml)

Streptomycin powder for injection (750 mg and 1000 mg)

Sabutamol tablet (2 mg and 4 mg)

Respirator solution 5 mg/ml

Pilocarpine (2% drops)

Cefadroxil tablet (500 mg)

Desferrioxamine for injection (500 mg)

Lithium tablets (300 mg)

## INDIA'S 'SILVER DIVIDEND', CHALLENGE TO OPPORTUNITY (ABOUT OLD AGE POPULATION)

The term silver dividend refers to the potential economic opportunities arising from an increasing ageing population, much like the demographic dividend that benefits from a large working-age population.

Challenges of Elderly Population

### Elderly Care:

As the population ages, the demand for healthcare services and long-term care increases. The elderly often require more medical attention, specialised care, and assistance with daily activities, placing a strain on healthcare systems and caregiving resources.

### Mental Health Issues:

Around one-third of the elderly population suffers from depression and low life satisfaction, often feeling unmotivated and disconnected from work or society.

These mental health challenges further complicate caregiving and healthcare needs.

### Emerging Opportunities

**New Business Opportunities:**

The rising demand for elder care has created new markets for healthcare services, retirement communities, mobility aids, and other elder-focused products.

This is beneficial for the economy, creating jobs in healthcare, home care, assistive technology, and senior living industries.

**Economic Growth:**

The increased healthcare consumption among the elderly, presently estimated at \$7 billion, represents a growing market that could stimulate economic growth, especially in health services and related industries.

### Current State of the Aging Population

The healthcare consumption of the elderly population in India is currently estimated at \$7 billion, and this number is steadily rising. This is a significant figure, driven by the growing healthcare needs of this demographic.

**Chronic Illnesses:** Three-quarters of the elderly in India suffer from at least one chronic ailment, including cardiovascular diseases, diabetes, and respiratory conditions.

**Limitations in Daily Living:** Approximately 25% of elderly individuals experience difficulties with daily activities due to decreased mobility and age-related issues.

**Mental Health Concerns:** A third of the elderly population displays symptoms of depression and low life satisfaction, often feeling unmotivated and disconnected from productive activities.

**Economic Insecurities:** Many elderly individuals in India face economic insecurities as they rely on their children for financial support, leading to feelings of dependency and burden within families. The lack of financial independence exacerbates their mental and emotional challenges.

## Health Empowerment and Inclusion

**Health Literacy:** Improving health awareness among the elderly and their caregivers is vital. Enhancing health literacy helps the elderly understand preventive care and manage chronic conditions better.

**Ayushman Arogya Mandir (AAM):** The Ayushman Arogya Mandir initiative is a key step toward improving healthcare access for the elderly, delivering comprehensive primary healthcare at 1,50,000 centres across India. These centres aim to provide universal and free healthcare services to all.

**Expanded Healthcare Services:** Under this initiative, primary healthcare centres, which previously focused on basic medical services and maternity care, now aim to cover broader health services, benefiting the elderly in particular. This involves a preventive, promotive, curative and rehabilitative component under the multiple systems of ayurveda, yoga, naturopathy, unani, siddha and homoeopathy (AYUSH).

## Additional Measures Needed

**More Hospitals, Doctors, and Clinics:** Increase the number of healthcare facilities and professionals to meet rising demands.

**Teleconsultation Services:** Make telemedicine accessible to the elderly, allowing for remote healthcare consultations.

**Training and Sensitization:** Ensure healthcare workers are trained to handle the specific needs of the elderly and provide compassionate care.

**Focus on Mental Health:** Address mental health issues, including depression and

social isolation, which are common among the elderly.

**Nutrition:** Monitor and ensure the elderly are consuming proper nutrition, as malnutrition can worsen health outcomes in old age.

## Silver Economy

The idea of transforming the ageing population challenge into an opportunity lies in embracing the silver economy—a market for goods and services catered to the elderly. This could include everything from healthcare products, assisted living services, and digital tools, to leisure and lifestyle activities, opening new business avenues and boosting economic growth.

For example, this economy includes the development of easy-to-use smartphones, specialised furniture, and other products tailored to the needs of older adults

As this demographic grows, it is becoming an increasingly significant market segment. In India, the current value of the silver economy is estimated at ₹73,082 crore and is projected to grow substantially in the coming years.

With the 60-plus population projected to reach 13.2% by 2031 and 19% by mid-century, the elderly will represent a major consumer group. This age group, especially professionals aged 45-64, is often considered the wealthiest, leading to the saying: “They become rich before they grow old.”

A significant portion of this demographic’s spending—about a third—is on healthcare. This presents a tremendous opportunity for businesses focused on health, wellness, and senior care. As the demand for elder-specific products and services rises, the silver economy is expected to grow rapidly in both India and globally.

# GLOBAL HUNGER INDEX

## Context:

India's struggle with hunger and malnutrition has been underscored by its ranking in the 2024 Global Hunger Index (GHI), where it stands 105th out of 127 countries with a score of 27.3, categorising it in the 'serious' range.

## What is the GHI?

The GHI is a peer-reviewed annual publication designed to comprehensively measure and track hunger at global, regional, and national levels, reflecting multiple dimensions of hunger over time.

Created in 2006, the GHI was initially published by the US-based International Food Policy Research Institute (IFPRI) and Germany-based Welthungerhilfe. In 2007, the Irish NGO Concern Worldwide also became a co-publisher.

In 2018, IFPRI withdrew from the project and the GHI became a joint project of Welthungerhilfe and Concern Worldwide.

The GHI is intended to –

Raise awareness and understanding of the struggle against hunger,

Provide a way to compare levels of hunger between countries and regions, and

Call attention to those areas of the world where hunger levels are highest and where the need for additional efforts to eliminate hunger is greatest.

Theme: The theme for the 2024 Global Hunger Index (GHI) is “How gender justice can advance climate resilience and zero hunger”.

## Global hunger statistics:

Current GHI score: 18.3, shows a slight improvement from 2016's score of 18.8.

Vulnerable populations: 2.8 billion people cannot afford a healthy diet.

## Regional disparities in hunger:

**Sub-Saharan Africa:** Highest rates of malnutrition and child mortality globally and ongoing conflicts in Somalia and Sudan exacerbate hunger crises.

**South Asia:** Countries like Afghanistan, India, and Pakistan are facing substantial hunger challenges.

## Issues:

**Difficulties in achieving SDG 2 (Zero Hunger by 2030):** The GHI 2024 reveals that 42 countries face alarming or serious hunger levels, marking a stagnation in the fight against hunger despite decades of progress.

**Gender disparity:** Women are particularly vulnerable to food insecurity due to discriminatory norms and violence, limiting their access to resources.

## Underlying causes of hunger:

**Climate change and environmental degradation** impacts food production and threatens the natural foundations of economies and agriculture.

**Armed conflicts** lead to significant displacement and disruption in food systems and affect cultivation.

**Lower-income countries** struggle with debt, diverting funds away from critical development needs.

**Success stories amidst the crisis:** Countries like Mozambique and Nepal have achieved significant improvements in their GHI scores since 2016, showcasing that progress is possible.

## A call to action:

The GHI 2024 underscores the urgent need for coordinated efforts to address the intersecting crises of climate change, armed conflict, gender inequality and economic instability.

It emphasises the importance of supporting vulnerable populations, particularly women, in the fight against hunger.

## India Specific Findings in the GHI

### 2024:

Alarming child malnutrition rates:

Approximately 35.5% of children under five are stunted, indicating chronic undernutrition, while 18.7% are wasted, a sign of acute malnutrition.

These figures reflect a significant lack of adequate nutrition during crucial developmental periods, severely impacting children's physical and cognitive growth.

Furthermore, around 13.7% of the overall population suffers from undernourishment, which remains a persistent issue.

### Child mortality rates:

While there has been some progress in reducing child mortality, with 2.9% of children dying before their fifth birthday, the overall hunger situation remains dire.

The interplay between malnutrition and child mortality underscores the need for immediate action.

## India's Performance Trends in the GHI:

Minimal improvement over the decade:

There is a stagnation in India's performance

as it moved from a score of 29.3 in 2016 to 27.3 in 2024.

Although there have been gains in certain areas, such as child mortality rates, the overarching issue of hunger persists.

## Addressing Hunger and Malnutrition in India:

The need for comprehensive solutions:

India's GHI score serves as a stark reminder that economic advancement is insufficient for eradicating hunger.

A more holistic approach is required to tackle the underlying causes of malnutrition.

Effective policy interventions including key focus areas such as:

**Food security:** Ensuring access to nutritious food for all segments of the population is essential.

**Healthcare access:** Improving healthcare infrastructure can significantly impact maternal and child health outcomes.

**Maternal and child nutrition programs:** Investing in targeted nutritional programs for mothers and children is vital for breaking the cycle of malnutrition.

Some initiatives in India: National Food Security Act (NFSA), PM POSHAN Scheme, etc.

## AYUSHMAN BHARATH

### Why in news?

PMJAY is poised to play a pivotal role in building a Viksit Bharat. Health, after all, is the very foundation of well-being, national productivity and prosperity.

### Ayushman Bharat-PMJAY:

About:

PM-JAY is the world's largest health insurance scheme fully financed by the government.

Launched in 2018, it offers a sum insured of Rs.5 lakh per family for secondary care and tertiary care.

Health Benefit Packages covers surgery, medical and day care treatments, cost of medicines and diagnostics.

Ayushman Arogya Mandirs (AAMs), earlier called Health and Wellness Centres, have been established where free consultations.

Bharat's UHC model is based on a public-



funded comprehensive primary healthcare.

### Beneficiaries:

It is an entitlement-based scheme that targets the beneficiaries as identified by latest Socio-Economic Caste Census (SECC) data.

The National Health Authority (NHA) has provided flexibility to States/UTs to use non- Socio-Economic Caste Census (SECC) beneficiary family databases with similar socio-economic profiles for tagging against the leftover (unauthenticated) SECC families.

### Funding:

The funding for the scheme is shared – 60:40 for all states and UTs with their own legislature, 90:10 in Northeast states and Jammu and Kashmir, Himachal and Uttarakhand and 100% Central funding for UTs without legislature.

### Nodal Agency:

The National Health Authority (NHA) has been constituted as an autonomous entity under the Society Registration Act, 1860 for effective implementation of PM-JAY in alliance with state governments.

The State Health Agency (SHA) is the apex body of the State Government responsible for the implementation of AB PM-JAY in the State.

### Issues noted by the CAG report:

Registration of beneficiaries - The identification of beneficiaries based on the SECC could be irrelevant by now.

The CAG audit shows that matching of beneficiaries with the SECC in the online portal was not done and registrations and rejections of applications was done in an arbitrary manner.

The audit brought to light that there were large numbers of beneficiaries registered against the same mobile number or Aadhar.

Malpractices - The auditors found large scale corruption in insurance claims settlement.

Hospital empanelment done without checks - An Empanelled Healthcare Provider (EHCP) has to fulfil criteria like the presence of round-the-clock support systems like pharmacy, blood bank, laboratory, dialysis unit, ICU care etc.

Many hospitals after being empanelled for a certain set of fixed services, failed in providing them.

Missing hospitals - The existence of hospitals in the empanelled list did not necessarily translate into even their existence in the scheme

Shortage of infrastructure & personnel - Shortage of healthcare infrastructure, doctors and equipment in many States and UTs.

## THE UNDER-REPRESENTATION OF WOMEN IN THE JUDICIARY

### Context:

The lack of gender diversity within India's judiciary is a persistent issue that has significant implications on the fairness and inclusivity of the justice delivery system.

Despite initiatives to increase women's participation at entry levels, their representation at higher levels of the judiciary remains disappointingly low.

An Analysis of Gender Disparity in Judicial Representation

The gender imbalance within India's judiciary begins at entry-level positions, although some improvements are evident.

According to the Supreme Court of India's State of the Judiciary report in 2023, women account for 36.3% of the district judiciary, and in 14 states, more than half of the new civil judges (junior division) are women.

However, this progress fades at higher judicial levels, where, as of January 2024, only 13.4% of High Court judges and a mere 9.3% of Supreme Court judges are women.

Moreover, this disparity is accentuated in certain states, such as Bihar, Chhattisgarh, and Tripura, where women's representation is minimal or non-existent.

Such skewed representation creates a funnel effect, restricting the pool of women qualified for elevation to higher courts and exacerbating the gender imbalance.

## Reasons Behind Gender Imbalance in Judiciary

### Entry Level Barriers

#### Requirement for Continuous Practice

One significant regulatory obstacle is the requirement for continuous practice in some states for eligibility for judicial service positions.

Many states' Judicial Service Rules mandate that advocates must have a specific period of continuous, uninterrupted practice before being considered for elevation to the Bench.

This rule disproportionately impacts women, particularly those who may need to take career breaks due to family obligations, maternity, or childcare.

Unlike their male counterparts, women often struggle to meet this threshold due to a lack of systemic support for their family responsibilities.

## Absence of Maternity Benefits and Minimum Stipends

Maternity Benefits and Minimum Stipends; vital support systems for women in demanding professions are often absent or inadequate in the legal field.

Without paid maternity leave or financial support, many women are forced to choose between career advancement and family responsibilities.

This causes a significant drop-off in female representation before they even reach judicial roles.

For example, female advocates balancing family duties may struggle to maintain the continuity required by Judicial Service Rules, making the entry point into judicial positions a significant barrier in their career trajectory.

## Work Culture and Social Expectations

Apart from structural barriers, workplace culture and social expectations play a crucial role in shaping the experience of women in the judiciary.

The legal profession has historically been male-dominated, with deeply ingrained biases and cultural norms that are often unfavourable to women.

This is evident in everyday interactions within courts, where women frequently encounter subtle biases and, at times, overt discrimination.

For instance, in courtroom settings and professional gatherings, women judges, advocates, and staff may face challenges to their authority, unequal treatment, and stereotyping.

These issues make it harder for women to establish themselves as equals and earn the respect of their male peers.

## Another Major Reason for Women's Low Representation in Judiciary: Retention Challenges

### Unsupportive Policies

A key issue here is the unsupportive work environment, which fails to accommodate the needs of women, especially those with caregiving responsibilities.

Policies such as harsh transfer requirements illustrate how judiciary regulations often overlook the personal circumstances of female judges, making it difficult for them to maintain long-term stability in their roles.

Transfer policies are typically rigid, lacking

any flexibility or consideration of family obligations.

Since women are still primarily responsible for family care in many cases, these policies add a heavy burden and deter many from continuing in the judiciary.

### **Lack of Supportive Infrastructure**

Another factor that complicates retention is the lack of supportive infrastructure within court premises, which negatively impacts women at all levels of the judiciary.

Court complexes across the country often lack basic amenities specifically designed for women.

For instance, according to a 2019 survey by the Vidhi Centre for Legal Policy, nearly 100 district courts had no dedicated washrooms for women.

In higher courts as well, even women judge often face difficulties accessing adequate washroom facilities, let alone other female staff, lawyers, or litigants.

The absence of essentials like sanitary facilities and hygienic waste disposal systems not only affects physical comfort but also communicates a lack of consideration for women's needs, reinforcing their sense of marginalization in the profession.

### **Lack of Family-Friendly Amenities**

Moreover, the lack of family-friendly amenities, such as feeding rooms and crèches, exacerbates the struggle for women balancing work and family life.

While some courts, such as the Delhi HC, have taken initial steps in providing a crèche facility, such resources are severely limited and often come with restrictive age limits, like catering only to children under six years.

This renders such amenities ineffective for many women with older children, who still require dependable childcare.

## **Ways Ahead to Address the Underrepresentation of Women in Judiciary**

### **Adoption of 'Female Gaze' in Policies**

Adopting a female gaze in policymaking could bridge this gap, ensuring that women's unique needs are prioritized.

Implementing a female gaze involves examining the judiciary's policies and infrastructure through a feminist lens that recognises how ostensibly neutral regulations can inadvertently disadvantage women.

This approach challenges the male-centric perspective often inherent in judiciary committees and Bar Councils, which may lack female representation.

By using this lens, the judiciary can better address the gendered impact of policies and create a more inclusive environment for women.

### **Prioritising Women's Needs through Inclusive Policy**

For effective inclusion of women in the judiciary, policies must be crafted with women's specific challenges in mind.

Greater participation requires a shift towards women-centric perspectives that identify barriers to career growth.

For example, former Supreme Court Judge Justice Hima Kohli noted that unconscious gender biases in courts often sideline women in administrative duties.

Analysing High Court Building Committees reveals that only three HCs (Delhi, Allahabad, and Himachal Pradesh) have female members, highlighting the lack of representation in infrastructure-related decision-making.

### **Increase Female Recruitment in Judicial Administration**

Beyond infrastructure, a lack of representation

in HC Registries and judicial academies worsens the neglect of gender-sensitive policies.

As a result, women's experiences and needs are insufficiently reflected in policies or training programs designed to counter gender bias.

Implementing policies that are informed by women's lived experiences; such as gender-sensitive recruitment, transfer protocols, and support for familial responsibilities, could prevent the marginalization of women in the judiciary.

## Conclusion

The underrepresentation of women in India's judiciary reflects deeper systemic issues that extend beyond entry-level recruitment.

Bridging this gap requires a comprehensive overhaul of the judiciary's policies, infrastructure, and culture to be more inclusive and gender-sensitive.

Recognising and addressing women's unique needs through the female gaze would mitigate the unintended impacts of neutral policies and foster an equitable work environment.

# Economic Development & Agriculture

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## PM E-DRIVE SCHEME:

### Context:

Ministry of Heavy Industries has notified PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme.

PM E-DRIVE Scheme builds upon previous initiatives such as the Faster *Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME-I)*, 2015 and FAME-II (2019) programs.

*Electric Mobility Promotion Scheme 2024 (EMPS-2024)* has been also subsumed under it.

EMPS 2024 was launched in July 2024 for faster adoption of electric two-wheeler (e-2W) and three-wheeler (e-3W).

### About PM E-DRIVE Scheme

**Objective:** Expedite the adoption of Electric Vehicles (EVs) by providing upfront incentives for their purchase, as well as by facilitating the establishment of essential charging infrastructure for EVs. Also, it aims to promote EVs to reduce the environmental impact of transportation and improve air quality.

**Fund Allocation:** Rs 10,900 crore

**Time Period:** 2024-26

**Targets:** Support e-2Ws, e-3Ws, and e-buses. Installation of 22,100 fast chargers for e-4Ws, 1800 fast chargers for e-buses and 48,400 fast chargers for e-2W/3Ws.

**Nodal Ministry:** Ministry of Heavy Industries

Project Implementation and Sanctioning Committee (PISC), an Inter-ministerial empowered committee, headed by Secretary (Heavy Industries) is constituted for overall monitoring, sanctioning and implementation.

### Key Features of the scheme

**Subsidies:** Demand incentives for consumers (buyers/end users) to purchase certain categories of EVs.

**Aadhaar authenticated e-Vouchers** for EV buyers will be generated through PM E-DRIVE app/portal to reduce the upfront purchase price of EVs. The amount will be reimbursed to the original equipment manufacturer (OEM) by the Government of India.

**Proposed incentive** (based on battery capacity i.e. energy content measured in kWh): **5,000 per kWh in FY 2024-25** and **₹2,500 per kWh in FY 2025-26** for e-2W and e-3W categories (both capped at 15% of ex-factory price).

**Grants for creation of capital assets:** Includes e-buses, establishment of a network of Electric vehicle public charging stations (EVPCS) & upgradation of *identified testing agencies*.

**Project management agency (PMA):** The Scheme shall be implemented through a PMA, which shall be responsible for providing secretarial, managerial and implementation support.

## CABINET APPROVES NATIONAL MISSION ON EDIBLE OILS – OILSEEDS (NMEO-OILSEEDS) FOR 2024-25 TO 2030-31

### Context

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, has approved the National Mission on Edible Oils – Oilseeds

(NMEO-Oilseeds), a landmark initiative aimed at boosting domestic oilseed production and achieving self-reliance (Atmanirbhar Bharat) in edible oils. The Mission will be

implemented over a seven-year period, from 2024-25 to 2030-31, with a financial outlay of Rs 10,103 crore.

### Background:

The country is heavily reliant on imports which account for 57% of its domestic demand for edible oils. To address this dependency and promote self-sufficiency, the Government of India has undertaken a series of measures to enhance domestic production of edible oils, including the launch of National Mission on Edible Oils – Oil Palm (NMEO-OP) with an outlay of Rs 11,040 crore to boost oil palm cultivation in the country in 2021.

In addition, the Minimum Support Price (MSP) for mandated edible oilseeds has been significantly increased to ensure remunerative prices to the oilseed farmers.

The continuation of the PradhanMantriAnnadataAaySanrakshanAbhiyan (PM-AASHA) ensures that oilseed farmers receive MSP through price support scheme and price deficiency payment scheme. Besides, 20% import duty on edible oils has been imposed to protect domestic producers from cheap imports and encourage local cultivation.

### National Mission on Edible Oils – Oilseeds (NMEO-Oilseeds)

The newly approved NMEO-Oilseeds will focus on enhancing the production of key primary oilseed crops such as Rapeseed-Mustard, Groundnut, Soybean, Sunflower, and Sesamum, as well as increasing collection and extraction efficiency from secondary sources like Cottonseed, Rice Bran, and Tree Borne Oils.

The mission aims to increase primary oilseed production from 39 million tonnes (2022-23) to 69.7 million tonnes by 2030-31. Together with NMEO-OP (Oil Palm), the Mission targets to increase domestic edible oil production to 25.45 million tonnes by 2030-31 meeting around 72% of our projected domestic requirement.

This will be achieved by promoting adoption of high-yielding high oil content seed varieties,

extending cultivation into rice fallow areas, and promoting intercropping. The Mission will harness ongoing development of high-quality seeds by using cutting-edge global technologies such as genome editing.

To ensure the timely availability of quality seeds, the Mission will introduce an Online 5-year rolling seed plan through the ‘Seed Authentication, Traceability & Holistic Inventory (SATHI)’ Portal, enabling states to establish advance tie-ups with seed-producing agencies, including cooperatives, Farmer Producer Organizations (FPOs), and government or private seed corporations. 65 new seed hubs and 50 seed storage units will be set up in public sector to improve the seed production infrastructure.

Additionally, over 600 Value Chain Clusters will be developed across 347 unique districts, covering more than 10 lakh hectares annually. These clusters will be managed by value chain partners such as FPOs, cooperatives, and public or private entities.

Farmers in these clusters will have access to high-quality seeds, training on Good Agricultural Practices (GAP), and advisory services on weather and pest management.

The Mission also seeks to expand oilseed cultivation by an additional 40 lakh hectares by targeting rice and potato fallow lands, promoting intercropping, and promoting crop diversification.

Support will be extended to FPOs, cooperatives, and industry players to establish or upgrade post-harvest units, enhancing recovery from sources such as cottonseed, rice bran, corn oil, and Tree-Borne Oils (TBOs).

Furthermore, the Mission will promote awareness of recommended dietary guidelines for edible oils through an Information, Education, and Communication (IEC) campaign.

The Mission aims to significantly enhance domestic oilseed production, advancing the goal of Atmanirbharta (self-reliance) in edible oils, thereby reducing import dependency and conserving valuable foreign exchange while boosting farmers’ incomes.

This mission will also accrue significant environmental benefits in the form of low

water usage and improved soil health and making productive use of crop fallow areas.

## NATIONAL AGRICULTURE CODE

### Why in news?

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.

### NAC:

The National Agriculture Code (NAC) is being developed by the Bureau of Indian Standards (BIS) as a comprehensive framework to standardize agricultural practices in India. Inspired by the National Building Code and National Electrical Code, the NAC will establish guidelines for the entire agricultural cycle and emerging areas like organic farming and smart agriculture.

### Why is the NAC Needed?

**Lack of Comprehensive Standards:** While BIS has set standards for machinery (tractors, harvesters) and inputs (fertilizers, pesticides), many critical aspects of agriculture, such as field preparation, irrigation, and sustainable practices, lack standardized guidelines.

**Agricultural Diversity:** India's diverse agroclimatic zones, crop types, and socio-economic conditions require a unified yet adaptable set of recommendations.

**Emerging Challenges:** The rise of natural farming, organic practices, and the integration of technology like IoT in agriculture necessitates a modern and structured approach.

**Policy Alignment:** Policymakers and regulators require a consistent framework for schemes and regulations to enhance agricultural productivity and sustainability.

**Standards for the Agriculture Cycle:** Guidelines for crop selection, land preparation, irrigation, soil and plant health management, harvesting, and post-harvest operations.

**Input Management:** Standards for fertilizers, pesticides, and weedicides, ensuring safe and optimal use.

**New Areas:** Incorporation of natural and organic farming methods, sustainability practices, traceability, and smart farming technologies.

**Documentation and Traceability:** Emphasis on record-keeping for sustainability and market requirements.

### Benefits of the NAC

**Improved Decision-Making:** Acts as a guide for farmers, universities, and officials, ensuring uniformity in practices and better outcomes.

**Enhanced Quality Culture:** Promotes a standard-driven approach in agriculture, fostering consistency across practices and processes.

**Policy and Regulation Support:** Provides a reference for integrating standards into national schemes and regulations.

**Sustainability and Innovation:** Encourages environmentally friendly practices and the integration of technology for a modernized agricultural framework.

**Economic Gains:** Helps in optimizing inputs, improving crop yield, and ensuring market-ready produce through traceability and post-harvest standards.

### What Will the NAC Cover?



# ANUSANDHAN NATIONAL RESEARCH FOUNDATION (ANRF)

## Why in news?

The newly operationalised Anusandhan National Research Foundation (ANRF) today announced the launch of first two of its initiatives-- the Prime Minister Early Career Research Grant (PMECRG) and the Mission for Advancement in High-Impact Areas -Electric Vehicle (MAHA- EV) Mission.

## MAHA-EV Mission:

It aims to develop key EV technologies to reduce import dependency, foster domestic innovation, and establish India as a global leader in the EV sector, aligning with the government’s AtmaNirbhar Bharat vision.

It also supports the government’s goal of achieving a Viksit Bharat by 2047.

## ANRF:

ANRF has been established under the Anusandhan National Research Foundation Act, 2023 to seed, grow, and foster a culture of research and innovation throughout the country.

Its operationalization commenced with the First Meeting of the Governing Board (GB) in September 2024, chaired by the Prime Minister.

The meeting focused on strategic interventions to enhance India’s global positioning in key sectors, align R&D with national priorities, promote inclusive growth, and drive scientific advancements.

**ANRF launches 1st Mission for Advancement in High-Impact Areas (MAHA)- EV Mission**

**Objectives**

- Enhance domestic R&D capabilities on Electric Vehicle (EV) components to achieve strategic advantages in EVs for self-reliance and global competitiveness
- Position India as a hub for development of EV components

**Technology Verticals for establishment of e-Nodes**

- Tropical EV Batteries & Battery Cells
- Power Electronics, Machines, and Drives (PEMD)
- Electric Vehicle Charging Infrastructure

**General Conditions**

- Applicants (Lead PI and PIs) must hold a regular academic/research position in a recognized academic institution/national laboratory/any other recognized R&D institution in India with a proven track record in the relevant domain
- Participation of relevant industry/PSU/start-ups is mandatory

**Stakeholders Meeting:**  
October 26, 2024 (11 AM onwards) at IIT-Bombay

Visit: [anrfonline.in](http://anrfonline.in)

**Timelines**

Call Opening Date: 14.10.2024

Call Closing Date: 25.11.2024

## PMECRG:

It features a flexible budget and innovative initiatives aimed at simplifying research processes, promoting high-quality work, and positioning India as a global leader in science and technology.

It emphasised on nurturing young researchers, fostering a strong culture of research and innovation across India.

## Significance:

The mission will enhance domestic capabilities in the design and development of essential EV components.

It will strengthen competitiveness and position India as a hub for EV component development, driving global competitiveness and innovation.

By accelerating the shift towards electric mobility, it will contribute to a greener and sustainable future.

# WITH MALDIVES FACING A FOREX CRUNCH, INDIA GIVES \$750-MN CURRENCY SWAP ARRANGEMENT

## Context:

India signed a major currency swap agreement

with the Maldives for \$750 million to help the island nation tide over its current foreign

currency crunch, after Prime Minister Narendra Modi met with Maldivian President Mohamed Muizzu in New Delhi.

### Details:

India is set to extend financial assistance to the Maldives, offering \$400 million through the US Dollar/Euro Swap Window.

Additionally, ₹30 billion (about \$357 million) will be provided under the INR Swap Window.

The arrangement was signed between the Reserve Bank of India and the Maldives Monetary Authority under the SAARC Currency Swap Framework and is available until 2027.

### What is currency swap?

Currency swaps are agreements between two parties to exchange one currency for another at a preset rate over a given period.

The main purpose of currency swaps is to avoid turbulence and other risks in the foreign exchange market and exchange rate.

### SAARC Currency Swap Framework:

The SAARC Currency Swap Framework was established to provide short-term liquidity support to SAARC member countries.

The primary purpose of this facility is to address balance of payment crises and enhance financial stability among member nations.

Launched in 2012 and administered by the Reserve Bank of India (RBI), the facility includes all SAARC members.

This framework allows member countries to access swap arrangements in US Dollars, Euros, or Indian Rupees, depending on their needs. The framework provides certain concessions for swaps in Indian rupee.

### Other agreements:

Launch of the RuPay card in the Maldives.

Handover of 700 houses built with Indian assistance.

Agreement to enhance cooperation on trade using national currencies.

Plans to negotiate a Free Trade Agreement.

### Maritime and Economic Security:

A vision statement was released for a comprehensive economic and maritime security partnership.

Jointly constructed runway for the Hanimaadhoo international airport inaugurated.

## THE CASE FOR LEGALISING MSP

### Why in news?

The Cabinet Committee on Economic Affairs (CCEA) on Wednesday increased the Minimum Support Price for rabi crops for the next marketing season of 2025-26 with the MSP for wheat going up by ₹150 per quintal.

### Minimum Support Price (MSP):

The MSP regime was established in 1965 by setting up the Agricultural Prices Commission (APC) as a form of market intervention to enhance national food security and protect farmers from significant decline in market prices.

### MSP Calculation:

The Commission for Agricultural Costs & Prices (CACP) calculates three types of production costs for every crop, both at the state and all-India average levels.

**A2:** Covers all paid-out costs directly incurred by the farmer in cash and kind on seeds, fertilisers, pesticides, hired labour, leased-in land, fuel, irrigation, etc.

**A2+FL:** Includes an estimated value of unpaid family labour with A2.

**C2:** A comprehensive cost, which is A2+FL cost plus imputed rental value of owned land plus interest on fixed capital, rent paid for leased-in land.

The government maintains that the MSP was fixed at a level of at least 1.5 times the all-India weighted average Cost of Production (CoP), but it calculates this cost as 1.5 times the A2+FL cost.

### How can Legalising MSP help Indian Agriculture?

**Income Security for Farmers:** By providing a legally guaranteed MSP, farmers would have a safety net against price fluctuations, ensuring they receive a minimum price for their crops.

This could help stabilize their income, reduce the risk of financial distress, and potentially lower the debt burden on farmers.

The average monthly income of agricultural households is around ₹10,695, which is often insufficient for a dignified life.

Additionally, on average, 30 farmers die by suicide each day.

**Boost to Rural Economy:** Improved price realization from both government procurement and private sector transactions could enhance the purchasing power of rural communities, stimulating economic activity in these areas.

**Extending FRP Model and Direct Compensation:** Currently, private mills are mandated to procure sugarcane

at or above the Fair and Remunerative Price (FRP) set by the Cabinet Committee on Economic Affairs (CCEA).

This model could be extended to other MSP-covered crops. Furthermore, farmers should receive direct compensation if they are forced to sell below MSP, reimbursing them for the price difference.

**Legal Mandate for Private Crop Purchases:** Private players should be legally mandated to purchase crops at or above MSP, with rigorous monitoring systems in place and penalties for any violations. This would ensure that farmers are not solely reliant on government procurement agencies for crop purchases.

**Encouragement for Investment:** With assured returns, farmers might be more inclined to invest in better farming techniques, equipment, and inputs, potentially leading to increased productivity and agricultural growth.

**Corporate-Centric Approach:** When there is a conflict between consumer prices and farmer compensation, governments tend to favour the interests of profit-making corporations involved in agri-produce processing.

### Challenges Related to Farming and Legalising the MSP in India:

**Budgetary Concerns:** There

is a growing argument against legalising MSP, claiming that creating legal provisions is practically impossible. The combined value of all crops covered under MSP may exceed ₹11-lakh crore, while India's total budgeted expenditure in 2023-24 was around ₹45-lakh crore.

Thus, it appears unrealistic for the government to allocate such a large portion of the budget solely for purchasing crops from farmers. Moreover, farmers retain around 25% of their produce for personal and livestock use, further complicating the feasibility of legalising MSP.

**Complexity in Implementation:** Creating legal provisions for MSP is deemed challenging due to the vast array of crops and the diverse agricultural landscape in India. Ensuring compliance and fair implementation across the country poses logistical and administrative challenges.

## Market Demand Mismatch in Agriculture:

Lack of effective mechanisms for farmers to anticipate market demand and adjust their planting accordingly. Farmers often face price volatility and uncertainty because their planting decisions are not aligned with actual market demand. This disconnect leads to situations where high production levels result in oversupply and subsequent price drops, impacting farmer incomes negatively.

**Impact on Market Dynamics:** Critics argue that MSP, if not implemented carefully, could distort market dynamics and inhibit the efficiency of agricultural markets. This includes concerns about disincentivising private investment and innovation in agriculture.

For example, MSP has led

to a decline in the cultivation of crops other than wheat and rice because the government predominantly procures these two crops in large quantities for Public Distribution System (PDS) distribution.

**Limitations of APMC Law:** The Agricultural Produce Market Committee (APMC) Act prohibits farmers from selling their produce in any mandi other than their designated one. This makes farmers vulnerable to middlemen and vested interests. They are exposed to global prices but are not provided with access to cost-efficient technologies and information systems. This places them at a disadvantage with farmers from other countries.

Just 15% of the APMC markets have cold storage facilities. Weighing facilities are available in only 49% of the markets.

## CURRENT SCENARIO OF FERTILIZER IMPORTS

### Why in the News?

India is currently grappling with significant challenges in meeting its fertilizer demands due to dependency on imports, especially amidst the ongoing Ukraine and Gaza crises, which could further impact fertilizer availability and prices.

### About Fertilizers

A fertilizer is a chemical product either mined or manufactured material

containing one or more essential plant nutrients that are immediately or potentially available in sufficiently good amounts.

Fertilizers have played an essential role in agricultural production, providing vital nutrients for crops, increasing demands over the years.

### Macro & Micro Elements in Fertilizers

Macro Nutrients: Nitrogen

(N), Phosphorus (P), Potash (K), Calcium, Sulfur (S), and Magnesium are known as macro-nutrients (required in comparatively larger amounts).

Micro Nutrients: Iron (Fe), Zinc (Zn), Copper, Boron, Manganese Molybdenum, Chloride, and others are the micro-nutrients (required in a smaller quantity) for the growth and development of crop plants.

Among the various types, NPK (nitrogen, phosphorus,

and potassium) fertilizers are the most common ones, and Urea stands as the most highly consumed fertilizer in India.

*India is the second-largest consumer of fertilizers globally, with an annual consumption of more than 55.0 million metric ton.*

## Current Fertilizer Import Scenario

India's domestic fertilizer production does not meet its full demand, creating a dependency on imports. As per the 2023 Standing Committee of Parliament report:

Urea: 20% of the domestic requirement is imported.

Diammonium Phosphate (DAP): 50-60% of the demand is met through imports.

Muriate of Potash (MOP): 100% dependency on imports.

The report stresses a need for self-reliance in fertilizer production to stabilize supplies.

## Production and Consumption Trends

India's annual fertilizer consumption in 2021-22 was 579.67 lakh metric tonnes (LMT), with:

Urea: 341.73 LMT

DAP: 92.64 LMT

MOP: 23.93 LMT

N P K (Nitrogen, Phosphorus, and Potassium): 121.37 LMT

Domestic production for the year totalled 435.95 LMT, leaving a shortfall of 143.72 LMT. Notably, MOP is entirely imported due to the lack of local production.

## Impact of the Ukraine and Gaza Conflicts

Nicholas Sitko, Senior Economist at the Food and Agriculture Organization (FAO), highlighted potential volatility in fertilizer prices due to the Ukraine and Gaza conflicts. This unrest could:

Affect oil prices, impacting petroleum-based fertilizer production.

Disrupt imports from Russia and West Asia, two significant suppliers for India's fertilizer imports.

## Strategic Initiatives for Self-Reliance

Experts recommend increasing India's production capacity and reducing reliance on imports:

**New Urea Plants:** Since the 2012 investment policy, six new urea plants have been established, adding 76.2 LMT to India's production capacity. Currently, 36 urea plants operate, with recent additions

like Ramgundam, Gorakhpur, Sindri, and Barauni facilities.

Shift to Sustainable Fertilizers: Emphasis on nano urea and natural farming could reduce chemical fertilizer usage and dependency.

Investment in Domestic Production: The Standing Committee suggests fostering a favorable environment for investments from public, cooperative, and private sectors in fertilizer manufacturing.

## Policy Recommendations and Future Outlook

Increasing incentives for fertilizer manufacturing within India.

Encouraging use of nano urea and shifting focus to organic and sustainable farming practices.

Investing in infrastructure to better utilize existing fertilizers efficiently.

By expanding production capacities and promoting sustainable agricultural practices, India could gradually reduce its dependency on imported fertilizers, stabilizing the domestic market and insulating it from global disruptions.

# GEOGRAPHY,

# ENVIRONMENT,

# BIODIVERSITY AND

# DISASTER MANAGEMENT

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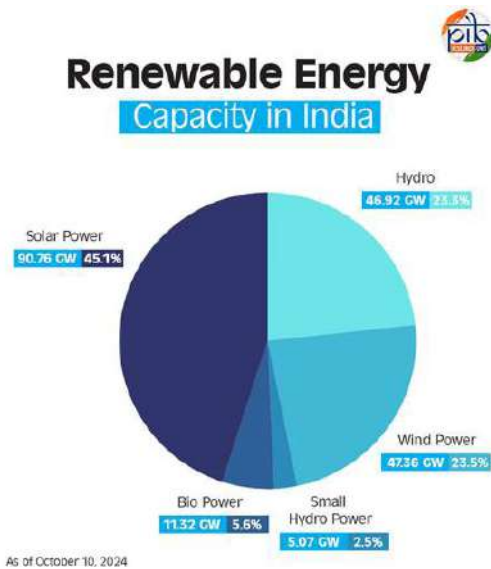
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# INDIA'S RENEWABLE ENERGY CAPACITY HITS 200 GW MILESTONE

## Context:

India has reached a significant milestone in its renewable energy journey, with the country's total renewable energy capacity crossing the 200 GW (gigawatt) mark as of October 10, 2024.

renewable energy-based electricity generation capacity stands at 201.45 GW, accounting for 46.3 percent of the country's total installed capacity. This marks a major shift in India's energy landscape, reflecting the country's growing reliance on cleaner, non-fossil fuel-based energy sources.



## Leading States in Renewable Energy Capacity

Several states in India have emerged as leaders in renewable energy capacity, contributing significantly to the nation's progress. Rajasthan tops the list with an impressive 29.98 GW of installed renewable energy capacity, benefiting from its vast land and abundant sunlight.

Following closely is Gujarat, which boasts a capacity of 29.52 GW, driven by its strong focus on solar and wind energy projects.

Tamil Nadu ranks third with 23.70 GW, leveraging its favourable wind patterns to generate substantial energy.

Karnataka rounds out the top four with a capacity of 22.37 GW, supported by a mix of solar and wind initiatives. Together, these states play a crucial role in advancing India's renewable energy goals and establishing a more sustainable energy future.

## Overview of India's Renewable Energy Landscape

India's total electricity generation capacity has reached 452.69 GW, with renewable energy contributing a significant portion of the overall power mix. As of October 2024,

# HORSESHOE CRABS

## Context:

Horseshoe crabs have been around for millions of years, but their habitats are increasingly being degraded. While scientists have now begun tagging them to track their movements and study them better on the beaches they come to nest on

green color when exposed to the air. The blood is blue because it contains a copper-based respiratory pigment called hemocyanin.

As fossils show, it has survived 445 million years without undergoing any morphological change.

It belongs to a class called Merostomata, living fossils, or those organisms that haven't changed in millennia.

## Key facts related to Horseshoe crabs:

A horseshoe crab's blood has a blue to blue-

IUCN Category– Data deficient

Listing of the crab in the Schedule IV of the Wildlife (Protection) Act, 1972.

Distribution - There are four species of horseshoe crab: the mangrove (*Carcinoscorpiusrotundicauda*), which inhabits the coastal waters of South and Southeast Asia; the Atlantic or American (*Limulus polyphemus*), found along the

Atlantic coast of the United States and the southeastern Gulf of Mexico; the coastal (*Tachypleusgigas*), also native to South and Southeast Asia; and the tri-spine (*Tachypleustridentatus*), found in Southeast and East Asia. India is fortunate to have two species: *Carcinoscorpiusrotundicauda* and *Tachypleusgigas*, both found along the Odisha coast.

## WHAT IS WAYANAD'S NEW X-BAND RADAR?

### Context:

After devastating floods and landslides killed more than 200 people in Kerala's Wayanad district in July 2024, the Union Ministry of Earth Sciences approved an X-band radar to be installed in the district. A torrential downpour triggered the landslide in the valley above Punchirimattom, near the Mundakkai region; its effects were compounded by a massive debris flow triggered by the rains.

### How do radars work?

Radar is short for 'radio detection and ranging'. The device uses radio waves to determine the distance, velocity, and physical characteristics of objects around the device.

A transmitter emits a signal aimed at an object whose characteristics are to be ascertained (in meteorology, this could be a cloud). A part of the emitted signal is echoed by the object back to the device, where a receiver tracks and analyses it.

Weather radar, also known as a Doppler radar, is a common application of this device. The Doppler Effect is the change in frequency of sound waves as their source moves towards and away from a listener.

In meteorology, Doppler radars can reveal how fast a cloud is moving and in which direction based on how the cloud's relative motion changes the frequency of the radiation striking it.

Pulse-Doppler radar can measure the

intensity of, say, rainfall by emitting radiation in pulses and tracking how often they're reflected to the receiver.

This way, modern Doppler radars can monitor weather conditions and anticipate new wind patterns, the formation of storms, etc.

### What is X-band radar?

Doppler radar relies on Rayleigh scattering, when the scatterer is much smaller than the wavelength of the radiation.

Radar trying to 'see' smaller particles like rain droplets or fog will need to use radiation of lower wavelengths, like in the X-band.

X-band radar is radar that emits radiation in the X-band of the electromagnetic spectrum: 8-12 GHz, corresponding to wavelengths of around 2-4 cm (this is in the microwave part of the spectrum.)

The smaller wavelengths allow the radar to produce images of higher resolution. However, the greater the frequency of some radiation, the faster it will be attenuated. So X-band radars have a relatively shorter range.

In Wayanad, the new radar is expected to be able to monitor the movements of particles, such as soil, to inform landslide warnings. The device will also perform high temporal sampling, that is, rapidly sample its environs, allowing it to spot particle movements happening in shorter spans of time.



## How many types of radar does India have?

The India Meteorological Department (IMD) started using radar for weather applications in the early 1950s. The first indigenously designed and manufactured X-band storm detection radar was installed in 1970 in New Delhi. In 1996, IMD replaced 10 outdated X-band radars with digital X-band radars.

In its X-band radar network, India has both wind-finding and storm-detecting radars, and some with dual capabilities.

The country also uses S-band radars (2-4 GHz) for long-range detection. The first S-band cyclone detection radar was installed in Visakhapatnam in 1970 and the first locally made variant was commissioned in Mumbai in 1980.

In September 2024, the Ministry of Earth Sciences said India is set to have 56 additional Doppler radars in a few years. On September 11, the Union Cabinet cleared the ₹2,000-crore ‘Mission Mausam’ to upgrade meteorological infrastructure in the country. This includes installing up to 60 meteorological radars until 2026 under the Mission’s first phase.

Minister of State for Earth Sciences JitendraPradhan said in August in Parliament that the government has started the process to procure and install 10 X-band Doppler radars to improve weather forecasting in the northeast States and in Himachal Pradesh’s Lahaul and Spiti district.

The initiative to install an X-band radar in Wayanad included installing a C-band radar (4-8 GHz) with an observational range of 250 km in Mangaluru.

## What is NISAR?

NASA and the Indian Space Research Organisation (ISRO) are currently developing a satellite called NISAR, short for ‘NASA-ISRO Synthetic Aperture Radar’. It will use radar imaging to produce a high-resolution map of the earth’s landmasses.

Its payload consists of an L-band radar (1.25 GHz, 24 cm) built by NASA and an S-band radar (3.2 GHz, 9.3 cm) built by ISRO. Together they will track and record changes in the earth’s various natural processes.

It is currently expected to be launched onboard an ISRO GSLV Mk II rocket in 2025, at a total cost of \$1.5 billion, the bulk of it borne by NASA.

# ATMOSPHERIC RIVERS

## Context:

Atmospheric rivers are shifting poleward, reshaping global weather patterns

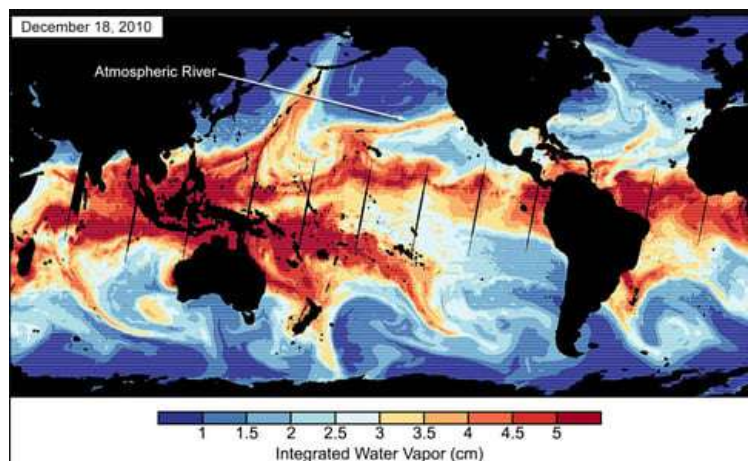
## About Atmospheric Rivers:

Atmospheric rivers are long, concentrated regions in the atmosphere that transport moist air from the tropics to higher latitudes.

They are responsible for 90 percent of the movement of moisture from the tropics toward the poles.

They are the largest transport mechanisms of freshwater on Earth.

They form when large-scale weather patterns align to create narrow channels, or filaments, of intense moisture transport.



Ten or more atmospheric rivers can be happening at once across the globe.

A well-known and strong one is the Pineapple Express, with moisture transported from the tropical Pacific around Hawaii to the US and Canadian West Coasts.

### Features:

Typically, 250 to 375 miles wide, atmospheric rivers can stretch more than a thousand miles long.

They are more frequent on the East Coast than they are on the West Coast.

They primarily occur during the winter of the respective hemisphere, when extratropical cyclones are most prevalent.

The average atmospheric river carries an amount of water vapor roughly equivalent to the average flow of water at the mouth

of the Mississippi River (second-longest river in North America).

When atmospheric rivers run up against mountains or run into local atmospheric dynamics and are forced to ascend, the moisture they carry cools and condenses, so they can produce intense rainfall or snowfall.

While they are an incredibly important source of rainfall, they can also bring flashflooding, mudslides, and landslides, sometimes killing people and destroying property.

When atmospheric rivers pass over land, they can cause conditions similar to those of hurricanes with intense and rapid rainfall, cyclone-force winds, and significantly increased wave heights.

## COMPANY USES MINING DUST TO ENHANCE CARBON CAPTURE

### Context:

Recently, Alt Carbon, a Darjeeling-based company is transporting basalt dust from Jharkhand and using it as an organic fertiliser to enrich soil and accelerate carbon sequestration. It has used about 500 tonnes of dust.

### Process:

Crushed basalt, a type of volcanic rock, is spread over land to increase surface area, accelerating natural weathering processes.

Atmospheric CO<sub>2</sub> reacts with minerals in the basalt, forming bicarbonates that are washed into oceans where carbon is stored for long periods.

This speeds up the natural carbon capture process, which normally takes thousands of years, making it efficient in 2-4 years.

### Location:

Basalt-rich regions like the Deccan Traps in Maharashtra and Gujarat, as well as Jharkhand and West Bengal (Rajmahal Traps), are ideal for sourcing the basalt rock.

### Environmental Benefit:

Apart from capturing carbon, basalt also acts as a soil enhancer, improving fertility and benefiting agricultural productivity.

### Scale:

For every 3-4 tonnes of basalt dust, 1 tonne of CO<sub>2</sub> can be sequestered over a few years.

### Usage in Carbon Credits:

Companies can purchase carbon credits generated from this process to offset their emissions voluntarily.

# CONNECTIONS ESTABLISHED BETWEEN VOLCANIC ERUPTION & IONOSPHERIC DISTURBANCES

## Context:

A recent study by Indian Institute of Geomagnetism establishes the role of volcanism in shaping space weather.

## Key findings of the study

**Ionospheric Disturbance:** Volcanic eruptions produce strong atmospheric gravity waves triggering formation of Equatorial Plasma Bubbles (EPBs).

EPBs, normally observed in the equatorial ionosphere, are depletions in ionospheric plasma density formed during post-sunset hours.

**Impacts Satellite Communication and Navigation Systems:** Generated EPBs can impact satellite communication and satellite-based technologies.

## Volcanism and its Impacts

A volcano is an opening in Earth's crust through which lava, ash, and gases erupt. Recent incidents include Mount Ruang (Indonesia, 2024), Whakaari/White

Island (New Zealand, 2024), etc.

## Positive Impacts of Volcanic activities

Short periods of cooling Earth's atmosphere: Particles from volcanoes can cause temporary cooling by shading incoming solar radiation

Source of geothermal energy: can provide free electricity for locals

Improvement in soil fertility by ejected volcanic ash

Provides Mining opportunities as magma brings valuable minerals to the surface.

Others: Tourism potential; ash acts as soil fertilizer, etc.

Negative Consequences of Volcanic activity

Impact on Climate: With the release of dust, ash, and other gases into the atmosphere.

Lead to disasters such as Tsunami (E.g. Tonga eruptions (2022))

Others: Leads to damage of lives, property, habitat, and landscapes

# WHY INDIA IS BUILDING A CLOUD CHAMBER AS PART OF MISSION MAUSAM

## Context:

Mission Mausam, launched by the Indian government, aims to enhance weather forecasting and actively manage weather events, including modifying rainfall, hail, fog, and potentially lightning strikes.

A key focus of the mission is cloud physics research, crucial for effective weather modification. To support this effort, India is setting up its first cloud chamber at the Indian Institute of Tropical Meteorology (IITM), Pune, to advance research in this field.

## What is Mission Mausam?

### About

In September 2023, India launched Mission Mausam to improve weather understanding and forecasting.

This will be done through expanded observation networks, better modeling and advanced tools like AI and machine learning.

### Nodal Ministry

Ministry of Earth Sciences (MoES)

### Objective

Improving Weather Prediction Accuracy:

By utilizing advanced technologies, Mission Mausam aims to provide highly accurate and timely weather and climate forecasts.

**Strengthening Climate Resilience:** The mission will equip various stakeholders, including citizens and last-mile users, to better tackle extreme weather events and the impacts of climate change.

**Broadening Capacity in Weather Sciences:** Through research and development, the mission will strengthen India's capability in atmospheric sciences, including weather modelling, forecasting, and surveillance.

#### **Focus area**

**Monsoon Forecasts:** Enhanced predictions for the monsoon season, critical for agriculture and water management.

**Air Quality Alerts:** Providing accurate air quality forecasts to help manage pollution.

**Extreme Weather Events:** Timely alerts for cyclones, floods, and other extreme weather conditions.

**Weather Interventions:** Techniques for managing fog, hail, and rain to minimize disruptions in daily life and business activities.

#### **Implementing Institutions**

**India Meteorological Department (IMD):** Responsible for daily weather forecasts and warnings.

**Indian Institute of Tropical Meteorology (IITM):** Engaged in tropical weather and climate research.

**National Centre for Medium-Range Weather Forecasting (NCMRWF):** Specializes in medium-range weather forecasting.

These institutions will be supported by other MoES bodies such as the Indian National Centre for Ocean Information Services (INCOIS), National Centre for Polar and Ocean Research (NCPOR), and National Institute of Ocean Technology (NIOT).

## **Why is India building a cloud chamber under Mission Mausam?**

### **About**

India's upcoming cloud chamber at IITM Pune will be a unique facility designed to study Indian monsoon clouds.

Resembling a closed cylindrical drum, it will simulate conditions for cloud formation by injecting water vapor, aerosols, and maintaining specific humidity and temperature.

Unlike basic cloud chambers in other countries, India's facility will include convection properties, crucial for monsoon research.

This advanced setup will allow scientists to study seed particles forming cloud droplets or ice particles. Globally, only a few such convective cloud chambers exist.

## **Why is India building a convective cloud chamber?**

Cloud physics involves studying cloud behavior, including interactions between particles, the formation of rain droplets and ice, and the impact of added atmospheric moisture from cyclones or low-pressure systems.

Establishing a convective cloud chamber aims to enhance understanding of these processes under conditions specific to Indian weather.

The controlled environment will enable them to manipulate parameters like temperature, humidity, and convection to better understand monsoon cloud behavior.

This knowledge will support strategic planning for weather modification efforts.

## **India's experience with cloud seeding**

The Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) was a decade-long program

conducted in four phases, focusing on cloud seeding to enhance rainfall.

In the final phase (2016-2018), experiments were conducted in the rain-shadow regions of Solapur, Maharashtra.

Results showed that, under suitable conditions, cloud seeding could increase

rainfall by up to 46% in certain locations and by about 18% in a 100 sq. km area downwind of the seeding site.

Despite these positive findings, it is acknowledged that cloud seeding is not a complete solution to rainfall issues.

## GLOBAL WILDLIFE NUMBERS DECLINED 73% SINCE 1970, SAYS WWF

### Context:

The latest report by the Worldwide Fund (WWF) for Nature highlights a severe decline in global wildlife populations.

### Findings of the report

From 1970 to 2020, the average size of monitored wildlife populations has decreased by 73%. In the 2022 report, the recorded decline was 69%, indicating an ongoing trend of population loss.

The report emphasizes that addressing the dual crises of climate change and nature loss requires urgent, coordinated action over the next five years. Data compiled by the Zoological Society of London (ZSL) included 35,000 population trends across 5,495 species, covering the years 1970 to 2020.

**Ecosystems at Risk:** The report showed that freshwater Ecosystems has witnessed the sharpest decline at 85%, with freshwater habitats experiencing significant losses. It also showed a 69% decline, reflecting extensive impacts on land-based wildlife. It declined by 56%, highlighting issues within ocean and coastal habitats.

**Key Drivers of Decline:** Habitat Loss and Degradation are predominantly caused by agriculture and food consumption practices worldwide. Other Threats include over-exploitation, invasive species, and diseases are also contributing to the rapid decline of wildlife populations.

**Implications for Global Ecosystems:** The declining wildlife populations serve as a critical indicator of escalating extinction risks and potential ecosystem degradation.

## SLAG'S ROLE IN CARBON CAPTURE AND ENVIRONMENTAL MANAGEMENT

### Why in news?

When lithified slag breaks down, it stores greenhouse gases like carbon dioxide through a process called mineral carbonation.

### Slag:

Slag, a by-product of steelmaking, has become a significant part of artificial ground, contributing to sedimentary deposits and impacting the environment. Its role in the

Anthropocene is increasingly studied for its dual potential: environmental harm and carbon dioxide (CO<sub>2</sub>) sequestration.

### Formation and Environmental Impact

Slag undergoes lithification, where industrial waste hardens into sedimentary rock.

This process can:

Release toxic metals like chromium and vanadium during weathering, contaminating

soil, water, and air.

Neutralize acidity due to its chemical stability, reducing environmental harm.

### Carbon Capture Potential

Lithified slag facilitates mineral carbonation, a natural weathering process where CO<sub>2</sub> reacts with calcium and other minerals in slag to form stable carbonates like calcite.

This mechanism is significant for:

Reducing atmospheric CO<sub>2</sub>.

Limiting the carbon footprint of the steelmaking industry.

This opportunity gains significance in light of projections suggesting a 10.5% rise worldwide in slag production by 2031. While the steelmaking industry is under pressure to lower its emissions — including

with processes that mitigate slag production — reusing slag to sequester carbon could reduce the industry's carbon footprint.

### Mechanisms of Carbon Sequestration

#### *Calcite Cement Precipitation:*

Dominates in areas exposed to rain and air above the waterline.

Calcium released from slag reacts with atmospheric CO<sub>2</sub> to form calcite.

#### *Calcium-Silicate-Hydrate (CSH) Cement Formation:*

Prevails in intertidal zones exposed to seawater.

This mechanism prevents slag dissolution, reducing toxic metal release.

## KAZIRANGA EMERGES INDIA'S SECOND BUTTERFLY DIVERSITY HUB

### Why in news?

Assam's Kaziranga National Park, famous for its one-horned rhino population, has also earned the distinction of being the second butterfly diversity hub, after Namdapha National Park in Arunachal Pradesh.

### Butterfly in Kaziranga Park

Kaziranga has emerged as the butterfly diversity hub, boasting 446 species.

Among the newly recorded species are the Burmese Threering, Glassy Cerulean, Dark-bordered Hedge Blue, Andaman Yellow Banded Flat, Ferrar's Cerulean, Great Red-vein Lancer, Peacock Oakblue, Single-

lined Flash, Yellow-tailed Walking, White Palm Bob, Dark-dusted Palm Dart, Clavate Banded Demon, Pale-marked Ace, Yellow Onyx, Long-winged Hedge Blue, Ace sp, Hill Ace, and Dwarf Banded Demon.

### About Kaziranga National Park

It is a UNESCO World Heritage Site.

Location: Golaghat and Nagoan in the state of Assam



It lies between Brahmaputra River and the Karbi (Mikir) Hills.

Rivers: Brahmaputra flows along the northern boundary of the park.

Numerous Other smaller rivers and streams such as Diphlu River, Mora Diphlu River, and Mora Dhansiri River pass through the National Park.

Landscape: Sheer forest, tall elephant grass,

rugged reeds, marshes, and shallow pools.

Fauna: Many endangered and threatened species like Rhino, Tiger, Eastern swamp deer, Elephant, Buffalo, Hoolock gibbon, Capped langur, and Gangetic River dolphin

It is inhabited by the world's largest population of one-horned rhinoceroses, as well as many mammals.

## TAMIL NADU DECLARES HEATWAVE A STATE-SPECIFIC DISASTER

### Why in News?

The Tamil Nadu government recently declared a heatwave as a State-specific disaster, enabling relief measures for those affected and compensation for families of heat-related casualties.

Interim actions to manage the heat will also be implemented, with funds allocated from the State Disaster Response Fund.

### Rising Frequency of Heatwaves in India

The World Meteorological Organization declared 2023 as the hottest year on record, with rising heatwave frequency attributed to anthropogenic climate change, as noted in the IPCC's Sixth Assessment Report.

In India, heatwaves have intensified, with significant health impacts documented. A study in Environment International highlighted frequent and severe heatwaves in recent decades, such as:

1998: Severe two-week heatwave, the worst in 50 years.

1999: Unprecedented April heat, with temperatures over 40°C for more than 14 days.

2003: Heatwave causing over 3,000 deaths in Andhra Pradesh.

2010: Ahmedabad heatwave led to around

1,300 deaths.

2016, 2018, 2019, and 2023: Extreme heatwaves across India.

In May 2024, a severe heatwave struck, with Churu, Rajasthan, reaching 50.5°C, the highest in eight years.

The heatwave resulted in 219 deaths and over 25,000 cases of heatstroke, impacting people across the plains and hills.

### What are Heat waves?

A Heat Wave is a period of abnormally high temperatures, more than the normal maximum temperature.

In India, Heat waves typically occur from March to June, and in some rare cases, even extend till July.

On an average, five-six heat wave events occur every year over the northern parts of the country.

Heat wave is considered if maximum temperature of a station reaches at least 40°C or more for Plains and at least 30°C or more for Hilly regions.

Based on Departure from Normal Heat Wave: Departure from normal is 4.50°C to 6.40°C; Severe Heat Wave: Departure from normal is >6.40°C

Based on Actual Maximum Temperature Heat Wave: When actual maximum

temperature  $\geq 45^{\circ}\text{C}$ ; Severe Heat Wave:  
When actual maximum temperature  $\geq 47^{\circ}\text{C}$

### Health Impacts of Extreme Heat

Rapid rises in heat gain compromises the body's ability to regulate temperature.

It can result in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia.

Prolonged exposure to extreme heat can lead to conditions from heat exhaustion to heat stroke and exacerbates issues like renal, cardiovascular, and pulmonary diseases.

Vulnerable populations—such as children, seniors, pregnant women, and outdoor workers—face higher risks. Extreme heat also impacts early childhood development, affecting learning, sleep, and mental health.

### Wet Bulb Temperature and Heat Stress

Wet bulb temperature is the lowest temperature achievable by evaporative cooling, such as sweating, and it measures the combined effects of heat and humidity.

Beyond this threshold, the body can no longer cool itself, leading to heat stroke or death.

This is particularly concerning for humid regions like India, with its extensive coastlines.

Research indicates that a wet bulb temperature exceeding  $35^{\circ}\text{C}$  for prolonged periods poses a universal heat stress limit, making heat dissipation impossible and inducing hyperthermia.

### Recommended Government Actions

Equip health centers and hospitals with essential resources like ORS and medications.

Offer water and shelters for those working outdoors.

Adjust work hours to minimize outdoor exposure during peak heat times.

Long-term goals include addressing climate change causes and improving infrastructure to reduce vulnerability, especially in low-income communities.

## PLACES IN NEWS | LITTLE PRESPA LAKE ON ALBANIAN-GREEK BORDER SLOWLY DYING

### Context:

Little Prespa Lake, located on the Albanian-Greek border, is slowly drying up.

The lake has deteriorated into a marshy watering hole, with most of its area now transformed into swamps or dried-up land.

Little Prespa Lake faces environmental threats from climate change, characterised by rising temperatures, reduced snowfall, decreased precipitation and also diversion of the Devoll River for irrigation in the 1970s leading to significant water loss.

### About Lake Prespa:

Lake Prespa is one of the oldest tectonic lakes in Europe.

It is the highest tectonic lake on the Balkan Peninsula, located at an altitude of 853 metres.

Balkan countries are countries located on the Balkan Peninsula in southeastern Europe. It includes Albania, Bulgaria, Croatia, Greece, Moldova, North Macedonia, Romania, Serbia, Slovenia, and Bosnia and Herzegovina



It is made up of 2 lakes.

Great Prespa Lake is located on the border of Albania, Greece, and North Macedonia

Small Prespa Lake is located in Greece.

The two Prespa lakes are located between two national parks located in three different countries.

Prespa National Park is in Greece and Albania,

Galicica National Park is in the Republic of Macedonia.

The Galicica Mountains separate Lake Prespa from Lake Ohrid, one of the oldest and deepest lakes in Europe.



## PYQ on Lakes

**Q- Which one of the lakes of West Africa has become dry and turned into a desert? (2022)**

1. Lake Victoria
2. Lake Faguibine
3. Lake Oguta
4. Lake Volta

**Answer- Option B**

### EXPLANATION

**Lake Faguibine in northern Mali is dry since the 1970s.**

Q- Consider the following pairs: (2022)

Reservoirs : States

1. Ghataprabha : Telangana
2. Gandhi Sagar : Madhya Pradesh

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1. Ghataprabha : Telangana
2. Gandhi Sagar : Madhya Pradesh
3. Indira Sagar : Andhra Pradesh
4. Maithon : Chhattisgarh

How many pairs given above are not correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

**Answer- Option C**

### EXPLANATION

Please Note the question is asking for Incorrect matches.

Pair 1 is incorrect: The Ghataprabha Reservoir is situated in the Belgavi district of Karnataka. With a storage capacity of approximately 659 million cubic meters, it facilitates irrigation across an area of 1,396,000 hectares. The Ghataprabha River is a significant tributary of the River Krishna.

Pair 2 is correct: The Gandhi Sagar Dam is among the four major dams constructed on India's Chambal River, located in the Mandla and Neemuch districts of Madhya Pradesh. It is a masonry gravity dam.

Pair 3 is incorrect: The Indira Sagar Dam is indeed a multipurpose project situated on the Narmada River, specifically at Narmada Nagar in the Khandwa district of Madhya Pradesh.

Pair 4 is incorrect: The Maithon Dam is situated on the banks of the Barakar River, approximately 48 kilometers from Dhanbad, Jharkhand. It features an underground power station and is a unique infrastructure in Southeast Asia. Developed by the Damodar Valley Corporation (DVC Ltd), the dam creates a reservoir spanning 65 square kilometers.

Q- Which one of the following is an artificial lake? (2018)

- (a) Kodaikanal (Tamil Nadu)
- (b) Kolleru (Andhra Pradesh)
- (c) Nainital (Uttarakhand)
- (d) Renuka (Himachal Pradesh)

**Answer- Option A**

### EXPLANATION

Kodaikanal, situated in Tamil Nadu, boasts a manmade lake created within the city in 1863 by Sir Vere Henry Levinge, the former Collector of Madurai. Kolleru Lake, located in Andhra Pradesh, is renowned as one of India's largest freshwater lakes and holds the distinction of being Asia's largest shallow freshwater lake, positioned between the Krishna and Godavari Deltas. Nainital, nestled in Uttarakhand, features a natural freshwater lake of tectonic origin located amidst the city. Renuka Lake, the largest natural lake in Himachal Pradesh, derives its name from the goddess Renuka.



# SCIENCE & TECHNOLOGY

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## MARBURG VIRUS DISEASE (MVD)

### Context:

Six people have died in Rwanda following an outbreak of the Marburg virus, the country's health ministry said recently.

### About Marburg Virus Disease:

MVD, earlier known as Marburg hemorrhagic fever, is a rare but severe hemorrhagic fever that affects both people and non-human primates.

**Causative agent:** MVD is caused by the Marburg virus, a genetically unique zoonotic (animal-borne) RNA virus. Marburg and Ebola viruses are both members of the Filoviridae family (filovirus).

The virus takes its name from the German city of Marburg, where it was first identified in 1967 in a lab where workers had been in contact with infected green monkeys imported from Uganda.

The reservoir host of the Marburg virus is the African fruit bat, *Rousettus aegyptiacus*.

**Transmission:** The virus can be transmitted from bats to primates, including humans, and

then spread through direct contact with blood or other body fluids from infected individuals.

### Symptoms:

Initial Marburg disease signs and symptoms include Fever, Chills, Headache, Muscle aches, Rash with both flat and raised bumps, often on the torso, Chest pain, Sore throat, Nausea, vomiting, and diarrhea

As the disease advances, symptoms can become more severe, including liver failure, delirium, shock, bleeding (hemorrhaging), and multi-organ dysfunction.

**Fatality:** The average MVD case fatality rate is around 50%. Case fatality rates have varied from 24% to 88% in past outbreaks depending on virus strain and case management.

### Treatment:

There is no treatment or vaccine for Marburg disease.

Supportive therapy, such as intravenous fluids, electrolyte replacement, supplemental oxygen, as well as blood and blood products replacement, improves survival.

## WHO APPROVES FIRST MPOX DIAGNOSTIC TEST FOR EMERGENCY USE, BOOSTING GLOBAL ACCESS

### Context:

Recently, the World Health Organization (WHO) has listed the first Mpox in vitro diagnostic under its Emergency Use Listing procedure.

### About:

Mpox, also known as monkeypox, is a DNA virus. It was first identified in monkeys in 1958 but has since been found to infect humans as well.

### Transmission:

Primarily transmitted to humans from animals, particularly rodents and primates, through direct contact or through contaminated objects.

### Symptoms:

Fever, headache, muscle aches, and a characteristic rash that progresses from macules to papules to vesicles and pustules.

## Global Outbreak:

In August 2024, WHO declared the mpox outbreak a public health emergency, leading to coordinated efforts to control its spread.

## Emergency Test:

The emergency use approval of the Alinity m

MPXV assay, developed by Abbott Molecular Inc, will play a crucial role in enhancing diagnostic capacity in countries experiencing Mpox outbreaks.

Currently, 35 laboratories across India are equipped to test suspected cases of Mpox.

# KALA AZAR

## Why in news?

India is on the verge of achieving a significant milestone by seeking certification from the World Health Organization (WHO) for eliminating Kala-azar as a public health problem. The country has maintained the required criteria for elimination—less than one case per 10,000 people for two consecutive years.

## About Kala Azar:

Kala-azar, also known as visceral leishmaniasis, is the second deadliest parasitic disease after malaria in India.

The disease is caused by the protozoan parasite *Leishmania donovani*, transmitted through the bite of an infected female sandfly.

Kala Azar is a parasitic infection transmitted by sandflies. It causes fever, weight loss, spleen and liver enlargement.

It is characterized by irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anemia.

Most cases occur in Brazil, east Africa and India.

Kala-azar is a treatable and curable disease, which requires an immunocompetent system.

If left untreated, it can be fatal in 95% of cases.

## There are 3 main forms of the disease:

Visceral leishmaniasis (VL), also known as kala-azar, is fatal if left untreated in over 95% of cases. It is characterized by irregular bouts of fever, weight loss, enlargement of

the spleen and liver, and anemia. Most cases occur in Brazil, east Africa and India.

Cutaneous leishmaniasis (CL) is the most common form and causes skin lesions, mainly ulcers, on exposed parts of the body. These can leave life-long scars and cause serious disability or stigma.

Mucocutaneous leishmaniasis leads to partial or total destruction of mucous membranes of the nose, mouth and throat.

## India's Progress Towards Elimination:

To achieve WHO certification, India must maintain a rate of fewer than one case per 10,000 people for another year. This would make India the second country, after Bangladesh, to eliminate Kala-azar as a public health issue.

India's National Health Policy (2002) originally aimed to eliminate Kala-azar by 2010, but this goal has been revised multiple times to 2015, 2017, and finally 2020.

The WHO set a global target to eliminate Kala-azar by 2020, which has now been extended to 2030 due to delays.

WHO Certification Criteria: A disease is declared eliminated when a country can prove that local transmission has been interrupted for a specific time period and there are preventive measures in place to avoid a resurgence. India's elimination certification depends on maintaining less than one case per 10,000 people at the sub-district (block PHCs) level for two consecutive years.

## Vulnerable Regions:

The highest number of Kala-azar cases come from Bihar, Jharkhand, West Bengal, and parts of Uttar Pradesh.

Bihar alone accounts for 70% of the country's cases, driven by factors like poor sanitation and climate conditions, which are conducive to sandfly breeding.

## EUROPA CLIPPER

### Context:

Recently, A SpaceX Falcon Heavy rocket carrying NASA's Europa Clipper spacecraft lifted off from NASA's Kennedy Space Center in Florida.

### About Europa Clipper Mission

The Europa Clipper is NASA's largest spacecraft for planetary exploration, with an estimated mission cost of \$5.2 billion

Aims: To place a spacecraft in orbit around Jupiter to perform a detailed investigation of Europa.

### Mission Objective:

To find out if the ice-encased moon Europa could be habitable.

Europa shows strong evidence for an ocean of liquid water beneath its icy crust.

Important science instruments with spacecraft  
Plasma Instrument for Magnetic Sounding (PIMS): Measures magnetic fields to detect the ocean's properties.

Mapping Imaging Spectrometer for Europa (MISE): Identifies surface composition.

Europa Imaging System (EIS): Captures high-resolution images.

Radar for Europa Assessment and Sounding Ocean to Near-surface (REASON): Probes beneath the ice to study the subsurface structure.

Europa Clipper Magnetometer :Analyses Europa's magnetic environment

Power Source: Spacecraft has large solar arrays to collect enough light for its power needs as it operates in the Jupiter system.

### About Europa

Europa is a moon of Jupiter that's considered one of the most promising places in our solar system to search for life beyond Earth.

Size: Slightly smaller than Earth's moon and its diameter is about one-quarter that of the Earth.

Potential for Primitive Life: Scientists believe Europa could potentially harbour microbial life near thermal vents at the ocean floor, similar to life forms found in Earth's deep oceans.

## INDIA HAS ELIMINATED TRACHOMA, SAYS WHO

### Context:

World Health Organization (WHO) has declared that the Government of India has eliminated Trachoma as a public health problem. With this, India has become the third country in the South-East Asia Region to achieve this milestone.

### What is Trachoma?

#### About

Trachoma is the leading infectious cause of blindness globally.

It caused by Chlamydia trachomatis, and is spread by direct or indirect contact with eye or nose discharges, especially in young children.

In endemic areas, up to 90% of preschool-aged children can be affected, with infection declining with age.

## Symptoms

Repeated infections over time can lead to scarring inside the eyelid, causing the eyelashes to rub against the eye (trachomatoustrichiasis), which leads to pain, corneal scarring, and ultimately blindness.

Women are at higher risk due to frequent contact with infected children.

## Transmission factors and prevalence

Transmission factors include inadequate hygiene, crowded living conditions, and limited access to clean water and sanitation.

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.

It remains prevalent in rural areas of Africa, Asia, Central and South America, and the Middle East, with Africa being the worst affected.

## Efforts to eliminate trachoma

Global efforts to eliminate trachoma are driven by WHO's SAFE strategy, which includes:

Surgery for trichiasis,

Antibiotics like azithromycin for mass treatment,

Facial cleanliness, and

Environmental improvements, such as better water and sanitation access.

WHO adopted the SAFE strategy in 1993 and launched the WHO Alliance for Global Elimination of Trachoma in 1996.

The World Health Assembly has set 2030 as the new target date for eliminating trachoma as a public health issue globally.

By October 2024, 20 countries had eliminated

trachoma as a public health problem.

Economic losses from blindness and visual impairment due to trachoma are estimated at \$2.9–5.3 billion annually.

## Why was trachoma such a challenge in India?

### *High Prevalence in Specific States*

Trachoma posed a significant challenge in India as it frequently resurfaced in new communities.

It was a leading cause of blindness in hyper-endemic regions like Punjab, Rajasthan, Western Uttar Pradesh, and Garhwal (Uttarakhand) between 1971 and 1974, where the prevalence exceeded 50%.

These areas were heavily impacted by the disease, making control efforts difficult.

### *Reduction in Trachoma Prevalence*

By 2005, trachoma accounted for only 4% of blindness cases in India.

A survey conducted in 2006-2007 indicated a significant decline in prevalence, prompting the Indian government to conduct a rapid assessment in hyper-endemic states.

## How did Indian govt address the issue of Trachoma?

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.

Programs like Swachh Bharat Mission and JalJeevan Mission played a vital role in eradicating the disease and ensuring a trachoma-free future.

### **Validation and Elimination**

The National Trachomatous Trichiasis (TT only) Survey was conducted from 2021 to 2024 across 200 endemic districts as part of the NPCBVI, following WHO's guidelines for trachoma elimination.

The NPCBVI team compiled all findings into a dossier, which was submitted to the WHO for final review.

After years of dedicated efforts, WHO officially declared that India had successfully eliminated trachoma as a public health problem.

### **What does WHO declaring India trachoma-free mean?**

WHO declaring India trachoma-free signifies a major public health achievement, marking an improvement in the country's water, sanitation, and hygiene standards.

According to experts, trachoma is often linked to poor sanitation, a common issue in developing countries.

With its elimination, India has reached "gold-tier" public health status, demonstrating significant progress in addressing these challenges and enhancing overall health conditions.

## CANDY LEAF

### **Why in news?**

Researchers from the Institute of Advanced Study in Science and Technology (IASST), Guwahati explored Stevia's medicinal properties. This study integrates network pharmacology with laboratory techniques (in vitro and in vivo) to uncover Stevia's effects on cellular signaling.

### **About the Stevia (Stevia rebaudiana)**

Stevia (*Stevia rebaudiana*) which is commonly known for its non-caloric sweetening qualities, also possesses therapeutic properties, according to new research.

It has potential benefits for managing endocrine, metabolic, immune, and cardiovascular diseases by influencing cellular signaling pathways.

**Impact on Cellular Signaling Pathways:** Stevia was found to inhibit phosphorylation of Protein Kinase C (PKC), a key cellular signaling pathway involved in inflammatory, autoimmune, endocrine, and cardiovascular diseases. By suppressing PKC phosphorylation,

Stevia influences downstream pathways that trigger inflammation, a root cause of various health issues.

**Potential for Treating Multiple Diseases:** The research highlights Stevia's potential to treat a range of conditions, including:

Endocrine and metabolic disorders like diabetes (type 1, type 2, and pre-diabetes).

Autoimmune diseases like rheumatoid arthritis

Cardiovascular diseases, such as hypertension and vasculopathy.

Chronic inflammation-related conditions, including chronic kidney diseases.

**Key Molecular Interaction:** Active molecules in Stevia interact strongly with AMP-activated protein kinase (AMPK), a key regulator of energy balance and inflammation. This suggests a need for further research to fully explore its therapeutic potential.

**Economic and Agricultural Impact:** Assam has emerged as a key exporter of Stevia, with



cultivation recognized by the North Eastern Council as a potential driver of economic

growth in northeast India due to global demand.

## SATELLITE COMMUNICATION AND NEW TELECOMMUNICATION ACT OF INDIA

### Why in news?

Allocating satellite spectrum- With India snubbing Reliance Jio's proposal to auction airwaves for satellite communication and favouring administrative allocation instead, the move is being seen as a big win for some of the company's biggest rivals, particularly billionaire Elon Musk's Starlink.

### Satellite Communication

Satellite communication uses orbiting satellites to provide connectivity to users on the ground, serving as an alternative to terrestrial networks like cable and fiber.

Benefits include wider coverage (reaching remote areas) and network resilience, making it useful in rural or disaster-prone regions.

While satellite services have higher latency than terrestrial networks, they require minimal physical infrastructure and are less vulnerable to damage from natural disasters.

Unlike terrestrial spectrum which is used for mobile communications, satellite spectrum has no national territorial limits and is international in character.

It is therefore coordinated and managed by the

UN agency, International Telecommunications Union (ITU).

India's satellite communication market, valued at \$2.3 billion annually, is projected to grow to \$20 billion by 2028. The country ranks fourth in terms of investments in the sector, globally.

### Telecommunication Act of India, 2023

The Act includes satellite communication spectrum in the list for administrative allocation, aligning with global norms.

Administrative allocation recognizes the non-exclusive, international nature of satellite spectrum, unlike terrestrial spectrum, which is exclusive to specific operators.

The International Telecommunication Union (ITU) manages satellite spectrum globally, coordinating usage across borders.

Auctions for satellite spectrum, attempted by countries like the US and Brazil, have been deemed infeasible due to technical challenges. These countries reverted to administrative assignment.

## INDIA'S FOURTH NUCLEAR SUBMARINE LAUNCHED

### Why in news?

India's fourth nuclear-powered ballistic missile submarine (SSBN), referred to as S4\*, was launched into water at the Ship Building Centre in Visakhapatnam last week, official sources confirmed. This submarine is bigger and more capable than the first, INS Arihant (S2).

The other three nuclear-powered ballistic missile submarines are INS Arihant, INS Arighaat and INS Aridhaman.

### About:

It has about 75% indigenous content and is equipped with Kalam-4 nuclear ballistic missiles with a range of 3,500 km, launched via vertical systems.

A nuclear-powered attack submarine of the Russian Akula class is set to join the force on lease in 2028.

INS Chakra, an Akula class vessel, was taken on lease from Russia in 2012.

The government plans the construction of

three more advanced diesel attack submarines at Mazagon Dockyards in collaboration with the French Naval Group.

A nuclear submarine uses a nuclear reactor for propulsion, providing unlimited range and endurance. It is limited only by food supplies, crew fatigue, and maintenance.

# AI-GENERATED MEDICAL IMAGES- DOWNSIDE RISKS OF AI IN MEDICINE

These are synthetic medical images created entirely by AI algorithms (e.g., GANs, VAEs, diffusion models) without using actual patient data or traditional imaging devices like MRIs or CT scans.

## How are these images created?

A variational autoencoder (VAE) takes an image, compresses it into a simpler form called the latent space, and then tries to recreate the original image from that compressed version. The process continuously improves the image by minimising the difference between the real image and the recreated version.

GANs involve a generator that creates synthetic images from random data and a discriminator that determines whether the image is real or synthetic. Both improve through competition—the generator tries to make its images more realistic, while the discriminator gets better at spotting fakes.

## Advantages

### *Addressing Data Gaps:*

Provide scalable, cost-effective solutions to the shortage of high-quality, annotated medical images.

Enable intra- and inter-modality translation, such as generating CT scans from MRI data.

### *Privacy Protection:*

Generated without patient data, mitigating privacy concerns and facilitating easier sharing for research and AI development.

### *Cost and Time Efficiency:*

Reduce the expense and time required to collect real-world medical data.

## Disadvantages

### *Lack of Real-World Complexity:*

May not capture subtle variations and nuances, such as tissue density differences or unique lesion patterns.

### *Truth Erosion:*

Over-reliance on synthetic data might distort diagnostic models, leading to inaccuracies in real-world applications.

### *Security Risks:*

Vulnerable to misuse, such as creating deepfakes that can manipulate clinical findings, cause misdiagnoses, or facilitate fraudulent claims.

## Challenges

### *Accuracy and Trust:*

Distinguishing between real and synthetic images may become challenging, eroding trust in AI-generated diagnoses.

### *AI Model Degradation:*

Training systems exclusively on synthetic data risks losing the variability and

richness of real-world cases.

### *Regulatory and Ethical Concerns:*

Balancing innovation with accountability and ensuring synthetic data adheres to healthcare standards.

## Way Forward

### *Collaborative Development:*

Close collaboration between clinicians and AI engineers to ensure synthetic images reflect real-world medical complexities.

### *Human Oversight:*

Establishing regulatory frameworks and maintaining human involvement to ensure ethical and accurate AI applications.

### *Balanced Usage:*

Combining synthetic images with real-world data to enhance diagnostic tools without compromising clinical integrity.

### *Regulatory Safeguards:*

Introducing standards to mitigate misuse and ensure synthetic images are used responsibly in healthcare.

Synthetic medical images offer transformative potential for healthcare but require careful integration with real-world practices to ensure they enhance rather than hinder patient care.



# SECURITY

What's Inside?

- 1. DEFENCE MINISTRY SEEKS ADDITIONAL TO EXPAND SCOPE OF IDEX SCHEME**
- 2. MARITIME EXERCISE MALABAR 2024**
- 3. AFSPA-ARMED FORCES SPECIAL POWERS ACT**
- 4. DRAGON DRONES**
- 5. SPARSH PORTAL**

## DEFENCE MINISTRY SEEKS ADDITIONAL TO EXPAND SCOPE OF IDEX SCHEME

### Context:

In Oct 2024, The Ministry of Defence is looking to expand its flagship Innovations for Defence Excellence (iDEX) scheme and has requested more funding from the Finance Ministry.

Innovations for Defence Excellence (iDEX) recently reached a milestone with the signing of the 250th contract, the first one under the Mission DefSpace.

### About iDEX (Innovations for Defence Excellence):

It is the flagship initiative of the Ministry of Defence (MoD), launched in April 2018.

Aim: To achieve self-reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes and

academia.

iDEX has partnered with leading incubators in the country to provide handholding, technical support and guidance to the winners of iDEX challenges.

iDEX will be funded and managed by a 'Defence Innovation Organization (DIO)' which has been formed as a 'not for profit company as per Section 8 of the Companies Act 2013 by the two founder members, i.e. Defence Public Sector Undertakings (DPSUs) - HAL & BEL.

iDEX will function as the executive arm of DIO, carrying out all the required activities, while DIO will provide high-level policy guidance to iDEX.

Under iDEX, financial support is provided to Start-ups/MSMEs/individual innovators and Partner Incubators through DIO.

## MARITIME EXERCISE MALABAR 2024

### Context:

Maritime Exercise Malabar 2024 is scheduled to take place from 08 to 18 October 2024, beginning with the Harbour Phase in Visakhapatnam, followed by the Sea Phase. Hosted by India, this year's exercise will see the participation of Australia, Japan, and the United States of America.

### About Malabar Exercise:

Initiated in 1992 as a bilateral naval exercise between India and the US, this multilateral war-gaming exercise expanded in 2007 to include Japan and Australia.

Quad and Malabar Exercise are closely

linked through their shared objective of enhancing security cooperation in the Indo-Pacific region.

Quad: Known as the 'Quadrilateral Security Dialogue' (QSD), the Quad is an informal strategic forum comprising four nations, namely -US, India, Australia and Japan.

The group met for the first time in 2007 on the sidelines of ASEAN.

Quad Leaders launched the Regional Maritime Initiative for Training in the Indo-Pacific (MAITRI) to maximise tools provided through Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA).

# AFSPA-ARMED FORCES SPECIAL POWERS ACT

## Why in news:

Manipur government extends AFSPA in hill districts for 6 months.

## Background:

Manipur has been affected by ethnic violence between the tribal Kuki-Zo people in the hills and the Meiteis since May 3, 2023.

AFSPA is applicable in Manipur since 1981. Manipur, a former Union Territory attained Statehood in 1972.

Both the State and Central Governments can issue notifications regarding AFSPA.

Currently, the Ministry of Home Affairs (MHA) issues “disturbed area” notifications only for Nagaland and Arunachal Pradesh. The notification for Manipur and Assam is issued by the State Governments.

## AFSPA:

The AFSPA gives unbridled power to the armed forces and the Central Armed Police Forces deployed in “disturbed areas” as specified under the Act to kill anyone acting in

contravention of law, arrest and search any premises without a warrant and ensures protection from prosecution and legal suits without the Central government’s sanction.

## Disturbed Areas described under AFSPA?

A disturbed area is one that is declared by notification under Section 3 of the AFSPA.

It can be invoked in places where the use of armed forces in aid of civil power is necessary.

The Act was amended in 1972 and the powers to declare an area as “disturbed” were conferred concurrently upon the Central government along with the States.

Once declared ‘disturbed’, the region is maintained as disturbed for a period of three months straight, according to The Disturbed Areas (Special Courts) Act, 1976. The government of the state can suggest whether the Act is required in the state or not.



## DRAGON DRONES

### Why in news?

A deadly new weapon in the Russia-Ukraine War, dragon drones are known to emit a molten metal that burns at 2,427 degree Celsius, essentially raining down fire.

### Definition:

Dragon drones are unmanned aerial vehicles equipped with thermite, a highly reactive substance capable of intense and self-sustaining combustion.

### Thermite Properties:

A mix of aluminium and iron oxide.

Burns at extreme temperatures, difficult to extinguish.

Capable of burning through materials like clothes, trees, vehicles, and even underwater.

Causes severe burns and bone damage in humans.

### Capabilities:

High Precision: Can bypass traditional defences.

Destructive Power: Combines thermite's intensity with drone mobility, making them highly effective and dangerous.

These drones are considered a new and alarming development in modern warfare, leveraging advanced technology for high-

impact destruction.

### Historical Use:

World War I: German zeppelins used thermite-laden bombs as a novel weapon.

World War II:

Widely used in aerial bombing campaigns by both Allies and Axis powers.

Allies dropped ~30 million thermite bombs on Germany and ~10 million on Japan.

Thermite hand grenades were used to disable artillery without explosions.

Modern Use: Primarily by espionage agents and special forces for its intense burning capability without noise.

### Legality of Use:

Permitted in War: Thermite is not banned under international law.

### Restrictions:

Use against civilians is prohibited under Protocol III of the Convention on Certain Conventional Weapons (CCW).

Limited to strictly military targets due to its indiscriminate nature and potential for severe burns and respiratory injuries.

Thermite remains a powerful incendiary tool with specific legal and ethical constraints in warfare.

## SPARSH PORTAL

### Context:

“Out of a total of 32 lakh defence pensioners, 30 lakh have been successfully linked to the SPARSH {System for Pension Administration (Raksha)} portal,” said RakshaMantriShriRajnath Singh during the 277th Annual Day celebrations of Defence Accounts Department (DAD) at Bharat Mandapam in New Delhi on October 01, 2024.

### AboutSPARSH portal:

The SPARSH (System for Pension Administration Raksha) portal is an initiative by the Ministry of Defence to streamline the pension process for the Armed Forces and Defence Civilians:

Pension automation: SPARSH automates the pension sanction and disbursement process.



Direct bank credit: SPARSH credits pensions directly into the bank accounts of pensioners.

Pension information: Pensioners can use the portal to view their pension-related information.

Services: Pensioners can access services through the portal.

Complaints: Pensioners can register complaints through the portal.

Transparent view: The portal provides a transparent view of pension accounts, including a history of events and entitlements.

Efficient management: The Defence Accounts Department administers the system to ensure efficient pension management.





# HISTORY



# ART & CULTURE



## What's Inside?

1. MARATHI AMONG 5 LANGUAGES ACCORDED 'CLASSICAL LANGUAGE' STATUS
2. THE MERAHOU CHONGBA FESTIVAL 2024 WAS CELEBRATED IN IMPHAL
3. HOPFIELD AND HINTON, MACHINE LEARNING PIONEERS, WIN NOBEL PRIZE IN PHYSICS
4. NOBEL PRIZE 2024
5. ANUBHAV AWARDS

# MARATHI AMONG 5 LANGUAGES ACCORDED 'CLASSICAL LANGUAGE' STATUS

## Context:

The Union Cabinet approved the recognition of Marathi, Pali, Prakrit, Assamese, and Bengali as classical languages.

## Significance:

PM Narendra Modi emphasized Marathi as a symbol of Indian pride, stating that the recognition would encourage more people to learn the language.

While these languages are primarily linked to states like Maharashtra (Marathi), Bihar, Uttar Pradesh, Madhya Pradesh (Pali and Prakrit), West Bengal (Bengali), and Assam (Assamese), the broader impact will extend nationally and internationally.

## Background on Classical Language Status

In October 2004, the Centre introduced the category of classical languages with Tamil as the first.

The recognition of a classical language is based on criteria established by a Linguistic Experts Committee.

According to the committee, the following revised benchmarks must be met for a language to be considered "classical":

High antiquity of (its) is early texts/recorded history over a period of 1500- 2000 years.

A body of ancient literature/texts, which is considered a heritage by generations of speakers.

Knowledge texts, especially prose texts

in addition to poetry, epigraphical and inscriptional evidence.

The Classical Languages and literature could be distinct from its current form or could be discontinuous with later forms of its offshoots.

Recognized Classical Languages are: Tamil ( 2004), Sanskrit (2005), Telugu( 2008), Kannada (2008), Malayalam( 2013) and Odia (2014).

## Benefits of Classical Language Status:

Once a language is designated as classical, the Ministry of Education provides various benefits to promote it, including:

Two major international awards annually for scholars of eminence in the language.

Establishment of a Centre of Excellence for Studies in the Classical Language.

Requesting the University Grants Commission (UGC) to create Professional Chairs in Central Universities dedicated to the classical language.

Institutional Support for Classical Languages:

The Ministry of Education has taken steps to promote these languages, such as:

Establishing three central universities in 2020 to promote Sanskrit.

The Central Institute of Classical Tamil facilitates translations of ancient Tamil texts and offers courses.

Centres of Excellence for Kannada, Telugu, Malayalam, and Odia were also set up to promote these classical languages.

## THE MERAHOU CHONGBA FESTIVAL 2024 WAS CELEBRATED IN IMPHAL

### Context:

Recently, people in Manipur celebrated the MeraHouChongba festival symbolizing unity amongst the indigenous people.

### About MeraHouChongba Festival:

It is an annual festival observed in order to strengthen the cordial bond between the indigenous communities living in hills and valley people.

It is only a festival wherein both hills and valley indigenous communities are observed together in the State.

This festival has been celebrated right from the time of NongdaLairen Pakhangba in the

first Century C.E.

Every year, in the month of Mera, which falls in September/October, this festival is celebrated, in which all the village Chiefs or Khullakpas and peoples from the surrounding hill areas fully take part

The royal palace officials share the same dias as the multiple village chiefs from communities such as Mao, Kabui, Zeme, Kom, Liangmei, and many more.

The main function of MeraHouChongba festival is the exchange of gifts between the King and village Chiefs and performance of cultural show and sports.

## HOPFIELD AND HINTON, MACHINE LEARNING PIONEERS, WIN NOBEL PRIZE IN PHYSICS

### Context:

#### *Nobel Prize 2024 Physics*

The 2024 Nobel Prize in Physics is awarded to John J. Hopfield and Geoffrey E. Hinton for the use of statistical physics concepts in the development of artificial neural networks.

**Artificial neural networks:** These are fundamental in machine learning and artificial intelligence. These help by allowing machines to find and recognize patterns in extremely large datasets and make learning possible.

**Significance:** Artificial neural networks have also been used to advance research across branches of physics such as particle physics, material science, and astrophysics.

They have now become essential parts of our daily lives, for example, in facial recognition and language translation.

**Risks:** While machine learning has enormous benefits, its rapid development has also raised concerns about using this new technology safely and ethically.

## NOBEL PRIZE 2024

### Nobel Prize 2024 Literature

The 2024 Nobel Prize in Literature has been awarded to South Korean author Han Kang, recognized “for her intense poetic prose that confronts historical traumas and exposes the fragility of human life.”

Han Kang has a distinctive approach to exploring significant historical traumas and the unseen societal norms that shape human experiences.

Her works delve into the delicate balance between life and death, body and soul,

showcasing her unique insight into the human condition.

**Literary Works:** Her literary journey began in 1993 with the publication of several poems in the magazine Literature and Society.

Han Kang's prose debut came in 1995 with the short story collection Love of Yeosu.

She gained major international recognition with her novel *The Vegetarian*, published in 2007. This work, written in three parts, explores the tumultuous consequences faced by the protagonist, Yeong-hye, as she rejects societal norms surrounding food consumption.

Notably, Han Kang is the first South Korean author to receive the Nobel Prize in Literature, marking a significant milestone in the global recognition of Korean literature.

### Nobel Prize 2024 Peace

The Nobel Peace Prize for 2024 was awarded to the Japanese organization Nihon Hidankyo, for its efforts to achieve a world free of nuclear weapons and for demonstrating through

witness testimony that nuclear weapons must never be used again.

Nihon Hidankyo is a grassroots movement, comprised of atomic bomb survivors from Hiroshima and Nagasaki—commonly referred to as Hibakusha.

In response to the atomic bombings in August 1945, this global movement emerged, uniting individuals committed to raising awareness about the devastating humanitarian consequences of nuclear weapon use.

The historical witnesses of the 1945 bombings have played a crucial role in generating and solidifying global opposition to nuclear weapons by sharing their personal experiences, creating educational campaigns, and issuing urgent warnings about the dangers of nuclear proliferation and usage.

Through their narratives, the Hibakusha help society articulate the indescribable, contemplate the unthinkable, and comprehend the profound pain and suffering inflicted by nuclear weapons

## ANUBHAV AWARDS

### Why in news?

On the directions of Prime Minister Shri Narendra Modi, Department of Pension & Pensioners' Welfare had launched an online platform named 'Anubhav' in March, 2015 to enable 'eligible' retiring/retired government employees in sharing their experiences of working with the Government.

### About ANUBHAV Awards:

It recognizes the contribution made by Retired Officials to Nation building while working in Government and to document the administrative history of India by written narratives.

The ANUBHAV Portal, established in March 2015, serves as an online platform for retiring and retired government employees to share

their experiences.

The portal was launched by the Government of India, Ministry of personnel, Public Grievances & Pensions, Department of Pension & Pensioners' welfare.

### Objectives:

It aims to create a database of significant suggestions and work experiences.

It channels the human resource of retiring employees for nation building.

Enable Ministries/ Departments to take crucial steps while considering useful and replicable suggestions.

### Eligibility:

To participate in the scheme, retiring Central Government employees/pensioners are

required to submit their Anubhav write ups, 8 months prior to retirement and up to 1 year after their retirement.

Thereafter, the write-ups will be published after assessment by concerned Ministries/ Departments. The published write-ups will

be shortlisted for Anubhav Awards and Jury Certificates.

Each ANUBHAV Awardees will be felicitated with a medal and certificate and a Prize of 10,000 rupees, whereas a Jury certificate Winner will be presented with a medal and a certificate.